

# THE THX DOMINUS DOMINUS LINE HAS FINALLY BEEN BREACHED!



## SUMMARY

#### **Products:**

- S7t Tower
- · S7c Center
- · S5m Monitor
- · S4s Surround

#### **MSRP:**

**S7t Tower Speaker** \$8,000/ea **D215s subwoofer** \$9,000/ea

· D15s Subwoofer

· D215s Subwoofer

· S4b Bookshelf

· D212s Subwoofer

· D12s Subwoofer

· B5t Tower

# **FIRST IMPRESSION**

# GOTTA HAVE IT!



### **EXECUTIVE OVERVIEW**

A few years ago, THX reorganized their certifications that expanded them to include a wider range of performance categories.

Previously, THX had certifications of Select2 and Ultra2 which indicated that the equipment was sufficient for certain room sizes and viewing distances (10' viewing distance/2,000 cubic foot room for Select2 and 12' viewing distance/3,000 cubic room for Ultra2). Both of these certifications were replaced with four new levels of certification: Compact (8 foot viewing distance/1,000 cubic foot room), Select (10-12 foot viewing distance/2,000 cubic foot room), Ultra (12 foot viewing distance/3,000 cubic foot room), and Dominus (20 foot viewing distance/6,500 cubic foot room).

Given how arduous the THX certification is for Ultra, many in the industry speculated whether any loudspeaker product would ever achieve THX Certified Dominus which is far more demanding. THX has very stiff requirements for a whole host of aspects of loudspeaker performance that look at frequency response both on and off-axis, dynamic range, distortion characteristics, impedance, sensitivity, and other qualities. The speaker must be able to maintain a very high level of sound quality at the listening position at an 85dB nominal level with 105dB peaks, and 95dB nominal with 115dB peaks for subwoofers. That is asking a lot at a 20-foot distance in a 6,500 cubic foot room. To give an idea of how large a room of that many cubic feet would be, think of a room with a 20-foot width, 40-foot length, and an 8-foot ceiling; that is a good deal larger than your average home theater room.

A group of loudspeaker engineers took THX's extreme requirements for Certified Dominus as a dare, and they formed a company that would produce the world's first (and, as of the time of this writing, only) THX Certified Dominus speakers and subwoofers. The company they formed is called Perlisten Audio, which is named after abbreviating the phrase 'perceptual listening experience.'

To be sure, these engineers didn't form the company merely for the purpose of just making the world's first Certified Dominus speakers. They decided to form the company to make the kind of speakers that took full advantage of their knowledge and talent, in other words, the best loudspeakers that they knew how to make and that they would want to own.

Given the extensive talent of the team and cumulative years of experience between them, it's not surprising to see the level of innovation that they managed to come up with now that they were no longer constrained by the normal limits of typical product development goals. This was going to be a loudspeaker engineer's loudspeaker and not just loudspeaker design per marketing research that assesses consumer desire in some market segment.

It takes some serious speakers to break the THX Certified Dominus barrier, so how did Perlisten accomplish this feat? The answer is cutting-edge loudspeaker design combined with brute force air displacement.

An example of the leading edge technology employed by Perlisten is their 'DPC' array that uses three 1.1" drivers across a waveguide that is used on all of Perlisten's speakers. The 'tweeter' is the dome mounted in the middle of the waveguide while two upper midrange drivers are mounted above and below the mouth of the waveguide. These upper midrange drivers are not tasked with playing lower midrange which greatly alleviates their displacement requirements nor are they tasked with playing treble which greatly alleviates their requirements for low mass.

Giving the drivers a more focused frequency band enables the engineers to optimize them much more than wide-band drivers. It also allows the engineers to optimize the tweeter for a higher treble range which enables it to perform that much better within its allocated range.

The waveguide also has a major role to play here, as optimal waveguide geometries are not easy to conjure. Perlisten's waveguide keeps the tweeter's horizontal dispersion wide and the vertical dispersion narrow at a consistent directivity up to the high-frequency limits of human hearing. It's the perfect shape for a directivity match with the midrange drivers.

The really cool thing about the DPC array is that the three drivers are used to reduce each other's vertical dispersion and also strengthen the axial response by means of phase summation and cancellation. Separate drivers that play the same frequency will inevitably start interfering with each other at high enough frequencies, and often times this can be a problem, but for Perlisten, it's a solution to reduce acoustic reflections off of the floor and ceiling.

This is a part of what is called beamforming, and it is a similar technique to how 5G transmitters precisely deliver a strong signal to a receiver in a specific direction instead of spraying it inefficiently over a broad angle. Likewise, the woofers flanking the DPC array do the same thing at lower frequencies, so vertical dispersion is restricted by design for all the deepest bass frequencies.

While a restricted vertical dispersion can be a desirable feature, a wide horizontal dispersion can also be desirable, and Perlisten's design looks to encourage a wide dispersion while discouraging vertical dispersion in a very clever approach to directivity control. One neat attribute about Perlisten's system of directivity control is that it doesn't need the speaker to have a really wide footprint.

Almost all other loudspeakers with highly controlled directivity use large horns to accomplish that objective, but, as a consequence, they are very large speakers with a wide front baffle. Perlisten's flagship speaker is not much larger than a normal tower speaker, but it is behaving in a way that you would expect from a gigantic speaker.





