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P r o d u c t R e v i e w

YG Acoustics Anat Reference Main Module Loudspeakers

by Doug Schneider
das@soundstage.com

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Every speaker designer has a story about the speakers he designs. Many times the story is based on fact—usually well-established loudspeaker-engineering principles—while other times it seems more like fiction, perhaps even science fiction. I've never heard two stories that were *exactly* alike and, frankly, this is a real problem for consumers. It makes it hard to determine what you should believe, and whose product you should buy.

Perhaps that's why some people choose to ignore the stories altogether and simply let their ears decide. I'm not one of them. I have an inquisitive mind, and I like to know how things work. As a result, I *want* the story behind it all. I want to know what the designer was thinking, particularly when the product under consideration is \$28,000 USD worth of stand-mounted loudspeaker from a relatively new US-based company. Yoav Geva, the mind behind YG Acoustics and the Anat Reference Main Module, gave me his story, and it's one of the most interesting ones that I've come across in quite a while.

The story

Yoav's goal is to produce the best loudspeakers in the world, period. But who doesn't have this goal, and, besides, what is "the best"? In Yoav's mind, the best speaker is the most accurate—the one that colors the signal the least. He wants to create conduits to the music, speakers with no real sonic signature of their own.

Furthermore, Yoav believes that to arrive at this ideal it is imperative not just to rely on measurements but to live by them. This flies in the face of those who believe that our existing measurements tell us little about how a component sounds. Yoav believes that if you know what you're measuring and you're doing your measurements properly, then you can have objective data that tells you everything you need to know about designing speakers. Yes, *everything*.

In terms of those measurements, what Yoav wants to see is flat-as-a-pancake on-axis frequency response, exceptionally controlled dispersion, and, perhaps trickiest of all, perfect driver-to-driver phase relationships at all frequencies. This can all be measured, and Yoav has even developed his own software

Review Summary

Sound

"Matter-of-fact... with very little editorializing of their own." "They're relentlessly neutral and make other relatively neutral-sounding speakers seem quite colored in comparison." "The Main Modules handle the lows quite nicely. However, they're not miracle-workers"; "a strong 50Hz'—just not 20Hz." "The Main Module's ability to cast a soundstage and carve out performers was every bit the match for its tonal neutrality."

Features

"The Main Module is a two-way, sealed-box design with the drivers mounted in an M-T-M configuration. The 5 1/4" top and bottom mid-woofers are from Scan-Speak's Revelator series and made to Yoav's specs.... The tweeter is a Vifa XT-series ring-radiator design that Yoav says is modified in-house." "The sides, top, back, and bottom of the Main Module are made from two layers of aircraft-grade aluminum. The inside layer is 12mm thick, while the outside layer is 8mm thick.... The front baffle is made from ballistic-grade aluminum-titanium."

Use

"The Main Module is definitely a *stand-mounted* speaker, not a *bookshelf* design. Few bookshelves could support it." "The impedance—which is stated as 4 ohms nominal, with a 2.7-ohm minimum point—mandates that you partner the Main Module with an amp that can deliver real current. Most tube amps shouldn't apply for the job."

Value

"The only *real* downside is, of course, the cost. I can't drop \$28,000 for a pair of speakers, but I'm certainly not oblivious to the fact that others can. At least if you begin with the Main Modules, you have an upgrade path to a speaker that should be something very special."

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to help him do that in order to achieve his goals in less time. He obviously likes fact far more than fiction.

As well, Yoav doesn't seem interested in compromise. As I said, he wants to produce "the best," so he picks parts for his speakers that he feels are commensurate with that goal. He's pursuing the state of the art in speaker design, and to do so he pulls out all the stops and invests a lot of thought and money into the venture. That's how he ended up with a stand-mounted speaker that's 28 grand.

Description

The Anat Reference Main Module's cabinet is certainly unique, but it's part of Yoav's plan. In an attempt to ensure flat frequency response, he tries to eliminate the cabinet as best he can by making it as inert as possible. As a result, the sides, top, back, and bottom of the Main Module are made from two layers of aircraft-grade aluminum. The inside layer is 12mm thick, while the outside layer is 8mm thick. Yoav says that each layer uses a slightly different alloy and thermal treatment. The front baffle is made from ballistic-grade aluminum-titanium.

