

ROBERT DEUTSCH

GoldenEar Technology Triton One

LOUDSPEAKER

I reviewed GoldenEar Technology's first speaker, the Triton Two (\$2999.98; all prices per pair), in February 2012.¹ It was and is an outstandingly good speaker, but I thought then that if GoldenEar would apply the same expertise to the design of a speaker with fewer cost constraints, the results could be better still. Sandy Gross, president and CEO of GoldenEar, must have been thinking along similar lines when he named the speaker Triton Two, leaving One for a more ambitious future product.

But the Triton One was slow in coming. Meanwhile, in the three years following my review, the Triton Two remained the top GoldenEar model as it was joined by: two lower-priced floorstanders, the Triton Three (\$1999.98) and Triton Seven (\$1399.98); two bookshelf models, the Aon 2 (\$799.98)² and Aon 3 (\$999.98); and some home-theater speakers and subwoofers.

I can understand why GoldenEar took their time in coming up with the Triton One. When you have a speaker as successful as the Triton Two, the expectations for any model above it will be correspondingly greater.

Well, the Triton One is here at last—and I was eager to hear if it would prove worth the wait.



¹ See www.stereophile.com/content/goldenear-technology-triton-two-loudspeaker.

² Reviewed by Robert J. Reina; see www.stereophile.com/content/goldenear-technology-aon-2-loudspeaker.

SPECIFICATIONS

Description Three-way floorstanding loudspeaker. Drive-units: 1.06" by 1.31" High-Velocity Folded Ribbon (HVFR) tweeter, two 5 1/4" midrange cones, three 5" by 9" woofers powered by an internal amplifier, four 7" by 10" passive radiators. Crossover frequencies:

100Hz, 3.5kHz. Frequency range: 14Hz–35kHz. Sensitivity: 92dB/2.83V/m. Nominal impedance: 8 ohms. Recommended amplification: 20–650Wpc. Built-in subwoofer amplifier: 1600W, class-D.

Dimensions 54" (1385mm) H (with base, no spikes) by

5 3/4" (150mm) W front by 8" (205mm) W rear by 16 5/8" (425mm) D. Weight: 80 lbs (36.4kg).

Finish Glossy piano black top with black cloth covering all other surfaces.

Serial numbers of units reviewed 051400053, 051400446.

Price \$4999.98/pair. Approximate number of dealers: 150.

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Description and Design

If you've seen the Triton Two, imagine a speaker that's the same general shape but a little taller, a little wider, and a little deeper—that's the Triton One, at 54" high by 8" wide by 16 5/8" deep, 80 lbs, and \$4999.98/pair. I find it sleek, and like the fact that its looks don't draw too much attention to the speaker, but I know that some consider the Triton series too plain looking. The cloth-covered look has worked well for some highly successful speakers, such as the Vandersteen 2 and the Quad ESL-63. However, if you want your speakers to look like fine furniture, the Triton One may not be to your taste.

The Triton One's cloth wrap hides an impressive array of technology. Like the Two, it's a three-way design with a powered, passive-radiator-loaded subwoofer section, and features GoldenEar's version of the famed Heil Air-Motion Transformer, called a High-Velocity Folded Ribbon tweeter. However, the Triton One is not just an inflated Two. The engineering team—headed by Bob Johnston, under the direction of Sandy Gross and with input from Gross's business partner, Don Givogue—examined every part of the Two's design, and considered how improvements could be made. According to Gross, "the basic plan was to make the One more dynamic, with even better bass and more refined at the same time."

A list of the differences between the Triton One and Two:

- ▶ The One's upper-bass/midrange drivers are 5.25" vs the Two's 4.5", which allows the crossover frequency to be lowered from 160 to 100Hz. These drivers have correspondingly larger internal chambers than in the Two.
- ▶ The One's cabinet is larger, with thicker walls; it's better damped and better braced.
- ▶ The One's passive cones and baskets are stiffer than the Two's.
- ▶ The One has three 5" by 9" long-throw bass drivers, vs two



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in the Two.

- ▶ The One has four 7" by 10" passive radiators, vs two in the Two.
- ▶ The One's crossover is a balanced design, which, among other things, is claimed to reduce the stray capacitance in the magnetic gap.
- ▶ Considerable development

of the DSP circuitry that's part of the hybrid passive/active crossover between the One's woofers and upper-bass/midrange drivers has allowed the crossover to now be phase perfect, says GoldenEar.

