



## Kevin Schmidt: We Are the Robots Exhibit Review



By mitchco  
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[Archimago](#), myself, and our lovely wives met up at the [Vancouver Art Gallery](#) where we viewed and listened to Kevin Schmidt's: "[We Are the Robots](#)" exhibit. The exhibit runs to Oct 28, 2018. It is an incredible audio visual experience!

Words and pictures can only convey so much of the experience, so I made three [binaural recordings](#) to share the audio experience.

Listening to binaural recordings over headphones puts you in the room, listening to the exhibit.

I first became aware of Kevin's exhibit via a thread on [diyAudio forum](#). Needless to say, as a diyAudio member, I had to experience the exhibit.

Reaching out to the Gallery's Communication Specialist, we arranged a time when our group could visit the exhibit. An interview was arranged with Kevin and I chatted with him just before making my way there.

I asked Kevin if those were Nelson Pass [KleinHorns](#). "Yes, I found Nelson's plans on the Internet and tried to replicate them using the dimensions as best as possible." I asked why these speakers. "They are ridiculously big." He found it interesting that the entire architecture of the huge horn is designed to boost the low frequency response of the [Lowther DX55](#) full range driver. What makes the design of this driver unique is its fast transient response with an equally fast damping factor, at the expense of low frequency extension. This is where the huge horn comes into play.

There are easier ways to design for low frequency response in a much smaller enclosure, but usually with bigger speaker drivers. That's the difference, as the magic is in this small, full-range driver. However, it requires this size of horn length and mouth to extend the low frequency response down to 40 Hz. The quality of the bass sound is as unique as its design. The binaural recordings do a reasonable job of representing this bass quality.

Kevin saw images online of different audiophile listening rooms and some people constructing exotic speakers. He liked the audiophile discussions around the idea of the full range driver to give a truer sound without any sound loss versus traditional designs that used multiple speaker drivers and passive crossovers.

Kevin created the exhibit to bring a DIY Audio sound reproduction system and acoustically treated listening room for folks to experience in a public place. An audiophile system like this is normally reserved to few private residences.

### The Exhibit

Arriving at the Gallery, we took our [LP's](#) up to the 2<sup>nd</sup> floor and had a look around. It wasn't obvious where the exhibit was located, and the Vancouver Art Gallery is a large place. Before long, though, we found an entrance to a hallway along a wall towards the back corner of the floor. The hallway became a passageway lined with acoustic panels that really dampened the sound level. We became aware of the change in sound with our senses heightened. Nearing the end of the hallway, we could hear music playing. Turning right at the end is the entrance to Kevin's exhibit:



This picture was taken later on in our visit. When we first turned the corner, we saw a half dozen or so women dancing to Abba in front of the speakers, having a great time! One woman exclaimed that we had to dance before we could put our music on. That sums up the mood of the exhibit. Awesome!

I am in the chair on the left with [binaural mics](#) in my ears, recording on a Sony HDR-AS100V Action Cam. We are all enjoying the music. During the two hours we were at the exhibit, a constant stream of folks wandered through. It was quite busy.

In classic West Coast, Vancouver style, the acoustics and esthetics of the room had a welcoming feeling. With the music playing, it feels like you are hanging at your friend's place, who happens to be an audiophile with an incredible sounding stereo, playing your records!

While people were still dancing, Arch and I looked around the exhibit. This was on the back wall as we entered into the exhibit from the acoustically dampened hallway:

## DIY Hifi, 2014

wood, Lowther DX55 speakers, DIY Kit Tube Amplifier, cables, hardware

## Excess Dispersion, 2018

kitchen cabinet/countertop laminate offcuts, waste MDF laminate

Courtesy of the Artist and Catriona Jeffries

*DIY Hifi* is an audiophile listening room featuring gigantic horn stereo speakers, a Kit Tube Amplifier, a stereo console, record player, baffles and furniture built by Kevin Schmidt. The full-range horn speakers are based on plans posted online by DIY audio guru Nelson Pass—an American designer of audio amplifiers since the 1970s. Though their monumental scale suits the setting of a gallery they are first and foremost intended for the private homes of audiophiles who fanatically build such listening rooms. Interested in presenting in a public environment an experience that usually takes place within the home, Schmidt's goal is to inhabit such an obsession.

*Excess Dispersion* is a series of new works built by Schmidt to augment *DIY Hifi*. They are arrays of acoustic diffusers designed to scatter soundwaves, preventing reverberation between parallel walls. With surfaces imitating the qualities of wood or stone, they are made from MDF laminate offcuts salvaged from kitchen cabinet shops working on renovations

occurring as a result of real estate speculation. By building this space using plans and designs from the public realm—the chairs included—and presenting it as a sculpture, Schmidt conflates domestic space with the gallery and the production of private artwork with public knowledge.

