



## Pro Studio Edition e-Newsletter

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### Home Project Studio Part I: Necessity, Dollars and Sense

by Michael Tarsia



Over the next few months we'll take a real world look at the why's, where's, when's and how's of creating a home recording studio. These series of articles are being written as it happens and I can venture to say that there will be many enlightening anecdotes, technical twists and surprising turns [for you and me] as I attempt to actualize a vision that is shared by many recording enthusiasts. On the way we will meet and delve into the brains of some true icons in the audio industry, deal with building contractors and equipment suppliers all the while plotting and implement a game plan that will be the most effective for the goals at hand. But before all that we need to go to the...

...Prologue:

*Necessity, the mother of invention reared its head and I was whisked away on its heels... (paltry attempt at prose).*

Sigma Sound, our family owned and operated recording studio [home to the "Sound Of Philadelphia"] had "issues". Large multi room facilities and their client base in Philadelphia, [always a tertiary market and the bastard stepchild to the NYC scene to boot], had been in decline for years. What can you do when a 50,000 dollar investment in 1968 yielded a facility that could generate 130 dollars an hr in studio time plus an additional 30% of that amount in tape and material related sales and 30 some years later an investment 40 times more than that could only gross 125 dollars or less an hour with no high dollar materials to sell with the session time? Factor in essential equipment becoming outmoded 3x's as fast as it did back in the 70's, overhead being exponentially higher and more large studios vying for the same business. Then add a dash of technological advance that makes high quality relatively low cost recording equipment available to the masses. Equipment so good, that when comparing the sound coming out of large multi-million dollar commercial studios outfitted with traditional gear and home software based studios, the argument of what is "better" becomes a purely academic exercise. The answer for Sigma was painful but simple...SELL.

That was an easy decision for my father who was pushing 70 and ready to retire, but for me it created a set of circumstances that made me evaluate almost every facet of my life. Do I move to NYC, LA or Nashville and become a staff engineer? Do I stay in the area, cull some fresh clients and subcontract studios as needed? Do I make my passion of recording a hobby and work a day job for first time in my 49 years of life? How about renting a space and building my own small room? Home studio?

One by one I weighed the pros and cons of each option. Having been on the board of The Society Of Professional Audio Recording Services, I had the opportunity to get an inside look at the state of major studio affairs around the country and the prognosis was not that good. Many top name studios were closing, downsizing or merging with competitors who were in the same boat. A lot of great engineers were out of work and rates for both studios and engineers had sunk progressively lower and lower. I figured that moving to another area would just be me taking the same problems with me. The bottom line isn't that there is not a place for great rooms and big studios it's just that a lot of what big studios did can now be done as well or better in a good home production room.

#### Strike 1

At Sigma, I worked my self into the position as the most requested engineer. That position had me working with national artists and major labels on a full time basis. While it was a trip to work with the some of the best in the business, it affected my career when these acts grew older, left the biz or opened their own small studio in their hometown. For decades this small select group of clients kept me busy leaving me little time for the local Philadelphia area music scene. Out of the loop in my own hometown, I would have to start from scratch and build a new client base as well as approach the many local professionals I was too busy to work

with before. With my credentials this would not be a problem but it would be a problem time wise, as I had to factor in a ramp up period. If I were renting I would have to eat that money as well as any unused money during inevitable slow periods later on down the road.

**Strike 2**

Then there was the issue of rates. The budgets of the local talent base would be hard pressed to support both my monetary needs and the price it would cost to rent a half decent studio in town every time I needed to touch a fader. And even when they could afford it, why did I have to split recording money for bands I found with an outside studio? Time was an issue too. Booking and juggling hours between a band's availability, my own and a third party studio was bound to turn into nightmarish exercise. On top of all that, like the icing on a melting cake was the realization that I couldn't control the things I believed were essential to a great recording experience for my clients. I was used to an A+ facilities and in Philadelphia there weren't any of those left that could still afford to operate. The things I always took for granted weren't necessarily the norm in many of the smaller, less expensive studios that were left in this area.

**Strike 3**

The next option was to get a day job in another sector and make recording a hobby. It became immediately apparent that trying to work in the 9-5 world after 30 years in the studio wasn't going to happen... Fini, end of discussion.

In the end, as I sat and pondered my situation, I was left with two viable options; rent a space and build a studio or build a home studio that could accommodate mixing, vocals and small overdubs and then rent out time in larger recording rooms for live tracking on an "as needed" basis. Before I made my final decision I compiled a list of pros and cons to both approaches and looked at what a good balance of my needs verses the money I could feel comfortable parting with. I would advise anyone in a similar situation to do the same.

