



Keith Yates Design

Architectural Acoustics & Theater Engineering

AVSForum Awards Keith Yates Design Home Theater of the Decade

Cinematographer's Connecticut Private Theater Project by KYD Wins Prestigious Award

Auburn, CA – January 20, 2020 – Keith Yates Design, the world-renowned master of the science of private theater design, engineering and calibration, has been awarded the [Home Theater of the Decade](#) by the AVSForum for their project with cinematographer Rob Hahn. When reviewing AVS Forum member reactions to past Home Theater of the Month winners, the choice for Home Theater of the Decade was obvious: [The Hahn Theater](#) by Keith Yates Design.



“This no-holds-barred theater is well known to AVS Forum regulars who frequent the site and follow the Home Theater of the Month series... it sets the standard for performance. The theater’s owner, Rob Hahn is a retired Hollywood cinematographer with A-list credentials, which helps explain where the inspiration—as well as the resources—to build this epic theater came from,” stated Mark Henninger, AVSForum.com. “In this context, the Hahn Theater by Keith Yates Design represents an ideal—covering all the bases needed to deliver a ‘truly reference’ viewing experience in a home theater. Keith and his team understand what it takes to turn sound into something tangible, visceral, that tricks you into thinking what you hear is real... and then tie it into what’s on screen in a manner that achieves transcendental suspension of disbelief.”

“Rob Hahn first connected with me in early 2012 for what would turn out to be our tenth [Black Label project](#), but this time with two pivotal differences,” Keith recounts. “First, Rob’s infectious passion sparked the architectural direction and animated our engineering discussions. And second, he ended up publicly sharing, in three AVS Forum threads, what we were up to and some of the art and science behind it,” recalled Keith Yates. “This Home Theater of the Decade

honor is largely the result of Rob doing what he did for decades as a Hollywood cinematographer: Train the light on others. Thank you, Rob, my friend, and thank you, AVS Forum for honoring what our partnership with Rob has created. I hope Rob's passion inspires others and the entire community as much as it did my team and me."

The Inspiration

Rob Hahn's motivation to build such an ambitious theater came directly from his experience as a DP (Director of Photography) in Hollywood, where "you work for months and months away from your family, only to see your work displayed in movie theaters on screens with dim bulbs, incorrect framing, out of focus lenses, and sound so painfully loud, it's unpleasant." To solve this problem, Rob decided to "build a theater that will properly showcase films in the manner they were meant to be seen - on a large constant-area screen, with powerful, intense yet delicate sound."

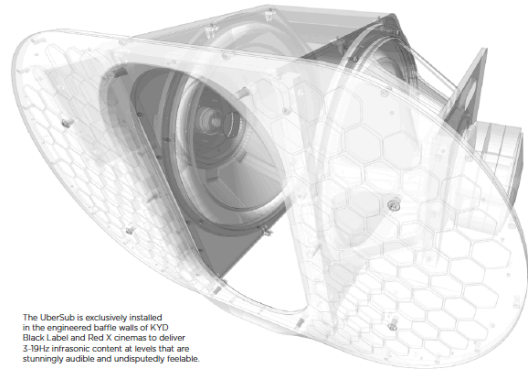
Keith Yates' vision was inspired after sitting under the stars at the edge of the Grand Canyon. Legs dangling over the abyss and staring into the blackness, he imagined a giant, brilliant film screen appearing maybe 50 yards in front of him, somehow magically suspended over the canyon, the glowing image surrounded by the huge black chasm. The screen was a vivid window into another world, like a giant light bulb, but with no light-reflecting surfaces around it to dilute the intensity and purity of the filmmaker's vision.

Together, they collaborated on Keith's architectural sketches and his team's 3D computer model, which allowed Rob to navigate around, zoom in and out, and attach notes to elements as large as the stage and proscenium, and as small as the tiniest molding profile. The result that their back-and-forth produced was something even better than Keith's Chasm. They got Rob's Chasm, and many agree that it worked.

Inventing a Mighty Monster

Human hearing extends down to 20Hz, which is three octaves below 20Hz, the low frequency "limit" tossed around in the AV world. This ultra-deep bass region below 20Hz is referred to as infrasonic. There's not much natural infrasonic content in music, though movies are positively pulsing with it: collisions, explosions, slams, stampedes, trains, helicopters, thunder, earthquakes, even the relatively distant sound of the family car quietly burbling in the garage.

