SMPTE RECOMMENDED PRACTICE — RP 56–1985

Safe Action and Safe Title Areas for 8-mm Release Prints

Introduction

Early in the development of the 8-mm type S program, it was recognized that the format would be used both for direct front and rear projection systems. Some committee members were concerned that the usable projectable image area might be different without specific standards for the two systems. It was, therefore, decided that it would benefit producers and laboratories if safe areas were developed for the 8-mm type S and 8-mm type R formats. This concept became more important as the image area documents changed from the concept of specifically defined areas with tolerances for size and positioning to the internationally agreed to system of developing a minimum camera area and a maximum projectable image area.

When the minimum and maximum area concept was accepted, the restatement of the positioning tolerances for the width caused a slight change such that the precise ideal format of 4:3 was lost in most cases. However, during the development of the initial committee document, it was recognized that there may be future application of the 8-mm type S system in television. Therefore, the need to maintain a precise 4:3 format for telecine use is significant. To derive the most useful areas, the committee proposes to utilize the standardized maximum projectable image area height for each format as the basis for all measurements.

For clarity and ease of understanding, a value of 100 percent for both the height and width has been established as shown in the figure. Because an ideal format does not exist, the 100 percent image area height is established as the basic parameter and the 100 percent width is derived by a ratio multiplication of 4:3 times the height. All other values shown in the table are percentage ratios with the exception of those in the last column, which are derived from the related American National Standards (see Section 3.4). By applying the above principle, the document achieves maximum usefulness while losing only 2 percent of the standardized width which can, when needed, be available for direct projection application.

1. *Scope*

1.1 This practice specifies the dimensions of the nominal safe action and safe title image areas for 8-mm release prints. The information provided applies to the use of these prints by either direct front or rear screen projection.

1.2 The specifications are also applicable to reversal original photography.

2. *Definitions*

2.1 The safe action image area is the area within which all significant action should take place to ensure visibility of the action in the usual projection situation.

2.2 The safe title image area is the area within which the graphic information (e.g., titles, credits, tabulations, etc.) must be confined to prevent loss of this information (cropping) in the usual projection situation.

3. *Specifications*

3.1 The dimensions shall be as given in the figure and table.

3.2 For convenience, the dimensions are also expressed as a percentage of the nominal maximum projection image height and width.

3.3 The safe action and safe title areas are nominally centered within the maximum projectable image area.

3.4 The dimensions of image areas are derived from the following American National Standards:

Motion-Picture Film (8-mm Type R)—Camera Aperture Image, ANSI PH22.19-1983

Dimensions of Projectable Image Area on 8-mm Type R Motion-Picture Film, ANSI PH22.20-1981

Dimensions of Projectable Image Area on 8-mm Type S Motion-Picture Film, ANSI PH22.154-1982

Dimensions of Camera Aperture Image on Super 8 Motion-Picture Film, ANSI PH22.157-1971 (R1984)

3.5 A format ratio of 4:3 is maintained for all areas. The maximum projectable image height is considered as the basic parameter for each format.

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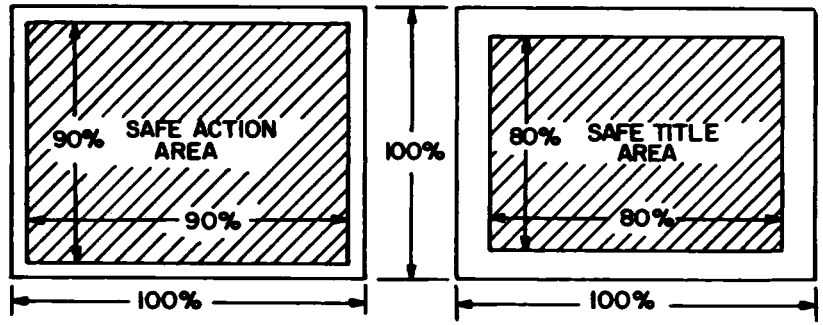


Maximum Projectable Image Area

Note: Safe areas are centered. True centers for all areas are established by an intersection of corner-connecting diagonal lines.

Dimensions

	Maximum Projectable Area		Safe Action Area		Safe Title Area		Minimum Camera Image Area	
	in	mm	in	mm	in	mm	in	mm
8-mm Type S								
Height	0.158	4.01	0.142	3.61	0.126	3.20	0.163	4.14
Width	0.211	5.36	0.190	4.83	0.169	4.29	0.224	5.69
8-mm Type R								
Height	0.130	3.30	0.117	2.97	0.104	2.64	0.143	3.63
Width	0.173	4.39	0.156	3.96	0.138	3.51	0.181	4.67

PROPOSED

SMPTE RECOMMENDED PRACTICE — RP 141

Background Acoustic Noise Levels in Theaters and Review Rooms

1. *Scope*

1.1 This practice provides measurement methods and recommended maximum levels for indoor background sound pressure levels in theaters and review rooms. The practice is limited to the noise of heating, ventilating, and air conditioning systems, intrusive noise from the projector(s) associated with the theater, and noise from any other mechanical or electrical equipment in the theater building. The practice is intended for application when the background noise is essentially a steady-state sound, without strong time-varying components.