<b>Rent A Room And Build</b>	
<b>Pros</b>	<b>Cons</b>
Can find space to suit specific needs	Cost of Rental
No clients wandering thru my home	Capital improvements to someone else's property
More "professional" looking	At mercy of lessor
Save space in my home	No "instant" access to equipment
Room for tracking	Possibility of having to share space with a "partner"
<b>Home Studio</b>	
<b>Pros</b>	<b>Cons</b>
24/7 access to gear	Clients wandering outside and in my home
No lease	Loss of space in home
No partners	Physical constraints of space in home
No monthly nut	Noise issues with neighbors
No outlay of costs for rental improvements	No room for tracking live dates

Having worked at a major studio that after years of success bled money made me a conservative person fiducially. This made rates and the financial bottom line a big issue especially when being confronted with the prospect of leasing space and paying rent. My father owned the Sigma real estate and I saw first hand how owning verses leasing benefited the studio owner when comparing Sigma's sale with the auctions of gear at leased studios that closed their doors. Plus, owning my home, I relished the idea of waking up in the middle of the night, walking a few feet, and turning on the computer to make music. Basic live tracking [drums/rhythm] today is a small if any part of most productions. If I could mix and do overdubs such as

vocals, keys, guitars etc.. right at home, rent when I had to and let someone else eat the overhead for the large recording space when I needed to track drums or strings and horns it appeared like it could be a winning situation for me. But I would have to deal with some things that given a perfect situation I wouldn't consider. Hmm..not much suspense here or we wouldn't have a series of articles...Home is where my hard drive is. *Michael Tarsia is a 2-time Grammy recognized Engineer, with 19 Gold and Platinum album credits. He is also a Director and Instructor for the Sigma Soundz Recording Arts Program.*



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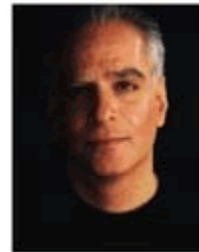
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### Home Project Studio Part II: Head Banging and Prep Work

by Michael Tarsia

#### Help!

An important reason that I want my own room is that I was used to the A+ quality of the recording experience that was integral to recording at Sigma Sound. Part of that A+ "musical magic" had to do with the fact that the studio space was built to demanding specifications. We had a trolley line running right outside of the recording studios that operated in the heart of a bustling city. In spite of this we could open a microphone up on a whispering vocalist and not have rumble from heavy vehicles, jet airplane noise, air conditioning hum, forced air whoosh or bleed from control room monitors leaking into the recording area and hence the recorded tracks. It's important to repeat this again...when cutting tracks there was NO BLEED from extraneous sources that could potentially tarnish the performance.



I had taken this too lightly and when I started my independent career working in the local studios the ramifications of that mistake became immediately apparent. I found myself saying:

"Hey can we take that again? The studio monitors were too loud."

"I'd like to do that again, I can hear a truck in the background."

"Oops I didn't hear the hum because the air conditioner in the control room masked the noise because I had to monitor low to make sure that the control room monitors didn't bleed into your mike."

"Sorry, the dog ate my homework."

Then there was the issue of dealing with rooms that had you constantly guessing if your ears or the room were messed up. Move my head here it sounds like this, turn a little or move an inch and it sounds totally different. Maybe if I put my head in a vise...you get the picture.

I wasn't used to making excuses for poor room design and I knew that before a computer went in or a speaker was placed in my small project studio, I had to have a listening and recording structure that rivaled the high quality facility that I took so much for granted during my 30 year tenure at Sigma.

The bar has been raised. It is time to take my vision and expectations and carve out a home studio that I can be proud to work in and bring clients to. I know what I want and by this time you should also. Now to deal with space, time and money limitations and make it all happen.