The Main Module is, by far, the most solid speaker I've ever reviewed. Each 19 3/4"H x 7 3/4"W x 19 3/4"D speaker weighs a staggering 130 pounds. Visually, with its raw-metal finish and rather generous proportions, it's like nothing I've seen. The Main Module is definitely a *stand-mounted* speaker, not a *bookshelf* design. Few bookshelves could support it.

But will an all-metal speaker be acceptable for most domestic settings? For that determination I deferred judgment to my wife, who obviously has good taste. Surprisingly, without hesitation, she told me that she loved the way the Main Module looks. In fact, she finds most wood-grained speakers downright ugly by comparison.

The Main Module is a two-way, sealed-box design with the drivers mounted in an M-T-M configuration. The 5 1/4" top and bottom mid-woofers are from Scan-Speak's Revelator series and made to Yoav's specs. Clever spider-like metal grilles magnetically attach to the drivers' bolts and offer a degree of protection—a nifty idea befitting a speaker this expensive. The tweeter is a Vifa XT-series ring-radiator design that Yoav says is modified in-house. On the front baffle, the tweeter is nestled inside a waveguide, something that helps control dispersion and will also provide a bit of loading for the tweeter to improve its efficiency. The speakers can be single- or biwired.

Yoav says the mid-woofers transition to the tweeter at about 1800Hz, which is quite low but guarantees a good blend between them and the tweeter. The use of steep fourth-order slopes ensures minimal overlap.

However, Yoav is not just rolling off the drivers in the crossover. He also applies some correction to achieve his goals of phase-correct behavior between drivers. This is, not surprisingly, something proprietary and Yoav is not apt to talk much about it. As a result, photos of the Main Module's crossover show

quite an elaborate array of parts, although Yoav says that only a minimal number of components are in the direct signal path.

The specifications, if accurate, are impressive. Yoav claims +/-0.7dB deviation from the upper bass to 20kHz (because this is a smallish speaker, deep bass is missing), and with less than 0.2dB difference from speaker to speaker. This last spec is very important to things like speaker imaging, but is often not quoted by manufacturers and probably not determined either. The impedance—which is stated as 4 ohms nominal, with a 2.7-ohm minimum point—mandates that you partner the Main Module with an amp that can deliver real current. Most tube amps shouldn't apply for the job. Sensitivity, though, is about average—86dB at 1m for a 2.83V input.

Finally, it's important to mention that the Main Module is only part of YG Acoustics' Reference series. This is a standalone speaker with limited bass output, but it can be augmented substantially. In fact, whenever I see these speakers at shows, Yoav doesn't show the Main Module separately. Instead, it's often with the powered Anat Reference Studio subs that mount perfectly underneath, extend the bass to 20Hz and eliminate the need for stands. These will set you back another \$32,000, bringing the total price up to \$60,000. Then you can add another set of Reference Professional subs *under* the Studio subs for \$32,000 more (\$92,000 altogether). The Professional subs are there to increase SPLs, not necessarily provide greater low-frequency extension.

Yes, the whole speaker system is rather expensive, but it's a well-thought-out design. Yoav has sloped the tops of the subwoofers, so that as the speakers grow, due to the addition of the subs, they also point downward, adjusting the listening position so the sound doesn't literally go over your head when you're seated. Thus, the Main Module shouldn't be regarded as a standalone speaker and nothing else. The potential upgrade path is critical when considering whether this speaker is right for you.

Setup

I used the Main Modules with the 150Wpc Simaudio Moon i-7 integrated amp and the results were fantastic. Along with the i-7, I used my Theta Data basic transport feeding both the original Stello DA220 and the upgraded DA220 Mk II DACs. Digital interconnects were i2Digital X-60 and DH Labs D-75. I biwired the speakers using Analysis Plus Silver Oval speaker cables, and interconnects between the DACs and i-7 were Nordost Valkyrja.

The speakers were placed well out in the room, with about seven feet to the front wall and five feet to each side wall. They were perched atop 26"-high stands specially supplied by YG Acoustics (but not available commercially). My goal in pulling the speakers way out into the room was to evaluate what they could do on their own and minimize the involvement of the room.