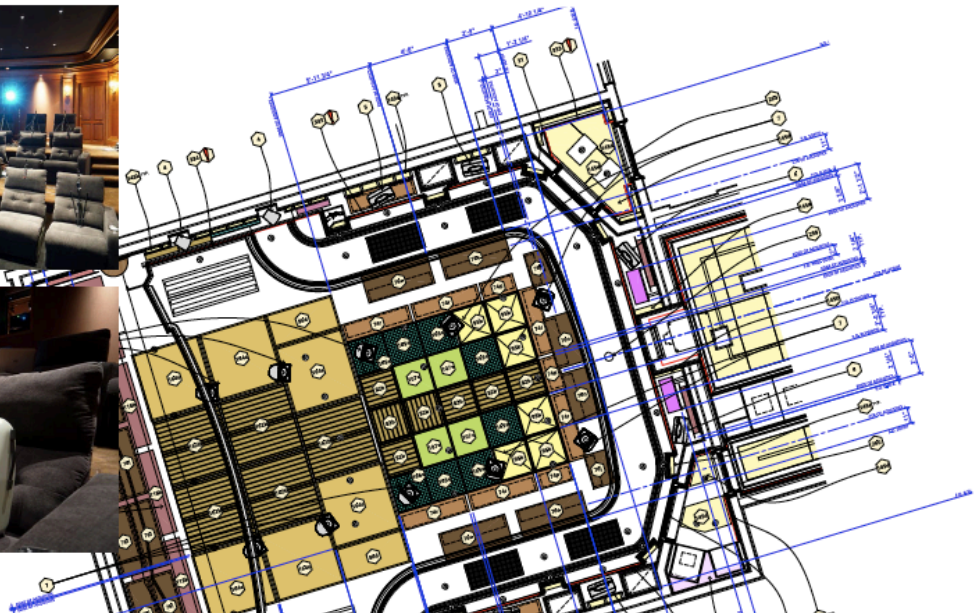
Although it's easy to find infrasonic-rich movie content, it's nearly impossible to find a subwoofer that can actually reproduce it. The physics of infrasonics are punishing: think 2-foot diameter subwoofer drivers in cabinets the size of walk-in closets. And Rob would need half a dozen of those closet-size behemoths plus a rack of multikilowatt amplifiers to drive them. When Rob said the first test disc he intended to play in his new room was Spielberg's *War of the Worlds*, Keith knew they had to actually solve the problem, and cleanly, from 20Hz all the way down to 3Hz. The end result of tackling this monster of a challenge was KYD's invention of their UberSub™ infrasonic subwoofer, six of which were installed into an engineered baffle wall taking up no additional space.



The UberSub is exclusively installed in the engineered baffle walls of NYC Back Label and Red X cinemas to deliver 3-10Hz infrasonic content at levels that are stunningly audible and undepotably feelable.

To Suspend Disbelief

A blind college Psychoacoustics instructor of Keith's had a knack for walking into an unfamiliar space and describing its size, shape, and placement of major furnishings. We all, blind or sighted, identify our surroundings by the way sound reflects off things in front of, behind, above, below, and to the sides of us. After Keith's first meeting with Rob, he imagined his blind instructor walking into Rob's theater, only to give up and say, "I have no idea how big this room is, or its shape, nothing. Yet I hear a room with a rich, natural ambience all around me; it's alive and glows." If Keith could get Rob's room to create a rich, soft acoustic glow, free of any strong individual reflections, he could stop the room from breaking the spell by announcing, 'Hey, wait, you're not in a jungle, you're just in a living room watching a movie.' Without the room's specific acoustic signature fighting the soundtrack's, Rob would be much more likely to suspend disbelief and enter the movie. Keith's pursuit led to the team to model different acoustic scheme solutions using ray-tracing, finite-element analysis, fluid dynamics simulations, and strange 3D microphones designed for concert hall and auditory perception research.