1.2 The practice does not cover intrusive noise from other sources outside the theater, such as airplanes, highway traffic, adjacent theaters, or the like.

1.3 The practice does not cover noise resulting from the operation of the sound system in the theater.

1.4 The practice does not cover vibration of the theater; i.e., movement of the building below 20 Hz.

2. *Test Conditions*

2.1 The air-handling system of the theater must be brought to the noisiest state in which it is used during screenings, generally "on," with cooling compressors operating. Any other mechanical or electrical equipment, such as projector exhaust fans, sump pumps, transformers, or the like, within the theater building should be brought to the noisiest state that will occur during screenings. The projector system should be running normally, with film. Power to the theater sound system should be turned off.

2.2 Measurements shall conform with American National Standard Methods for the Measurement of Sound Pressure Levels, ANSI S1.13-1971 (R1976), and shall be made with a type 1 meter as specified in American National Standard Specification for Sound Level Meters, ANSI S1.4-1983, and a class II octave band filter or class III third-octave band filter in accordance with American National Standard Specifications for Octave, Half-Octave, and Third-Octave Band Filter Sets, ANSI S1.11-1966 (R1976).

2.3 The measurement system shall be set to "slow" reading.

2.4 The measurement system shall be calibrated immediately before use by means of an acoustic calibrator accurate to within ± ½ dB for sound pressure level.

2.5 At high frequencies, room background noise levels are often in the same range as ordinary measurement equipment noise. Therefore, care should be used to ensure that the measured levels are not influenced in any band by noise in the measurement instrument(s) by testing the measurement instrument(s) under all relevant conditions, including switch settings of any attenuators or gain controls. Do not report noise levels at or below the capability of the instrumentation in use.

3. *Measurements*

3.1 Measurements shall be recorded in octave bands over the range from 31.5 Hz to 16 kHz as sound pressure level.

3.1.1 The preferred octave band center frequencies are 31.5, 63, 125, 250, and 500 Hz, and 1, 2, 4, 8, and 16 kHz.

3.1.2 If third-octave band measuring equipment is available rather than octave band or switchable bandwidth equipment, measurements may be made in third-octave bands and converted to octave bands by logarithmic addition of three bands (one at the octave band center and the two surrounding it):

$$\textit{Octave Band SPL} = 10 \log_{10} \left(10^{\frac{L1}{10}} + 10^{\frac{L2}{10}} + 10^{\frac{L3}{10}}\right)$$

where *L1 = SPL of first ⅓ octave, L2 = SPL of second ⅓ octave,* and *L3 = SPL of third ⅓ octave.*

3.2 The measurements to be recorded shall be made by averaging at a sufficient number of locations to provide averages with standard deviations under 2 dB, usually six locations chosen at random within the seating area at seated ear height at least 1.2 m (4 ft) from any wall surface will suffice unless there is an unusual spatial distribution of background noise. If the total range of the measurements in an octave band is less than 4 dB, then arithmetic averaging may be used; if more than 4 dB, then the average must be done logarithmically. Some review rooms may be so small that strong room modes will influence the low-frequency band measurements. Thus a small standard deviation may be unobtainable. In such cases, the low frequency bands may not be reliably reported, and therefore must be neglected in any calculations.

3.3 Plot the spectrum resulting from the recorded measurements on octave band noise criteria graph paper such as that shown in the figure. The point of the highest excursion of the background noise spectrum compared to the noise criteria curves is the NC rating. (Note that the original NC curves [see 5.1] have been extrapolated to the 31.5-Hz and the 16-kHz octave band for the purposes of this practice.)

