the absolute sound®

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THE AUDIO ARTISTRY DVORAK LOUDSPEAKER

New Company, New Approach

"There is nothing new under the sun," goes the hoary old refrain. Single-ended triode tube amplifiers are enjoying a rebirth and horn loudspeakers seem to be regaining attention, so this cliché seems especially applicable today. With all the attention focused on the refinement of well-known technologies, something truly new might easily slip by unnoticed. So it nearly was with the $5995 Dvorak loudspeaker from Audio Artistry. New speaker, new company, new approach. Will anyone notice? Count on it!

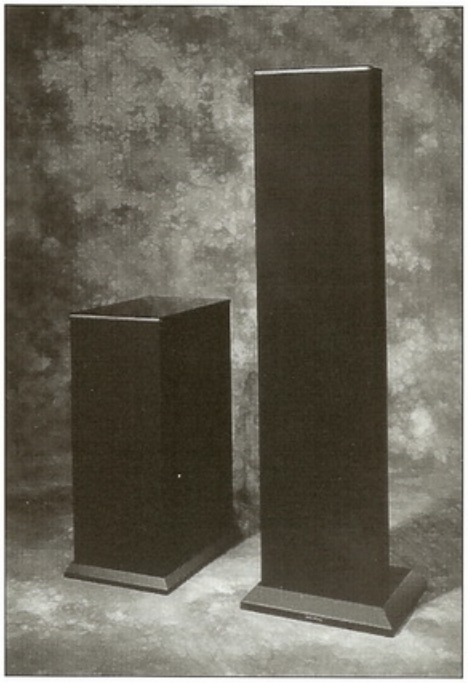
The Dvorak is a bi-amplified speaker system comprised of two main speakers, two subwoofers, and an electronic crossover. Each subwoofer sports two 12" woofers and each main speaker has two 8" midrange units and one-inch tweeter arranged in a straight D'Apppolito (midrange-tweeter-midrange) configuration. The main speakers and crossover can be purchased and run sans subwoofers for $4000. (In this setup, bass extension is limited to circa 40 Hz and dynamic range is decreased, but the performance remains well-balanced.) Notice, however, that you need the electronic crossover even if you only use the main speakers, and therein lies the story of something new.

What's the least linear part of your audio system? Loudspeaker? Pickup arm? Cartridge? None of the above. Your listening room is terrifyingly distorting. It has numerous resonances that become more noxious as the music gets louder. Each room resonance has a different amplitude and duration. Such resonances distort the frequency response of the system, often grotesquely, especially in the lower frequencies. The smaller the room, the worse the distortion of dynamics. Listen to any orchestral crescendo and observe how the increase in loudness is inconsistent, getting louder more quickly at some frequencies but not at others (those lucky enough to have a huge room can't really understand how the rest of us suffer. One of audio's most difficult (impossible?) feats is to shoehorn a bottom-octave-dwelling speaker into a small room. Combine a speaker that can do 16 Hz at 100 dB with 16' X 12' X 10' room and you've got motion sickness, not music.

So what do room resonances have to do with the Audio Artistry loudspeaker?

What do you think would happen if room sound were reduced by 5 dB? You hear the music with a great deal less room-imposed distortion. This is what I heard while reviewing the Dvorak loudspeaker. How did they pull it off? Is the Dvorak the latest attempt to use digital signal processing for countering room resonances? Nope.

The Dvorak has so many distinctive and superlative sonic characteristics, it is difficult to choose a starting place for the description. When all else fails, start with the bass. With the Dvorak, that's like opening with the ace of trump.



The typical room does the most damage in the bottom three octaves. In fact, the damage can be pervasive that many give up and choose a speaker with limited bass extension. Try as you might to "listen around" the nodes and nulls created below 200 Hz in such rooms, they are certainly there and they definitely obscure the music. If you sweep the frequency response of a small-to-medium room slowly, you will be astonished by the radical changes in level from one Hertz to the next (and if anyone tells you their room has been measured and is completely flat down to 20 Hz, laugh in their face).

Given such an environment, a 5 dB reduction in room sound is profound. "Snowbound," from Donald Fagen's *Kamakiriad* [Reprise 9 45230-2], opens with Walter Becker on bass guitar, prominently recorded, sliding from one end of the instrument's neck to the other. With a conventional monopole speaker in my room, the continuity of Becker's slides is disrupted by the room booming at certain frequencies and shying away elsewhere. Similarly, the bass lines throughout *Lyle Lovett and His Large Band* [MCA/Curb MCAD-42263] bloat irregularly, obscuring vocal harmonies. These room-induced problems vanished with the Dvorak.

The Dvorak woofer system, I feel, legitimately reaches to 20 Hz in my room (gleeful shock). Combine that frequency extension with a driver that exhibits virtually no overhang and much flatter in-room frequency response, and you've got state-of-the-art bass in a small room. The Dvorak not only properly reproduces the music's tonal foundation, but the recording environment as well. One benefit of a high quality subwoofer is the ability to recreate the feel of hall volume, the elusive sense of real space (most "ambience" is actually in the low frequencies). Listen to my favorite Shostakovich *Symphony No. 15* performed by the London Philharmonic Orchestra under Bernard Haitink [London 417 581-2] for an illustration of this. And note carefully the bass drum towards the end of the fourth movement. The drummer lightly taps the skin of a big drum while muting it with a towel. For years the identification of this instrument defied me. I knew there was a big bass sound there but wasn't even sure if it was a drum, since its overtones are heavily dampened by the towel. First time I heard it with the Dvorak, I knew exactly what it was. (The only other speaker that rendered it intelligible was the Wilson X-1, in a large room.)

By unmasking notes in the lower octaves, the Dvorak allows the remainder of the musical spectrum to be reproduced with almost unprecedented clarity. Ever notice how your favorite recording sounds completely different in your friend's system? For better or worse, the lower octaves are completely different because the low frequency dips and peaks are in completely different places. With the Dvorak, you hear it all. *Nosferatu* by Art Zoyd [Ear-Rational Records ECD 1008] takes on an eerie, almost seductive, beauty when the bass harmonies written by the band emerge as the underpinning to the horrific dissonances that ride along the surface of the music. Thanks to the Dvorak, I have deeper appreciation of this elegantly evil masterpiece.

There are some limitations in the bass. Since the drivers are effectively mounted in free air, they bottom out more easily below their 18 Hz free air resonance. You can't push the Dvorak beyond roughly 92 dB with sub-30 Hz content. However, you will find that most of the "deep bass in your collection really isn't. If the bass really is present, such as those low pedal organ notes, on "The Vikings" from Reference Recordings' *Pomp and Pipes* [RR-58CD], be judicious when you set the loudness level or you'll have the same heart attack I did. The Dvorak sailed through HP's favorite *Pictures at an Exhibition* [Levi/Atlanta Symphony Orchestra; Telarc CD-802296] at 105 dB peaks with nary a shudder (wish the same could be said for me).

Another result of the Dvorak's dipole design is greater dynamic linearity during crescendos. As I listened to the second movement of Beethoven's *Symphony No. 7* as performed live by Leonard Bernstein and the Boston Symphony Orchestra [Deutsche Grammophon 431 768-2], I was struck dumb when the first crescendo hit. It sounded different, yet familiar. Minutes passed before the sun came up. I had heard something like it before—in the concert hall. This crescendo built in a linear and progressive fashion that was contrary to the typical non-linear crescendos caused by room resonances. Further, I could listen at louder levels without the blare and strain normally associated with such levels. In fact, by putting so much less energy into the room, you can listen at 95 dB peaks in the basement, go up to the first floor and barely hear them (it's spooky, believe me). Finally, a full range speaker for apartment dwellers that won't bother the neighbors.

Of course, musically congruent bass is only part of the story. I cannot overstress the fact that the design lends itself to greater tonal coherence by reducing the masking effects created by room distortions. While the Dvorak doesn't have the raw dynamic horsepower and resolution of the new Wilson WATT/Puppy System Five, it is remarkably well-balanced. Dynamics are also consistent across the Dvorak's bandwidth; the speaker keeps the music's structural rhythms temporally coordinated.