#### Where to build

A small row home in a large city is not the ideal location for a studio but that is my challenge. The home's unfinished basement only has a 7-foot ceiling and narrow 26-inch wide steps leading down to it. So that option and the isolation [both acoustic and traffic wise] it would have provided was out of the question. I was already in the process of gutting my upstairs, so I choose a location in the back of the 2nd floor as ground

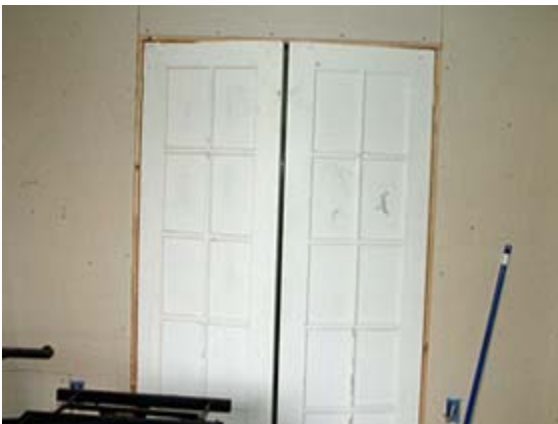
zero. Luckily there are many angles present in that room but it is rather small, having a 14' X 10' main footprint. One wall is common with my neighbor's, another is a back wall facing my yard. The third wall is against steps and the interior wall butts my bedroom.



*Inside space looking at door to steps and window of outside wall*



*Common wall with neighbor.*



*French doors leading to bedroom.*



*Original entrance to bedroom and wall against steps.*

When anyone decides to build a studio in their home they should look at what room is the most isolated, needs the least treatment and works in relative harmony with the rest of the house. This space was at the top of my steps, next to the bathroom and shared only one common wall with neighbors that I had to be concerned about. It has an easy run to connect dedicated power and was the best choice when balancing all options.

I should note that when saying "least treatment" one should avoid square rooms, low ceilings, areas with high ambient noise, space that abuts others property and areas that constrict traffic to the rest of the house. Good space for setting up a home studio is one with rectangular [square is a no-no] or multiple angled walls, good ceiling height, separate or restricted access to the rest of the home, isolation from neighbors and away from noise such as street traffic.

### **Sound advice**

I had known from the beginning that sound leakage would be a major issue. I didn't want to spend an arm and a leg to float the whole studio space but I wanted to be able to work nights and weekends. The first thing I needed to do was to see how much leaked thru the common and back walls. I went to Radio Shack and bought a cheap SPL meter. Then I enticed a former employee over with promises of a great dinner and set up a simple experiment.

We brought a sound system into the unfinished space. I had already eliminated the idea of hung speakers because the room was too small and anything would essentially be a near field monitor so we set the speakers on chairs close to where I figured they would be when the room became operational. I cranked up the bass on a graphic Eq and put on a low frequency heavy recording. Then I knocked on my neighbor's door and told them I like to play my music loud and didn't want to annoy them. I asked if I could go into their bedroom and listen as my friend played music [Getting my neighbors involved and showing concern for their happiness would be a benefit later down the line, I figured, and I did need to hear how much sound passed thru their walls]. I went upstairs and called my friend on my cell phone. I told him to start playing the music at a level of 85 dB (level of most accurate human hearing response hence best level for mixing) measured from approximately where I would be sitting when mixing. I then listened as he brought up the music in 5 dB increments. Not too bad, at 100 dB in the shell of the future studio the leakage in my neighbor's bedroom reminded me of a neighbor in my old apartment complex playing his TV too loud late in the evening [when there are no masking sounds.] This wouldn't be good past 10 pm, but nominally acceptable during the daytime. I thanked the neighbor and went back to ponder my next step.



*Nick Colleran and Joe Horner of Acoustics First circa 1979 at their self-built Alpha Studios.*

I know the golden rule of any studio design, having been involved in a few major build projects, and that is "get the structure right first". A recording studio is only as good as the space it's in and changing a space after gear is in is a nightmare and waste of resources. At this point, I needed a game plan for construction and wanted the space to be the best it could be. So I called on Nick Colleran at Acoustics First.\* Nick owned a large studio, played in bands and produced records during his exciting lifetime so he knows exactly what a person is looking for when they come to him with audio concerns.

I gave Nick the lowdown on the purpose of the room, it's dimensions, the leakage I was experiencing and my goal of having it look and sound like the professional rooms I was used to working in. I knew this wasn't going to be an easy job, but Nick's great demeanor and unflappable personality immediately put my mind to rest. At this point I will defer to Nick and have him cut to the chase about, approach, execution, egg cartons, foam, burning buildings and poison gas. [did I get your attention?...good!]

### **Moving and grooving**

The design Nick came up with is a classic Live End/Dead End setup. I was relieved by the fact that space issues I thought would be detrimental such as the French doors were now turned into beneficial tools for bass management.

When the fabric samples arrived this past week, I was impressed by the wide assortment of colors to choose from. Also, as a youth I had been in the hospital for 6 weeks with badly burned hands so the added knowledge that the materials Nick will be using are rated highly in that area really helped to put my mind, and I'm sure my insurance company's, at ease.