Sound

Making a speaker that has *no* sound of its own is impossible. Other than the slight electrical and mechanical sounds other components make, the speakers are the *only* thing in your

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audio system that really makes any sound. They're in charge of turning electrical signals into an acoustical event. Therefore, what someone means when talking about a speaker having *no sound* is that it adds little distortion to the signal fed it—*i.e.*, it's neutral.

When I first heard the Main Modules I was taken aback by *their sound*, not for the lack of it but for how matter-of-fact they were, with very little editorializing of their own. For example, I reveled in Mariza's *Transparente* [Times Square Records TSQ-CD-9047], which was conveyed without being too bloomy, as has happened with so many speakers, and without being either too present or distant either. The bass that the Main Modules delivered was deeper than I first thought it would be from a two-way with smallish dual mid-woofers. In my room, I achieved a strong 50Hz or so at reasonable listening levels. All in all, the Main Modules handle the lows quite nicely. However, they're not miracle-workers—the extreme lows on the opening track from the Cowboy Junkies' *The Trinity Session* [RCA 74321183562], "Mining for Gold" specifically, went AWOL. This track will pressurize your room if your speakers are capable of it, but the Main Modules alone aren't. As I said, "a strong 50Hz"—just not 20Hz.

But what I liked about the bass, besides the reasonable extension, was the lack of bloat and, in particular, the absence of an upper-bass hump, which is basically a "lift" in the response placed anywhere from 100 to 200Hz. This is often designed into smaller speakers, but it sometimes shows up in floorstanders as well in order to give the *perception* of increased output lower down. This hump makes speakers sound bigger than they really are, but artificially so. The Anat Reference Main Modules have none of that. They go fairly low, but without any embellishment—a trait I like.

And they have none of that added drama through the midrange and highs either. In fact, I've never heard such an even-handed presentation through the entire frequency range (save for bass below 50Hz). The Main Modules aren't forward or recessed—they're right in the middle, and the apt phrase for this is obviously "neutral." But they're also more than that. They're relentlessly neutral and make other relatively neutral-sounding speakers seem quite colored in comparison.

But such a presentation ended up being a double-edged sword. For example, when I put on Mariza's *Transparente*—which is exceptionally well recorded—the result was nothing short of glorious, with the music reproduced exactly the way it was intended to be when laid to tape. Furthermore, the level of resolution was such that every nuance and subtlety came forth in a way that made many other speakers sound like they were masking details. This wasn't like removing a film from glass to see better; it was like removing the glass itself. But, on poor recordings, such neutrality gave flaws nowhere to hide, sometimes with a painful outcome.

For instance, one day I was playing some older music for a friend and pulled out Bruce Springsteen's *Nebraska* [Columbia CK-38358]. Musically, I think this is Springsteen's best album,

but sonically it's abysmal. The notes in the booklet tell you that it was recorded on a four-track Tascam cassette recorder, and it sounds like it. Furthermore, the CD I have sounds poorly mastered. It's thin, lacking in dynamics, and harsh. The music gets a 10, but the sound gets a 2. When the Anat Reference Main Modules zeroed in on this recording, it sounded downright awful. In fact, my friend was aghast at how bad this very good music sounded.

Paradoxically, though, that's the strength of the Anat Reference Main Module, and the crux of what these speakers and YG Acoustics are about: Yoav wants accuracy above all else, and the Main Modules deliver it.

Obviously, taming the upper midrange with some sort of depression would ameliorate what I heard with the Springsteen disc, but Yoav wants *none* of that. Utter neutrality is what he's after—the cold, hard truth. As a result, the Anat Reference Main Module's presentation will turn some off for showing too much and not being voiced in a way to be always pleasing to the ear. Essentially, Yoav has created a speaker that's tonally neutral, startlingly revealing, and thoroughly unforgiving, which is in stark contrast to speakers where a designer contours its sound in a way that he feels is more classically "musical." The Anat Reference Main Module is heroic for its honesty—I nicknamed it the "lab-instrument loudspeaker." You can literally analyze recordings with it, but can you handle such truth? It's worth thinking about.

