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... Kevin Hunt, Chicago Tribune



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MartinLogan Purity Floor-standing Electrostatic Hybrid Speakers
A Secrets Speaker Review 

Written by John E. Johnson, Jr.

Friday, 15 February 2008

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Introduction

MartinLogan (ML) is a name that all audiophiles know, but the average consumer does not. There are two reasons for this. One is that ML is a high-end speaker brand, and so will not likely be found in most hifi supermarkets (maybe an occasional Best Buy). Secondly, their speakers are all electrostatic (ESL) in design, and ESLs are a specialty product, only sought after by a certain type of user.



The odd thing is that ESLs have been around as long as cone speakers, but they didn't "take off", because they had to be very big in order to produce sound at all frequencies. ESLs use a thin membrane suspended between perforated plates, and the membrane cannot move very far, so it has to be big in order to move enough air for the bass. Cones on the other hand, could be much smaller and still reproduce the bass. So, cones it was, for many decades.

In the 1950's, ESLs did begin to "take off" on their own, and in the early 1960's, the KLH Model 9 was introduced. It was a full range ESL, about the size of a door. I was in high school at the time, and my father and I went down to Seattle Stereo to get some speakers. I remember seeing the Model 9s being driven by McIntosh power amplifiers. The sound was to die for, as far as I was concerned, and I would have loved to see them in my home. They still needed to be big, and in fact, the setup included a pair on each side. I think they were something like \$1,500/pair. My father was not an audiophile (although I was one, I wasn't even aware of that word), so he opted for some Jensen monitor speakers instead, at \$150/pair.

Fast forward to 1980 or so. I was living in Baltimore, Maryland, and drove over to a high end store near my home. There, on the showroom floor, were a pair of MartinLogan ESLs. They were larger than the KLH Model 9s. Can't remember what they wanted for them, but I will never forget the sound. Classical guitar was right in my lap. The detail, the transparency, and plenty of bass. Even though I still could not afford them, I decided right then and there that, someday, I would own ESLs. When I looked at hifi magazines, I always dwelled on the advertising pages for MartinLogan.

Specifications

- Design: ESL Hybrid
- ESL Panel: 200 in²
- Woofers: Two 6.5" Cone; Bass Reflex Enclosure
- Amplifier Power: 200 Watts RMS (Drives ESL Panel and Woofers)
- MFR: 41 Hz - 23 kHz \pm 3 dB
- Sensitivity: 93 dB/2.83 Volts/Meter
- Dispersion: 30⁰ Horizontal
- Dimensions: 52.3" H x 9.7" W x 14.7" D
- Weight: 51 Pounds/Each
- MSRP: \$2,995/Pair USA

Now, two more decades have passed, and I am editor of a hifi magazine myself. I have three listening rooms, and I have ESLs in one, planar-magnetic speakers in the second, and ribbon speakers in the third. All three of these types of speakers are "planar", meaning that the drivers are flat, and so are the speakers themselves. ESLs use electrostatic fields to move the driver (a thin plastic membrane), while the other two use permanent magnets to move a membrane through which the power amplifier current is passed. All three have similar characteristics, namely fantastic detail and transparency.

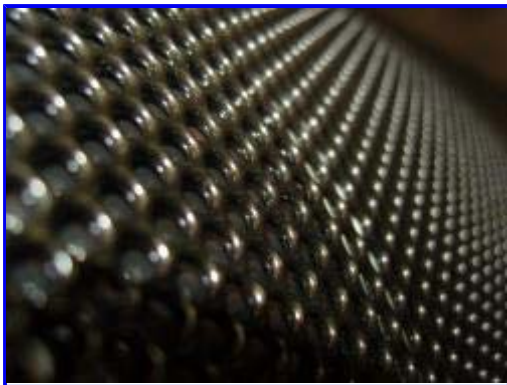
The reason for the detail is that the "driver", being very, very light, responds quickly to the amplifier. The reason for the transparency is that there is no enclosure. The membrane or ribbon is suspended in open air, front to back. And, this front to back open placement results in the speaker being a dipole. This means the sound comes out the front as much as it does the rear. When the sound is moving out of the front, it is moving into the rear, and visa versa. Since sound is coming out the rear, placement is crucial. Also, you have to put them near an AC outlet, since ESLs have a power supply to produce the electrostatic charge on the plastic membrane.

The irony is that none of the planar speakers I own are MartinLogans. No particular reason for that, I just ended up with other brands that came my way in the review process.

But finally, MLs have arrived for me to try out, to listen to, to test, and to enjoy. This model is called Purity.