- ▶ The One's DSP uses 56- rather than 48-bit processing, and the sample rate has been raised from 96 to 192kHz, both for measurably lower noise and distortion.
- ▶ The Triton One's subwoofer amplifier has an output of 1600W vs the Two's 1200W, and its damping factor is

MEASUREMENTS

I used DRA Labs' MLSSA system and a calibrated DPA 4006 microphone to measure the GoldenEar Triton One's frequency response in the farfield, and an Earthworks QTC-40 for the nearfield responses. The Triton One has a very high specified voltage sensitivity of 92dB/2.83V/m. My B-weighted estimate was 91.3dB(B), which is within

experimental error of the specification.

The One's nominal impedance is specified as being "compatible with 8 ohms." The solid trace in fig.1 reveals that the impedance magnitude ranges between 3 and 6 ohms for much of the audioband, with minimum values of 3

ohms at 301Hz and 3.1 ohms at 4.2kHz. As tends to be the case with a design using a passive high-pass filter with a fairly low corner frequency, the electrical phase angle becomes increasingly capacitive below that frequency; although the impedance magnitude rapidly increases below 100Hz, mitigating the effect of that phase angle, there is still a combination of 4.1 ohms and -50° at 100Hz, which will require a good 4 ohm-rated amplifier to drive the speaker to acceptably high levels.

Because a "sock" covers the Triton One's carcass, it wasn't possible to make meaningful measurements of the enclosure's vibrational behavior. However, the impedance traces are free from the small discontinuities that would suggest the presence of resonances and I note that Robert Deutsch found both that the speaker's cabinet was less lively than he remembered

Stereophile GoldenEar Triton 1 Impedance (ohms) & Phase (deg) vs Frequency (Hz)

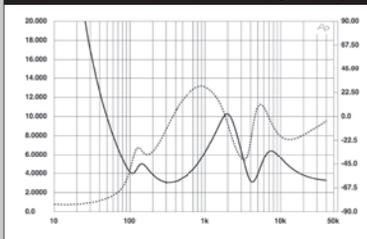


Fig.1 GoldenEar Triton One, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.).

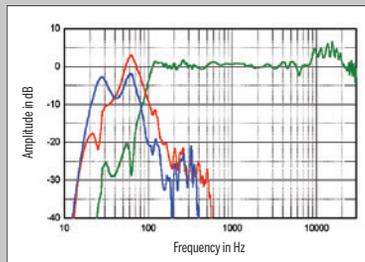


Fig.2 GoldenEar Triton One, anechoic response on tweeter axis at 50°, averaged across 30° horizontal window and corrected for microphone response, with nearfield responses of midrange units (green), woofers (red), passive radiators (blue), respectively plotted below 300Hz, 500Hz, 300Hz.

significantly improved. Instead of using a single large power supply, the One's sub amp uses a separate, small supply for each circuit section, which is said to prevent signal coupling between sections.

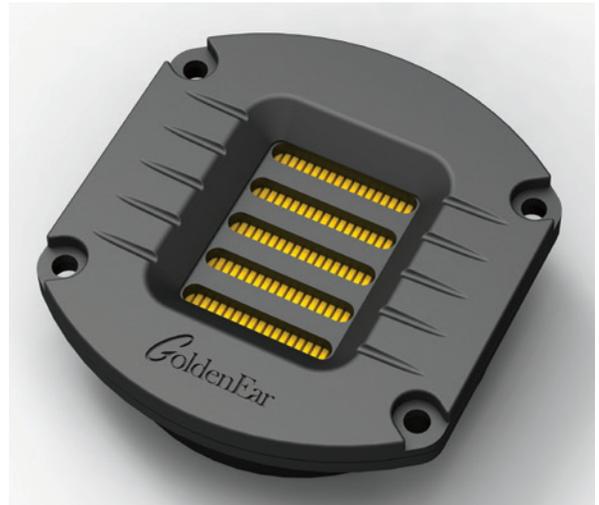
Setup

The Triton Ones were set up in my listening room in about the same positions other speakers have occupied.³ Sandy Gross came by to help set them up, tweaking the speakers' distances from the front and side walls and their angles of toe-in.

The Triton One is provided with spikes, though I didn't install these until the speakers' positions were finalized. But when all spikes were fully screwed into the speakers' bottom plates, Gross felt the angle was not optimal—when I sat down to listen, the tweeter axes fired somewhat over my head. The solution was to lean the Ones a bit forward, which he achieved by leaving their spikes installed at the back of each speaker, but using only the smaller rubber feet at the front.

The Triton One has only one control: for subwoofer level. Setting this is mostly a matter of personal preference. I kept tweaking it, and eventually settled on a setting in the middle of the range.