It has been the artist's experience in listening to vinyl records of material that he knows well that somehow more detail can be discerned on this system. Throughout the exhibition, Schmidt invites members of the public as well as a selection of his friends and colleagues to bring records from their collection to play in the gallery and similarly discover new sounds.

In addition, he has installed an audiophile reel-to-reel recorder which intermittently plays a field recording of the current audio environment in the Peace River Valley—one that will soon change drastically due to flooding of the valley by the Site C dam project.

I can relate, as my sound system is partly DIY Audio, including a pair of Nelson Pass [ACA kit amps](#) that I assembled. [diyAudio's](#) motto: "projects by fanatks, for fanatics."

During my conversation with Kevin, he spoke about the details of the diffuser panels that make up the *Excess Dispersion* exhibit. Kevin used QRDude's [Quadratic Residue Diffuser \(QRD\) calculator](#) for calculating the acoustic dispersion pattern for each type of diffuser panel.

The software program automates the math calculations required to design the acoustic panel. When sounds bounce off the panel, rather than bouncing directly back like a mirror reflection, the sound is spread out in a pattern that diffuses the sound. Sounds that bounce directly back to the listener, produces what is called a [comb filter](#), which colors the sound. In true audiophile style, we don't want any coloration to our sound reproduction.

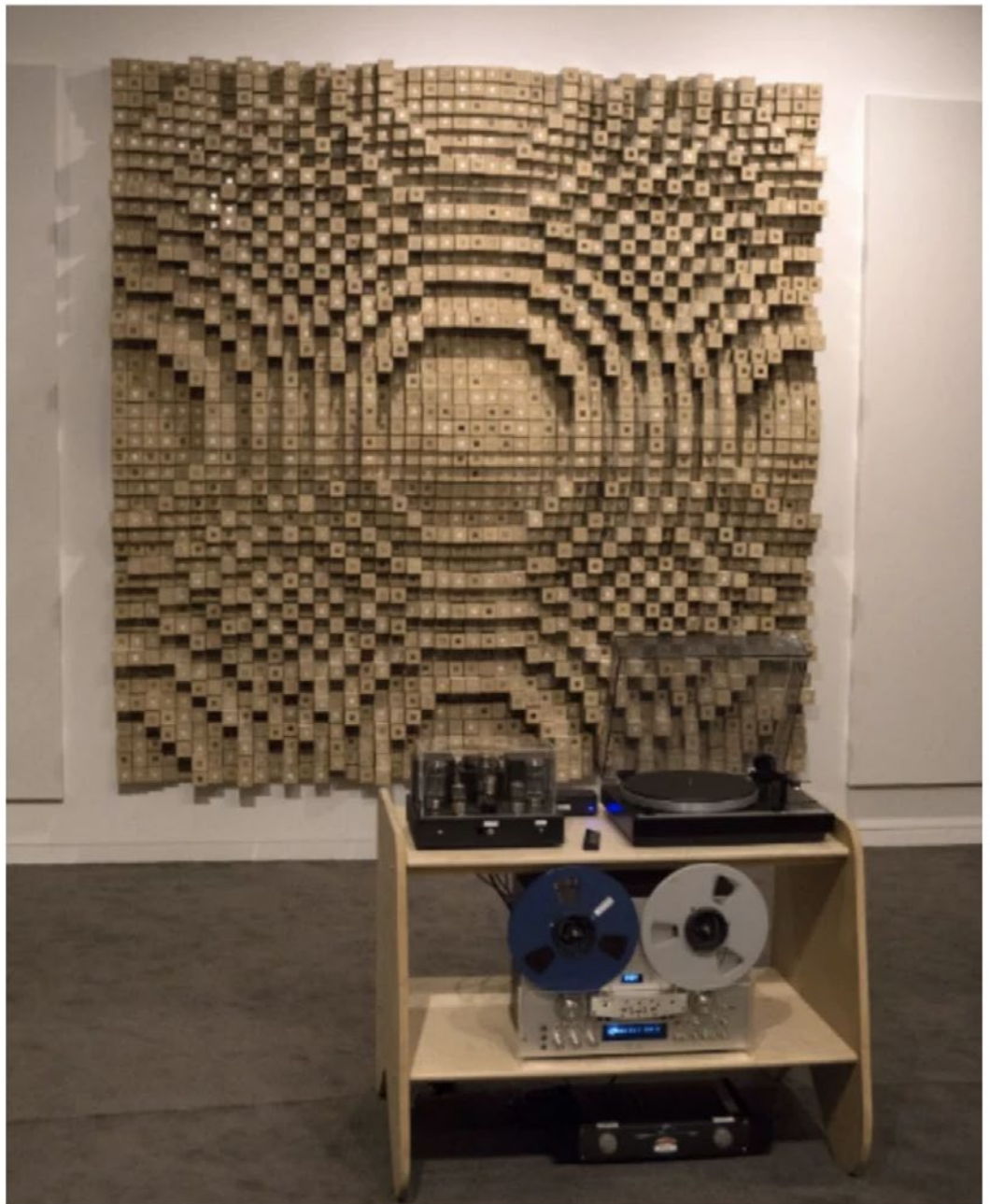
Why not use more acoustic absorption panels, like the ones used in the hallway leading into the exhibit? Too much absorption sucks the life out of the sound and therefore the music. Some absorption is good, but the room needs to be a bit lively. Diffusing the sound instead of absorbing it, allows the room to be livelier, but with the comb filtering diffused or mathematically randomized:





