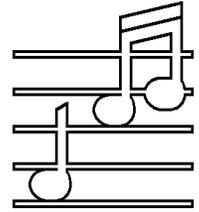


AUDIO BASICS



AN IRREGULAR NEWSLETTER OF AUDIO INFORMATION

June, 1999

The Stereophile Hi-Fi 99 Home Theater & Specialty Audio Show

The following report is written by Mithat Konar, designer of the acclaimed Biro loudspeakers. I am going to add my own observations first as follows and not be as kind as he was:

Observation One: There was absolutely nothing displayed at the show that was worth the price being demanded for it; \$20,000 amplifiers, \$80,000 speakers, get real. The object is the music, not to impress your neighbors with expensive toys.

Observation Two: There was nothing at the show that could stand comparison with a Super Pas Three, a Super 70i, and a Fet Valve Dac with any old \$100 CD player driving a set of Biro L/1s connected with \$10 worth of cables in a properly acoustically treated room, and that's not the best we can do by far.

Observation Three. There was nothing at the show in the way of HDTV, DVD, SuperDisk or whatever that could stand direct comparison to a good laser disk player driving my old Advent 750 projector TV with the digital out of the laser disk player running through an AVA Dac and on to those old rebuilt Dyna units mentioned above and the Biro L/1s.

Observation Four: The sound universally sucked, the video was fuzz, the rooms sounded like boxes, and the prices were beyond all rationality.

My Questions: How could anyone who could possibly afford the prices being asked for megabuck toys possibly be stupid enough to buy them? And, why were all the manufacturers, reps, salesmen, and magazine writers standing around smiling while their ears bled out?

Frank Van Alstine

A Day At The Fair

A report from Stereophile's HI-FI 99, The Home Theater & Specialty Audio Show, by Mithat Konar — owner and director of engineering, Biro Technology

I'll probably get into trouble for this.

Last time I publicly voiced my opinions of an audio trade show was years ago. The show was an Audio Engineering Society convention, and after it ended I posted to the internet a brief summary of some of the highlights I encountered. One of

those highlights involved an amusing and embarrassing (for the exhibitor) exchange with the manufacturer of some studio monitors. At the time I was working in the research and development division of an electronic music instrument manufacturer and had nothing professionally to do with the loudspeaker industry. So I figured there were no foul commercial interest issues to prevent me from speaking my mind.

Well, I was wrong. It seems that one of the people involved with the company I was working for had some professional or personal relationship with someone who had some relationship with the monitor manufacturer, and... Well let's just say that I wasn't a candidate for favorite son after that.

At least this time I work for myself and so I won't get into trouble with the boss. But also this time I am rather involved in the loudspeaker industry, and that puts me in a rather awkward position. With that in mind, I decided the fairest thing I could do is to write a report about the HI-FI 99 show without mentioning any names. This is far less limiting than it might first seem as I think the trends I saw at the show are more important than any specific products. Here then are some highlights from the show that Frank Van Alstine, president, and Aado Perandi, electrical engineer, of Audio by Van Alstine, and I visited during the two 'trade only' days.

The very first room we entered belonged to the maker of some well-respected quasi-minimum phase loudspeakers. And it was awful. Virtually no care was taken to address even the worst of the room acoustics issues. The room itself (as was the case for most rooms at the show) was a rectangular hotel room devoid of all the furniture you'd normally expect in a such a room.

The loudspeakers were set up where the two beds would normally have been, and immediately behind them were a pair of wooden headboards permanently attached to the wall. There were huge standing wave problems in the room, and effectively nothing was there to absorb or diffuse the mids and highs, much less control the standing waves. When we pointed out to the loudspeaker designer that we couldn't hear his speakers through the room — and what we heard was not good — he informed us that he deliberately didn't do anything to address the room's acoustics. His reasoning was that the environment in which we were hearing the speakers pretty well represented the acoustics in which his typical customer would install his system.

On the surface, this might seem like okay reasoning except: (1) a 'typical' domestic listening room will have more furniture and other stuff in it diffusing and absorbing the sound than was found in that room, (2) I suspect many 'typical' customers spending over \$5000 on a system *will* go to some length to help a room's acoustics if they need to, and (3) if the sound we heard was what he expects is 'typical' of his system in a real room, then he didn't do a very good job of making his system work in a 'typical' room.

After that room, I was looking forward to something where the system had been set up with more care and with equipment that let me enjoy the music. Room after room we searched, but to no avail. Every room on several floors had significant defects that drove us out of the room relatively quickly. Frank had much less patience than I. I had an interest in learning *why* things sounded so bad — was it the source, the amps, the speakers, the lack of attention to the room, or a combination of the above? I guess Frank has been there and done that enough that he no longer cares. I on the other hand figured this may be an opportunity to learn from others' mistakes.

Unfortunately, in most cases I was not able to determine what gear in any particular situation was being offensive. Which for me again reinforces the concept that you can't fairly audition a piece of equipment unless the rest of your system is working very well. I've heard time and time again poorly performing amplifier and sources make tweeters and woofers sound broken and vice-versa.