The treble is also noteworthy of comment. It is exceptionally clean. For me, a rapidly struck hi-cat cymbal tells me more about the treble performance of a speaker than all the delicate bells of an orchestra combined. Reproduce the strikes on that hi-hat cleanly, without smearing, and you have something special. This the Dvorak does with aplomb in the opening measures of Wynonna Judd's "Father Sun" from *Tell Me Why* [MCA/Curb MCAD-10822]. The only shortcoming is a minor suppression of the extreme overtones: The Dvorak slightly rolls off the extreme highs. This lends the Dvorak its principal character—it is slightly laid back in presentation. People accustomed to reach-out-and-grab-you transient attacks and touch-it palpability may feel something is missing, and they would be partly right. Some of the missing "immediacy" is actually a lack of the distortion we have become used to as a part of the "hi-fi" experience. But the Dvorak does go just a bit too far. The musical effect of the Dvorak's suppression is that the apparent pace is retarded. While the music's "pop" and "strut" seem mellow, the Dvorak, nonetheless, maintains the timing relationship of the instruments because it re-creates the transient contours of the notes accurately. Thus, it doesn't drag you along with fiery urgency, but softly insinuates itself into your rhythms. It is relaxing—and hypnotic. Before you realize it, you're conducting along with Bernstein; time has stopped. I would be remiss if I didn't remark upon the Dvorak's therapeutic value: Every time I came to the listening room with a stress headache, the Dvorak vanquished it within 15 minutes.

Spatially, the Dvorak Loudspeaker recreated a soundfield which, if called for by the recording, expands far beyond the room boundaries. It could be better at focusing instrumental images, though. The precise location from which the sound of an instrument originates is just slightly uncertain, even at center stage. Nor does the Dvorak separate images in the soundfield with the greatest precision, especially with respect to depth. It isn't bad at these soundstaging characteristics, but it could use some improvement. Given how well it performs otherwise, the Dvorak's shortcomings are not bothersome to me.

The Dvorak could be improved with respect to low-level transient resolution. The most subtle microdynamics are obscured so slightly you might not notice it. Nevertheless, there is more information to be had, and I suspect improvements in the crossover will extract it.

In my time as a reviewer, I have learned not to trust products that sound different, no matter how engaging, exciting, or impressive they may seem initially. Typically, that which makes something exciting makes it aggravating in a month's time. The Dvorak is different sounding. It is a sonic break from convention. For that reason, I kept my emotional distance and denied its charms, but only for so long. After the honeymoon period was over, the Dvorak moved me (as it moved one visiting reviewer-colleague to tears during the Beethoven). After four months, I like it more than I did the day it arrived. It serves the music and rejects hi-fi artifice. In sum, the Audio Artistry Dvorak is a technological marvel, a small room miracle and a great loudspeaker.

—Thomas O. Miiller

Manufacturer's Comment:

What delightful reading! We at Audio Artistry were extremely gratified with the review of the Dvorak Loudspeaker System. Being a new company offering an unusual product, there is always the nagging question—Will anyone recognize what we have to offer? You sure did! We are convinced others will follow...

We were impressed by your reviewer's acuteness of hearing when he described the weaknesses of the system. As engineers, we understand that every design is a balance of different factors. The "slightly laid back presentation" tried to account for the large number of recordings, especially of classical music, where the microphones pick up an unfamiliar, too-close-up sonic perspective of the orchestra. We struggled with the crossover design for a long time until we found a solution that now gives us textbook-like results... Recent improvement in the crossover [have] increased the resolution with respect to low level transients. More than that, human voice is now reproduced with an uncanny fidelity and presence and the focus of instrumental images has improved.

As engineers at Audio Artistry, we get personal satisfaction out of good design, but it is even more gratifying to see our product appreciated for the new level of enjoyment it provides. We are pleased to have the Dvorak Loudspeaker introduced to the public in such honest fashion.

Siegfried Linkwitz
Audio Artistry

YES, VIRGINIA, THERE IS A LINKWITZ...

