

Measurement Methods for Motion-Picture Camera Acoustical Noise — Field Method



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1 Scope and field of application

1.1 This guideline provides a simple method for measuring the acoustical noise output of motion-picture cameras in use on the set of a production. The guideline applies to noise occurring in only one circumstance: in front of a given camera in a specific acoustical environment. Thus, the measurements given by this guideline are not comparable with others made in different situations.

1.2 This guideline also gives limits on acceptability of measured camera noise due to the combined effects of the camera and its environment. Methods for reducing camera noise which are practicable on the set are included.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this guideline. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this guideline are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

IEC 60651 (1979-01), Sound Level Meters

3 Definitions

For the purpose of this guideline, the following definitions apply:

3.1 sound pressure level, L_p , in decibels: Twenty times the logarithm to the base 10 of the ratio of the sound pressure to the reference sound pressure. The frequency weighting network used shall be indicated; for example, A-weighted sound pressure level, L_{pA} . The reference sound pressure is 20 μPa .

3.2 reference point: The center of the film aperture in the camera gate.

3.3 measurement distance: The distance between the reference point and the measurement point.

3.4 background noise: The A-weighted sound pressure level at the microphone position with the camera inoperative.

4 Acoustical environment

4.1 Criteria for adequacy of the test environment

Ideally, the test environment should be free from reflecting objects other than a single reflecting plane so that the source radiates into a free field over a reflecting plane. In practice, measurement to this guideline shows the effects of the environment. No environmental correction factor is applied in order to keep the measurement simple, but users are cautioned that the results are not directly comparable from one situation to another.

4.2 Criterion for background noise

At the microphone positions, the A-weighted sound pressure level due to the background noise shall be at least 3 dB below the A-weighted sound pressure level with the source operating. (Background noise levels which are less than 3 dB below the sound level of the source to be measured are too high for the purposes of this guideline. Under such circumstances, it is not possible to determine the A-weighted sound pressure level of the source to reasonable accuracy. However, the result determined with higher background noise levels may be useful as an indication of the upper limit of the sound pressure level of the source.)

5 Instrumentation

5.1 General

A sound level meter that meets the requirements of IEC 60651 shall be used switched to the "impulse" characteristic.

To minimize the influence of the observer on the measurements, a cable should preferably be used between the microphone and the sound level meter. The observer shall not stand between the microphone and the source whose sound pressure level is being measured.

5.2 Calibration

At least before each series of measurements, an acoustical calibrator with an accuracy of ± 0.5 dB shall be applied to the microphone for calibration of the entire measuring system, including cable, if used, at one or more frequencies. One calibration frequency shall be in the range of 250 Hz to 1000 Hz. The calibrator shall be checked annually to verify that its output has not changed.

6 Camera installation and operation

6.1 General

The camera to be tested shall be installed and mounted with respect to the reflecting plane in the position that is representative of normal use. The camera shall be provided with all noise-control means normally employed, such as any blimp, barney, or optical clear-glass filters in front of the lens.

6.2 Auxiliary equipment

Care shall be taken to ensure that any auxiliary equipment does not radiate significant amounts of sound energy in the test environment in conformity with 4.2. If practicable, all auxiliary equipment necessary for the operation of the device under test shall be located outside of, or acoustically isolated from, the test environment.

6.3 Operation of the camera during tests

During the acoustical measurements, the source shall be operated as follows: