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## Why the Grimm LS1 is the World's Best Complete Audio System

*by Timothy Roth*





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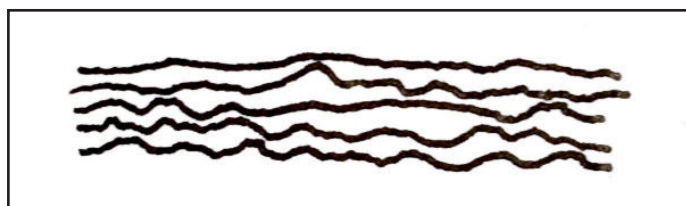
## High Fidelity: Why the Grimm LS1 is the World's Best Complete Audio System

by Timothy Roth

[Images by Roth, courtesy of Grimm Audio, and courtesy of the University of Rochester; album art courtesy of their respective labels]

### The Theory

One day when looking closely at a copy of the Beatles' first mono single, "Love Me Do" (a replica, sadly), I had an epiphany. You see, my vision is in the extreme nearsighted range, which is mostly a curse but also a blessing because my eyes are like microscopes. The average human eye can see down to about 100 microns, or a tenth of a millimeter. Without my glasses, I can see individual silk fibers, which are 10 microns in width (red blood cells are seven, can't see those). This means that holding the Beatles record close, I was able to see the actual individual grooves of the record and their wobbly shape. And for a mono record, what you see is what you get: those lateral backs and forths are simply a linear description of the pressure waves they're intended to create. They're just amplitude intensities represented by a line, beautifully simple and pure. It has always boggled my mind that the sound of, say, John and Paul's voices singing simultaneously, along with the drums, bass, and guitars, and even the ambience of the room, can be encoded into a single line. And here it was, right in front of me. That's when I had the epiphany: I want to hear that. I want to hear



Hand drawing of what some of the record grooves look like

that, nothing more, nothing less. I want to hear those pressure waves in the air exactly the way they are encoded on this record. I don't want to hear gold-plated cables, line conditioners, Shakti stones, phono stages, amps, preamps, DACs, drivers, or room reflections. I don't want to hear my audio system, I just want to hear the record.

Unfortunately, we don't live in a world where we can achieve that level of perfect reproduction. Really, the perfect speakers would be full-range pulsating orbs (just one for a mono record) floating in an infinite sky. Nor do we live in a world where most audiophiles want that kind of high fidelity, which I find unfortunate. It seems that all hope of achieving perfect reproduction has been abandoned by most audiophiles, partially because of the near impossibility of achieving it with the materials and know-how available on this planet, but perhaps even more so because of a preference for a subjective experience of the euphonious rather than objective reality.

I've never been easy with that crowd. I'm in love with Truth, and I'd rather hear the truth than a sonic bubblebath even if it is sometimes less pleasant. An irony of the audiophile world is that so many people talk about "high fidelity" but really have no interest in fidelity. The word fidelity is derived from the Latin *fidelis*, which means faithfulness. Webster defines fidelity as follows: "1 a: the quality or state of being faithful or loyal; b: accuracy in details: exactness; 2: the degree to which an electronic device (as a record player, radio, or television) accurately reproduces its effect (as sound or picture)".

To be sure, there are people in the audiophile industry who truly seek fidelity. One such person is Michal Jurewicz, the designer of the Mytek DAC, one of the best DACs on the market. In a phone conversation with him, Michal lamented the preference for the euphonious in the audiophile world over faithfulness, a taste for the subjective rabbit hole with no end over the firm ground of objectivity.

This ironic disregard for fidelity in the audiophile world is what I call "the sepia-tinted glasses philosophy." It's like someone who insists that the best way to look at a sepia-tinted photograph is through sepia-tinted glasses. In this thinking, the best way to hear music is through a system that sounds "musical." This often translates to the euphonious, the esoteric,

tube amps (which do subjectively sound great, by the way), and, frankly, a speaker that is sluggish in the time domain. My contention, and there are many who agree, is that a sound system can't sound "musical"; only music can sound musical, and the more faithful a sound system is to the music, the more musical the music will sound (this is not always the case for systems that get close but not close enough, as I'll mention below). An absurd example of this informal logical fallacy would be that a trumpet will sound best through a trumpet-shaped speaker or that a speaker designed like the human ear will sound more "natural" (I'd be curious to know if there are such speakers).

One example of a very good loudspeaker that is nevertheless decidedly not high fidelity is MBL's 101E Mk II Radialstrahler. Having heard these speakers myself, they are superb in many ways, but I found them to be a bit diffuse, lean, and far too airy and bright. A look at the philosophy behind their design, which I found in their product pamphlet, explains why. They're designed to radiate music evenly in all directions, which is the reason for their innovative oval-shaped ribbon design. And while that concept comes close to the ideal of the perfect orb or point source radiating sound evenly with no possibility of diffraction, diffraction is the goal with the MBL MkII's. You see, in real life encounters with music, you don't just hear the instrument, you also hear the ambience of the room, such as a jazz club, outdoor surfaces, the cavernous inside of a stone-built church, or the ambience of the music hall. So why not have your walls create the same effect by having sound bounce off them in all directions? The problem is that the room ambience of a recorded performance is already encoded in the record, so if you combine that with your own room's ambience, you get the chaotic, diffuse, overly-atmospheric sound of the Mark IIs. This is looking at a sepia-tinted print through sepia-tinted glasses. These speakers are still among the best I've ever heard, as their strengths outweigh their weaknesses, but they're not really for pursuers of fidelity. They're euphonious, but not exactly truthful.

So how do we get to true fidelity? I would argue that it is through achieving accuracy in the three main domains of faithfully reproduced music: a flat frequency response, correct phase, and a ruthlessly fast transient response for the time domain. Of course, there are theoretical objections to accuracy in any

one of these three domains. For example, it may be feared that fast translates to analytical or clinical. The typical objection to a flat frequency response is deftly summarized by the article "Down With Flat!" by J. Gordon Holt and published by Stereophile in the mid-80s. Though dated, this thinking is still rampant in the audiophile community. Without going into detail, the main reasoning behind the article is basically that speakers should be designed to work well in a room with hardwood floors, huge windows, and mirrors. For this reason, he claims the top end is too tipped-up on speakers that measure flat and that the bottom is too thin. In other words, speakers should be designed according to the lowest common denominator when it comes to listening rooms. Another problem with the argument is that the recordings themselves may overemphasize the high end or have a thin low end. And how would you know what's too much or too little anyway without an objective reference? We get used to what we hear at home. Finally, what counted as "flat" in the mid-80s was likely nowhere near the "flat" of today. And if you get close, but not close enough, the dips and peaks, even if minor, are going to stand out more starkly.