This is a close up of a [2 dimensional QRD panel](#). While the panel was constructed using reclaimed wood scraps, the mathematical pattern behind the design of the panel also reduces [slap](#) or flutter echo. The goal is to reduce the room coloration to the sound quality without making the listening room an [anechoic chamber](#).

While the mathematical calculation can be performed quickly with a computer, cutting each length of wood to a specific length, times the number of variations, times how many pieces of wood...



... is a significant amount of manual effort. Same goes for the sidewall one dimensional diffuser panels. In fact, all of the furniture in the room including the equipment stand was designed and built by Kevin.

On the back wall are 1D diffuser panels that Kevin constructed, again out of reclaimed wood:



Photo courtesy of Mike Lee from diyAudio

One will see this type of diffuser panel on the sidewalls of the exhibit as well.  
Let's zoom in on the audio gear:



That's a lovely Thoren's 320 turntable connected to a NAD phono preamplifier. Arch was spinning the Beatles and the women were still dancing. Unfortunately, the fun ended soon, as it turns out the needle in the cartridge was damaged, and that needle had just replaced the one before that. I can sympathize with the Gallery, as it is a public exhibit and not everyone knows how to operate a turntable.

[@Archimago](#) made mention that he had a spare Shure cartridge at home and could have brought that. We then tried spinning Peter Gabriel's Shock the Monkey, which confirmed another issue, the tube kit amplifier:





Increasing the volume beyond a certain level simply increased the level of distortion, but not the volume, which was already too low level. KT66 output tubes is what I can remember.

Arch and I were looking at the inputs to the amplifier thinking of plugging in our phones, as we both have large digital music libraries... who doesn't these days. This is one of the themes of the exhibit re: the commercialization and commoditization of products and services in our world today. I had at the last moment decided not to pack my kit of cables and adaptors. It would not have made much difference as the tube amp needed servicing.

Then the Art Gallery's A/V person came in to rewind the Pioneer reel to reel deck:



The reel to reel is playing a field recording of nature sounds that were captured at Peace River Valley in BC, Canada. The situation there is juxtaposed in the exhibit. In order to listen to records, one must turn off the nature sounds.

Both Arch and I started a conversation with the A/V person. Yes, unfortunately, the needle for the record player was damaged again. And yes, the tubes in the amp need replacing and re-biasing. However, the A/V person had a solid state amplifier on the floor, as a plug-in replacement while the tube amp goes out for servicing. She asked us if we would like the amp swapped out now. Sure! Arch asked if she had adapter cables where we could plug our phones into the amp. Yes, please! We were excited, as we had a chance to experience the loudspeakers and the room:



### **Listening Impressions**

How does one go about describing the sound quality heard at the exhibit? It's hard to convey the "size" of the sound coming from the KleinHorns. It's a wonderful blend of sound from the speaker drivers, the huge back loaded horns, and the acoustically treated room.

Big and lively, not overly absorbent or "dead" sounding, but not colored either. Just a huge stereo image where you are fully immersed in the sound. As you will hear in the binaural recordings, the bass was smooth and articulate. Rather than me using fancy words to describe what I heard, why not experience the auditory scenes yourself by making a trip to the exhibit. If that isn't possible, then try these binaural recordings.

### **Binaural Recordings**

As mentioned at the beginning of the article, these binaural recordings are intended to be listened to with headphones. Ideally, use closed back or phones that seal well and isolate as much of the outside noise as possible.

The idea is that you are hearing the auditory scene at the exhibit, which includes the sound from both the loudspeakers and the room. You are hearing what I heard, as if you were sitting in the listening chair in the picture above. Closing your eyes, sitting in your favorite chair, in a quiet environment, is the ideal way to experience this binaural acoustic event.



