



MartinLogan Theos ESL Speakers Review

Summary

Product Name: **Theos**
Manufacturer: **MartinLogan**
Performance Rating: 
Value Rating: 
Review Date: **December 14, 2012 07:05**
MSRP: \$ **4995**



MartinLogan Theos Review

Specifications

- Frequency Response: (+/- 3dB) 43Hz to 23,000Hz
- Horizontal Dispersion: 30°
- Vertical Dispersion: 44" (112cm) line source
- High Frequency Transducer: XStat™ CLS™ electrostatic transducer
 - » Panel Dimensions: 44" × 9.2" (111.8 × 23.4cm)
 - » Radiating Area: 405 in2 (2,616 cm2) (front and back)
- Low Frequency Transducer: 8" (20.3cm) cast basket, high excursion, aluminum cone with extended throw drive assembly, non-resonance asymmetrical chamber format, down-firing bass reflex port.
- Sensitivity: 90 dB/2.83 volts/meter
- Impedance: 4 Ohms, 0.8 at 20kHz.
- Recommended Amp Power: 20–400 watts per channel
- Crossover Frequency: 425Hz
- Components: Custom-wound E-I core transformer, air core coils, polypropylene capacitors.
- Inputs: Custom bi-wire tool-less binding posts, bi-amp compatible
- Power Draw: Idle: < 1W/channel
 - : Max: 2W/channel
- Weight: 43 lbs. (19.5 kg)
- Dimensions: 59.3" × 10.7" × 18.8"

Pros

- Great looks
- Amazing detail and natural sound
- Controlled dispersion limits room interaction

Introduction

The MartinLogan Theos sit at the top of their ESL line at \$4,995/pr, but just below their Reference line. Over the

Cons

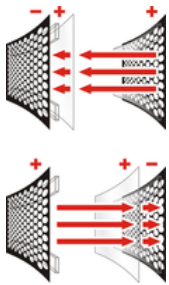
- Need to be pulled out into the room farther than most speakers
- Have to register for full warranty
- Exposed panel means it is more easy damaged by stray children

past 30 years MartinLogan has managed to take a niche loudspeaker technology, overcome its flaws, and create some amazing loudspeakers. Don't think that these are anything like ESLs of the past. They throw a wide soundstage, provide a nice sized (if not huge) sweetspot, play plenty loud, and have smooth integration between panel and 8" bass driver. The only lacking feature is deep bass for movie watching, but that's okay because a subwoofer can handle everything below 40Hz. Overall, we don't have much to complain about and quite a bit to rave about. Although the Theos are not even in MartinLogan's Reference line, they would sit as the crown jewel of many companies' lineup.

MartinLogan Theos History, Overview & Build Quality

There are few speakers on the market today that say, “Look at me, look at me!” as elegantly as the MartinLogan Theos—and far fewer speakers that are as visually striking and which still sound good. Unfortunately, electrostatic speakers are the not-so-innocent victims of much misinformation in the audio community. This is due, in large part, to the deficiencies of early designs. Here are just a few of these holdover ideas: electrostats only sound good with some music, they have a very narrow soundstage, they are too fragile, they require a really expensive amp, and so on and so on. I set out to test each of these ideas (but you will have to read on to see how the Theos fared). Aren't I just the worst?

Two Guys in Kansas



Electrostatic loudspeaker technology has been around since the 1920's, but it wasn't something you would want to show off in your living room. The electrostatic membrane was made of pig intestine coated in gold leaf and required an array of expensive and dangerous electronics. My guess is the pig intestine was likely enough to dissuade most shoppers of the day. In 1957 the first commercially successful full-range electrostatic speaker was released (no pig intestine here), the legendary Quad ESL (electrostatic loudspeaker). The speaker had many of the hallmarks of a great ESL and a few disadvantages as well. Namely, early ESL designs could not produce much bass, were highly directional, could wreak havoc on amplifiers, and couldn't reach high output levels. Thankfully, many of those deficiencies were about to be overcome.