The Design

The Purity is a new type of design for ML. While they have marketed hybrid models (ESL panel plus cone woofer) in the past, this one has a 200 watt Class D (switching - ICEPowerASC200) power amplifier that drives the ESL panel and the woofers. You can connect the power amplifier outputs of your receiver to the speaker binding posts, or the line-level outputs of your SSP or TV to the RCA inputs. As I mentioned, full range ESLs have to be big, but a lot of people don't want large speakers in their living rooms. So, in order to reach that market, ESLs were designed that had smaller panels, but a cone woofer to handle the low frequencies.



The Purity is only a little more than four feet high. The panel is just 10" wide, and there is a woofer enclosure at the base. So, the active area of the ESL panel is small. However, regardless of the size, you still get the detail and transparency. The tradeoff is that the woofer has to handle everything below 450 Hz, which includes part of the range of the human voice. Well, OK, it is not a full range ESL, but it also is not the size of a door. That is its market: the person who wants the incredible ESL sound, but doesn't have the room for the big one or just does not want a big one. The base of the Purity is adjustable by rotating it so that the speaker will point either straight out at the conventional seated listening position, or slightly upward, if your seats are on raised platforms as in some home theaters.





On the other hand, for that full sized ESL, you need a big amplifier because ESLs are difficult to drive (impedance) and are not very sensitive. MartinLogan has addressed that in the Purity by adding a built-in 200 watt RMS power amplifier that drives both the ESL panel and the woofers. So, you give away something due to the small size, but you get something back in having the powered drivers. That's the Purity.



On the rear panel (photo shown above), you can see the single set of binding posts, an RCA line-level input for the amplifier that powers the entire speaker, and a bass level toggle. Normally, you just connect your power amplifier output to the binding posts, and the signal is routed to the built-in amplifier. Otherwise, you can, if you want, connect a line-level output from your processor or receiver to the RCA line-level input, which then drives the amplifier directly. The toggle lets you adjust the bass output depending on how close the speaker is to a wall (walls and corners produce bass loading).

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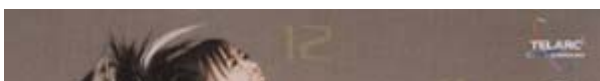
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In Use

I tested the Purity's with a McIntosh MCD201 SACD player, Lamm L2 Reference preamplifier, and McIntosh MC1201 monoblock power amplifiers. Cables were Legenburg and Nordost. I also listened to the setup with the preamplifier outputs connected to the RCA inputs on the Purity's, rather than using the McIntosh power amplifiers. Using the RCA inputs, the setup had increased sensitivity.

I was very excited to fire the Purity's up. and they did not disappoint me.





I was also excited to play this Telarc SACD of Hiromi, as she is one of my favorite artists. The combination of SACD and the Purity's was magic. Her music is partly electronic, and there is an amazing amount of transient detail that has to be delivered in order to fully appreciate what her jazz group can do. I suspect that I did not miss any of it with the combination of great electronics and these fine speakers. They won't play quite as loud as my full range ESLs, but then, they are the size of doors. The bass was, on the other hand, just as tight as my full range ESLs, which surprised me.



Classical piano is an excellent test for the timbre of speakers, and the MartinLogan ESLs came through just like I expected with this Telarc Schubert SACD. Very natural, full bodied, crisp leading edge transients.



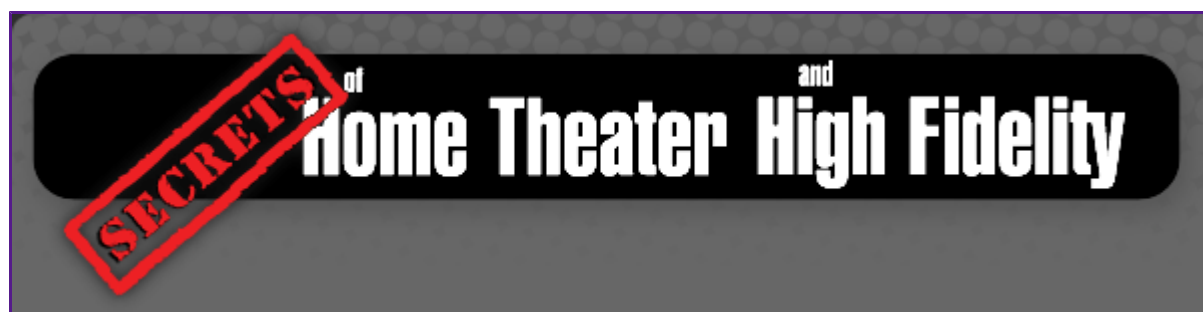


The female voice is probably the best test for boominess in speakers, so I put on this Telarc SACD of Tierney Sutton. I felt the Purity's had just a little too much bass, but it wasn't boomy. So, I simply flipped the toggle on the rear that let's you decrease the bass by 3 dB.



Popular guitar is personified in the US by several musicians, and the Los Angeles Guitar Quartet (LAGQ) is a good example. Here, in this Telarc SACD, I listened for the leading edge transients, and heard them all. It is this detail capability that sets ESLs apart from conventional tweeters.