I am eagerly awaiting the first shipment of the wall treatments and have been playing phone tag with various builders. Joe Horner of Acoustics First is designing the placement of customized absorbers and diffusers and eventually the iso booth. The excitement and tension are palpable. Stay tuned for the next installment of the home studio project. Who knows what challenges we'll confront?

**(Continued on next page)**

## Background on men involved in Stage 1:

### Nick Colleran on Mike's New Studio

While I was visiting Joe Tarsia in Philadelphia, Michael joined us for lunch where the subject of later life career opportunities for recording engineers came up. I reinforced two of Michael's earlier points in this article: working for someone else after 50 isn't in the cards and the role of a traditional studio, as well as the income-to-investment ratio, has reversed over the past fifty years. With that original conversation in mind, I embraced the challenge when Michael asked me to design his home studio.

Usually our team interviews a new client, qualifies their needs and presents solutions to correct and enhance the sound characteristics of their space. Having known Michael and his father for years, I had a pretty good idea going into this project what he would be looking for but I still needed to get a few things straight before I could present some solutions for his home studio.

1. Expectations
2. Dimensions showing walls, doors, windows etc.
3. Materials the space and coupled areas are constructed of
4. Ballpark budget concerns
5. Time constraints

As I surmised, Michael wanted a room that would have acoustic properties as close as possible to Sigma Sound his family's former business. He sent all the data I requested and he also supplied photographs and rough leakage measurements. Armed with this information, I set out to help Mike achieve his goals. At this point, it is time to break down the considerations when designing an acoustic space.

For accurate monitoring it is necessary to eliminate the first reflections that might combine with the direct sound before getting to the mixer's ears, coloring the sound and affecting the stereo image. Secondly, we needed to make the back wall acoustically ambiguous, diffusing the sound field to make the room feel acoustically larger and eliminating a defined single reflection that says there is a wall behind the listener.

Thirdly, give the bass somewhere to develop. This is partially accomplished by broadband (bass) traps and extended by the features already present in Michael's space.

Contrary to the popular conception, bass does not accumulate in corners, it just appears that way when the reflected out-of-phase energy meets the incoming wave and cancels in the middle of the room. This is easy to demonstrate by holding a single speaker producing a 1 kHz tone at a distance of 6.5 inches from a flat surface. Since 1 kHz is approximately 13 inches long, the half-wavelength distance will cause the positive wave crest to meet the incoming negative wave trough and sum to zero [you will not hear any audio] No amount of equalization will overcome this. It's a zero-sum game. You must fix the acoustics first!

Bass trap is a counterintuitive and misapplied term. Trapping the bass does not destroy it but rather prevents it from reflecting back and causing the cancellation just described. The term "bass trap" is often applied to broadband corner absorbers that also go after the higher frequencies. If bass is the only problem, they will make the room too lifeless. In Michael's home studio, the room to the mixer's right provides the extra space for the bass to roam and a thick, pleated curtain that will be covering the double doors takes care of the high-end, first reflections. A window to the left provides a similar function. However, just venting the bass is not enough, without the absorbers and diffusers to eliminate cancellation, the neighbors will hear the bass while you do not.

For common walls, noise barriers and vibration isolation should be considered. Mass blocks transmission, when combined with internal wall absorption to eliminate the drum effect (tap one head and the other vibrates). We used lead foil in the seventies. Now there is mass loaded vinyl. This can be applied as a layer under the fabric wall covering and is a good solution for noisy neighbors, with or without a studio. For more difficult jobs an additional layer of wall mounted on resilient channels with vibration isolators may be

### Nick Colleran

In the 1960's Nick was a guitarist, songwriter and record producer. In those days he worked alongside the likes of Ed Greene, George Massenburg and Joseph Tarsia.

During the 1970's Nick started Alpha Audio Recording Studios to stay in show business. As well as being the builder and owner of Alpha, Nick also engineered sessions for the likes of Bruce Springsteen, David Sancious, Pat Benatar, George Clinton, Poison and a host of other notable artists.

In 1978 his chief engineer Joe Sheets found an anechoic acoustical foam in an industrial magazine. They made a deal. Joe Horner built a demo booth and it showed at the New York AES convention in 1979. They were the only acoustics company there.

In 1986 he became president of SPARS. The Alpha studio had joined in 1979 upon Joe Tarsia's recommendation.