The objection has also been raised that no two ears hear the same thing anyway. The Fletcher-Munson curve shows that everyone has slight variations in their hearing, and the curve is, in fact, an average of samples. First, such differences are slight and nowhere near the +/-6dB (or worse) frequency response of most speakers, audiophile speakers included. Second, considering this is the case, why not give your ears the best possible chance of hearing the real thing? Why make the problem worse?

The kind of speaker Holt would not be pleased with is the ubiquitous-in-professional-studios Yamaha NS-10Ms, a pair of which I own. They are prized for their flat frequency response and fast response. They sound good to me, but many people hate their sound as being too analytical. Therefore, they serve more as workhorses for getting a good mix rather than for enjoyable listening. But the truth is that their abrasiveness is due to the fact they're not exactly flat. They have a bump in the nastiest and most difficult part of the mid-range, which is partly why mega-producers use them. It helps them focus on and solve problems in this range. Plus they have metal dome tweeters that come off as too bright and fatiguing, why is why many engineers place tissue paper (!) over them. It

seems, then, that approaching flat and fast is like approaching the eye of a hurricane. The closer you get, the more hellish it gets, but if you can get through to the center, you're in paradise. The Grimm LS1 gets there, so they're a joy to listen to. They don't come across at all as cold, analytical, or brash. Just the opposite, in fact. They're a joy to listen to, as I'll get into in my listening examples.

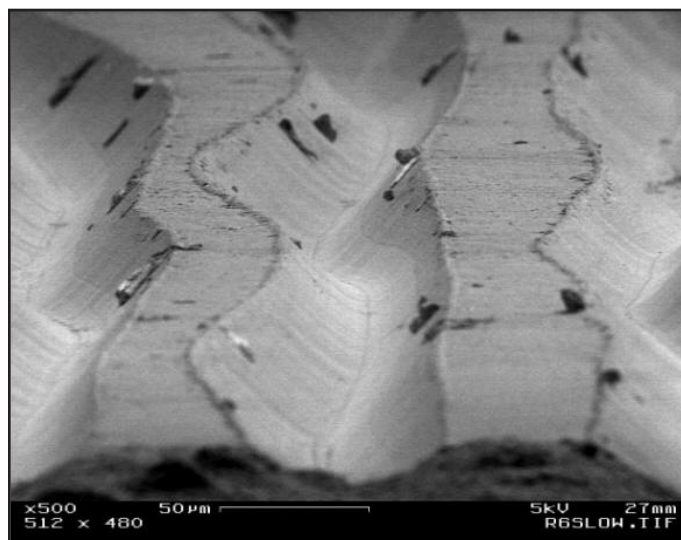
The controversy surrounding flat frequency response brings up the closely related question of what exactly a loudspeaker should do. Peter Breuninger, in an Absolute Sound review of the MBL MkII, incidentally, paraphrases Jonathan Valin's perceptive categorization of types of listeners as follows:

"TAS Executive Editor Jonathan Valin (JV) coined the ingenious three-listener concept. You remember: the fidelity-to-master tape listener, the sounds-good (to them) listener, and then the 'true'-to-concert-sound listener (this publication's founder, Harry Pearson's 'absolute sound' standard)."

I would have to stand with the "fidelity-to-master-tape" crowd, with a slight amendment, "fidelity-to-final product," as the final product, regardless of format or bit rate, is all we have to work with (and the cutting of vinyl masters usually includes minor EQ tweaking of the master tape). The "sounds good" philosophy makes sense from the "life is short" perspective, but as an artist, I don't have time in this life to experience anything less than the artists' intent. The third philosophy is just misguided. How do you get a "true-to-concert sound" from the finished record unless that sound is contained in the record? And if that's the case, a faithful system will recreate that vibe. If it's not there, then your system is merely hypothesizing what isn't there, creating an illusion of "concert sound" that has no basis in the actual record. (And why not just go to a concert? It's a lot less expensive.) In other words, the system is coloring the sound. It's like selecting the "Hall" option on a bastardized all-purpose home entertainment receiver. It might sound like it's in a hall, but that's because the receiver is slathering on a fake additional ambience on top of the recording. I see speakers trying to emulate such effect to be no better, no matter how much they cost. Nor is it realistic to try to "get inside the recording studio with the band" (although with great recordings, you can get right to the threshold). The record is an impassible barrier, the event horizon, to

that experience. Great recordings of bands indeed pull off that vibe quite often, so you can get that experience, but only because it's in the source, i.e., the record. If that vibe isn't there, or isn't intended (like many classic psychedelic-era fantasia-creating Beatles songs like "Strawberry Fields Forever"), then your system is just hypothesizing at best and mangling the artists' intent at worst.

This preference for the subjective, of seeing the world through sepia-tinted glasses, is understandable, and I have even come to accept it. Like I said, life is short, so you may as well spend it listening to a sound system that sounds good to you, however you define "sounds good." But some of us would rather hear what the artist thought sounded good, not what we think sounds good. And the only way to achieve that revelation of artist intent is through the pursuit of fidelity.



*Scanning electron micrograph image of stereo record grooves. This is what I want to hear (minus the dust). [Image courtesy of University of Rochester: URnano]*





### *The event horizon*

Seeing those grooves on the Beatles record and the desire to hear them faithfully reproduced set me on a quest: to find the most accurate speakers, and the audio system driving them, in the world.

My first criterion, and the one I believe is most crucial to hearing the artist's intent, is a razor-flat frequency response. After all, of the three key aspects of faithful reproduction, an uneven frequency response is the most likely to warp that beautiful record groove in such a way that the distortion would be visible to the naked eye. In searching (i.e., hours of Googling) for speakers flatter than the typical  $\pm 6$ dB range, I immediately noticed that most audiophile speaker manufacturers don't even publish their frequency response. They don't want you to know that it's actually worse than  $\pm 6$ dB. And even that standard is wildly sloppy. It means that you could have an over- or under-emphasis in the audible range relative to the input signal of as much as 12 decibels! Talk about coloration. How this is acceptable is beyond me.

So I started looking for speakers that are at least  $\pm 3$ dB. This narrowed the field dramatically, due in part to the physical difficulty of building a mechanical device that can be that disciplined across the entire audible range and due in part to the lack of interest among many audiophiles. Not surprisingly, while I found many audiophile speakers that fit the bill, most of these speakers were designed for professional use in the recording studio. Audio engineers, after all, are staking potentially millions of dollars and a Grammy or two on hearing what they're actually making. One of the most pre-eminent speakers in this field is the legendary Bowers and Wilkins Diamond 800 series. For example, these speakers are used in the control,

mixing, and mastering rooms at Abbey Road Studios. In fact, the B&Ws are used throughout the audio industry, including major film studios. But  $\pm 3$  is still a potential 6dB difference, still well within the easily noticeable realm. I decided to go for  $\pm 1$ dB, not expecting to find anything. To my astonishment I found a dozen or so. This time they were all mixing/mastering studio speakers, some of them cheating by using digital room correction. Then I decided to try  $\pm 0.5$ dB, a maximum difference of a decibel, basically indistinguishable to the human ear. Only one speaker came up: the Grimm LS1 (and without cheating).

This pretty much ended my search because of my criterion for flat above all else. I was relieved to find, upon reading their specs, that their transient response is far faster than any other speaker I'd ever heard of, including the most demanding and most well-respected professional studio speakers, where detail is just as important as flat response. Their phase correctness is equally impressive. I had finally found what, on paper at least, may be the most accurate speakers in existence, except perhaps (though I doubt it due to the near-impossibility of the feat) for some speakers built in-house by certain mastering studios, such as the world-renowned Bernie Grundman Mastering, but that remain a trade secret. What made me even more excited was the discovery that the Grimms aren't just speakers. They're a complete audio system. The DAC, preamp, amp, all the electronics, are housed within. So the astonishing measurements of the speaker are actually measurements of the entire chain, from input to output.

Again, not surprisingly, the Grimm LS1 was initially aimed at the mixing/mastering studio. But now it's also aimed at the living room, which is revolutionary in itself and which I'll discuss more below. If you go to their website, [www.grimmaudio.com](http://www.grimmaudio.com), you will see that the exact same LS1 is listed under both the "pro products" and "hifi products" tabs. The hifi version has a much more upscale and elegant cabinet and shorter legs for level placement at the listener position. The pro version has taller legs to raise the speaker above the console. The volume/switcher and USB interface are not included in the pro version but are available separately. But this system isn't just a professional work horse. It's a true audiophile product made by audiophiles for audiophiles, whether in the studio or in the living room.

But how would these speakers sound? I feared that if they sounded like shrill, analytical crap, I would have to ditch my theory of high fidelity and simply accept that the subjective is all we have.

## The Reality

When the system arrived at my humble abode on a beautiful early summer day, I was both excited and nervous. My theory was at stake.

Setup was fairly quick and easy, basically consisting of attaching the legs to each speaker with nifty magnets that snap the whole thing together. Then the base plates are attached and the subs placed on the plates. There was some very simple wiring to do, followed by downloading the software and pairing it up with my laptop. The whole process took less than an hour, and music was already coming out these beauties!

Now for a bit of background. The LS1 was designed primarily with mixing/mastering studio engineers in mind who need to hear exactly what's going on in the recording to make it translate well across widely varying systems. This means rigorously faithful and precise playback that lends itself to close analysis. This could translate to the dreaded word “analytical” with a lesser speaker. Fortunately, the LS1 is not lesser. While making a pleasing-sounding speaker was not the main aim, the Grimm designers found that accurate presentation and a smart approach to design, especially attending to how the system behaves acoustically, resulted in a truly “musical” sound (not a surprise to me). While minimal digital signal processing is used to align the drivers, crossovers, and phase, the main result comes down to brilliant engineering first and foremost, with the DSP only a finishing touch.

First, the decision to go with a wide baffle is boldly retro. Wide baffles were a common design strategy in the 30s and 40s. The benefit to the wide baffle is that, according to the manual, it “move(s) the baffle-step frequency below 250Hz,” below which point human hearing perceives sound as unidirectional. This approach pushes directional difficulties below the point where directionality becomes irrelevant. The legs, which surround the cabinet, are rounded to attenuate edge diffraction, thus significantly sharpening the



stereo image. “As a bonus,” the manual notes, “the shallow cabinet moves the lateral resonance inside the box significantly above the cross-over frequency of the low frequency driver. This avoids boxiness before any electronic correction is applied.” I would also mention that the cabinets I’m testing are made of real bamboo, and they look gorgeous.

They opted to use Seas drivers, which feature a magnesium cone that attenuates cone breakup effects. The tweeters also have an even and distortion-free frequency response into the midrange, which allowed them to set the crossover lower to ensure even dispersion and further improve imaging.

Another interesting design choice is that the sub, called the “LS1s,” lies on its back so that the driver faces upward (it looks super cool). Grimm offers the LS1s as an option whose main purpose is to free up the woofer, allowing a higher SPL capacity and bringing the flat frequency response from 40Hz down to 20Hz. (In fact, using a tone generator, I saw the subs begin moving at about 9Hz! And they became audible and visceral at 15Hz.) While they claim that the sub is not essential, I beg to differ. In some of the electronic and hip-hop tracks I played on the LS1, the earth-shattering infrasonic jackhammer punch into your floor, enhanced by lying on their back, that verges on the terrifying (on U2’s song “Mofo,” from their Pop album, I thought my floor was going to collapse) just isn’t there with the subs switched off. For this kind of music, it’s just more thrilling to have the subs on, and it makes the woofers sound more open where they would otherwise be taxed to the limit.

One of the most unique aspects of the system is that all the electronics are contained in the left leg of each speaker. This considerably reduces clutter and makes for the shortest, purest signal path possible.

Digital signals are re-clocked by a modified version of Grimm's "legendary" CC1 clock, which is widely adopted in the professional world. There are actually three CC1 circuits, one in each leg and one for the USB interface.

By the way, if you have any concerns regarding whether Grimm is capable of providing their own truly audiophile-class electronics, you can lay them to rest by recognizing that their DACs and clocks are a standard in the professional audio community and that millions of dollars and Grammy Awards are currently being staked on these components. These aren't just afterthoughts that you can easily improve or replace with third-party tweaking. The design of these components is a passion for this company, backed by decades of experience gained by their principal engineering team consisting of some of the most well-known audio engineers around: Bruno Putzeys, Guido Tent, Peter van Willensward, and Eelco Grimm. Their combined fields of expertise in different areas of audio design are what qualify the Grimm LS1 as a total system that is more than the sum of its parts. This isn't a Sony home theater package. Even the power supply regulators are their own painstaking design, made with the performance of the entire system in mind.

And this is what audiophiles who find it counter-intuitive or impossible to accept that an all-in-one system can be good need to understand: the LS1 was designed with the entire system in mind, knowing that any one component will affect all the others. What they came up with is a balanced system whose final integrated form is near-perfect linearity and accuracy. Home-assembled audiophile systems composed of various parts from various manufacturers, no matter how ingenious each individual component is, cannot enjoy such a claim (unless you're really lucky). That's why this complete system could only be degraded by tweaking and is intentionally designed to be tweak-proof. Anything that could be substituted in would not have been designed with the final ensemble, and how it all works together, in mind.