4. *Recommended Levels*

4.1 The maximum desirable noise criteria ratings by classification are:

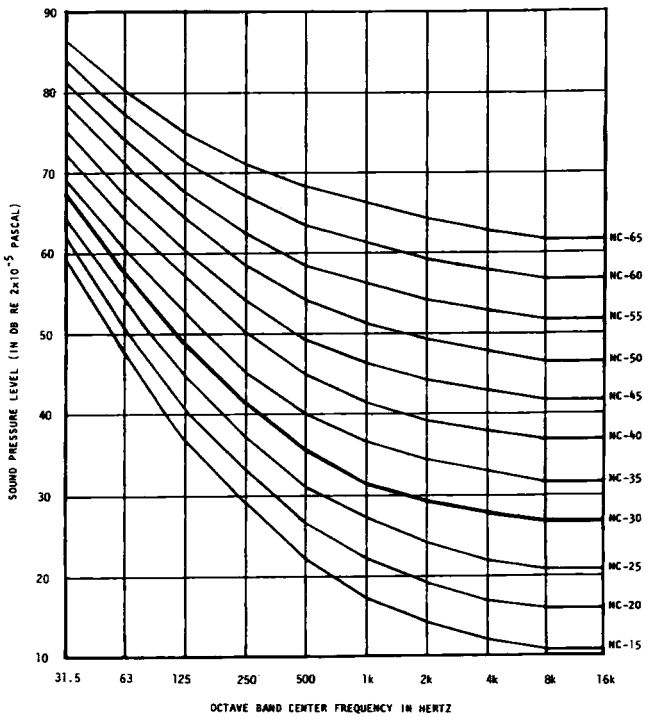
A. Review room and premier showing:	NC-20 to NC-25
B. First-run theaters:	NC-30
C. Sub-run theaters:	NC-35
F. Sub-acceptable which can lead to dialog intelligibility problems and complaints:	NC-45

4.2 The classifications above should be applied to the highest use of a theater; that is, if a theater is used for both first and sub-runs, classification B should apply.

5. *References*

5.1 Beranek, Leo L., ed., *Noise and Vibration Control.* McGraw-Hill Book Company, New York, 1971, p. 565.

5.2 Blazier, Warren E., Jr., "Revised noise criteria for application in the acoustical design and rating of HVAC systems," *Noise Control Engineering,* vol. 16, no. 2 (March-April 1981), pp 64–73.



Appendix

(The appendix is not a part of this SMPTE Recommended Practice; but is included for information purposes only.)

A1. The noise criteria curves are to be used for rating indoor noise levels. The curves, if followed as design criteria, do not result in neutral sounding background noise spectra. Many listeners observe that an NC spectrum sounds too "rumbly" and too "hissy," having too much very low- and very high-frequency energy. A constant sloped spectrum at —5 dB octave from low to high frequencies has been observed as producing a more neutral sounding spectrum and is probably more suitable for design purposes (see 5.2).

A2. The NC rating of a space does not represent the spectrum of the background noise; valuable information about the "quality" of the noise in a space is missing from any single number rating. It may be useful to retain records of the complete spectrum, since there exist methods to further characterize the noise, such as the RC method, which may yield more information. In particular, spectra with narrow band concentrations of energy sound "tonal"; subjectively, they might be increased in rating by as much as 8 dB relative to the continuous spectrum, depending upon how far above the average spectrum the tonal component lies.

A3. Too little noise in a theater or review room may be a problem as well as too much. With too much noise, detail is obscured and, ultimately, intelligibility suffers. With too little noise, intermittant intrusive noise may become audible and annoying; therefore, it is advisable to use reasonable background noise levels to mask intrusive noise sources.

A4. Dubbing studios are advised that if the background noise levels in studios are much lower than those in theaters, low level sounds which are audible in the dubbing studio may be inaudible in theaters because of masking.

A5. As a guide to whether high levels of vibration are present, measurement of the "linear" weighting of a type I sound level meter compared with the octave band sound pressure level can provide useful information: if the level of the linear measurement exceeds the logarithmically added sum of the band levels from 31.5 Hz to 16 kHz by more than 3 dB, then vibration which may be detectable by the audience is present.

A6. As a practical matter, large diameter microphones are useful for measuring the sometimes very low theater noise levels due to their low self noise, but large diameter microphones also show relatively strong diffraction effects at high frequencies. To obtain an adequate spatial average at high frequencies, the microphone should be rotated at least about a line perpendicular to the floor and a line perpendicular to the side walls to obtain the average reading at each location for the high frequency bands.

PROPOSED

SMPTE RECOMMENDED PRACTICE — RP 140

Position of Photographic Audio Record for Routine Test Signals

1. *Scope*

This practice reserves the section of the audio record available for routine audio tests on negative photographic audio records. The position specified is for audio records in the editorial or parallel sync position before the record has been advanced.

2. *Audio Record Test Area*

The sync pop synchronizes with the "2" frame of the SMPTE leader. Following the pop, there shall be two unmodulated frames. The next 14 frames of the audio record negative are reserved for routine audio tests. These tests may include a cross-modulation test, a sequence of tones, or unmodulated record for making base density readings. When this area is used on a negative, the test is not to be removed when preparing the negative for printing. (Forty-one unmodulated frames will still remain following the test signal frames and the start of program audio.)