I drove the Triton Ones with a McIntosh Labs MC275LE, a tubed power amplifier that has the easy-on-the-ears smoothness that is the hallmark of the best tube electronics, but without any of the rolling off of tonality at the top and bottom of the audioband that impairs resolution—descriptors that also apply to my preamplifier, a Convergent Audio Technology SL-1 Renaissance. Rated at 70Wpc but generally known to produce about 90W, the MC275LE had more than enough power to drive these speakers to levels



GoldenEar's version of the famed Heil Air-Motion Transformer is called a High-Velocity Folded Ribbon tweeter.

that were about as high as I could tolerate.

Sound

Once I begin a review, I try to keep as a constant every potentially confounding variable that could influence my evaluation of the product (see <http://tinyurl.com/189dpp1>). I don't change components in the system during a review—

but this time I had to make an exception.

The problem was with my digital source: an Ayre Acoustics CX-7e^{MP} CD player. I was in the initial phase of

³ For a picture of my room, see the sidebar to my review of the Focal Aria 936, in November 2014, <http://tinyurl.com/189dpp1>.

measurements, continued

from the Triton Two, and that any resonances were almost always masked by the music.

The green trace in fig.2 shows the quasi-anechoic response on the GoldenEar's tweeter axis at 50", averaged across a 30° horizontal window and spliced at 300Hz to the midrange units' output measured in the nearfield. Other than a boost of up to 5dB

between 9 and 20kHz, the Triton One's farfield response is extremely flat. I suspect that the slight comb filtering evident in the top octave results from reflections of the tweeter's output by the metal-mesh grille, which is held away from the baffle. This should have no audible consequences, given the ear's reduced sensitivity in this region.

The midrange drive-units cover a

wide range, not rolling off until 120Hz or so in the upper bass. The three racetrack-shaped woofers (red trace) cover a much narrower bandpass, peaking between 50 and 70Hz, and the four passive radiators (blue trace) are tuned to a low 25Hz and peak between 20 and 40Hz. Though there is a second peak in the radiators' output, I suspect that this is crosstalk in the measurement from the woofers' output. The responses of both the woofers and the radiators roll off below the latter's tuning frequency with a much faster slope than the usual reflex 24dB/octave, but the Triton One otherwise offers respectably low bass extension.

How audible is that top-octave peak? RD did note that he "would avoid combining these speakers with components whose intrinsic sound is on the bright side: the Triton Ones will let you hear it." However, looking

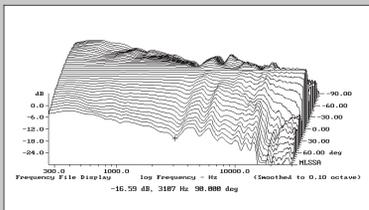


Fig.3 GoldenEar Triton One, lateral response family at 50", normalized to response on tweeter axis, from back to front: differences in response 90-5° off axis, reference response, differences in response 5-90° off axis.

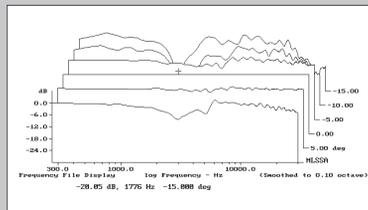


Fig.4 GoldenEar Triton One, vertical response family at 50", normalized to response on tweeter axis, from back to front: differences in response 15-5° above axis, reference response, differences in response 5-10° below axis.

break-in and casual listening when the Ayre began to make a purring sound when playing a disc. This would continue until I stopped the player. Sometimes the purring would go away for a while—and then come back again. There was no obvious effect on the sound, but I couldn't be sure that it wasn't having *some* subtle effect, and it wouldn't be fair to the Triton One to review it with a source component that may not have been working properly. I ended up replacing the Ayre CX-7e^{MP} with PS Audio's DirectStream DAC (DS) and its companion PerfectWave Memory Player CD/DVD transport (PW); the full story of my experience with the DS and the PW can be found in my Follow-Up review of the DirectStream, elsewhere in this issue.

As I was simultaneously reviewing the Triton One and the PS Audio combo. I had to periodically switch my focus from the speakers to the CD player, noting any changes in sound as I explored the performance of the PS Audio components, and considering what those changes told me about the sound of the speaker.