Here, it should be strongly cautioned that even the Theoretically Perfect System will be rendered useless by a poorly designed room and poor placement. Grimm recommends that suitable room treatment be used, optimally a partially, but not fully, deadened room. Here's where I had the most trouble

with set-up, and this is the part that took dozens of man-hours, sweat, measurements, re-measurements, and occasional cursing, to get the system to remain linear in my room, at my listening position. Here is where I fault Grimm for not providing sufficient guidance in their manual. After all, a flat frequency response, precise time domain, and accurate phase can be rendered meaningless by a room that distorts all three. I would like to see them provide thorough recommendations concerning the ideal room treatments to install along with the ideal equipment to measure and solve room interference problems (of course, a professional acoustician can always be hired to address these concerns, which would be money well spent).

Furthermore, although this is a contentious issue, I would have liked at least the option to have a more aggressive DSP option for room correction. No, this is not the ideal approach, especially with the purity the Grimm engineers had in mind, using very minimal DSP only at the last stage to fine tune and match all the drivers. However, I believe having the sound of these speakers get screwed up in the typical untreated living room scenario is an even worse option. Room correction would be an evil, but, in my opinion, a lesser evil for people who do not have the resources or the passion to get it right. Fortunately, I was able to take the room mostly out of the equation by using well-placed acoustic paneling by Auralex, measuring and re-measuring frequency response at the listening position using tone-generating software to ensure the flat frequency response was maintained, and, perhaps most importantly, by listening. The bass response is the most difficult to control in a room, so





the main way I knew I finally had everything in the right place was when an acoustic bass sounded like a real acoustic bass, an electric bass sounded like a real electric bass, and otherworldly computer or synthesized bass sounded truly otherworldly.

I should note that I used a nearfield arrangement due to my room size and my interest in close analytical listening of the kind in a mastering studio. While nearfield isn't for everyone, I find it to be the most immersive way to listen to music.

The Grimm manual recommends an extreme toe-in of 45 degrees to reduce the effects of room reflections, to maintain a realistic stereo image over a wider range of listening positions, and to reduce any effects of cone breakup. I already found any supposed cone breakup distortion to be practically invisible, and in the nearfield arrangement with proper room treatment, the other two issues were irrelevant. Thus, their note that in some situations the traditional on-axis position, with the tweeter pointed at the ear, will sound better than the 45-degree toe-in was true in my case. I found the traditional toe-in angle used in the studio to be preferable, but I take their word that the 45-degree angle may work better for most other situations.

Finally, before going into the actual experience of listening to this system, I need to note that I decided to do all listening purely in the digital domain from my MacBook, using the Audirvana platform, and using the USB cable to plug directly into the LS1. In this setup, Audirvana doesn't actually do any processing. It simply sends the 0s and 1s right into the LS1's DAC. The reason I decided to go with this option is that I wanted the pure LS1 experience. Any outboard equipment or processing will color what the Grimm does in some way. Sending raw bits straight to the LS1 removes this problem.

My listening included everything from 256 kbps iTunes files to 192kHz/24-bit files in the PCM realm (the LS1 can currently process PCM up to 384kHz/24-bit). But most deliciously, I took advantage of the LS1's ability to do DSD64 and DSD128. The LS1 is also multichannel-capable when paired with an external preamp or processor.

## The Realization

I first want to note that for the first few weeks of testing the system, I literally jumped every time a track started playing. The sound coming out was so tangible, present, and alive, it was startling every time, as if a new physical entity had suddenly entered my room.

In my listening examples, I will include everything from rock to hip-hop to jazz to classical, but I will start from lowest fidelity to highest. And yes, the difference is highly noticeable on this system, even to friends and family with untrained ears who came by for listening sessions. In fact, I soon learned that I had to start with regular 44.1kHz/16-bit and end with hi-res because everyone noticed when we went from hi-res back to standard CD. The return to a duller, flatter, grimmer sound was not only noticeable but actually pointed out in unsolicited comments.

First, let's start with "Hells Bells," by AC/DC, whose most recent release and remastering is exclusive to iTunes in 256kbps and is labeled as "Mastered For iTunes" (not especially impressive, but for what its worth, a small improvement from typical iTunes downloads that are just compressed CD rips). I wasn't expecting much. I had already road tested a few 256 kbps tracks and was slapped in the face with exactly what I expected, a thin, brittle sound. But when I put "Hells Bells" on, I was genuinely shocked by how good it sounded. I know, I know, it's heretical to say that about a low-res file, but I'm just honestly reporting what I heard. The sound of this song through the LS1 is nothing less than monumental. When a few seconds in Angus Young starts playing the opening riff in the right speaker, it's almost terrifying in its immediacy. It sounds like fresh strings through shiny, metallic pickups being put out by an actual tube amplifier. But what's most impressive is when the kick drum starts. It's a fully detailed kick right in the center of your chest with detail ranging from just the heavy bass thump to the high-frequency tick of the skins. It's so present and real, it's more frightening than the guitars. Then, when the cymbals and hi-hat come in, it's a shimmering, sonorous bit of ear candy that, combined with the equally crystal clear snare, shifts the whole song into overdrive. From there it's just pure rock and roll, and I like it. When Brian Johnson's voice comes in, it's right in your face and the whole thing is now completely



over-the-top. The soundstage is huge, but you get the sense that it's because that's exactly what's in the recording. The soundstage doesn't sound forced or enhanced, like a lot of speakers that specifically try to emphasize it. Why this file sounds so incredible I chalk up to the simple fact that it's one of the most legendary mixes ever made. Everything is at exactly the same volume level, and every element sounds completely independent of the others. Apparently, it's such a genius mix, its clarity can cut straight through the crap format. Again, for anyone doubting this heretical statement, I challenge you to come here right now and experience it for yourself (just bring a bottle of the finest scotch).



Next up is "The Miracle (of Joey Ramone)," the lead-off track from U2's new album *Songs of Innocence*. This is an unadulterated joyful, exuberant, stomping rock and roll song, one of U2's very few. This too is in 256 kbps "Mastered For iTunes" because that's all that's available right now until the physical release comes out on October 13 in CD and vinyl. Despite the low-res, this song simply stomps through the room. There's some filminess to it that is the hallmark of an Mp3, but this is as good as I've ever heard an Mp3 sound. The highlight is about three-and-a-half minutes in when the music stops and there's just the most thrilling ultra-low-bass sine wave that blows through your spine and then drops an octave lower to where it's only audible through your feet. This is followed by celestial acoustic guitars that sound like shining stars. Over the top of all of this, Bono's voice

is crystal clear and sounds magnificent. The center image is pinpoint accurate.

