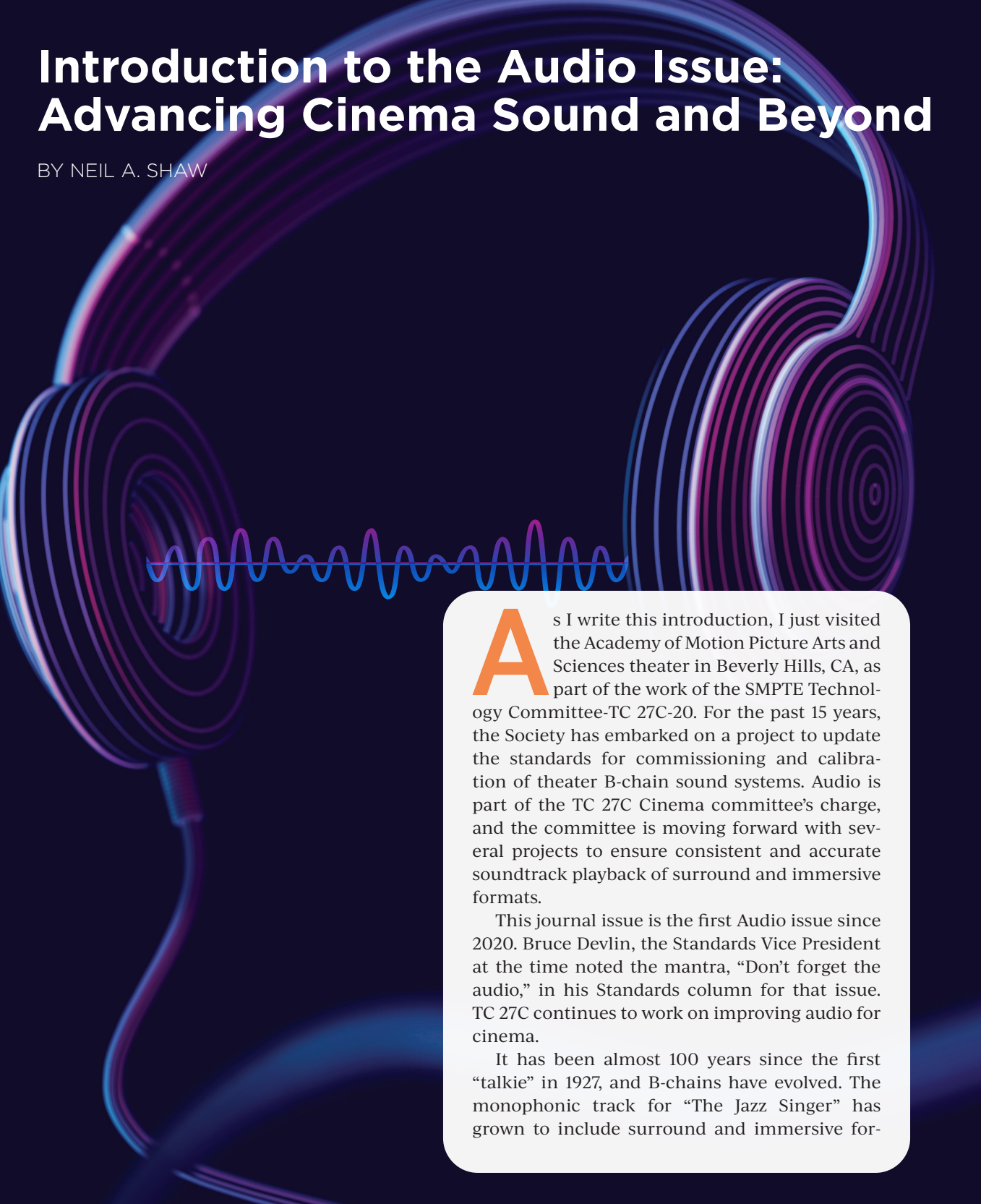


# Introduction to the Audio Issue: Advancing Cinema Sound and Beyond

BY NEIL A. SHAW



**A**s I write this introduction, I just visited the Academy of Motion Picture Arts and Sciences theater in Beverly Hills, CA, as part of the work of the SMPTE Technology Committee-TC 27C-20. For the past 15 years, the Society has embarked on a project to update the standards for commissioning and calibration of theater B-chain sound systems. Audio is part of the TC 27C Cinema committee's charge, and the committee is moving forward with several projects to ensure consistent and accurate soundtrack playback of surround and immersive formats.