Like or hate such a revealing nature, few listeners will quibble with the way these speakers can image, *providing* you're sitting in the sweet spot. In fact, I wasn't quite prepared to experience a soundstage laid out with such extreme specificity. The Main Module's ability to cast a soundstage and carve out performers was every bit the match for its tonal neutrality. For example, when I played "Everest" from Ani DiFranco's *Up Up Up Up Up Up Up Up* [Righteous Babe RBR013-D], there was no mistaking where Ani's voice and guitar were: left of the stage. The placement was pinpoint precise with absolutely no smear or drift. When I played the soundtrack to the movie *The Mission* [Virgin CDV 2402], I'd never heard the individual voices placed so precisely in space. As well, the depth the speakers presented was nothing short of miraculous. The stage began from *way* behind the speakers, and the performers hovered tangibly in space and without any question as to where they were positioned. All other speakers I've reviewed seem diffuse, even confused, in comparison.

However, as I said, that was *providing* I was in the sweet spot, which is dead-center—not only between the left and right speakers, but with my ears exactly at tweeter height. If I stood up, the stage lost its precision, more so than with a typical two-way minimonitor that has a single tweeter above a single mid-woofer. However, I don't accuse YG Acoustics of having done something wrong here. I believe this is mostly a result of the M-T-M driver configuration in general—I hear it with all speakers of this type. It has to do with the phase relationships between the mid-woofers and the tweeter, as well as one mid-woofer to the other, which is more complex than if you just have a single tweeter and mid-woofer.

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Overall, the Main Modules have no obvious weaknesses. Where they fall back in a few areas, they come across as simply average, but not necessarily deficient. But where they excel—the tonal neutrality and the imaging precision, for example—they soar. In fact, it's these strengths that I sorely missed when the Main Modules were packed up to leave. I enjoy accurate, revealing speakers that allow me to dive right into recordings, and none that I've heard does it better than this one. The Main Modules' ruthlessly revealing nature certainly makes bad-sounding recordings unbearable, but I'm not one who likes to hear music prettified, its flaws covered up.

The only *real* downside is, of course, the cost. I can't drop \$28,000 for a pair of speakers, but I'm certainly not oblivious to the fact that others can. At least if you begin with the Main Modules, you have an upgrade path to a speaker that should be something very special.

Comparison

As you can probably guess, I don't have any \$28,000 stand-mounted speakers lying around the house to compare to the Anat Reference Main Modules. In fact, I don't know that any other such speakers exist. However, even if there were others, I don't think it's necessarily right to limit comparison to speakers that sit on stands. Whether speakers are perched on stands, sit on the floor or are attached to a wall, their goal is to produce sound, and they can be compared on this account. Furthermore, the Main Module is quite large, so it's likely to be used in a way that typical floorstanders would, and because of the cost involved, people who are thinking about buying this speaker will likely be looking at floorstanders too.

In terms of floorstanding speakers, I've reviewed many, although they have been priced somewhat lower than the Anat Reference Main Modules, including, most recently, Focus Audio's Master 2.5 at \$18,590 per pair and Mirage's overachieving, 360-degree-radiating OM Design OMD-28 at \$7500 per pair. The comparison among these speakers is interesting because they're as different in their sonic performance as they are in price.

The Master 2.5s and OMD-28s cleaned up on the Main Modules in terms of bass extension—no surprise there. They have larger woofers and cabinets, and, as a result, they are capable of much deeper and weightier bass. They can also play louder, too—considerably so. The Main Modules alone just aren't made for that. Perhaps the Studio subs change this, but the Main Modules alone don't do what big floorstanders will down low.

However, within their operating range, and providing they aren't pushed to extraordinarily high levels, the Main Modules counter with a level of fidelity and resolution that the larger speakers don't match. Both the Focus Audio and Mirage speakers sound considerably warmer, fuller, and more forgiving by comparison. When it comes to neutrality, then, the more expensive Main Modules certainly get the nod. In fact, the Main Modules could have "laboratory grade" stamped on the back as a way to distinguish them.

Although the OMD-28s cast the largest soundstage, filling the front end of my large room completely, and the Master 2.5s

and Main Modules tied for sheer soundstaging volume, neither the Mirage nor the Focus Audio speakers were capable of the pinpoint placement of the Anat Reference Main Modules. In fact, the YG Acoustics speakers' stage was so well laid out, holographic and razor-sharp that I found it hard to believe I was getting such sound from stereo. Even multichannel recordings rarely sound this exact.

