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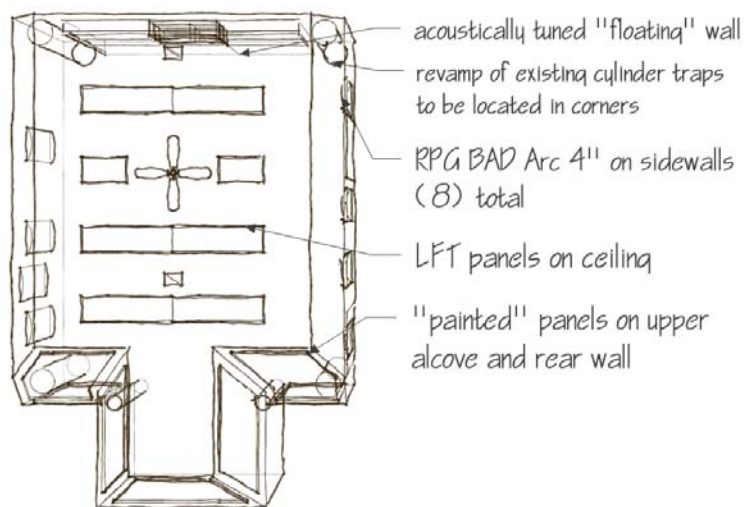
Art Smuck dedicated listening room case study

February of 2010: Ft. Worth, TX



Hybrid 3D Plan View of Design Concept

Art Smuck: listening room
Acoustic Make-Over



Size: 23' L x 19'-6" W x 10'-6" H, w/ 6' L x 10' W

center/rear alcove

Volume: 5,200 cu. ft. approx

Original Concern: "no major concerns, but rooms a little over-damped"

Basic Scope of Work: Art's original statement was simply that the room is "a little too dry". After some conversations, the scope was refined to the goal of creating "better definition across the entire frequency spectrum". This then put all factors of the room within review. Art liked these terms and we both agreed that nothing less was worth pursuing.

"I just keep playing disc after disc and find myself laughing out loud at times when I realize just how much we have improved the listening space sonically, it's incredible."

Client Background: Art Smuck is a highly evolved audiophile with extensive awareness of the room/speaker/ear relationships...that is 100% relevant to the following case study. <http://forum.audiogon.com/cgi-bin/fr.pl?vevol&1115953260>

Materials:

- Additional course of drywall to existing walls
- Wood floor
- Revision of existing DIY cylindrical broadband "traps"
- RPG BAD Arc panels
- AcousDecor PP (painted panel)
- AcousDecor LFT (low frequency trap)
- Custom designed diaphragmatic "floating" front wall
- Existing RealTraps QRD diffusors



Analysis/Design process:

- Review existing space: construction, treatments, speaker/ear position, speaker type
- Instigate discovery “chats” to better understand client goals for room finishes
- Delivery of acoustical analysis and initial design objectives. Note: this was an “interactive” off-site process accomplished by acoustical model analysis and specific performance question and discovery.
- Delivery of acoustical design in 2D and 3D formats.
- Design development and revisions based on acoustical and aesthetic concerns.
- Preparation of materials lists including sources and basic cost estimates.
- Communication with client’s contractor.
- Support client with proper installation tips and techniques
- Note: this whole process was accomplished off-site and YES...there is not pre/post test data. **I firmly believe in the value of acoustical testing and analysis of such data...but at same time, certain elements of room physics are given. Art has a high “acoustics IQ” and the room needs were readily understood...at the end of the day services are as needed for each unique client. “Off-site” was the best option for Art.*

This entire acoustic make-over was driven by the term “misappropriation of acoustical materials”.

This term implies that the room had all the *basic* elements of appropriate acoustical control, but the materials are not fully sufficient and not in the best locations to yield optimal function. In layman’s terms, the non-discerning ear would think the space was great acoustically...but this is not Art!



Target number one was the “shell” or the room surfaces themselves. An additional layer of ½” drywall was specified for all wall surfaces. A single layer of drywall is simply too vague in the manner which low frequencies transmit/reflect thus yielding a mushy bass response. In this case, single drywall was just not a suitable canvas for full-range/hi-resolution listening. By doubling the drywall, we do increase the need for “bass trap” effectiveness which is addressed in the emerging design plan.

The floor: I highly suggested a true wood floor (not laminate). Such a floor yields “musical warmth” that is part of a great listening environment. There were some great discussions on how area rugs could be utilized for visual and acoustical balance...the results speak for themselves.

So we now have more consistent mid-bass and bass information within the room and have increased the

brightness of the room by changing from carpet to wood floor, time for some muscle!

Low frequency control: the approach is best described as a multi-armed. Art's existing cylindrical traps were reviewed and it was decided that they could be tweaked and repurposed to address major corner modal build-ups as well as the acoustical pressure change at rear alcove junction. UltraTouch bonded cotton insulation was used to "fill" the cylinders. The diameters and locations of the cylinders were specified. RPG BAD Arc panels are the second weapon in the LF (low frequency) control process. These panels offer a poly curved binary amplitude diffusion face combined with linear absorption down to 100 Hz. These panels are a significant factor in the overall balance of the final product. The ceiling is tweaked with what is called an LFT Panel. This panel is essentially a hi-pass filter providing tremendous absorption between 100Hz and 400 Hz...again, we did not want a "dead" space.