Acoustics First Corporation was founded in 1997. His company Acoustics First does everything from noise control for factories, professional recording studios, movie production facilities, office buildings, home theater for artists... The list goes on!

necessary. Since Michael would not be dealing with too much heavy- impact, structure-borne sound and he isn't worried about sound leaking downstairs we saw no need to float the floor, although that is a relatively low cost item in new construction. Michael's room will have a layer of one-pound per square foot mass loaded vinyl (BlockAid™) on the common wall, installed under the Sound Channels® acoustical fabric wall covering.

Other considerations for materials were building codes, ease of use and long term wear. The entire wall area is treated with an acoustical wall covering that takes the "edge" off of the drywall and allows for less critical placement of furniture and other materials. It installs like heavy wallpaper and only needs to be cut straight and hung in a consistent direction to look good. It can be held in-place with staples at the top until the adhesive dries to prevent rolling down the wall. Panels and traps are hung like pictures over the wall covering, eliminating the need for precise fabric and panel cuts. Anyone who can measure accurately should be able to install these materials. We've had accountants do it!

In addition, these materials wear well and are Class A fire rated. Acoustical polyurethane foams, while highly effective acoustically do not wear well and produce toxic smoke when burning. The same is true for carpet installed on a wall. It may have some acoustical value like the shag of the seventies but not pass vertical and corner burn tests. Egg carton, while having some absorptive qualities have been proven to have "holes" at certain frequency ranges and are also a fire hazard. If desired, the diffuser panels can be attached to the wall covering with hook and loop (Velcro®).

The last piece to install provides both an enhanced listening space and an opportunity for good lighting effect. That is the ceiling cloud over the mixer. This eliminates the reflection between the desk surface and the ceiling and provides an opportunity for indirect lighting. If used with a dimmer, it allows the room to have a subtle glow while working. If the room looks good, it always sounds better!

### **Joseph E. Horner**

Before beginning a long career as a recording engineer, Joe was a music teacher, percussionist, gunsmith and piano tech. Joe walked into Alpha Audio Recording Studios one late evening in 1972 to play vibraphone on a Sears commercial. He stayed 18 more years. His prior skills came in handy. Joe designed the first acoustical foam booth for AES NY in 1979.

From then until now Mr. Horner has worked with quite a few easily recognized names from Aerosmith and Pat Benatar the Temptations and GWAR.

\* [ACOUSTICS FIRST CORPORATION](#) offers a full range of acoustical materials including sound absorbers, barriers, diffusers, and specialty products. These are used in STUDIOS for recording, broadcast and multi-media production; ENTERTAINMENT including Karaoke, home theater and critical listening rooms; ARCHITECTURAL applications in auditoriums, churches, concert halls, gymnasiums, and theaters; EDUCATIONAL and COMMUNICATIONS functions such as distance learning classrooms and teleconferencing; and numerous INDUSTRIAL noise control situations.

In the late 1970's, Alpha Audio Acoustics introduced Sonex anechoic wedge foam to the professional audio community as an instant solution to a common acoustical problem. Acoustics First Corporation was formed in 1997 by one of the founders of Alpha Audio to continue to bring such innovative products to an even broader market. Our knowledge and experience acquired over more than twenty years in the industry is freely shared with our end users to provide the best choice of materials for a particular application. If needed, we are happy to provide the names of qualified acoustical consultants and installers.

Products supplied by Acoustics First include traditional polyurethane foams, Class 1 Melamine foams, high density fiberglass panels covered in Guilford of Maine's FR701 fabric, high NRC wall fabrics, dense mass barrier materials, diffusers of wood and metal or formed plastic, prefabricated low frequency bass traps, sculptured ceiling tiles, decoupling devices, and other specialty items. Brand names include The Art Diffuser®, Cutting Wedge® acoustical foam, Sonora™ wall panels, Cloudscape® ceilings, Sound Channels acoustical wall covering fabric, and BlockAid™ mass loaded vinyl noise barrier.

### Home Project Studio, Part III: The truth about isolation booths

by Michael Tarsia

*Part III of PSE's exploration into the construction of a home studio. We find ourselves immersed in the building of the isolation booth, after a slight delay caused by expected but unforeseen delays.*

The room is coming along well. Two dedicated 20-amp circuits have been installed for audio power. Lines have been run for lighting. The ceiling has been insulated and the outer walls are ready to be prepped for paint and wall treatments. Now that the main part of the room is taking shape, it is time to look at the ISO booth design and construction.