Every audio enthusiast has heard of the Linkwitz-Riley fourth-order (24 dB/octave) crossover. But who are these guys? Siegfried Linkwitz is one of the principals of Audio Artistry, serving as Vice President of Research & Development. With a name like "Audio Artistry," you might think the speakers are designed by a bunch of tinkerers stuffing parts in boxes until they hear something they like. Far from it. Audio Artistry is comprised of individuals who know their way around a lab: Linkwitz is a senior engineer with Hewlett-Packard specializing in microwave technologies, and an avid amateur recordist. Marshall Kay, the president of Audio Artistry, is a field engineer for Hewlett-Packard, responsible for designing and implementing customized measurement systems. Linkwitz and Kay are friends with one Brian Elliot, Ph.D., electro-acoustic consultant, with whom they exchange many ideas. The Dvorak subwoofer (more about that soon) is the product of Elliot's fevered intellect (industry egghead Richard Marsh is said to be mightily impressed by Elliot's genius—he spent seven years developing the dipole woofer concept). The Audio Artistry team is rounded out by Tom Hoffman, Vice President of Sales & Marketing (gee, these guys have more veeps than IBM!) who is the resident tweak. Kurt Pasquale is Vice President of Manufacturing and a computer-aided design (CAD) expert.

Alright, enough already. Come on, Tom. What's so different about the Dvorak?

Okay. It's a dynamic coil design. The trick is: The Dvorak is also a dipole up to 2000 Hz. Sure, there have been dipole subwoofer designs (the Quad-63/Gradient subwoofer comes to mind). And electrostatics and ribbon designs are obviously dipolar. But, to the best of my knowledge, the Dvorak is the first dynamic coil design that not only has an open baffle (a la the Alons and the Dahlquist DQ-10), but deliberately maximizes the bandwidth over which dipole cancellation takes place. Other dipole designs attempt to minimize dipole cancellation.

Dipole cancellation: A quick primer, then. As a driver moves back and forth, it creates pressure variations (sound) in the air in front and behind it. The back wave of a drive (in this case, a dynamic coil) is 180 degrees out-of-phase with its forward-firing output. Below a certain frequency (determined by the width of the driver or the baffle it is mounted on), the out-of-phase back wave and in-phase front wave wrap around the outside of the driver and meet, cancelling each other. (Two wave forms, 180 degrees out-of-phase with one another, will cancel each other completely; in actual practice, something less than 180 degrees will occur.) This significantly decreases the amplitude of the affected frequencies. Thus, the need for frequency equalization (both above and below the 100 Hz crossover point) provided by the outboard crossover's electronics—without which the Dvorak would be one bright critter.

In 1992, Linkwitz published an AES paper setting forth the basic principle of a full-range dynamic coil dipole that would have the advantage of being small, and also avoid the beaming problems associated with planar dipoles. He then set out to construct it, with a little help from his colleagues. The Dvorak was introduced at the 1994 Winter CES in Las Vegas. It was there that I came upon the Dvorak (guided by Sallie Reynolds, bless her soul) and was smitten. Time spent in the Audio Artistry room was literally restorative, and over three days I returned, time and again, for relaxation—and goose bumps. My friends, understand one thing: This almost never happens at shows. Especially if you're talking about a full-range (down to 20 Hz) speaker in a room not much larger than a walk-in closet.

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1 *Development of a Compact Dipole Loudspeaker, Siegfried Linkwitz, AES reprint No. 3431 (N-5), October 1992.*

Speaker Specifications

Dimensions:
Main speaker 55" H x 12.5" W x 4.5" D
Woofer 29.5" H x 11" W x 20" D
No. & Size of Drivers:
(4) 12" woofers
(4) 8" bass/midranges
(2) 1" dome tweeters
Crossovers Points/Slopes:
100 Hz, 24 dB/oct.
2000 Hz, 24 dB/oct.
Sensitivity:
88 dB—2.83 volts @ 1 m
Impedance (nom/min):
8 ohms nominal
Available Finishes:
Black
Weight:
Main speaker 45 lbs. ea.
Woofer 50 lbs. ea.
Crossover 10 lbs.

Manufacturer:
Audio Artistry, Inc.
8312 Salem Drive
Apex, North Carolina 27502
(919) 319-1375

Designer:	Siegfried Linkwitz
Source:	Manufacturer loan
Serial Number:	94030010
Price:	Main speaker/ crossover $3995 (operates stand alone to 45 Hz) Woofer $1995
Warranty:	Five years

NOTE: See issue #100 for Tom Miiller's Loudspeaker Product of the Year recommendation.