Moving on to full, uncompressed CD rips, we have "Black Skinhead," from Kanye West's latest release. This is where I first describe the Grimm LS1 as mind blowing. This track is so monumental on these speakers, I played for everyone, even my mom. The song starts off with ripples of synth bass that you can literally see, feel, and touch. They extend horizontally and in layers, like a row of neon tubes of different colors. You can practically touch the roundness of these ripples. Then the most powerful drums you can imagine kick in. This is where the LS1 becomes a 3D printer. It creates a heavy, solid, metallic object that invades your room and that you could swear is a real physical entity. This will make you jump out of your seat if you're not prepared. Also cool is the backing vocal effects, which are out of phase to create a three-dimensional hallucination of the music surrounding you while entering straight into the center of your head. This song really shows off what the LS1 is capable of. I call it my "taking the Porsche from zero to a hundred" track.

Another test track is the song "Kid A," by Radiohead. This track pushes every speaker to the breaking point. It's filled with unnatural synthetic sounds from highest to lowest in frequency, and it demolishes every speaker I've ever heard it on, except for these. This is the first time I have heard this song presented correctly and with ease. What's especially troublesome for 99% of speakers is the modulation of Thom Yorke's robotic vocal in pitch-altering sweeps. Every speaker I've heard this song on over- and underemphasizes certain parts of the sweep, where in some parts his voice is too loud and nasally. The keyboards that sound like an alien abduction version of chimes over a child's crib are equally difficult to control, with most speakers turning them into a garbled, harsh mess. The LS1 handled both with perfect clarity and smoothness throughout. Also exciting is the bass drop in the first part of the song, where the LS1 presents it as it's supposed to sound, scaling downward until it becomes a concrete floor under your feet. This is a true sonic adventure, and the LS1 takes you on that ride effortlessly. Listening to this on the Grimm, I also realized for the first time that this is an analogue recording. The unmistakably characteristic tape hiss is fully present. I've never heard that before,

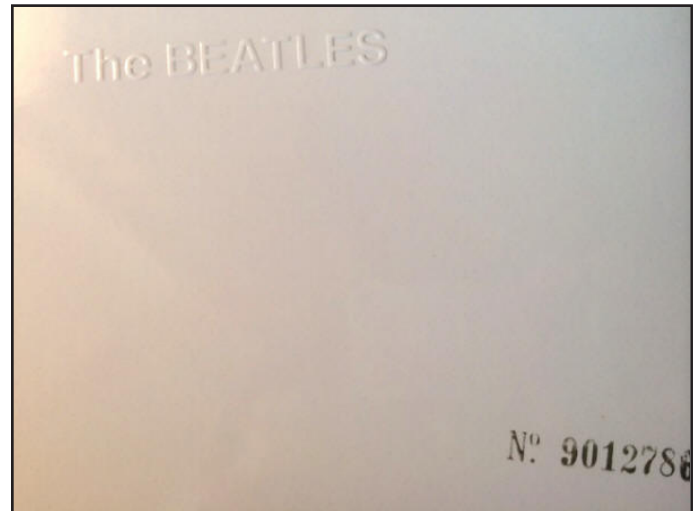
and I've tested this track on everything I've ever listened to, including systems in the \$250k range.

My all-time favorite Radiohead track, and possibly my favorite song ever, if judging by the amount of dopamine released in my brain, is "Separator," from their dreamlike album *The King of Limbs*. This song is equally demanding on speakers, but in a very different way. "Separator" is filled with barely audible sonic details that create the feeling of subconscious impressions, to the point where they make you wonder if they're there at all or if it's just your imagination. One of these elements is what sounds like breathing in the center of the track on my Sennheiser HD650s. The LS1 tells a different story. It's actually someone talking. The sound is part of the drum loop. The mysterious talking is dead center, just above and slightly behind the hi-hat. It's still barely audible, but it's there.

Back to U2 and their classic song "I Still Haven't Found What I'm Looking For," from *The Joshua Tree*. I wanted to hear this song because it's such a dense but brilliant mix by Daniel Lanois. I wasn't disappointed. Every element occupies its own space despite what should be a murky recording. Bono's voice is right there in front of you. You can touch it. And Larry's kick drum is equally present where it would typically be buried under such dense instrumentation. This is where I first describe the LS1 as presenting an almost overwhelming emotional experience. This song is absolutely gorgeous and rich on these speakers. Here is where ruthless, analytical accuracy can inexplicably make someone weep, as it did to a friend of mine when playing him this track. Heck, it even made me misty-eyed.

It's time for my second-favorite band after U2, The Beatles. Here, I used their 44.1kHz/24-bit tracks that were exclusive to the apple USB version of the 2009 remastered box set. I'll mention three songs specifically. First up is "A Hard Day's Night." This is where the LS1 is more truthful than some people might like. This song screams PCM. It's bright, brash, and just plain digital-sounding on these speakers. The LS1 shows no mercy. It's as if these speakers are telling you "here's where PCM can go wrong." More pleasant-sounding systems might try to massage a track like this into something warm and fuzzy, but that's not the truth. I suspect the harshness of this track, and the album in general, is due to the fact that

PCM is just not an ideal format for a record heavy on acoustic guitars and harmonica and light on bass. I can only imagine what this would sound like if it had been transferred straight to DSD from the original two-track stereo master tape. I have found the presentation of acoustic guitars on DSD to be smooth and warm, like what an acoustic guitar actually sounds like.



More straightforward heavy rock sounds much better on the Beatles remasters, like "Everybody's Got Something To Hide Except For Me and My Monkey," from *The White Album*. This track just rocks on the LS1. It's heavy, hard-hitting, and captures the raw, overdriven grittiness of the scorching electric guitars. Ringo's drums are heavy as a cement truck. And you can hear every single note of Paul's grinky-sounding bass as if you can see the strings hitting the fretboard.

But the best sounding Beatles album on the apple core is *Abbey Road*. This record is massive on the LS1. That has a lot to do with its warmth and rich bass. It's an emotional experience listening to this beautiful music on these speakers, and a lot of that emotion is coming from the weight of the bass guitar. Here's where audiophiles need not fear bass, as so many seem to do. Bass equals emotion, and when you can feel the bass pulsating through you it immerses you in a total sonic experience. *Abbey Road* is like a warm hug from a close friend. The stand-out tracks on the LS1 are "Come Together" and "Here Comes the Sun." It was when listening to the latter track that I had a revelation. Despite that fact that this song has more toppings on it than just about any other Beatles song, except their most psychedelic, for the first time it struck me: underneath it all I'm hearing, for the first time, the band and how

beautiful their chemistry is when they play together. I started to cry. I had never heard the Beatles in this way before, despite listening to their records million of times. It was as if you could see the four of them all putting their heads down and playing together in unison, fully in a symbiotic trance, each one bringing something magical out of the other.