In fact, I suspect the lack of this understanding in the industry is in part responsible for the state in which we find it. Say you have a harsh sounding CD player that you're using as your primary source. You can ameliorate that somewhat with a soft sounding loudspeaker or a spongy amp. Or a bloated amp can be made less annoying by an anemic, overdamped, or brightly balanced loudspeaker. In other words you can introduce various distortion and colorations to make other distortions and colorations less annoying.

But this is not the way to build hi-fi. Unfortunately, I don't think the industry at large gets this. Instead they chase the tail of whatever gear or distortion is in vogue, thereby making products that try to flatter the errors du jour. And things don't get better, they just become different.

At any rate, in room after room we heard system after system that made me want to turn it off and/or leave. I found nothing that did the music any service — and I'm not exaggerating. No music was better than everything I heard until...

Just for giggles we walked into the rather large room occupied by the manufacturer of classic 'direct reflecting' and miniature 3-piece 'lifestyle' systems. There we were treated to the best hospitality we had yet encountered — wine and cheese. It was too early in the day for me to start downing Merlot, and I had the materials from my somewhat large lunch still in my stomach, so I abstained from both.

However, I noticed their very tiny two speaker, subwoofer, and CD player system in the corner was making some music, and it wasn't annoying me. It was by no means great, but it was certainly not irritating either. We ended up chatting with the reps there, who gladly confessed to their audio ignorance as readily as they accepted our compliments that the sound wasn't driving us away as all other systems we'd seen had.

Before you think that I'm going to start recommending this system to those needing a 'lifestyle' product, let me warn you that the \$3000 system price tag was way out of line for the quality of sound it was delivering. I've heard several boom boxes and mini systems deliver sound quality at least as good for about an order of magnitude less.

One room where I *was* able to tell what was responsible for the nasties I heard was jointly hosted by a loudspeaker manufacturer and a manufacturer of vacuum tube amplification gear. Whoever setup the room was able to resolve the standing wave issues rather effectively and had most of the mid and high frequency reflections under control as well. I was impressed.

One result of this was that I could tell that the speakers were quite nice — well integrated drivers with good balance and resolution. I could also tell that the amplifiers they were driven by were getting into some serious trouble — compressing and getting harsh when the source got just a little bit demanding. I approached the speaker company's namesake and told him that it seemed like he had a really good design on his hands. He was pleased. In fact, I continued, I thought the speakers were much better than the electronics that were driving them and that he should consider driving them with something else.

Unfortunately he seemed to take offense at this. Was it because I unintentionally gave him a sideways insult by suggesting that he wasn't able to hear the problems? Was the electronics manufacturer a business partner or a friend? I guess I'll never know, but it does show how personally things are taken in the industry. And I really just wanted to help him show people how good his speakers really were.

Not surprisingly, vacuum tube electronics were everywhere at the show. It seemed every other room featured some kind of tube amplification. Typically these were frightfully expensive but very beautiful craft works. Unfortunately, their sonic performance never met the expectations brought on by the stunning visual aesthetics and price tags.

Many of the tube amps featured were (again no surprise) single-ended class-A jobbies with power ratings ranging from insanely small to merely inadequate. The systems with single-ended class-A amps I listened to sounded pretty much as you'd expect: loose in the bottom, honky in the mids, and a bit bright — all these being artifacts caused by the interaction between the typically high output impedance of these amps and the non-constant input impedance of most loudspeakers. However, even systems with speakers specifically designed to mate with low-power, single-ended class-A amps sounded this way. This made no sense — but at this point in the show I had come to expect nothing to make sense.

Another characteristic of the single-ended class-A amps I heard was that they sounded rather compressed. While this is certainly a 'sound', it must be kept in mind that the 'sound' is a result of what the amp is *adding* to the signal. In other words, I am more convinced than ever that what draws some people to these single-ended class-A amps, despite what they say, is what they do *wrong* rather than what they are supposed to do right. I personally don't like the sound and have a hard time imagining who would.

A few loudspeaker manufacturers jumped onto the retromania bandwagon instigated by the single-ended class-A amp makers and showed systems inspired by or taken from classic systems of the past. These systems — mated with appropriately vintage-style electronics — were large, not very attractive, and pretty terrible sounding. Just what you'd expect from 40-year-old speaker technology. This retro kick might be fun for some, but for me it doesn't serve the music very well at all.

In the 'new technology' department there were a couple notable entries. The developer of the AC-3 audio standard was demonstrating projected HDTV in a 5.1 soundroom, and the much talked about but little heard Direct Stream Digital (DSD) audio encoding scheme was being demonstrated in a few rooms.

I don't think I'm qualified to talk about the visual aspects of the HDTV demo, but I thought the sound left a something to be desired. If 5.1 is a format that can *add* to ones listening pleasure, this demo failed to prove it. Not only was the LFE

channel way too loud, but the sense of space from the five remaining speakers was worse than what I'd expect from even a slightly good two-channel system.

I'm not really sure what I can say about DSD. Yes, the demo of the new encoding scheme (which is essentially a sigma-delta conversion system without the intervening conversion to PCM and back) sounded better than the standard CD Red Book version of the same recording. But it was impossible to tell *why* it was better. Both signals went through different D/A converters for starters, so it's possible that the differences I heard had more to do with differences in the converters than in the format.