In the 1970's Gale Martin Sanders and Ron Logan Sutherland met at a local HiFi shop in Lawrence, Kansas. They decided to try to create an ESL that could compete, and ultimately outperform, typical dynamic loudspeakers. They formed MartinLogan and by 1983 displayed the Monolith, their very first electrostatic hybrid loudspeaker. In fact, we recently did a factory tour at MartinLogan's headquarters in Lawrence, and the original Monolith's are still there, packaged away safely. After the Monolith, things started to pick up and MartinLogan continued to advance and push ESL technology, which brings us to modern day. The Theos is one of the latest additions in their ESL lineup and includes many of the technological advancements they have made over the past three decades.

How Does it Work, Magic?

Although it might be easy to just claim that MartinLogan uses black magic to conjure up sound from a 4 foot tall transparent panel, there is a slightly more helpful answer. A thin diaphragm/membrane is stretched tight and sandwiched in between two perforated metal grills, or stators. The diaphragm is only 12 microns thick (that's 1/8 the thickness of a human hair) and is made of a special material that MartinLogan developed with 3M. The diaphragm is given a constant positive charge while the charge on the stators is reversed thousands of times per second. By changing the charge on the stators from positive to negative and back again, the diaphragm is pushed and pulled back and forth. As the diaphragm moves back and forth thousands of times per second it rarefies and compresses the air (it “creates” sound). This is arguably an over-simplification as there are a number of special components and complex processes that are involved in production. Luckily, MartinLogan has a great YouTube channel that can help fill you in on some of the gaps.

Theos Overview

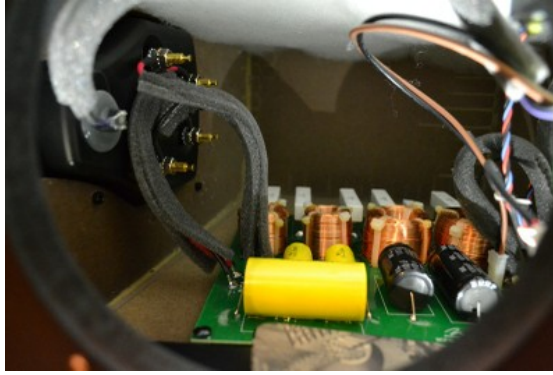
The Theos' panel is 44" high by 9.2" wide, the same height as their \$14,999/pr Summit X. The tall panel allows for a larger listening area vertically, higher output, and a lower crossover frequency. The Theos' panel plays down to 425Hz, below which a front-firing 8" aluminum driver with cast basket takes over. On the bottom of the cabinet is a tuned port that is flared on both sides. A low crossover of 425Hz means that the entire 44" panel plays all of the high and mids, avoiding a crossover in the critical midrange. Once I got the speakers setup properly I found the panel and 8" driver to blend nicely, something that has been an issue with older models.

Every MartinLogan ESL has a 30 degree curve, which is intended to allow for a wider listening area while maintaining controlled dispersion. The hallmark 30 degree curve is known as CLS, or Curvilinear Line Source. One of the advantages of controlled dispersion is that the room does not affect the sound of the speaker as much as it would if the speaker had a wider dispersion. The downside to controlled dispersion is that the sweet spot can be very small. According to MartinLogan a 30 degree curve is a perfect balance to allow for a wide listening window and big soundstage, while still minimizing room interaction. On the flip side, the Theos (and all their other ESL speakers) are di-polar, so proximity to walls will dramatically affect the sound.

The Theos are rated at 6 ohms (they dip lower at high frequencies), with a sensitivity of 90dB. One of the big concerns many people have about ESL's is that they require a big amplifier. MartinLogan claims that their speakers will work fine with most receivers, even if the receiver isn't rated to handle a 4 or 6 ohm load. I hooked them up to a number of amplifiers, from a bottom-of-the-line \$100 amp to \$4k monoblocks and had no trouble. I tried different volume levels and source material and was never able to make an amp go into protection or clipping. You can actually throw a ton of power at these speakers and it's likely the 8" driver will give out way before the panel (though we experienced neither). With that said, they sonically benefit from high quality amplification.