Now we arrive at the star of the bass trapping effort, the diaphragmatic floating front wall. A diaphragmatic trap is a tuned system that includes a "rigid" membrane face in a sealed cavity. The type of membrane, depth of cavity, use of insulation (and type) all have bearing on the desired effect...and the final result is all in the execution. For more information on specific types of bass traps, please read this article:

<http://audioholics.com/education/acoustics-principles/bass-trapping-ideas>

Floating wall concept: Art sent an image of a modern bedroom space with a floating wall that served as a headboard. He asked if I could do something with this design thought and I jumped at the chance. The wall was tuned to the first and second order "Y" axial modes, the 40Hz SBIR cancellation based on speaker positioning, and faced with a wide "Q" upper bass absorption system (the actual finish surface is ¼" drywall). There was enough surface area for these systems to be effective, and importantly I didn't "ask" too much from any one part of the system. The goal is a combined attack with the corner broadband trapping to yield an extremely tight and accurate bass response that can handle higher SPL content as well as soft details without adverse resonance! This is key to the soundstage development. *Comment:* the realism factor and depth of the listening experience is cluttered by the rear emanating energy of free-standing speakers.



The General room character...the single defining element influencing how this room sounds and feels is the RPG BAD Arc panel (located on sidewalls). A short list of their benefits include: transient control, room ring control, improve the harmonic content of the midrange, control specular reflections and disperse high frequencies. The design is based on the percentage of coverage, the dispersion pattern of Art's Line Array speakers, reflection points, and Speaker/Boundary concerns. When you have a speaker with such controlled off-axis response, it is very important to control room ring in the mid bands (below 800 Hz) between the parallel surfaces.

The rear portion of the room is special. The existing space has such great architectural bones it seemed obvious that should be brought forward...and acoustically, this area was the single biggest neglected part of the previous space. To counter the lower mid reflected energy and tame the possibility of brash high frequency reflections, a special acoustical panel with a painted finished was specified. The panel has the typical performance of a 2" commercial rigid fiberglass panel, but has a client selected latex paint finish (factory applied). Some time ago a designer peer of mine said in a

conversation, "Just how much fabric can you look at in a room?"...that conversation came to mind in this aspect of the design.

The final tweak was really to leave the existing RealTraps diffusors in place in front of the alcove window. The plants help reduce edge diffraction from outside corners of the alcove (and they look great).



Comments from designer: I have to mention the contributions of Art's contactor and lighting designer who both accepted the "purpose" of the space and brought excellence to their efforts. In my opinion, it is not easy to create a modern design space with the warm earth tones. In this regard, the lighting design is key...note the shadows off the RPG BAD Arc panels. And, of course the lighting of the floating wall is inspiring. To put the right fixture> with the right Kelvin> at the right place is an art.

In further detail of the construction effort, time was taken to access the existing floor system and beyond just the wood floor finish, the existing subfloor/joists system was stabilized and properly insulated. This is part of the room response; in fact (pun intended) it is the foundation of the low frequency response.

In greater detail of the speaker/listener location, extensive time was applied in reviewing Art's speaker and ear locations to first make sure he was not in a modal area of concern. He had his ducks in a row, his speakers were placed to evenly excite the room (meaning full and balanced room support) and the splay should be on target for proper imaging. Only on-site experimentation can fine tune the exact relationship between bass response and imaging.

Quotes from Art Smuck:

On the process and experience with HdAcoustics: *"My experience with audio has always been through listening and the emotions and feelings it creates throughout the experience, the "science" of it has never been a predominant fixation or factor for me. I was very comfortable that Jeff understood my goals, simple as they were, and was very confident he knew how to design an approach that would move me further into enjoying my listening."*

Sonics: "I am most definitely hearing what I want to from my listening space; it has been a significant improvement to my enjoyment of the music my system and room produce." Low end is tight and punchy with authority, the mid-band sounds as natural as it ever did and true to our original goals we added some sparkle and air to the top end but kept things from being too shiny or etched sounding. Better balance across the spectrum was truly achieved.

On the soundstage and image: *"One cut I use is Rimsky-Korsakov's Scheherazade to evaluate the soundstage and image. The previous room (and I was*

happy in this regard) placed me in the first row at stage level. The new room places me in the 15th row at conductor height, but also renders the players in a more lifelike size with real and audibly defined spacing between sections and instruments...amazing...unbelievable."

Overall: "I just keep playing disc after disc and find myself laughing out loud at times when I realize just how much we have improved the listening space sonically, it's incredible. Also important was our ability to accomplish everything we wanted to aesthetically with the room as well, this made the head interior designer at our house as happy with the outcome as I was"

From HiFiListener (one of Art's peers), a review

of the room: *It was with great anticipation to have been invited to hear Art's system in his newly renovated room this past weekend. The months of waiting were more than worth it. Quite frankly, previous listening sessions were very enjoyable in his gorgeous looking room, with no major issues that were distracting to the overall experience regarding gear he's selected, set-up, or the room itself. I'm not one to use sweeping statements, but I was simply not prepared for the improvements I heard. Using all the same components as before, the differences noted were the result of the meticulous use of structural and acoustic treatment*

enhancements.

The image presented was clearly better focused, allowing the music to come through with a greater sense of ease. One was aware that the music was not just coming directly from his line-array speakers, but was flowing towards the various seating positions by getting "off" the speakers as well. This allowed the speakers to create much of the heralded, "disappearing act." Listening off axis provided as much enjoyment I have ever encountered in a system, and never had me feeling that I was missing out on much until it was my turn to take the center chair. The sweet spot was HUGE!

What was clearly an impressive system before has clearly jumped to a new level of involvement and listening pleasure. The listening room is always any audiophile's/music lover's limiting factor. Art is fortunate to have such a launching pad that this room provides for his existing set-up and for any future equipment changes. Lastly, the incredible visual impact when you first walk into the room will immediately have you feeling serene and excited at the same time. You just know that you are about to experience something very, very special...

**Room Before HdAcoustics
Make-Over**

