

# LOUDSPEAKER FOCUS



## Acoustic Energy Radiance 1 Loudspeaker

Re-Imagining A Classic  
Steven Stone

**T**he British speaker manufacturer Acoustic Energy burst onto the audio scene in 1987 with the AE 1. Even after twenty years the AE 1 and AE 2 (released in 1990) still rank among the top two-way monitors available regardless of price or country of origin. Not content to rest on its laurels Acoustic Energy has continued to refine and improve its speaker designs. The Radiance 1 is AE's latest thinking on affordable high-performance small monitors. The goal was not to push the envelope at the cost-is-no-object state of the art, but to attain a new level of performance at a reasonable price. Considering the condition of the world's economy, more for less could be the new state of the art for consumer products.

### Radiant Technologies

According to Mat Spandl, Acoustic Energy's head of research and development, AE had two principal design goals: The first

was off-axis frequency response that was as near perfect as possible; the second was the lowest distortion within the physical limits of the speaker system. To achieve them AE looked at every component in the Radiance 1 starting with the midrange/woofer. Using a Finite Element Analysis system to model an ideal set of characteristics for its alloy cone driver's surround, so it would correctly terminate excess energy, AE built and tested many prototype drivers with different blends of rubber surround, dampening, and stiffness. Variations in surround geometry were also tested. The Acoustic Energy design team also decided to reduce the effects of heat build-up in the midrange/woofer driver. As the temperature in voice coils rises, electrical resistance also rises, which changes the sensitivity of the drive unit and alters the intended alignment of the crossover. AE employed a unique twin-winding technique on its midrange/woofer voice

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coil to double its heat radiation area. In addition, the Radiance midrange/woofer uses a thermally conductive aluminum former to improve heat transfer into the driver's cone and dustcap.

The Radiance 1's tweeter uses a completely new iteration of AE's ring-radiator design. (A ring radiator supports the tweeter's synthetic silk diaphragm at two pivot points instead of one as with a conventional dome tweeter. With very little unsupported material, there's less opportunity for the tweeter's surface to develop non-linear resonances.) A metal ring called the "DXT Acoustic Lens" surrounds the new tweeter, serving as a waveguide to increase the effective size of the tweeter without the negative effects of actually using a physically larger-diameter tweeter. The DXT lens also allows the tweeter to behave as a virtual "point source" because it places the unit some distance behind the front baffle. The tweeter's radiation pattern is constant across an angle of operation defined by the lens' angle. This gives the tweeter the same acoustic power response as the midrange/woofer.

For the Radiance 1's crossover, Acoustic Energy's designers followed the maxim, "Keep it simple." Compared with AE's previous generation of speakers, the Radiance's crossover has gone from eleven components down to only four, with no resistors whatsoever in the network.

The cabinet is the final part of the Radiance 1's sonic solution. AE chose curved sides because this reduces acoustic standing waves inside the cabinet, increases the enclosure's rigidity, and lowers the cabinet's panel resonances. A rear port was employed to substantially increase the Radiance 1's bass extension.

The Radiance 1 comes in two real-wood veneer finishes—a light-colored "natural ash" and the almost-black "antique ash." Internal connections use high-quality OFC copper wire; the enclosure is fitted with two pairs of five-way gold-plated binding posts and bridging connectors for bi-wiring or single-wiring. The speaker grilles have a magnetic attachment system so no holes mar the front of the speaker.

The Radiance 1 is manufactured in Malaysia at the newest factory of Acoustic Energy's parent company, ProSonic Industries. This is the primary reason for the Radiance 1's modest price tag.

## Radiant Sound

My usual methodology when reviewing small speakers is to audition them first on my desktop for a month before moving them into a room-based system. Unlike some speakers, which require a substantial break-in period before they sound their best, the Radiance 1s produced better than acceptable sound from the get-go. Since they are a ported design, they put out substantially more bass energy than comparably sized sealed-enclosure speakers. This took some getting used to. Prior to the Radiance speakers I'd been listening to a steady diet of Spondor SA1's, ATC SCM7s, and Paradigm S1s on my desktop, all of which have sealed cabinets.

In my conversations with the Radiance's designers I learned that the speaker was intended to be used *without* a subwoofer. According to the folks at AE, considering subwoofers *de rigueur* with small speakers is a uniquely American thing. So I did most of my critical listening with my subwoofers turned off. (Naturally I did try using subs in both my desktop and room-based systems—I *am* an American, after all—and found it difficult to

obtain a blend that successfully avoided excessive upper bass and midbass.) As the Radiance's published specifications confirm, don't expect to get anything below 50Hz even in the most bass-friendly environment. Also don't expect the Radiance's bass to have the same rise time as a sealed-enclosure speaker. The initial attack from percussion instruments such as tympani is not as quick as through any of the sealed-enclosure speakers that I mentioned earlier.