The binaural mics I used have a measured flat frequency response down to 20 Hz, as verified in this article on [measuring headphones](#). While I could have hauled my [Lynx Hilo](#) reference AD/DA converter and a stereo mic preamp, the point of the binaural recordings are simply to give a sampling of the acoustic event.

Disclaimer: The binaural audio clips are not full song recordings and conform to the spirit of "fair use" for copyright material for the purpose of education and research. The author nor the publisher derives any financial benefit from these audio clips. The clips are in lossless FLAC and ALAC (Apple) formats recorded at 48 kHz sample rate.

Don't forget to turn up the volume a bit to hear both the speakers and the room, as the dynamic range is pretty good.

From Arch's collection, we listened to Daft Punk, Game of Love.

[Daft Punk binaural DR10.flac](#) download (28 Meg)

[Daft Punk binaural DR10.m4a](#) (Apple) download (28 Meg)

I left the ambient noise in at the beginning of this clip so that one can hear the room. I was also adjusting the binaural mic in my right ear which is that rustling sound you will hear. Throughout the clip you will hear people talking and moving about, which gives a really good sense of the acoustic space.

By the time the drums come in, you can hear the liveness of the room. The overall frequency balance sounds very good. Not too dark, not too bright, just right. The bass on the KleinHorns is tight and articulate. The high frequencies sound extended for a full range driver. One can hear it on the drum kit's hi hat sounds and "s" sounds on the vocals.

Next we listened to Giorgio By Moroder off Random Access Memories.

[Giorgio binaural DR14.flac](#) download (28 Meg)

[Giorgio binaural DR14.m4a](#) (Apple) download (28 Meg)

What I really like is the spoken voice in the acoustic space. At about 1:50 into the clip, there is just Giorgio's voice being reproduced over the speakers in the room. Really gives one a sense of being there. The bass sounds low and solid, the drums snap, and the voice natural sounding. Listen closely to the bass line as it moves up and down with each note sounding solid and even.

Enya off the Lord of the Rings: Fellowship of the Rings soundtrack ("May It Be").

[Enya binaural DR9.flac](#) download (30 Meg)

[Enya binaural DR9.m4a](#) (Apple) download (30 Meg)

Get ready for goosebumps...

At the very beginning of this clip, way off to the left and behind, is a door leading into a stairwell that you can hear being closed. Right after that, you can hear Archimago say, "Let's try some Lord of the Rings" after he pressed play on his phone located where the gear is. Arch is saying this as he is walking back towards me to my left and up. Up because I am sitting in the chair and Arch is walking. This should give one a good sense of being in the acoustic space.

What can I say? This is one of the reasons why folks build this type of speaker. It is an incredibly immersive audio experience. The Lowther drivers are known for their articulate vocal reproduction and one can certainly hear it on this clip. The big horns with their huge imaging makes Enya sound ethereal to say the least. Every nuance articulated with the room adding liveliness without coloring the sound. It's a great example of Kevin's DIY Audio and Excess Dispersion exhibits working together to produce a wonderful sonic experience.

## Epilogue

If you're in or around the Vancouver area this October (2018), come see and hear Kevin's exhibition. As [tapestryofsound](#) says on [diyAudio](#), "...right now possibly the only place in the world where someone can hear in a public place a unique and unforgettable sonic experience."

The two hours we spent at the Exhibit went fast. We were listening to Enya and were told that the Gallery was now closing. The Gallery is well run, everyone is approachable and friendly. Security let us know what we could touch, which was the DIY Audio exhibit, but not the Excess Dispersion diffuser panels.

What does this have to do with computer audio? Computer audio is so ubiquitous that the public will rarely see or hear anything like this again. The KleinHorns and diffuser panels require significant time and effort to construct. They also require a fairly large space to operate in. Juxtapose that with plugging in headphones into a phone and having instant access to 40 million digital audio songs. While one is convenient, the audio visual experience is not the same.

The resurgence of vinyl in recent years probably has more to do with a certain demographic that dislikes the [overly compressed music](#) being pumped out of their digital devices. Turntables, tonearms, cartridges and needles are not convenient and finicky. Tube amplifier kits require maintenance of tube replacement and periodic biasing. Again not convenient, but for some, offers unique sonic benefits that are unachievable any other way.

Kudo's to Kevin Schmidt: We are the Robots Exhibit. Not only an audio visual treat, but the underlying theme of the exhibit is thought provoking and happening right now.

Don't forget to bring your records! And as backup, your digital audio library on your phone ☺

Thanks Archimago for the great photos. It will be interesting to hear your take on our wonderful visit! Thanks Mike Lee from diyAudio for providing the front page and back wall diffuser panel photo's.