This journal issue is the first Audio issue since 2020. Bruce Devlin, the Standards Vice President at the time noted the mantra, "Don't forget the audio," in his Standards column for that issue. TC 27C continues to work on improving audio for cinema.

It has been almost 100 years since the first "talkie" in 1927, and B-chains have evolved. The monophonic track for "The Jazz Singer" has grown to include surround and immersive for-

mats for various media. While cinema sound is a focus of 27C, audio for pictures is not limited to the cinema or even soundtracks for other media. There are important and necessary audio-related processes for today's distribution services for content delivery, including over-the-top (OTT) streaming, over-the-air, cable, and satellite.

Calibration of cinema B-chains is essential for the soundtrack to match, as much as possible, what is produced in the dub stage by the sound team to the director's vision. Current methods use a two-channel measurement system to compare the reference signal to the measured signal. The first paper, "Transfer Function Measurements When the Reference Signal is Known but not Accessible," introduces a method that uses a recording, a virtual reference, in the analyzer so that only the microphone signal from the venue is needed. The technique can also correct for sample rate differences between the playback system (B-chain) and the analyzer.

A new way to adjust the loudness range for OTT and broadcast is proposed in "Speech Intelligibility and Audio Monitoring in OTT." A review of loudness normalization, loudness to Dialog Ratio (LDR), and listening tests in three studios using some pilot test clips is presented for three situations (level by meter, level at "moderate" level, and a tilt at 1 kHz in response) to determine satisfactory speech intelligibility; listening tests with some clips with known listener complaints with speech intelligibility; and perceived speech intelligibility for three frequency responses (flat, and tilts at 1 kHz with both -6 dB and -12 dB at 20 kHz). The improved intelligibility with the equalization tilt looks similar to the X-curve.

As content workflows increasingly use IT infrastructures and

software-based applications, asynchronous operations allow for mesh-like interconnections, enabling event-driven architecture. Concepts and system architecture, as well as operational improvements, including, but not limited to, latency reduction and improved reliability, are addressed in the paper "The New Paradigm of Software Architected Broadcast Facilities: An Asynchronous Media Framework Running on IT Infrastructure."

"Cinema Sound Playback Level and Audience Satisfaction," follows a *Journal* article from 25 years ago, "Are Movies too Loud." On a visit to the local bijou, one can experience loud special effects. Due to complaints from audience members, theater managers have turned down the cinema processor to attenuate the loudest portions of a soundtrack. This can bury the dialogue to a point that is hard to understand. This paper presents a study of genres, audience age, gender, and fader level vs. subjective evaluations of overall loudness, loudest scenes, and dialogue level.

The final paper shifts from audio to virtual production. "Demystifying the Use of Compression in Virtual Production" presents a methodology for assessing bitrates, image syn-

chronization, color balance, video compression, latency, and quality assessment parameters. The author uses six popular codecs and analyzes a dataset of four video sequences to assess their impact on in-camera quality.

To close, as soundtracks evolve, the 27 TC-20 B-chain group investigations to better understand soundtracks and cinema performance include an ad hoc group (AHG) on dialog intelligibility, an AHG on linearity and coherence, an AHG on coverage, a Drafting Group (DG) on clip-analysis, a DG on Characteristics and Expectations, a DG on Characteristics and Expectations Technical Documents, a DG for the revision of ST 202 Dubbing Stages (Mixing Rooms), Screening Rooms and Indoor Theaters electroacoustic response, and related standards. The TC 27C-10 D-Cinema has a study group (SG) on D-Cinema Origins.

#### About the Author



Neil A. Shaw is the principal at Menlo Scientific Acoustics, Inc., and a consultant in acoustics and communications technologies.

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