The Triton One proved extraordinarily revealing of the effects of the various comparisons and tweaks I was making with the DS-PW. The effects of using different cables (three HDMI, one XLR) between the PW and DS were easily audible. The same with the beneficial effect of substituting Hi-Fi Tuning Supreme fuses for PS Audio's stock ones. And when, late in the listening period, PS Audio sent me updated firmware for the DS, the resulting improvements were obvious. The Triton One is a high-resolution loudspeaker, which had its payoff in listening to music as well as listening for the effects of system tweaks. With almost every CD I played in the DS-PW, I noticed musical details that had previously been inaudible or could be only faintly heard. Resolution had been one of the Triton Two's strengths as well. However, while I didn't have a pair of Twos on hand for direct comparison, my sense was that the Triton One is a significant advance on the already high resolution offered by the Triton Two.



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When I played recordings of orchestral, choral, big-band, and rock music at impress-your-friends levels, the Triton Ones sounded quite spectacular, and showed little sign of strain. "Winter Wonderland," from Clark Terry and Frank Wess's *Big Band Basie* (CD, Reference RR-63CD), had the requisite punch but remained musical, and the speakers didn't protest, even

though the level was a notch higher on the CAT preamp's volume control than my usual maximum. Audio Tools' sound-pressure-level meter app (C-weighted, fast) on my iPhone 6 gave a peak reading of 94.7dB; the actual level was probably higher, the reading of the meter limited by the clipping of the iPhone's input circuitry. Whatever the actual level, it was subjectively loud enough that if I'd played music at that level for visitors, I'm sure most of them would have

measurements, continued

at the One's lateral-dispersion plot (fig.3), which is normalized to the tweeter-axis response, it appears that the speaker's output declines rapidly to its sides above 10kHz. This will tend to produce a flat top-octave balance in rooms of small to medium size. However, this graph also reveals a small degree of off-axis flare at the top

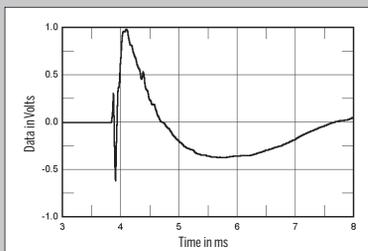


Fig.5 GoldenEar Triton One, step response on tweeter axis at 50° (5ms time window, 30kHz bandwidth).

of the midrange units' passband that might correlate with RD's comment above. In the vertical plane (fig.4), a sharply defined suckout centered on 1176Hz develops 10° above the tweeter axis, which I suspect is an interference effect between the two midrange units. To get the most neutral balance from the Triton One, listeners should sit with their ears within a $\pm 5^\circ$ window

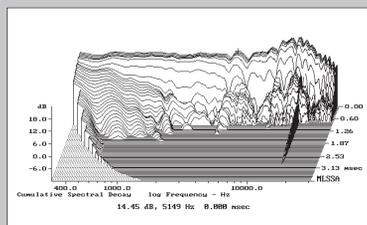


Fig.6 GoldenEar Triton One, cumulative spectral-decay plot on tweeter axis at 50° (0.15ms risetime).

centered on the tweeter axis, which is 40" above the floor with the speaker on its base.

Turning to the time domain, the GoldenEar's step response on the tweeter axis (fig.5) indicates that the all the drivers are connected in positive polarity; the smooth blend between the units' steps indicates optimal crossover design. As suspected earlier, a reflection of the tweeter's output can be seen just before the 4.5ms mark, which results in the top-octave comb filtering noted earlier, as well as a degree of low-level hash above 12kHz in the Triton One's cumulative spectral-decay plot (fig.6). Overall, however, the initial decay in this graph is superbly clean.

To judge from its measured performance, Sandy Gross and Bob Johnston have produced another finely engineered loudspeaker.—**John Atkinson**

asked me to turn it down.

One of the things I appreciated about the original Quads, when I had them, was that I could play the speakers at a low level and all the music was still there. They didn't *have* to be played loud. (And, of course, the Quads *couldn't* really play loud.) The Triton Ones were similar to the Quads in this respect: I didn't feel I had to play them loud to hear all the music. I think this is a testament to GoldenEars' high resolution. In fact, some of my best times with the speakers were late in the evening, listening at what, in audio-demo terms, would be considered barely above background level (C-weighted peaks in the low 70s)—but which my system and the Triton Ones rendered as very plausible illusions of listening to music in a concert hall or opera house.

The tonal balance was fundamentally neutral, the highs clean and extended; the various percussion instruments in Ana Caram's "Viola Fora de Moda," from the *Chesky Records Jazz Sampler & Audiophile Test Compact Disc, Vol.1* (Chesky JD37), being clearly differentiated. Another test of transient accuracy that I like to use is *All Star Percussion Ensemble*, led by Harold Farberman (Golden Strings GS CD005). The instruments on this recording cover the entire audioband, including timpani and bass drum at the bottom. The sound through the Triton Ones had an appealing crispness, with no smearing of transients. However, I would avoid combining these speakers with components whose intrinsic sound is on the bright side: the Triton Ones will let you hear it.