The ultimate step—and comparison—however, would be to match all of these speakers bass note for bass note by adding the Studio subs to the Main Modules, even though the price tags would be way out of line. It's only then that I could compare apples to apples and see if YG Acoustics' by-the-rules approach yields the best full-range loudspeaker on earth. That test, however, is not for me to do. It's tough enough lifting 130-pound speakers into my third-floor listening room. I'm not sure my back, or floor, would take the extra weight of the subs.

Conclusion

Clearly, the Anat Reference Main Module is an extraordinary speaker in many ways, and there's good reason that Yoav Geva has such a fine story to tell. This speaker shows tonal neutrality and soundstaging prowess that are uncanny. Its way of cutting through a recording and laying out the soundstage with painstaking precision is the best I've heard from *any* speaker.

However, the Main Module is also \$28,000 per pair, needs stands, and has limited bass extension. Therefore, it is certainly not a speaker for everyone. The kind of person who buys it is obviously well-heeled, in search of the most honest and revealing loudspeaker available, but not necessarily in need of really deep bass extension—perhaps a hypercritical audiophile or a recording engineer. But it's certainly also possible that the person who buys this speaker might consider it a first step, and then take the journey upward and replace the stands with one or both of YG Acoustics' subwoofers to achieve true full-range sound later on.

Whatever the case may be, the Anat Reference Main Module is an intriguing, sophisticated loudspeaker that may well represent the pinnacle of objective, measurement-oriented loudspeaker design here and now. Even if you can't afford it, or would never buy it, you should try to hear it and experience what it can do. It's a benchmark for what "precision" in audio reproduction is about. It might, in fact, give *you* some stories to tell.

...Doug Schneider
das@soundstage.com

Company Info

YG Acoustics

Anat Reference Main Module Loudspeakers

Price: \$28,000 USD per pair.

Warranty: Five years parts and labor.

Computerize Loudspeaker Laboratories LLC

The exclusive manufacturer of YG Acoustics loudspeakers

4941 Allison Street, Unit 10, Arvada, CO 80002

Phone: (720) 840-6441 :: Fax: (303) 420-0156

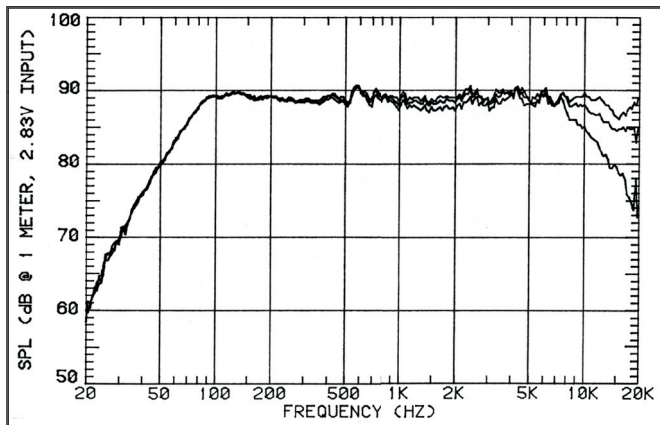
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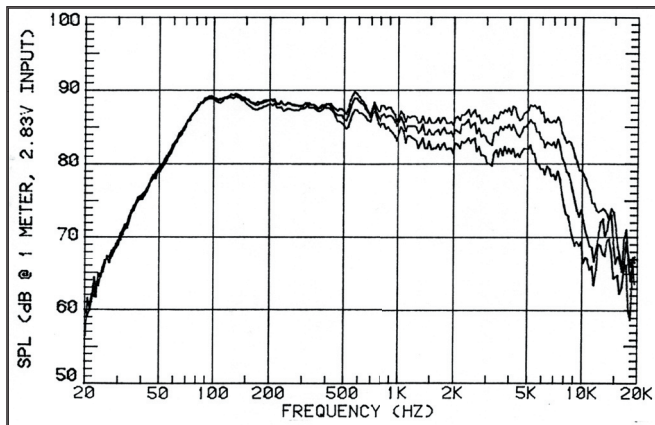
Product Measurements