I had just ordered industrial felt to “float” the inner framing of the booth when I spoke to Nick Collierian at Acoustics First. He told me about a newer way to float the frame using Vib-X, a vibration-isolating pad made of DuPont Neoprene. Vib-X pads have a ribbed design, can be cut easily, don't degrade over time, and are especially good at rejecting low frequency transmissions. I quickly called and cancelled my order for the felt.

Along with the pads, I got some Vib-X washers to isolate the bolts securing the wall footers.



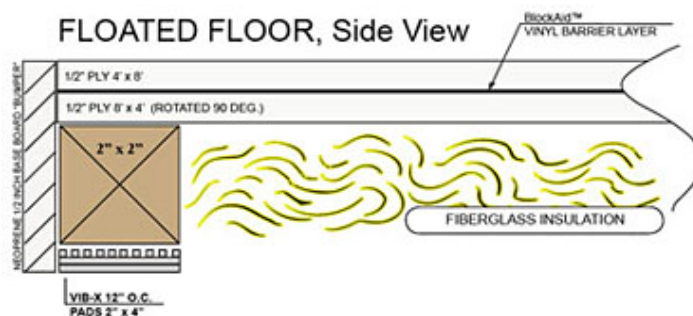
Inner framing with Vib-X washer.

It should be noted that an ISO booth is a room within a room. The outside of the structure is of typical design, while the inner structure is meant to “float” separate from the outer structure (and the entire building) by means of insulators, like the Vib-X pads and washers, as well as physical space.

The whole process of building the booth has been a bit nerve-racking for me. The room needs to float and be isolated, but air must flow through it. In addition, cables, wiring for lights, and electrical outlets must be strung through, and a door has to be installed. All of these holes in the structure can ruin the room's isolation qualities if not treated properly.

#### Building the room

First the outer wall was constructed. At the same time, consideration for anything that had to be fed through the walls was mapped out and fabricated. This meant that all wiring and boxes had to be extended long enough to get through the two walls, and a provision for a run above the booth had to be put in to ensure ease of adding anything to the room at a later date.





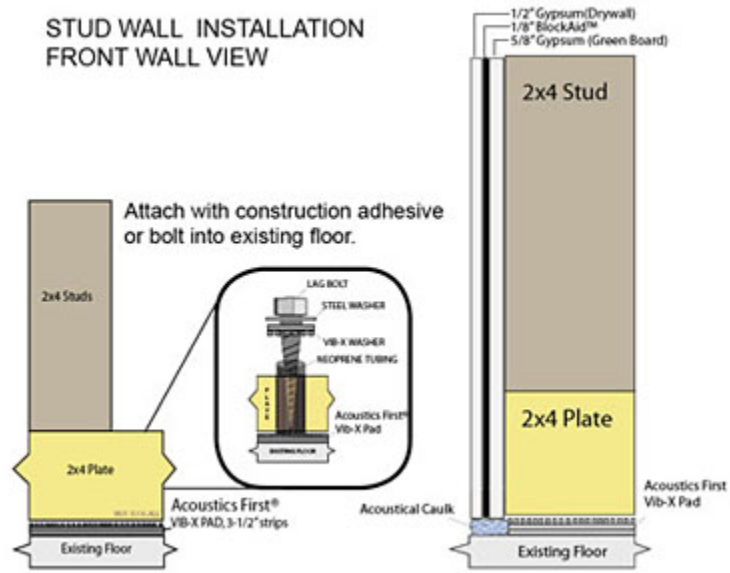
Once the outer walls were finished, the Vib-X was installed on the footers and headers of the inner wall. The inner wall itself is situated so it doesn't touch the outer wall of the booth. I found a 28-inch door and metal frame for an entrance and am now working on a design to place the door in an optimum position for both sound and space. A glass window is being ordered to give the ISO room door a view to the studio to make it less claustrophobic.

The inner walls, the ones you see as you stand in the finished room, consist of a layer of 1/2" sheetrock, Block Aid vinyl barrier, and 5/8" green rock.



**Green rock, Block Aid, sheetrock.**

### STUD WALL INSTALLATION FRONT WALL VIEW



The airflow issue wasn't as bad as I expected due to the fact that a soffit was already put in next to where the booth is being built. I must admit, the original purpose of the soffit was for bass trapping. The soffit will be my "exhaust duct" and will be boxed in hard fiberglass insulation.