I toed the speakers in so they were pointing directly at me in my sitting position, and I used the base adjustment so that they were pointing straight out rather than upward. They do fall off when moving off axis, but not as much as ESLs that are flat rather than curved like the Purity's. Between 1 and 10 watts played the speakers at good listening volume.



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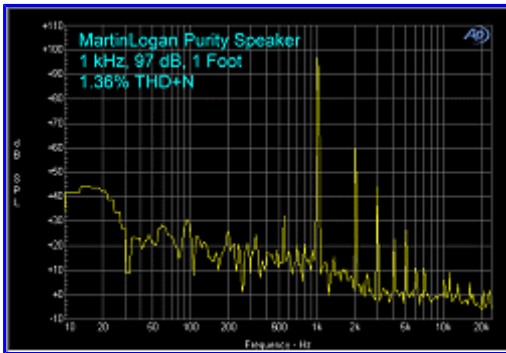
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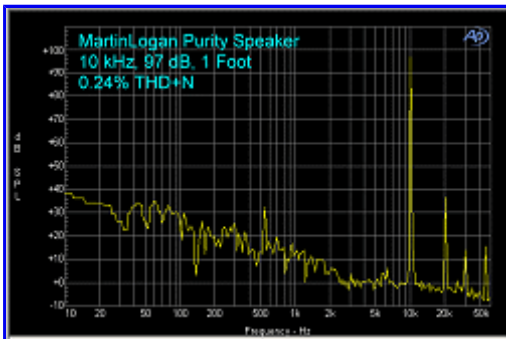
On the Bench

THD+N measurements were within an 80 kHz bandwidth. I set the SPL to 97 dB instead of 100 dB that I use for conventional speakers because half the sound is coming out of the rear in an ESL. I used the RCA line-level input for the measurements, rather than a power amplifier into the speaker binding posts. I did not measure the impedance/phase because the speaker binding posts are connected to the built-in power amplifier.

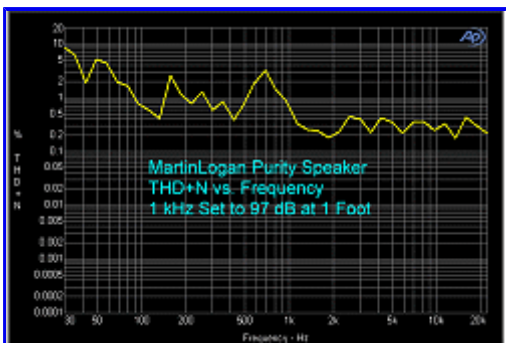
At 1 kHz, THD+N was 1.36%.



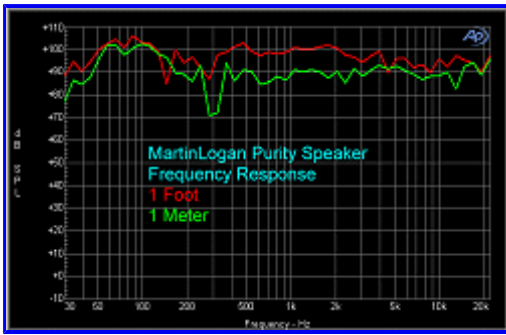
At 10 kHz, distortion was lower, at 0.24%.



THD+N vs. Frequency showed that the Purity's have more distortion at the lower frequencies, like all speakers. The crossover is at 450 Hz, and there is a spike just above that, probably due to the crossover network. At 1 kHz and above, distortion stays generally at or below 0.5%. Undoubtedly you are surprised at the amount of distortion in the bass frequencies. We are the first consumer A/V magazine to publish graphs of THD+N vs. Frequency for speakers across the entire audible spectrum, and I believe we are going to find, as we measure more speakers, that there is more distortion than we thought there would be. I suspect also that we may be less sensitive to distortion in speakers than we imagine. We might be more sensitive to distortion in amplifiers because the negative feedback that is often used tends to increase the amount of upper harmonics, whereas in speakers, the upper harmonics tend to have a relatively low value. Upper harmonics are very irritating to the ears.



The measured Frequency Response shows why I felt there was a little too much bass. You can see a bass hump regardless of whether the microphone was at 1 foot or 1 meter (I took the measurement with the bass toggle at the zero position). In general, the FR was pretty flat out to 20 kHz. If you use these with an SSP or receiver, I would suggest setting a low frequency crossover to a nice subwoofer at around 60 Hz. In any case, a subwoofer will help with the lowest octave.



Conclusions

At a price of less than \$3K/pair for the MartinLogan Purity hybrid ESL/Cone speakers, you can have the kind of detail you won't usually find with conventional midrange drivers and tweeters. ESLs are not for everyone, but even if you are not the adventurous type, you should at least hear them for yourself and then make up your mind. While you're at it, listen to the full range models too.