Build Quality

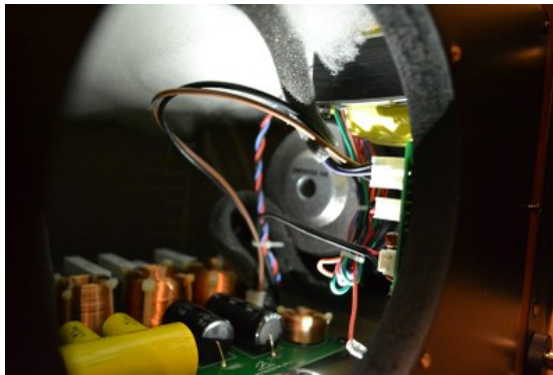
We know that the Theos look good, but beauty is only skin deep, right? Apparently nobody at MartinLogan is familiar with that statement because obvious care was taken in designing these speakers.



Internal shot of Theos from bottom opening

The air core inductors and poly caps for critical circuit paths are high quality and the resistors are mounted on stand offs for better heat dissipation. It's rare to see this level of detail employed in a loudspeaker crossover but it's welcomed.

The 8" aluminum bass driver has a bumped back plate to prevent driver bottoming and is vented for heat dissipation. The cabling is twisted pair to minimize interference and wrapped in insulation to prevent them from slapping around inside the cabinet. One side of the cabinet has a piece of batting glued in place.



Theos circuitry and bass driver



Theos port tube

The bottom firing flared port is about 3" in diameter and flared on both ends. Many companies cut costs and only flare the side you see. Flaring reduces port noise and placing the port on the bottom of the cabinet and angling it allows for a longer tube than would otherwise not be possible in such a small enclosure. You might notice there is no internal bracing, but it isn't necessary in an enclosure this size since the panel lengths are significantly smaller than wavelengths of operation of the woofer.

The Theos come with both spikes and rubber feet. Both options are oversized, which makes height (rake) adjustment easier than with most speakers.

I only have two complaints. The speakers came with a 220v European power supply on accident. Luckily, I was able to drive over to MartinLogan and pick up the proper power adapters. Secondly, the wood veneer looks nice, but has rough patches when you run your finger over it. Each cabinet is buffed by hand, so it seems this particular set of speakers must have been produced on a Friday afternoon.

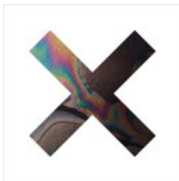
MartinLogan Theos Setup, Listening Tests, Measurements & Conclusion

Setting up the Theos was actually extremely easy. I followed the instructions in the manual to determine distance from rear and side walls. Proper toe-in is achieved by sitting at the listening location and pointing a flashlight at the panel. The light will reflect back at a certain point on the panel, adjust the toe-in of the speaker until the light reflects off of the inner $1/3^{\text{rd}}$ of the panel. Using the flashlight technique the speakers ended up pointing almost straight forward, with the light reflecting off of the inner $1/4^{\text{th}}$ to $1/3^{\text{rd}}$ of the panel. As seen in the measurements, the high frequency response smoothly rolls off as you move off axis. By pointing the Theos forward the soundstage opened up, the speakers disappeared, and treble was more subdued.

The Theos are designed to be a little further into the room than other MartinLogan models. They ended up 46" from the back wall to the panel and 7' apart. That put them a few inches closer to the side walls than the recommended minimum of 2', but I was able to treat first reflections. The test equipment was an Oppo BDP-93, Denon AVR-3311, and a pair of Anthem M1 Monoblock amplifiers.