The inside of the box will have two 90-degree hard fiberglass barriers so that any extraneous sound will be minimized as it tries to pass around the corners. A low noise fan will be placed on the far end to evacuate air outside the studio properly and a vent will be situated on the near end where the duct will connect to the booth.

On the intake side, air being pulled into the booth will come in around two feet from the floor on the outer wall, run down the stud wall to a "T," then pass down the adjacent stud wall and exit a few inches above the inner wall floor. As in the soffited area, by going thru 90-degree bends, the sound from these holes in the system will be greatly reduced.

The floor of the booth must also float off the room's original flooring. Wood blocks with Vibe-X "feet" and two-inch plywood with high-compression vinyl sandwiched in make the floating floor. Insulation will be packed in between the floating floor and the original flooring, and the edges of this floating floor will also be isolated from the inner walls of the booth.

Diligence in the construction process is very important. It can't be stressed enough that the weakest link lowers the isolation properties of the entire booth.

As I said at the beginning of this series, I knew this would be a learning experience for me and that there would be twists and turns for us during this journey. At Sigma, I had a team of people who tackled different issues. I oversaw and lent my opinions but didn't get into the nitty gritty. Plus money was never an issue there. If a wall had to be torn down or if we needed triple-isolating filters put into lighting schemes, it was just done. In my situation in the home studio, time and money are big issues, and a balance between goals and gold have to be met.



**Layers, from bottom to top: Vib-X, 2x2" block, high-compression plywood, vinyl, plywood.**

We've now encountered some of those expected but unforeseen twists. Late shipments, construction crews who are juggling different projects, money shortfalls, and things behind the walls have made the job more difficult and time consuming. I didn't follow my own rule to triple any projected completion time and then be happy when it took a little less.

I had hoped to have the booth completed by now, but that didn't happen. Hopefully by next month, great pictures of a finished booth will be in the mix.

*Michael Tarsia is a 2-time Grammy-recognized Engineer, with 19 Gold and Platinum album credits. He is also a Director and Instructor for the Sigma Soundz Recording Arts Program.*

*Acoustics First Corporation offers a full range of acoustical materials, including sound absorbers, barriers, diffusers, and specialty products used in studios for recording, broadcast, and multi-media production. Learn more at <http://www.acousticsfirst.com/>.*



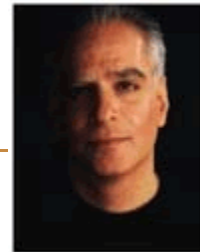
ISO "room" before...



ISO "room" so far...



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### Home Project Studio, Part IV: Nearing completion

by Michael Tarsia

*95% of the studio is complete, enough to book mixing sessions and cut vocals. It took many man-hours and finagling to get to this stage. All that's left are the finishing touches. Anything that could go wrong did. I was way behind schedule, with a lot of clients gently pressuring me to get it together. But now we can finally look at the final stages of the control room and iso booth construction.*

#### Wall treatments

After all the walls were sanded and primed, Sound Channels from Acoustics First was applied to all vertical surfaces. Sound Channels is a dimensional fabric that combines excellent acoustic properties with a Class A fire/smoke retardant rating.

Sound Channels looks like carpet but is lightweight and easy to apply. At first we followed the installation instructions that said to "double cut" the material – that is lay the sections atop one another before slitting. This procedure is oftentimes used in putting up wallpaper, which is really what the process of installing Sound Channels is. But I think the instructions might have been for a different type of fabric. This had ridges, so we took a flat metal bar and cut along an indented furrow line of each section we fabricated.



Sound Channels acoustic fabric covers the walls of the booth.

Sound Channels adheres to the wall with Chapco 305, a specific adhesive that is made for interior wall carpet installation. This stuff is so good that we could skip the installation suggestion of putting temporary staples at the top of the fabric strips to hold them while the adhesive dries. Prepping is very important: sealing the drywall with primer before applying the adhesive paid itself back in dividends. This D.I.Y. job by an inexperienced installer took about 24 hours – I had to cut and adhere some 40 linear feet of the fabric. I should note that my room has many angles, uneven areas, and doors and windows to go around. Not to mention the booth has a bowed wall.

Once the fabric was installed and cured, we hung the bass traps and absorbers that Nick at Acoustics First recommended based on a dimensional drawing of the space. On the front wall there are two half-round cylindrical broadband absorbers by Geometrix. These are made with 1-inch thick curved acoustical glass fiber with wooden supports.

Between the bass traps are two rectangular Sonora absorbers. On the ceiling over the engineering console there's a Sonora panel made specifically to hang horizontally.