Apart from these three songs, the Beatles catalog is filled with quirky sounds that are nearly imperceptible, except on my Sennheisers, so I often use certain tracks that have barely audible Easter eggs in them to test speakers. All audiophile speakers I've heard, including systems in the \$250 grand range, fail to represent some or all of these "inaudibles." The LS1 presents all of them in crystal clarity. One of my favorites is when John says "Bye!" at the count in of "Sgt. Pepper Reprise". This is one you can detect on just about any speaker, and once you notice it, you'll never forget it's there. It's right between Paul counting "two" and "three". I've heard this on every system I've tested, buried in the mix, but on the Grimm, it occupies its own space and it's right out front. You can even ear a phasing effect on John's voice in which it comes out hard left and right simultaneously.

A similar moment occurs at the end of "Helter Skelter". The Beatles had been playing that song over and over for hours (8½, to be precise) that day. Each time they performed it, it became more and more raucous until the final take (21!) is just pure evil mayhem. As the song breaks down at the very end, just before Ringo screams "I've got blisters on my fingers!", you can hear an unmiked John way in the back shouting up to the control room, "How's that!!?" It's a wonderfully "John moment". And I have only ever (barely) heard it on my Sennheiser HD650s. On the LS1, it's fully articulated, which is all the more remarkable because it's just coming in from mike feed, and from mikes that are placed right up close to the instruments, and in a barrage of noise! Hats off to the Grimm's ability to reproduce the tiniest of details and in their correct position. It really does sound like John is tilting his head up and yelling to the control room upstairs, and within the full space of the large Studio Two at EMI.

There are two imperceptibles I don't hear on these speakers, and I don't blame the Grimm. The first is the 15-kilocycle tone at the end of "A Day In the Life" just before the gobbledegoose inner groove that re-

peats infinitely and where Paul sounds like he's saying "never could be any other way." For whatever bizarre anomalous reason, I have only ever heard that tone in the left speaker of a Kia I was driving once and in my Mazda 3 (possibly the same driver manufacturer?). This is a mystery I will never be able to explain. Anyway, while you can hear a static crackle at that point on just about any system, that's not it. Rather, it's a pure sine wave that sounds like a tiny bright star about the size of a single atom up against the inner top of your skull. Recently, I stopped hearing it in the Mazda. This likely means that at the ripe young age of 39, I have lost the ability to hear up to 15kHz, which makes me sad (this is normal age-related high-frequency hearing loss). My tone generator confirms this. I lose perception of sound at around 14kHz. So it's not the LS1's fault I don't hear it.

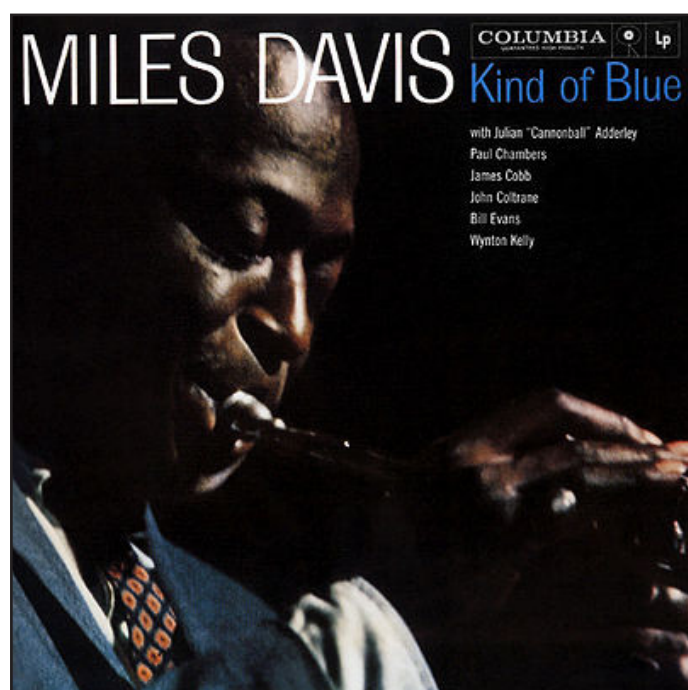
Finally, as the song "Magical Mystery Tour" fades out, there's a lovely little chime as the song decays, possibly from a celesta. I've always enjoyed that trippy little bit on headphones. It's panned hard right and clearly audible on the Sennheisers. On the LS1, it's perceptible, but just barely. This puzzled me at first until I switched the left speaker off, at which point that celesta appears again (the Grimm's software options are very handy; turning off the left speaker is as simple as pushing a button). The reason I'm hearing it on headphones and not the speakers is that, in the cans, there's complete separation between the two channels. But with both speakers in a trilateral arrangement, my right ear is also hearing the left speaker, and at the end of that song, the instrumentation in the left speaker is ten times louder than that dying out in the right speaker. This makes me wonder why the engineers, specifically Geoff Emerick, buried such a lovely little part in the mix. Why was that part recorded at all? Perhaps EMI had amazingly built in-house speakers. That's not the case, however. According to engineer Ken Scott, they were using "Terrible, crappy Altecs [5As in a 612 cabinet, to be precise] that you really had to fight to get a good sound out of, but when you did it sounded good anywhere." My conclusion is that Geoff Emerick paid no mind to it in the mix; in fact, it was probably already buried in a bounce-down pre-mix (they only had four tracks to work with at the time, and with numerous overdubs) before it even got to the mixing stage, which means Emerick probably didn't even know it was there. The LS1 plays it in crystal clarity when the left speaker is turned off, so I don't blame the speak-



ers but rather the arrangement in which both ears hearing both speakers simultaneously. If anyone does hear it clearly on their stereo, let me know.

“Smells Like Teen Spirit” in the recent 96kHz/24-bit remaster from HD Tracks is enormous on these speakers. That’s an understatement. It’s towering and monumental, like a granite cliff just showed up in your room. Take everything I have said up to this point about the music being physical, tangible, and weighty in its presence and multiply it by a factor of ten. You get the feeling of what it might have been like to be in the studio with the band when they were playing everything at 11. My nephew wanted to hear it, so we stood back instead of sitting in the uber-zone chair, and I played it at about 102dB (I usually keep it around 85). I felt the same way I did when I heard the song for the first time: this is a paradigm shift. I really thought that song would destroy such mid-sized speakers. The LS1 can go up to 105dB, and at 102 it didn’t sound like they were being taxed at all. Instead, the speakers vanished and were replaced by a gargantuan live heavy metal band. It was completely mesmerizing. The sound stage was massive, but each element was fully tangible and absolutely precise in their placement. We were in awe. “Teen Spirit” is definitely one of those songs you don’t want to follow up with a CD when demoing the LS1 for friends.