Microphone measuring position: tweeter axis
 Grille: off
 Sensitivity: 89.0dB (averaged 300Hz-3kHz, 2.83V/1m)

Frequency response, 20Hz - 20kHz (measured @ 2m, plotted @ 1m)

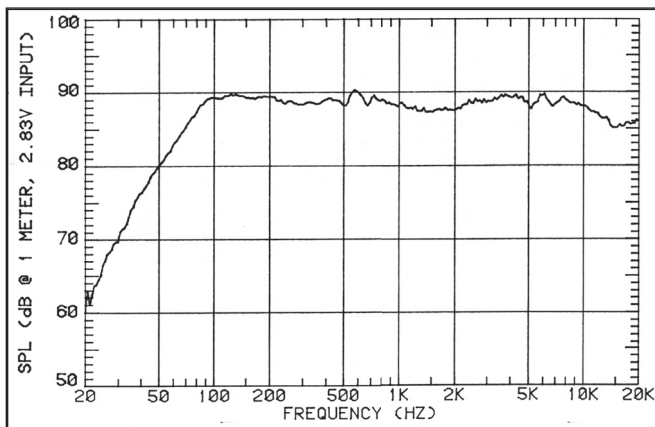


Top curve: on-axis response
 Middle curve: 15 degrees off-axis response
 Bottom curve: 30 degrees off-axis response



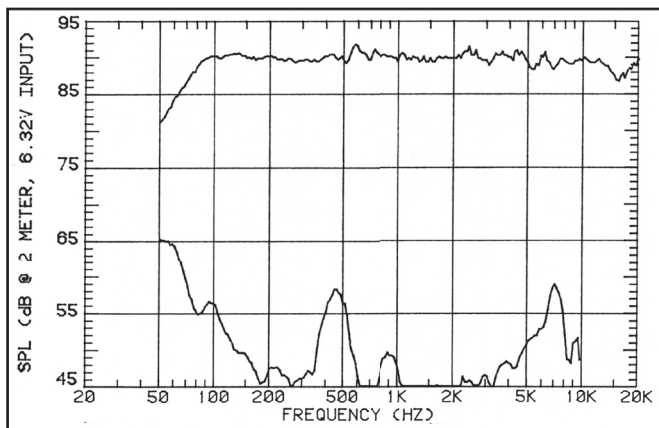
Top curve: 45 degrees off-axis response
 Middle curve: 60 degrees off-axis response
 Bottom curve: 75 degrees off-axis response

Listening Window, 20Hz - 20kHz (measured @ 2m, plotted @ 1m)



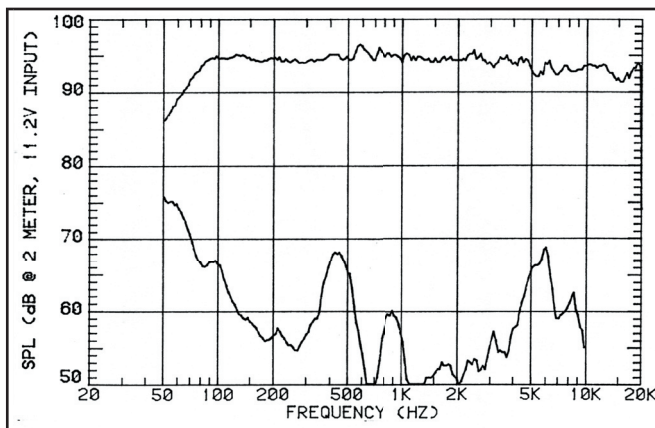
Response curve is an average of five measurements:
 on-axis, 15 degrees left and right off-axis, 15 degrees up and down off-axis

THD+N @ 90dB, 50Hz - 10kHz (measured @ 2m)



Top curve: frequency response @ 90dB SPL
 Bottom curve: THD+N @ 90dB (50Hz - 10kHz)

THD+N @ 95dB, 50Hz - 10kHz (measured @ 2m)