**Half-round Geometrix sound absorbers.**

Once these sound controllers went up, we noticed a marked difference in the treated room versus the room right next to it (my bedroom). The room is by no means “dead,” nor was it ever meant to be. The treated room has a much more pleasant, controlled feel to it than the painted drywall with its edgy “slap.” Of course, this was determined by shouting and clapping our hands. When all is finished, full range music will be the gauge for the room’s acoustical success.

#### **Floors and workstation**

The next step was laying a floor for the studio. Half-inch plywood had already been glued and screwed into the floor. The next step was to lay flooring. I choose 3/4” Bruce hardwood oak. It’s durable, looks great, and fits nicely with the warm vibe I was looking for in the space. The oak was laid both in the control room and isolation booth. Trim was cut and painted for the floor and ceiling and now it was finally time to deal with the airflow and cable runs to the iso booth.

The booth... Wait, I’m still uncertain and afraid. I think I’ll build a workstation first.

Fortunately for me, we had a room at Sigma that had a Protocols rig set up in an Argosy workstation, so I knew of the company and the quality of their materials. I ordered the VR 70 Argosy workstation with flat top rack sections for near field monitors. The console came neatly packed in about 13 boxes. It takes at least two people to assemble these babies, as some pieces are large and unwieldy, so my dad came over to lend a hand. It took us only three and a half hours of moderately-paced work to put the console together. The instructions were clear and concise and the fit and finish of the workstation was impeccable.

#### **Okay... okay... the booth**

The make-or-break day had come.

I had to commit to cutting holes for airflow and wiring in the booth, and close the outer (visible) ceiling. I decided we should put a two-inch cant in the ceiling so it and the floor were not parallel. Just like the control room, the booth shouldn’t be dead, just controlled and pleasant. On the one large wall in the room, we took two pieces of leftover 1 1/4” round and mounted it vertically at the centerline of the wall. Then we took a piece of masonite (pegboard without holes) that was a little wider than the width of the wall. I am bad at math so we cut it with trial and error.



**Console and bass traps.**

Once we found the right size to make a nice curve, centered at the now half-round “keel,” we screwed the masonite to the walls in two horizontal sections. Before the second section was in, we stuffed some fiberglass between the wall and masonite to hinder any sympathetic vibrations that sound waves might induce in the arced panel. We did the same thing for the top panel and then used duct tape to hold the two panels together before we put the Sound Channel fabric over it. Once all the fabric was installed in the booth, we put quarter-round up in the corners and top and bottom to further reinforce and hold the curve line.

Our next issue was getting wires from the workstation to the booth. I did not want to build a run through the floor, so I had decided early on to run plastic pipe up the wall, behind the console, then across the ceiling and into the soffit that was being used as a conduit for a room-to-room vertical fan.



After the pipe was painted and hung, we used a string that was set inside as a “fish” to pull six 22-gauge communications cables into the booth. Once inside the booth, we used Wiremold piping and Wiremold boxes to surface mount two boxes: one for microphone connections and one for headphones. We pulled three lines in each box. Two lines were connected to off-the-shelf switch plates with XLR connectors surface-mounted to them. The other line in each box was tucked in and is available for a future application. We made the same terminations on the other end of the wire and then connected them to my Digidesign 192 converter.



After the lines were checked, we mounted a room-to-room variable-speed fan to suck air out of the booth. This was mounted over the steps in the stairwell by attaching it to the soffit's outside wall. Inside the soffit, we made two vertical half-inch-thick plywood plates and mounted them to segment the soffit into three equal zones. A large hole was cut in each. Now air being pulled out of the box had to run through three 90-degree bends, significantly lowering any noise that could seep through the opening.

Early on in the construction of the booth, we anticipated the need to have air flowing into the booth, but acoustically, you don't want a straight hole through the walls. So we made eight-inch cuts in the outside wall, between two studs, and framed it with 2x4s. The same thing was done on the inside wall, offset from the other hole, so air and any sound it carried had to pass thru three

**Diffusers line the wall to the booth.**

90 degree bends before it entered the room.

### Final touches

This part of the work was the final major hurdle. The doors have been sealed temporarily with weather strip, and we'll look at the door and the proper way to seal it on the next installment. At least that's the plan. It's been a real whirlwind of activity filled with surprises – both good and bad. My first session for recording was booked and it didn't look like the studio would be 100% complete by downbeat. Stay tuned next month for an honest evaluation and any changes that need to be implemented.

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