Listening Tests

CD: The XX - *Coexist*



If you enjoy alternative or ambient music, then you need to check out the XX. Their music is very bare, allowing one to really listen intently to one instrument or one voice. Many of the tracks also have deep, sustained bass. In the opening track, "Angels", it sounded as if the solo female vocalist was right in front of me. The bass was clear and satisfyingly deep, but the Theos couldn't quite reach as low as the song called for. As I cranked it louder the 2,000 watt M1 amps poured more power into the Theos but the 8" aluminum drivers never lost their composure. MartinLogan's goal was obviously clean and articulate instead of subterranean bass. In "Chained" there are two vocalists, one male and one female. I could easily distinguish their different places in the soundstage; the male on the left, female on the right, and a drum kit in between them. The entire CD felt sound natural and lifelike and at times the soundstage extended well beyond the confines of the speakers.

SACD: Alison Kraus + Union Station - *Live*



I recently picked up this SACD by accident. I thought I had bought a used CD from a local record shop but when I got it home I was delighted to discover it was actually an SACD. I was in for just as pleasant a surprise when put it in the Oppo and hit play. Have you ever sat down and listened to something and it sounded so good you couldn't stop smiling? Well, that's how much emotion the Theos were able to portray.

On Track 3 the female vocals were smooth, natural and laid back. Alison Kraus' voice floated effortlessly and transparently in the middle of the soundstage with pin point accuracy. Every pluck and strum of a fiddle, guitar, banjo, and dobro from the Union Station Band was pristine. I could identify each instrument on the stage. On track 5 the standup bass emanated from the middle of the stage, set behind the other instruments. A quick glance at the album art verified that the standup bass player was right in the middle of the stage, behind the other musicians. On disc two there are a number of Dobro solos that the Theos played with incredible detail. The instruments didn't sound like they were right in front my face, or set way back, they were the perfect size and distance. The only slight complaint was that sometimes the Dobro floated around between middle and left side of the soundstage, but it wasn't bothersome. I may have been able to fix this by fiddling with the speaker placement a little more, but they sounded so good right where they were. What can I say, the Theos absolutely rocked every track on this two disc set. I could have sat listening for hours. (In fact, I actually did.)

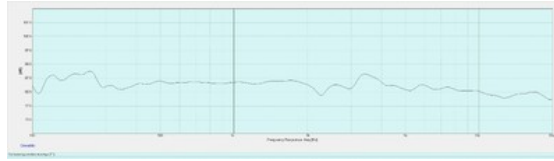
Various

I threw a ton of music at these speakers and one thing became very clear, the Theos sound superb with quality recordings and revealed the flaws in bad recordings. Their ability to convey every bit of detail and lack of coloration means that if something was recorded poorly you will find out pretty quickly. With that said, I spent a number of hours listening to low bitrate music over Pandora and directly off my iPhone. For background music the Theos were great with compressed music, but for critical listening tests choosing high quality tracks is crucial.

The speakers also sounded good as I walked around my listening area. Stereo imaging did fall off quickly as you move from side to side, but the general sonic signature stays the same. For those hesitant about electrostatics because of a need to accommodate multiple listening positions, I would put that worry to rest. This doesn't mean that all electrostats have wide enough dispersion for a multi-seat application; the unique height and curve of the Theos' panel are what makes this possible. Electrostats with short or flat panels will likely still exhibit a very small sweet spot.

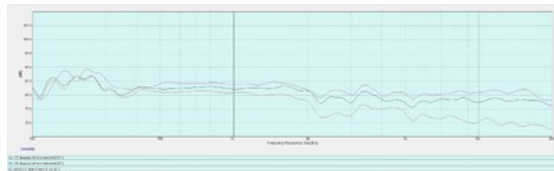
Measurements

I used a Dayton Audio OmniMic test system with 1/12th octave smoothing for frequency response measurements. I pulled the speaker into the middle of the room and took measurements at ear level (about 38") and from distances of 1 and 2 meters away from the front of the panel. Although the results were quite good, this is not how MartinLogan measures their speakers. Their concern is how a speaker sounds at the listening location, in accordance with their recommendations, I moved the speakers so they were between 2-5 feet (.7-1.5 meters) from the back and side walls, and took some measurements from an average listening distance of 2 meters. Not surprisingly, the measurements were slightly more linear.