Since on my desktop speakers are only one-and-a-half feet away from my ears, any discontinuities between drivers are obvious. The Radiance 1's drivers integrate as seamlessly as any speaker I've experienced. This continuity between drivers makes the Radiance's midrange especially beguiling. Even when I listened to the speakers from a room away, instruments such as acoustic guitars possessed a particular rightness that was both musical and exceedingly natural.

Considering their size, the Radiance 1s have quite decent dynamic response if used in a properly proportioned space. These are definitely small-room speakers. In larger venues they

## SPECS & PRICING

**Type:** Two-way, reflex-loaded mini-monitor

**Driver complement:** One 130mm pressed alloy mid/bass, one 38mm neodymium ring-radiator tweeter with DXT

**Frequency response:** 50Hz to 45kHz +/-3dB

**Crossover:** 1.8kHz

**Power Handling:** 150W peak program

**Impedance:** 8 Ohms

**Sensitivity:** 88dB at 1W/1m

**Dimensions:** 12.6" x 7.3" x 9.8"

**Weight:** 8Kg per speaker

**Price:** \$1200

### ACOUSTIC ENERGY

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### ASSOCIATED EQUIPMENT

#### Desktop System

EAD 8000 Pro CD/DVD player and transport, MacPro Dual core computer with iTunes 7.61, Amarra software, Locus Design Polestar USB cable, Devilsound USB DAC, High Resolution Technologies MusicStreamer+, Bel Canto

Dac 3, Bel Canto 96/24 adapter box, Reference Line Preeminence One B passive controller, Bel Canto S-300 stereo amplifier, Accuphase P-300 power amplifier, Modified Dyna St-70 amplifier, Earthquake Supernova Mk IV 10 subwoofer, PS Audio Quintet, AudioQuest CV 4.2 speaker cable, AudioQuest Colorado interconnect.

### Room System

CEC TL-2 CD transport, Oppo BDP-83 Blu-Ray/Universal transport, Sony BPS-300 Blu Ray Player, Apple TV, Sonos Z-90, Lexicon MC-12B HD pre/pro, Bel Canto M-1000 power amplifiers, two JL Labs Fathom F112 subwoofers, two Genesis 2/12 subwoofers, Sound Anchor single column 24" speaker stands, PS Audio Quartet and Duet AC devices, Synergistic Research Designer's Reference interconnects and speaker cables.

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run out of steam well before they get beyond a *mezzoforte*. Even in a small room they need a fairly powerful amplifier to ring out their maximum in clean SPLs. The Bel Canto REF 1000 II and Accuphase P-300 amplifiers had enough juice to drive them comfortably, but my Dyna Stereo 70 did not. But even with these larger output amplifiers the Radiance 1s are not going to give you lifelike levels from a recording of a full symphony orchestra without noticeable compression.

Through most of their range the Radiance 1s have excellent resolution. On my latest live concert recordings made at 88/24 and played back through the Amarra software package into the Bel Canto 96/24 USB/SPDIF box I was able to hear well into the mix, so deeply in fact that I could identify the conductor's breathing as he led the orchestra through Schubert's *Unfinished* Symphony. Only in the midbass does the Radiance's resolution falter. String basses and even the piano's lowest register lack the same level of resolution as violas and the pianos' upper octaves.

The Radiance's upper registers rival several more expensive small monitor speakers. The tweeter is revealing without being artificially airy. On my Seraphim reissue CD of Rudolf Kemp's Beethoven Symphonies I can clearly hear the tape hiss from the original analog masters, but the hiss is well in the background, and the piccolo and violin section's highest notes come through without any sense of veiling.

As you would expect from a decently designed small monitor the Radiance 1s image spectacularly well. Whether on my desktop

or in a room they displayed the entire breadth of a symphony orchestra with panache. Did the Radiance 1s beat the other small monitors I currently have on hand? No, but they didn't perform any worse than several that were substantially more expensive.

Unlike other small monitors that I've set up in my room, the Radiance 1s needed to be positioned farther into the center and away from room boundaries to deliver the best timbral balance. If they get too near a wall or especially a corner they will begin to have too much upper bass. This excessive bass bloom can also be a problem if you try to use them as nearfield monitors on a desktop too close to a rear wall. Let them breathe and the Radiance 1s will work fine; crowd them and you'll be end up with a noticeable bass hump.

### Final Racetrack Ruminations

Using a pitchfork to shovel snow is a bad idea. Employing a speaker in a different manner than envisioned by its designer is an equally inappropriate pastime. The Acoustic Energy Radiance 1 speaker was designed for small rooms and for use without a subwoofer. If you have such a space you will discover the Radiance 1 is capable of producing beautiful music in it. If you try to employ the Radiance 1 in a larger room or on a desktop with or without a subwoofer you may find it less to your liking.

"Horses for courses" is an old equestrian British saying. The Acoustic Energy Radiance 1 is a heck of a fine filly; just choose the track she runs on carefully. **TAS**