But perhaps more importantly, I have concerns with the theoretical aspects of DSD, and no one at the show was able to lay those to rest for me. First, signal processing of DSD signals is far more difficult than it is for standard linear PCM signals. That means that processing artifacts introduced into recordings could degrade the signal beyond anything that might be gained in the format. A representative from one of the developers of DSD even confessed that their first generation of DSD mixers was pretty awful.

Second, no one has yet been able to answer for me a rather fundamental question about the dynamic behavior of sigma-delta systems in general. Sigma-delta conversion uses healthy doses of feedback to linearize what is basically a very nonlinear system. Actually, the feedback is used to shift the nonlinearities into frequency regions outside the range of interest. For example, in typical 64x audio sigma delta conversion (the type used in DSD and most other sigma-delta converters) the conversion errors are shifted out of the dc to 20kHz (or so) region and into super-audio regions.

One element in the feedback loop is a multipole filter. Like all filters, this one has a finite settling time. That means that the *system* will have a finite settling time — or a minimum time it will take for conversion errors to be shifted out-of-band for dynamic signals. The \$64,000 question (the one that no one has yet been able to answer for me) is: is that settling time less than one baseband cycle (i.e., 1/20,000 sec.) for the best sigma-delta converters?

If the answer to the above question in "yes", then indeed 64x sigma-delta systems can deliver the same resolution as 16 or 20-bit direct PCM conversion under dynamic conditions. If the answer is "no", then 64x sigma-delta systems will likely forever have the hard top end I've come to associate with this conversion technique. I await an answer to this question — I can't be the only person to have asked this.

To the best of my knowledge, I heard no 96kHz/24-bit recordings at the show.

Toward the end of our first day we stopped in front of a room that was serving some 16 year-old single-malt whiskey from the Isle of Islay in Scotland. I poured myself a small amount (neat) and took a sip. The stuff really, really didn't suck. With a smile on my face I entered the demonstration room.

I was immediately impressed with the extent the exhibitor had gone to give the room a pleasant atmosphere as well as to tame some of the room's acoustic issues. At the far end of the room were a pair of active loudspeakers next to pair of refrigerator-high displays showcasing the amplifiers being used to drive them. We were drawn in (at last!) by what promised to be truly high-fidelity sound. Sitting down on the comfortable sofa, I was not completely disappointed.

The mids were relatively clean, the highs extended but not hard, and the bass was reasonably well controlled. The system

had the kind of resolution and reach into the recordings that I was accustomed to from my system. And (not surprisingly) the imaging was wide and deep. However, there were a few problems: the low end was somewhat overbalanced, there was some noticeable coloration in the mids, and it seemed that perhaps there was a dip in the system response around 3 kHz. I thought the low end problem could have been solved simply by attenuating the woofer a bit (trivial since this was an active system) and the problems in the mids cleared up by moving the amplifier display out of the sound stage.

I spoke with a representative of the Scottish firm and told him that this was the best sound we had yet encountered at the show. He was pleased. I also shared with him my ideas for improving the sound. We decided that a return visit was called for — if for no other reason than to sample some more of their very excellent whisky.

So we returned to the room as the last stop on our last day. The whisky was still there as were the amplifier displays. Apparently they just couldn't find anywhere else to place them — my idea of placing them diagonally in the corners was deemed unworkable for some reason. However, I was told that they took my advice and attenuated the woofers a few dB — and indeed the low end was improved. We sat for the duration of our drinks and very much enjoyed the sound.

I asked the representative how much the system cost. The cost of the active crossover, amplifiers, and speakers was around \$90,000. The CD player source was a mere \$20,000. Adding the cost of the preamp to the system brought the bill up to the cost of a small home in the Minneapolis area. I reflected that the sound I heard was still no better than what I was accustomed to from a combination of Biro loudspeakers and AVA electronics, and given that a Biro/AVA setup comes at a cost roughly 1/40th of the cost of the system in question, my enthusiasm waned somewhat. However, I was still thankful that at least someone seems to remember what music is supposed to sound like.

In all, I found the show to be very disappointing. I really wanted to find (1) a line of electronics that I could recommend to people who — for whatever reason — didn't like the idea of buying their audio electronics via mail-order, and (2) a line of loudspeakers to help AVA round out what they could offer their clients since my tiny little company is currently only able to manufacture a limited range of systems. I found neither.

This is not to say that there couldn't have been some good equipment and values hiding here and there at the show. I suspect that indeed there may have been — it's just that if there was it was connected and/or setup in such a way that you'd never know it.

Thinking that maybe my expectations had been elevated by the hype at the show, I turned on my living room system the minute I came home. This modest system is based around an AVA Super 70i amp and a pair of my L/1 loudspeakers. I was not mistaken. The sound that issued forth communicated more music than anything I heard at the show, and it did so without resorting to frequency shaping tricks or euphonic distortions. It did what hi-fi is supposed to do: get out of the way and let the music come through without editorialization. It can't be *that* hard to do this, can it? After all, we do it all the time.

Well, it seems to be a lot harder than one might think.

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