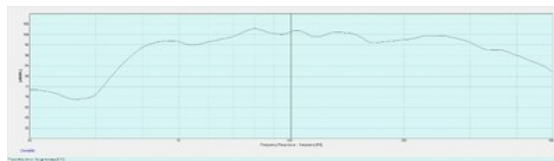
MartinLogan Theos In-room 2 meter Listening Window Response (1/12th octave smoothed)

I took a total of 7 measurements (on-axis +15 deg & +30 deg horizontal and +15 deg vertical) and averaged the response for an overall impression of what listeners will hear. Other than the 4db boost at 3.5Khz, the response was very linear. The big bump below 300Hz was likely due to the room, so I cannot fault the Theos.



**MartinLogan Theos In-room 2 meter SPL vs Frequency Response (1/12th octave smoothed)
purple trace: on-axis; black trace: 15 deg off-axis; brown trace: 30 deg off-axis**

The on and off axis comparison is a very enlightening graph considering the roll off of the ESL panel. The graph clearly shows the directionality of the ESL panel. During my listening tests the speakers were very laid back, this is largely due to the roll off of high frequencies when off axis. MartinLogan recommends that the inner third of the panel faces you, meaning that you are sitting about 10 degrees off axis. This position yields a smooth roll off the treble and gives the speaker a laid back presentation. As you can see, once you step outside of the 30 degree curve of the ESL panel the response drops off more quickly.



MartinLogan Theos 1/2 meter groundplane bass measurement (1/12th Octave Smoothed)

In order to accurately measure the bass response of the Theos I took a 1/2m groundplane measurement with the speaker standing upright (port facing the floor). The results were quite smooth, with a sharp roll off at above 300Hz. This was predictable because the Theos are crossed over at 425Hz and utilize a 2nd order x-over. The Theos played strongly down to 40Hz, right in line with the official 43Hz -3dB point. It is nice to see a company report accurate measurements, far too many companies fudge their measurements for the sake of selling more speakers.

Conclusion



For \$5,000/pr there are a lot of great speaker options on the market, but none quite like the Theos. The look of the speakers screams "high end" and they are sure to amaze anyone who has never seen an ESL speaker. They do need to be pulled out into the room a little farther for proper bass response than some other ESL's from MartinLogan. For those of you that are concerned about this, the next step up in MartinLogan's lineup, the Ethos, are a little more versatile with an on-board amp and level controls. As far as sound quality goes, you will be hard pressed to find better. The transparency and detail of these speakers is incredible. Whether watching movies or listening to music, the Theos are a treat to listen to. Highly recommended!


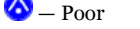
The Score Card

The scoring below is based on each piece of equipment doing the duty it is designed for. The numbers are weighed heavily with respect to the individual cost of each unit, thus giving a rating roughly equal to:

$$\text{Performance} \times \text{Price Factor/Value} = \text{Rating}$$

Audioholics.com note: The ratings indicated below are based on subjective listening and objective testing of the product in question. The rating scale is based on performance/value ratio. If you notice better performing products in future reviews that have lower numbers in certain areas, be aware that the value factor is most likely the culprit. Other Audioholics reviewers may rate products solely based on performance, and each reviewer has his/her own system for ratings.

Audioholics Rating Scale

-  – Excellent
-  – Very Good
-  – Good
-  – Fair
-  – Poor

Metric	Rating
Build Quality	
Appearance	
Treble Extension	
Treble Smoothness	
Midrange Accuracy	
Bass Extension	
Bass Accuracy	
Imaging	
Soundstage	
Dynamic Range	
Fit and Finish	
Performance	
Value	