

CEA Bulletin

Home Theater Recommended Practice: Audio Design

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Foreword

This guide outlines recommendations for the audio design of high performance home theaters. CEDIA and its certified Electronic Systems Contractors (ESCs) follow these practices, where applicable, to deliver high value to dedicated home theater environments, helping ensure full performance potential for the equipment and the room.

Home Theater Audio Design provides a baseline for the design and installation of residential spaces to be used for home theater or multi-channel music playback. While the focus of these two applications is home theater audio design, many of the practices are applicable to multi-purpose, two-channel and other acoustic spaces.

CEDIA recommendations are assembled from its ESCs' years of experience and cumulative wisdom. Industry standards, practices and recommendations published by other relevant bodies, as well as commonly accepted commercial practices now regarded as "de facto standards" in the audio industry, are also represented in this document.

Standards include those from:

- Society of Motion Picture and Television Engineers (SMPTE)
- Audio Engineering Society (AES)
- International Telecommunications Union (ITU)
- European Broadcasting Union (EBU)
- International Electrotechnical Commission (IEC)
- International Organization for Standardization (ISO)
- American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE)

Accepted commercial practices include those from:

- Dolby Laboratories, Inc.
- THX, Ltd. (THX)
- Imaging Sciences Foundation (ISF)

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Introduction

Home theater rooms are gathering spaces with one main purpose: watching movies. These rooms can also have other uses like listening to and performing music, entertaining, gaming, or simply lounging. It is important that the professionals who deliver the home theater experience be aware of the precise set of video and audio standards by which film content is created. *Home Theater Audio Design* outlines the various design parameters relevant to the proper design of a home theater that meets relevant industry guidelines. Additionally, these practices ensure that a home theater supports other media uses such as music, gaming, and broadcast TV.

Whether used as a dedicated space or a multi-purpose space, a properly executed home theater should be able to faithfully reproduce the picture and sound content. That's because the film director and the entire crew working alongside the director carefully craft the content to create an emotionally engaging story that can transport the audience to far away lands in far away times. The best way to ensure that an ESC's projects are successful and that customers are satisfied is simply adhering to movie technical production standards.

As is evident from the length of this document, when designing a home theater, many factors come into play. Several are interdependent and interactive, and the design process will invariably be iterative. This means that every step will need to be revisited and altered, continuing around the circle of decision points multiple times until the work is finished. Some compromises are inevitable. For example, the picture screen and front speakers will compete for space since they need to be in the same location. Of the several ways to deal with that issue, some yield better overall results than others. Ultimately, the best sounding and best looking home theater is the one with the most intelligent set of compromises!