Next up is two analogue records in 192kHz/24-bit: Folk Singer, by Muddy Waters, and Kind of Blue, by you know who. Folk Singer is mastered quietly, so



you have to crank it, but when you do, the dynamic range is so huge you get a full sense of each musician in the room. Muddy’s gritty voice is very prominent in the mix, but his subtle slide licks remain fully intact. Kind of Blue is even more spacious and three-dimensional. This is in large part because the remastering engineers bypassed the stereo master tape and went straight to the original multitracks to create a new stereo mix, thus removing a generation of tape. The result is breathtaking. I especially enjoy hearing details like the reed in the saxophone and the sound of the stand-up bass in the corner. The bass is presented naturally on the LS1, full, round, and deep, even with distant mike placement.

I listened to far too many DSD recordings to list them all right now. I’ll just point out that for rock music recorded on analog tape, DSD on the Grimm LS1 is like Häagen-Dazs ice cream compared with foamy, gooey ice cream: it’s smooth, rich, dense, and flavorful. This is where acoustic guitars really sound at ease, whereas PCM tends to turn them overly metallic and bristling. Being a player of both acoustic and electric guitar, I know when the sound is right. One of my favorite rock recordings on DSD is “Midnight Rambler,” from the Stones’ 1969 Let It Bleed album. Keith’s guitar opens the song in the right speaker, and it is the true sound of a tube amplifier. Keef pull out those bright chords and it has that bell-like roundness that I hear when playing through my Fender tube amp. In the center is the almighty rhythm section of Wyman/Watts. Again, the LS1 highlights the rhythm in a hard-hitting solidity that grounds the whole song and lets Keef and Mick Taylor have at it. There’s a nice part in the middle where the song stops and you can hear someone laughing in the background and the reverberance of that laugh, though very quiet, through the whole room and above the warm tape hiss. The LS1 presents every little detail in its entirety.

I’ll end with the cream of the crop, a set of pure DSD recordings from NativeDSD.com. At this very moment I’m listening to a track called “Chiquita” by Puente Celeste, as recorded by Todd Garfinkle. This is a recording of five musicians on acoustic instruments using a minimalist two-microphone setup straight into a Korg MR2000S at 5.6MHz. There was no post-production. What you hear is the recording. In fact, I haven’t heard anything quite like this since sitting behind a mixing console. I’m hearing pure mike feed.



Instinctively, I find myself wanting to reach for the faders to play with the balance. This track highlights that DSD128 is truly an invisible recording format. Right now, the LS1 is an open window into the recording session. Everything sounds right tonally, like you'd hear the same thing walking into the room with the musicians. The acoustic guitars and bass sound fully present, and the vocal is completely raw. The room is small and dead, bringing a warm and intimate encounter with just the musicians and their instruments. I can tell that the separation between instruments is clearly achieved just with expert microphone placement. I highly recommend this recording for anyone who wants to know what it's like to sit in a control room, listening and looking in to the live session as it unfolds. I've truly never heard anything like this from a recording. To this point, I have only heard DSD128 transfers from analog tape. Without the tape hiss, you really hear the full natural decay of every instrument, which is all the more tangible in a dead room, despite that it was not Garfinkle's preferred environment. I love the ultra-processed chemical rock sound of the Beatles, U2, Radiohead, Coldplay, and Kanye West, etc., because the goal isn't to faithfully reproduce jack squat. It's to use the recording studio and equipment as a paint brush to create sounds and sonic landscape fantasias that have never existed before. But I also love pure recordings of acoustic instruments in their natural environment. This is it.

Now I'm listening to an equally raw recording by Jared Sacks (of Channel Classics and Native DSD) of a session recording of the Mahler 1 finale, which is available on the free "Just Listen" sampler at Native DSD. The track is a raw, unprocessed, unedited master: no EQ'ing no mastering. This is an interesting experience because Jared used the Grimm 64fs AD recorder. So I'm hearing an AD/DA conversion solely using Grimm components. The experience I'm having is just as direct as the "Chiquita" track, only with a far more expansive room and a much larger ensemble. All I can think right now, is wow. The Grimm is producing the largest dynamic range I've ever heard. This is a massively immersive experience. And the bass! The cellos and drums in certain parts provide the explosive floor shaking rumble that you hear an actual orchestral performance, and it's in perfect clarity. There is no sense that these speakers are struggling to reproduce the bass in a controlled manner in competition with the celestial high strings

and woodwinds high above it. Instead, I'm hearing absolute purity. Holy cow. I'm speechless right now and, to be honest, frightened. My goodness. I'm going to end it here because I literally don't know what else to say but come here now and listen to this!

So what about "Love Me Do"? That record and what I saw in those grooves was simply a symbol of what I want to hear: the record. It was an icon, an idea, presented in a way in I could see with my own eyes. It's not that I wanted to hear "Love Me Do" per se but that I wanted to hear the exact pressure waves of any and all records. Besides, the only way to hear that particular record is to have one of the original pressings. Incredibly, the original master tape was discarded; it's at the bottom of a very deep landfill somewhere in England. All currently available copies are a digital transfer from a copy of the original vinyl record. This is true even of the version on the otherwise all-analog Beatles In Mono vinyl box set that recently came out (see the liner notes in Mono Masters). The truth is, I didn't even listen to "Love Me Do" because I don't have the real thing.

My final impression of the Grimm LS1 is this: these are the most immersive, dynamic, detail-rich, nuanced, elegant, engaging, emotional, and yes, musical speakers I have ever heard. By far. This system has impressed me in every way. And I believe the Grimm LS1 is revolutionary on so many fronts. It's not just barrier breaking in terms of accuracy in the frequency, time, and phase domains, it also offers a tamper-proof purity in a complete package that will prove attractive to the next generation of audiophiles who may be intimidated by the never-ending rabbit hole of increasingly expensive esoteric equipment that may or may not integrate well and that may or may not end up reproducing anything close to what could be considered high fidelity.

But the most revolutionary thing about the Grimm LS1 is that it makes the mastering room and the living room the same room. Why is the mastering studio so important? Because mastering (except pure DSD recordings) is the final step in the production process in making a record like "Love Me Do." It's when the actual artifact which we call "a record" is created. This is the stage when the final artistic decisions are made regarding what the artist wants us to hear, what the artist hopes we will hear. All that hard work that went into making a record comes

down to that final session in the mastering studio, where hearing exactly what is going on in the record is equivalent to making the record. And when those final grooves are cut, or when those zeros and ones are finally arranged, there is no going back. The event horizon has been cast in stone forever (until someone decides to remaster and repackage it!). From the artist side, the event horizon has been reached in that the record can no longer be altered and the artist releases all control into the hands of its audience. That baby has been birthed and is now out there in the world. From the audience side, the record is an impassable barrier beyond which the listener cannot reach in and get to something “more real,” like many manufacturers falsely claim, as if their product can provide missing information. That barrier can be an open window, of course, but only if the record itself is respected as being that very window. In the straight-to-DSD recordings, for example, the LS1 become a gateway through which you can walk straight into the control room. For most records, those grooves or strings of digits are the finished artwork. The point where the mastering engineer and listener can meet is those very grooves reproduced in their exact, unadulterated, uncolored form, by taking the sepia-tinted glasses off and just experiencing the work of art the artist created. But the Grimm LS1, because it is so faithful, so truly high fidelity, makes that impassable barrier irrelevant. Because these speakers are intended to be the tool on which the work of art is both created and experienced, the Grimm LS1 is the event horizon.