In my review of the Triton Two, I noted that at times I could hear a box resonance in the midrange—a common problem with box speakers, and one not easy to fix. The Triton One's thicker walls and improved damping and bracing seem to have done the trick. The box resonance, while not completely absent—a task impossible to achieve even in theory—was much lower in amplitude than I remember from the Two, and was almost always masked by the music.

One of the Triton Two's strengths was its bass, which eclipsed that of just about every other floorstanding speaker of similar size and price that I've heard—so I was a bit surprised that, with the Triton One, GoldenEar chose to focus their efforts on bettering that performance—it sure didn't need it. I suppose it was a matter of building on what had already been accomplished—and, for many people, what most clearly distinguishes speakers from one another is in the area of bass extension and power. (Another reason for focusing on the bass was so that use of Triton Ones in a home theater might make it possible to forgo a subwoofer.)

Because each Triton One has three powered woofers and four passive bass radiators, one might predict that its sound would be heavy, with overemphasized bass. This was simply not so. As I listened to a variety of music, it became clear that GoldenEar had chosen to go for quality rather than mere quantity of bass. The low bass was certainly there—GoldenEar claims 14Hz, which I couldn't achieve in my listening room, but I think this was at least partly due to my use of the McIntosh tube amp and the size and shape of the room itself. In any case, I think faithful reproduction of the 20–40Hz octave is a more realistic target to strive for, and this was well within the One's abilities.

A few years ago, at an audio show, I was given a CD-R of deep-bass demo tracks by Poh Ser Hsu, of subwoofer manufacturer Hsu Research. Featured are such audiophile favorites as Béla Fleck's "Flight of the Cosmic Hippo," Mickey Hart's "Kodo Drums," etc. The Triton Ones sailed

ASSOCIATED EQUIPMENT

Digital Sources Ayre Acoustics CX-7e^{MP} CD player, PS Audio DirectStream DAC & PerfectWave Memory Player CD/DVD transport.

Preamplifier Convergent Audio Technology SL-1 Renaissance.

Power Amplifier McIntosh Labs MC275LE.

Cables Digital: Nordost Valhalla 2 XLR (AES/EBU), Nordost Blue Heaven HDMI, PS Audio HDMI 10. Interconnect, Speaker, AC: Nordost Valhalla 2.

Accessories PS Audio P5 Power Plant AC regenerator, Arcici suspense rack, PolyCrystal amplifier stand, Furutech RD-2 CD demagnetizer.—Robert Deutsch

The sound through the Triton Ones had an appealing crispness, with no smearing of transients.

through them, the bass always tuneful and firm. In music that didn't reach down into the deep bass, there was no midbass emphasis to give a false impression that there was deep bass. If anything, there appeared to be some weakness in the midbass; the voices of male singers—primarily

baritones and basses, tenors to a lesser extent—seemed to lack some chest resonance. This could well have been due to the speakers' interaction with my room; JA's measurements might shed some light on whether this is a characteristic of the GoldenEars.

The Triton Ones were soundstaging champs: the stage was wide, higher than the speakers themselves, and presented great depth when called for. Imaging was precise, a precision only enhanced when the PS Audio DirectStream DAC was updated with the latest firmware. Playing the "Depth of Image" tracks (34–42) from *Best of Chesky Jazz and More Audiophile Tests, Vol.2* (Chesky JD68), I could hear the difference between the sounds of the acoustic clicker at 50', 60', and 70'. I fancied I could even hear the difference between 70' and 80', but I wouldn't swear to it.

Class A Sound for a Class B Price?

To answer the provocative question posed by that subhead: No, I don't think that GoldenEar Technology's Triton One delivers the quality of sound you can get from speakers like MBL's Radialstrahler 101 Mk.II (\$70,500), Sonus Faber's Amati Futura (\$36,000), Vivid Audio's G1 Giya (\$65,000), Wilson Audio Specialties' Alexia (\$48,500), or YG Acoustics' Sonja 1.3 (\$106,800). If you yearn for and can afford one of these Class A superspeakers, go for it.

And yet, the mere fact that it's not unreasonable to compare the sound of the \$4999.98 Triton One with the sounds of speakers costing tens of thousands of dollars more per pair says a lot about the GoldenEar's level of performance. For the audiophile who doesn't have—or doesn't wish—to spend the money for cost-no-object speakers, yet wants sound quality that approaches what such expensive models can produce, I recommend first listening to the Triton One. You may decide that it's all the speaker you need. ■