The Quietest of Quiet Rooms

With the room envelope and projector enclosure optimized to reject intrusive noise, the heating/cooling system stood as the largest source of noise pollution. The noise criterion for the room was set at NCB 0 with the HVAC system operating at 7-10 air changes per hour. This ventilation rate, driven by our Indoor Air Quality requirements, is 3 to 4 times higher than commonly achieved in custom homes in North America. The measured result was a NCB -6 (minus 6), which is just below the human hearing threshold, and appreciably quieter than any known residence or professional cinema, dubbing stage, director screening room or recording studio in the world. Rob reported that, when first entering the Theater, his friends and movie-industry colleagues remark that, in contrast to the closed, claustrophobic nature of anechoic test chambers and other ultra-quiet environments, his theater is the opposite, sounding large, spacious and airy. "I can't tell you how many times I've heard, 'I could live in here, starting right now, Rob!'"

Best of Their Breed

Each aspect of the project was tasked to meet these goals; Architectural, Millwork, The Bones, Baffle Wall, Acoustic Technology, A/V Technology, HVAC, Technical Power, Science & Reports and Partners. Special thanks go out to KYD team members most involved in the project: Andrew Steele, Remi Audfray and Bob Markham (engineering); Kyle Cramer (CAD); and Mike Moore (construction administration); to Rick Koch, his son Gill, and Bob Cebulski of [Davenport Contracting](#), whose collective trust and dedication to "getting it right" were an inspiration to everyone involved; and to Geoff Franklin and his team at The Projection Room Technology Integration for his care and attention to the entire Project.

A/V Technology

[JBL Synthesis](#)

- 3 SDA-8300 (8x300-watt) power amplifier
- 1 SDA-4600 (4x600-watt) power amplifier
- 3 M2 Main (left, center, right) speakers
- 4 AC28/26 Front side surround speakers
- 6 8340A Side and rear surround speakers
- 10 SCS-8 Top/ceiling surround speakers

[JL Audio](#)

- 8 SHOC-24 subwoofers with IWSv2 amplifiers

[Kaleidescape](#)

- 1 Strato Movie player
- 12 DV700 Disc vaults
- 2 Terra Movie servers

[Mark Levinson](#)

- 3 No.531H 300-watt mono power amplifier, drive woofers of JBL M2 speakers
- 1 No.533H 3x300-watt/ch power amplifier, drives high-frequency of M2 speakers

[Stewart Filmscreen](#)

1 Directors Choice 4-way masking video screen, microperforated Sno-Matte material, 228" x 110" video image

[Sony](#)

1 4K SXR Home Cinema Projector VPL-VW5000ES, 5,000 lumen brightness

[Trinnov](#)

1 Altitude 32-channel Preamp Processor, Dolby Atmos, DTS:X Auro-3D

[Keith Yates Design](#)

6 Infrasonic UberSub Modules incorporating horizontally opposed, force canceling 24-inch drivers powered by 6,000 watts amplification each



"Every one of my guests starts rattling off dozens of movies they want to see now 'for the first time' (whether they've previously seen it or not). Dream realized," shared Rob Hahn.

[About Keith Yates Design \(KYD\)](#)

Keith Yates Design is the world's leading design & engineering firm specializing in high-end, purpose built private theaters and screening rooms, as well as acoustic design for residential multi-use common areas and high-spec commercial facilities.

Magazine headlines have celebrated KYD's work as "magic" (*Architectural Digest*), "inspirational" (*Home Theater*), "perfection" (*Residential Systems*) and most recently recipient of the "Home Theater of the Decade" by *AVSForum*.

Serving clients world-wide from their base in the Sierra foothills between Sacramento and Lake Tahoe, Keith Yates Design draws on a **science-based approach** supported by over \$400,000 in specialized engineering **tools** and an **in-house team** of architects, engineers, interior designers, project managers and construction administrators. The company has over 400 venues built or under construction throughout the US and around the world, from California to Bangkok.

Not an A/V dealer or installer, since 1991 KYD has focused on envisioning, modeling, optimizing, documenting, testing and obsessively calibrating these exquisite venues for marquee-name directors, cinematographers, technologists and, especially, everyday movie and music lovers seeking to be transported to another place and time.

For more info find them at keithyates.com or email at info@keithyates.com.

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