Of course, this can only be fully realized if the Grimm LS1 is more widely adopted in the professional world. A number of studios are in fact using them already. But the point isn't that they literally be used in the making of a record, the point is that, for the first time, in a world where the pro and hi-fi enthusiast worlds have been explicitly separated, a manufacturer is now marketing their product to both the professional world and the audience simultaneously. The aim is to bring those two worlds together into a single unity, to sit in the same chair. I hope this paradigm shift catches on. The gauntlet has been thrown. The question now is whether anyone will step up to the challenge and improve upon this new path Grimm have opened up. I hope this new concept of uniting the recording studio and the home becomes a trend so that the artist and audience can sit down together and listen to the same thing.

Finally, it's been said that these aren't “audiophile speakers.” If that's the case, I relinquish my membership in this club effective immediately. I'm guessing this comment was made because these speakers are tweak-proof. But if the end result is near perfection, why would you want to tweak it? I have nothing against tweaking. One of the greatest joys in life is opening a package fresh off the truck with the newest, shiniest piece of equipment in it lovingly crafted by people who devote their lives to perfecting their art. And it gives us an opportunity to go back and listen to our favorite records with a fresh perspective. But it's the complete system that counts in the end and whether it is of the highest fidelity. If that means being content with a system that can only be screwed up by a new component, so be it. Yes, it takes some of the fun out of it, but ultimately I'm more interested in the music than the tweaking.

The truth is, these are indeed audiophile speakers because they're true “high fidelity.” And if that means not being a tweaker, I'm fine with that. If it's really “all about the music” and not the components in and of themselves, I'll take the music. You can have the endless whirlwind of bigger, better, and more expensive components. The Grimm LS1 delivers the music, nothing more, nothing less.

Before listing the pros and cons, I'll leave you with actual quotes from people who came by to listen.

These are unsolicited comments. I never asked them what they thought or experienced, I just let them talk if they had something to say, and they didn't know that my jotting in a notebook was me writing their words down:

“I think my life will mostly be the same from now on, but it won't be all the same.” (overheard phone conversation to the wife)

“It was seriously one of the most amazing experiences of my life.”

“It really does do something for your soul to get that far inside the music.”

“I heard the religious power of music.”

“Oh...my...GOD.” (said at least a dozen times)

“People need to unplug from the Matrix.”

“I seriously underestimated what was about to happen.”

“It’s so lush.”

“The voice is right there. I can touch it.” (Bono’s voice in “Still Haven’t Found”)

“It’s three dimensional.”

“It was so vivid, my mind created a music video.” (Kanye’s “Black Skinhead”)

“It’s like I’m lying down right next to the guitar amp. But I’m not hearing instruments, I’m hearing the musicians playing the instruments.” (Van Halen’s 1984)

“I’ve never heard sound in motion before.” (Sgt. Pepper)

“I’ve heard that album a million times before, but not like this. It was a different album.” (Sgt. Pepper)

“Is there a speaker behind the foam pad?” (referring to the pad directly in front of the listening position; this was an innocently earnest question)

“Do you have speakers in the back?” (another genuine question)

“I don’t think I can even go to a live concert anymore.”

“I can hear Paul’s fingers hitting the fretboard.” (“Everybody’s Got Something to Hide”)

“There’s a guitar amp in your room.” (various songs)

“I had no idea.”

“I don’t know how long we listened to music. I wasn’t aware of time.”

“I feel transformed.”

“It sounds like music.”

## Pros:

- As it turns out, Truth equals Love.
- The LS1 brings the mastering studio into your room, which is a revolutionary paradigm shift. You hear the artists’ intent rather than your system or your own personal preferences.
- If you’re looking for uncompromising accuracy in reproduction, these might just be the best speakers on the planet. (They’re the best speakers I’ve personally heard, and I’ve heard some amazing speakers.)
- According to Bill Parish, the distributor who sent me these gems, “it has an incredible sound that is the most linear in the industry and measures flatter than any audiophile speaker” (email correspondence). That’s saying a lot, and it confirms the results of my Google search.
- It is a complete system, from DAC to amp to drivers, that is brilliantly integrated for optimum performance. And it effortlessly outperforms individual-component systems I’ve heard costing ten times as much. Really.
- Good recordings (and even intentionally ramshackle lo-fi filthy recordings, e.g., The Velvet Underground, The White Stripes) have an overwhelming emotional impact.
- It does DSD128. Yes, it does.

- At the ridiculously reasonable price point, it’s maximum bang for your buck. That’s a massive understatement. It’s more of a ground-floor investment in an IPO that is guaranteed to be a moonshot on opening day.

## Cons:

- Not for tweakers.
- No speakers are perfect, but these are damn close.
- It is essential to invest the time and resources in matching these speakers with your room in order to hear them at their maximum potential. The best approach would be to have a professional acoustician work with you.

- Room correction, at least as a lesser-of-two-evils, would be a nice option to have in the worst-case-scenario of a room that can't be tamed with limited resources.
- They don't sound good. In fact, they don't have a sound. They just humbly get out of the way and play musical music (and that musical music sounds oh so good).
- They show no mercy to poorly recorded, mixed, and brickwall-mastered standard PCM. What you get is exactly what the final product is. But even this stuff sounds amazing.
- Not for seekers of the euphonious over truth (but the truth is far more euphonious than you could ever imagine).
- The price point won't appeal to audiophiles who presume that costlier = better. (It doesn't. Deal with it.)
- The sub is optional (it shouldn't be).
- It seems, in my experience, that power conditioning can very slightly affect the sound. I don't know the science behind why this phenomenon occurs, but it is something that should be addressed, as you probably don't want to plug the LS1 directly into your wall. I would like to see Grimm develop or recommend a power interface that doesn't affect its sound. The LS1 contains its own power regulators, so perhaps this point is moot.
- I used to be in love with my Sennheiser HD650s. Now they sound just awful, to the point of being unlistenable.

**Grimm Audio**

[www.grimmaudio.com](http://www.grimmaudio.com)