Along with clever approaches in directivity control, Perlisten also tackles THX Certified Dominus in allocating raw displacement only where it is needed instead of having it in frequency ranges where it isn't necessary.

The reason is that the quantity of air that needs to be moved to maintain the same SPL rises exponentially as frequencies fall. For example, Perlisten's S7 series uses four 7" bass drivers to move air below 1kHz where things get tougher, especially below 100Hz. 1kHz, on the other hand, would be tough for a dome tweeter but is not much of a challenge for a couple of midrange domes in addition to the tweeter. The midrange drivers get filtered out at 4.4kHz leaving the tweeter alone to reproduce that range for which it is far more suited.

Perlisten's driver layout ensures that the speakers will be able to play at high levels with very low distortion which is, of course, mandated by THX to achieve a Dominus rating. It's worth pointing out that Perlisten's R5t floorstanding speaker, a very substantial three-way tower, is only Dominus certified for a surround role.

Only Perlisten's S series is THX Certified Dominus for front LCR roles and are presently the only speakers in the world officially certified for that function.

As was said before, it is asking a lot to achieve THX Reference levels at a 20-foot viewing distance. Indeed, it requires the S series to have a relatively high 92dB sensitivity, and that is extremely high for a speaker with a -10dB frequency of 22Hz. This is a speaker that has high sensitivity as well as deep bass extension, all while maintaining a reasonable size; so much for Hoffman's iron law! The THX Certified Dominus also extends to Perlisten's subwoofers. Needless to say, it takes one heck of a sub to hit Certified Dominus since subs have an additional 10dB level of output needed beyond the main loudspeakers, but Perlisten's subs look like they have the chops to do it. First of all, the drivers boast 30mm of one-way linear excursion which signifies a tremendous level of controlled displacement.

We should emphasize the word 'control' here since there are subwoofer drivers that can move further than that, however, they don't do so in a controlled manner, whereas the Perlisten subwoofer driver cones can move over two inches both ways with near-absolute control over the cone position.

Linear excursion means the cone tracks the signal accurately, so the driver can move that distance only while only producing the sounds that it is supposed to without adding distortion products. Perlisten is able to achieve this level of linear excursion by employing all of the tricks of modern driver engineering including using a carbon-fiber composite cone, multiple shorting rings, massive magnet motors, and multi-layered spiders for suspension that doesn't inhibit the driver's travel until absolutely necessary.

For an even greater degree of control, Perlisten's flagship subwoofers, the D215s and D212s, uses a push-pull driver arrangement where another driver is added to counteract asymmetric distortion that results in far lower even-order harmonic distortion products. I would say that is overkill to achieve low distortion, but these are the lengths you can go to for no-holds-barred, state-of-the-art performance, especially if you don't want the subwoofer to be the size of a refrigerator.



HORIZONTAL DIRECTIVITY



VERTICAL DIRECTIVITY



Of course, all of that linear excursion isn't useful without adequate power to take advantage of it, but the Perlisten subwoofers have a very serious power plant in a 3kW short-term RMS class-D amplifier.

What is more, that amplification is very tightly controlled by a lightning-fast 32-bit ARM processor that monitors temperature, current, voltage, fault detection, and performance diagnostics in realtime.

This is complemented by a powerful DSP that enables users to fine-tune the subwoofers' behavior to an extraordinary degree using app control supported by iOS and Andriod devices. Users can switch between different inputs (the Perlisten has both balanced and unbalanced inputs) as well as adjust input gain, phase, low-pass filter behavior, different performance modes, and users can even configure a 10-band parametric equalizer.

There are three different presets that all of these settings can be saved on. Smartphone apps are nifty, but what if your phone isn't handy at the moment? Perlisten has a 2.4" LCD touchscreen display mounted at the top front of their subs for easy access to many of these functions.





The technology deployed to make Perlisten's speakers sound futuristic is matched by their futuristic industrial design too. They have a smooth look that rounds the vertical edges while keeping the horizontal edges more angular. If these are from the future, it is a clean 'Star Trek' future rather than a baroque 'Blade Runner' futurism that has a convoluted and busy aesthetic. They don't look like traditional loudspeakers and subwoofers, but they do look sleek and very cool. Perlisten's products can be had in a wide range of colors, and they are amenable to custom colors as well as some real wood veneers if a customer has a specific request.

Of course, something that looks this nice and also has this level of engineering does come at a price. Pushing the envelope this far isn't an inexpensive endeavor, and Perlisten's flagship tower speaker, the S7t, starts at \$8k each (for the premium high gloss finish), and their flagship subwoofer, the D215s, starts at \$9k (also in high gloss). However, if you want some of the most sophisticated loudspeakers and subwoofers that are available, in both looks and technology, that is certainly not an unreasonable cost. Perlisten products can only be purchased from dealers. They are still establishing a dealer network, so if you are interested in purchasing a Perlisten loudspeaker, the way to do that is to contact their distributor, Fidelity Imports (https:// fidelityimports.com), with queries on where to purchase. Perlisten isn't doing direct sales which makes sense since most people buying at this price point do want a demo first. All of their products come backed with a 5-year warranty. We are very intrigued by Perlisten's offerings and will be taking a much closer look at their speakers in a full review in the future. Keep an eye on Audioholics to see what we find; is THX Dominus just for bragging rights, or is it the ultimate endgame for home theater?

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