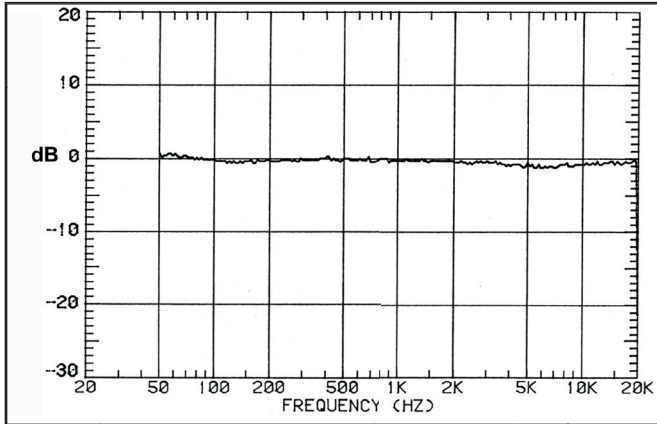
Top curve: frequency response @ 95dB SPL
 Bottom curve: THD+N @ 95dB (50Hz - 10kHz)

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Product Measurements

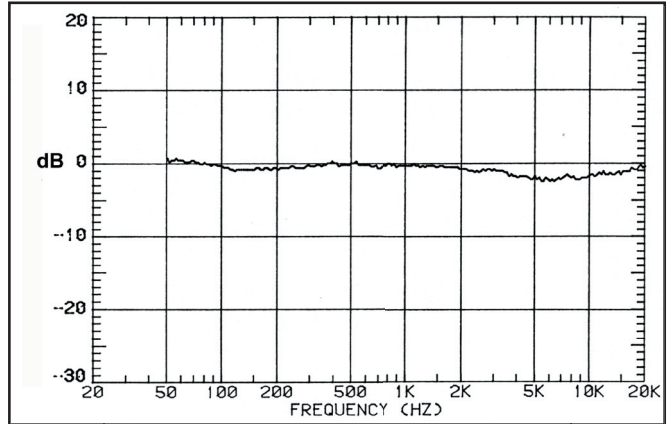
Deviation from Linearity

Difference @ 90dB, 50Hz - 20kHz (measured @ 2m)



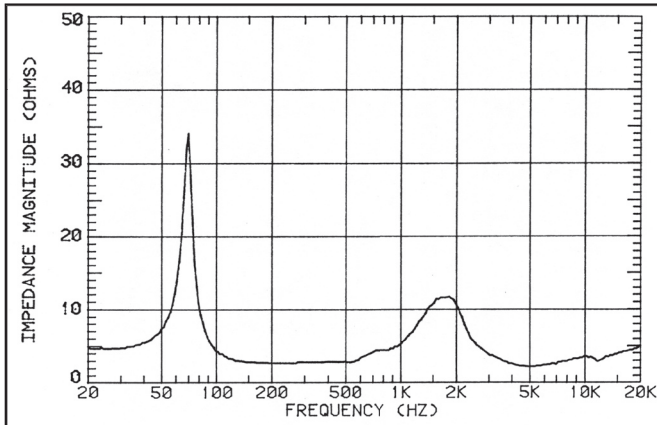
Curve: difference from 70dB at 90dB

Difference @ 95dB, 50Hz - 20kHz (measured @ 2m)



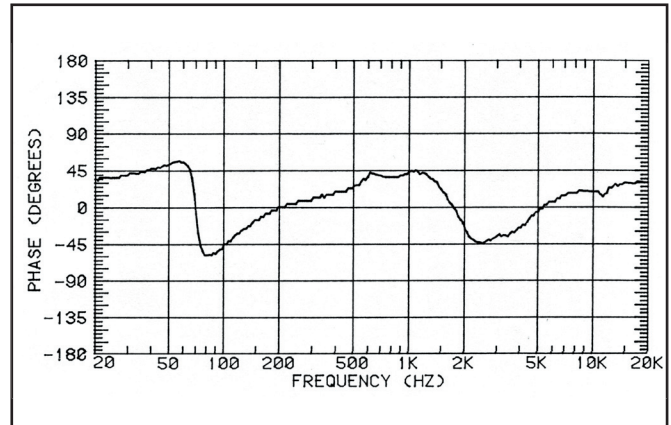
Curve: difference from 70dB at 95dB

Impedance



Vertical axis: impedance :: Horizontal axis: frequency

Electrical phase



Vertical axis: phase :: Horizontal axis: frequency