

SMPTE RECOMMENDED PRACTICE

Relative and Absolute Sound Pressure Levels for
Motion-Picture Multichannel Sound Systems —
Applicable for Analog Photographic Film Audio,
Digital Photographic Film Audio and D-Cinema



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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Administrative Practices.

SMPTE RP 200 was prepared by Technology Committee 20F.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Recommended Practice. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

Introduction

This section is informative and does not form an integral part of this Engineering Document.

The motion picture industry is unique in having the target and capability of ensuring that the audio heard in the playback theatre matches that heard in the mixroom/dubbing theatre when the content was created. The two main criteria defining the audio environment are frequency response and level. B-chain electroacoustic frequency response is defined in SMPTE ST 202. This companion document covers a method for measuring and defining the absolute and relative audio level using steady state wideband pink noise. Note that the procedures defined in this document do not apply in the home, with or without picture, as the consumer normally has an uncalibrated and arbitrarily adjusted playback level.

1 Scope

This practice specifies a measurement method and wideband sound pressure levels for motion-picture dubbing theatres, review rooms, and indoor theatres using steady state wideband pink noise methodology. Together with SMPTE ST 202, it is intended to assist in standardization of reproduction of motion-picture sound in such rooms.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows. Normative prose shall be the authoritative definition. Tables shall be next, followed by formal languages, then figures, and then any other language forms.

3 Normative References

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

SMPTE ST 202:2010, Motion-Pictures — Dubbing Stages (Mixing Rooms), Screening Rooms and Indoor Theatres — B-Chain Electroacoustic Response

IEC 60268-17 (1990-10), Sound System Equipment — Part 17: Standard Volume Indicators

4 Definitions

4.1

absolute sound pressure level

the spatially averaged sound pressure level of a single channel of a theatrical sound system measured with broadband pink noise at the *reference electrical level* as a stimulus. The reference level for sound pressure is $20\mu\text{N/m}^2$.

4.2

average responding meter

a meter which provides a voltage indication proportional to the average value of the rectified signal, with ballistics as described in IEC 60268-17.

4.3

bass extension

the technique of creating low-frequency information where there is no dedicated *LFE* channel, i.e. from an analog film photographic sound-track. The audio is taken from the sound-track, low-pass filtered, processed, and sent to the subwoofer (see Annex A.3).

4.4

B-chain (final chain)

that part of a motion-picture sound reproduction system, as shown in Figures 1 and 2, commencing at the audio input source selector and terminating in the listening area defined in Figure 3 (see Annex A.5 and Annex A.7).

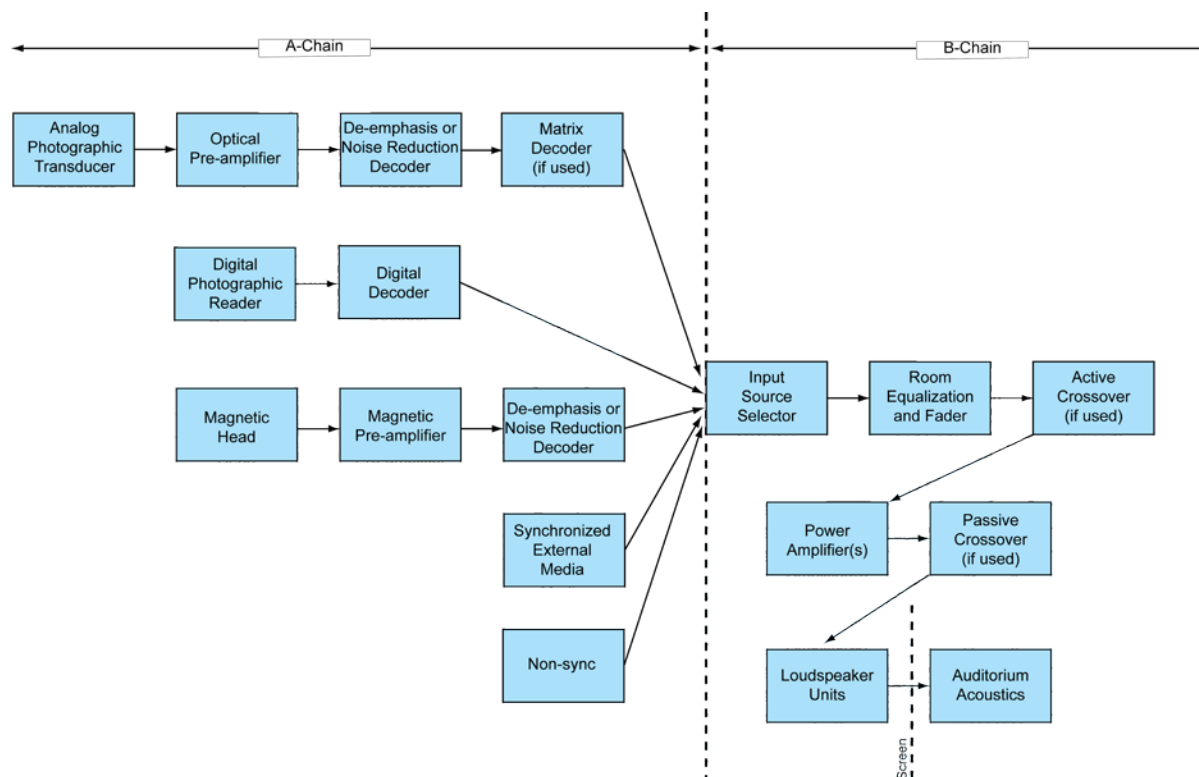


**Figure 1 – Complete theatrical sound reproduction chain
(Traditional Film Formats – see Annex A.7)**