

Canton Ergo RC-A Loudspeakers

Manufacturer: Canton Electronics Corporation, 1723 Adams Street N.E. Minneapolis, MN 55413; 612/706-9250; www.cantonusa.com

Price: \$5,000/pair

Source: Manufacturer loan

Reviewer: David R. Moran

You know much of this story, probably. Nearly a half-century ago the teacher, writer, and fertile engineering thinker Edgar Villchur explained to his sharp student Henry Kloss a revolutionary finding of Villchur's: the serious advantages of sealed loading — acoustic suspension — of a loudspeaker driver. The two men went on to form Acoustic Research, which effectively launched the modern hi-fi industry. Both were keen on deep, low-distortion bass, which is omnidirectional by definition, and came eventually to realize that the most natural overall playback balance entailed wide, non-beamy, as-omni-as-feasible radiation from the non-bass driver(s) as well.

To that end, Villchur designed the dome tweeter that remains standard today, surpassed only by his protégé Roy Allison's unequaled nipple-like design. Kloss, after leaving AR and founding KLH and then Advent, designed a double-roll tweeter that was intended to decouple at higher frequencies and partly succeeded.

Wide radiation pattern — dispersion — with smooth total power response in the listening room had become a major goal.

Over the next two or three decades the issues attending this goal were refined, in fits and starts. And there were significant departures as well. Amar Bose tried splashing the sound around the front of the listening room in a rather haphazard manner, with huge and ongoing commercial success. Horns, planars, and other novel designs have regularly had their moments. Other companies, when recording engineers and eventually consumers began to pay more attention to the stereo stage image, touted regressive virtues: treble beaminess and the concomitant increased focus and tighter imaging became their design goals. What was never remarked was that this tightness occurred only in the treble — no one has really succeeded in making the midrange and lower midrange beamy. Heck, it's hard to make even the lower treble beamy.

Some designers continued to believe the hoary myth that on-axis frequency response, rather than total output, was what chiefly matters to our ears listening in an enclosed space. (It is trivially easy to

show this ain't the case. Why have tweeters at all? Why not just boost the rolled-off top of your midrange driver? And of course the perceived sound from a speaker does not change, oh no, when you, and it, move from a tiled bathroom to a normal living room to outdoors, or when you reposition your speakers in your listening room, or when you remove its rugs and curtains. Of course on-axis response does matter to a certain extent, else speakers would sound the same from behind as they do from your seat in front.)

Other designers went on about phase matters, "transient" or "timing" behaviors and "alignments," and still do.

In general, though, by 20 years ago designers, magazine reviewers and customers were paying new and increasing attention to the *quality* of a speaker's radiation pattern. How smooth could it be made to be? More important, when it wasn't smooth, meaning there were divots (scallops, lumpy stitches, joints, seams) in the off-axis responses around the crossover, did it make a difference, and if so what kind? Was it a difference to the imaging only, to the overall tonal balance, or to both?

What, in other words, is demonstrably, audibly important in speaker designs?

Floyd Toole and colleagues, most of them at the time independent academics and researchers in Canada and Europe, authored a series of influential papers on tests of listener preferences and the audibility of various loudspeaker design parameters. While unsurprising to more than a few working loudspeaker engineers, their conclusions resulted from exhaustive, detailed work that confirmed and quantified — substantiated — the investigative trends.

I was working for a leading audio-engineering company that had just branched into loudspeakers. From this employment at dbx (meaning, for a non-engineer, studies), including Mark Davis's Soundfield Imaging loudspeaker program in the early 1980s, I came to understand in concrete form the specifics of what Davis meant when he wrote that what we hear when we audition a loudspeaker in a domestic room *is* its radiation pattern.

After dbx was bought and scattered in the late 1980s, I purchased our flagship piece of pro measurement gear, a temporally averaging RTA with ultra-steep third-octave filters, small-fraction-of-a-dB resolution, and computational memories. I added some good measurement mikes, with an eye to formulating a loudspeaker-reviewing protocol. I ran it by Davis, Allison, and a few other solid engineers I knew. They all vetted my proposal. I

would haul speakers outside and measure their horizontal radiation all the way around the cabinet, in averaged slices, at seated ear height and typical listening distance. I could also look at vertical radiation. Starkly exposed by this protocol would be all crossover and other dispersion problems: for example, misjudged baffle widths. (So, incidentally, would any “Allison effects” — dips resulting from the height of the woofer from the ground, potentially filled in in a room, or more likely worsened, depending on the driver’s distance from the other two near surfaces.)

For these last 15 years, then, in *CD Review*, *Digital Audio*, *Speaker Builder*, the *Boston Audio Society Speaker*, and now here in *Sensible Sound*, I have been preaching that gospel of detailed analysis of horizontal radiation pattern all round the cabinet, and advocating the euphony of smooth driver joins and baffles. During this time, many reviewers far more prominent than I am — Tom Nousaine, Don Keele, John Atkinson et al. — have taken up this cause, in part anyway. Today, in all the audio magazines that run measurements, you regularly see a graph of at least part of the forward radiation pattern. (This year’s *Audio Critic*, recently arrived with several such speaker reviews, is a good example.) That’s not nearly enough, but it’s a start. Some even try to get their own gear to show accurate and correlative room responses. Hardly ever do you see just those meaningless “time”-based (time-gated) graphs anymore, which were all there was until just a few years ago.

I can’t take credit for all of this development, not fully anyway. But I believe I was there first, influenced and supported by a few informed loudspeaker engineers.

The most recent of the papers by the Canadian researchers et al. (many of whom are now in the audio industry, some at Harman) is Sean Olive’s “Differences in Performance and Preference of Trained v. Untrained Listeners in Loudspeaker

Tests,” published in the September *AES Journal*. Even as this crowning work and its predecessors are thorough substantiations of common wisdom that has been increasingly recognized by all sophisticated investigators, the findings can be bluntly summarized: loudspeaker designs that sound good measure well in frequency response, and vice-versa — “provided the measurements are of radiation pattern, particularly horizontal radiation pattern.”

Olive’s paper drives a big stake into the myth of the importance of on-axis response: about one design, speaker B, he notes, “More serious is the rather substantial dip in its sound power response centered at 3kHz, which is caused by a mismatch in the directivities of midrange and tweeter through their transitional passband regions. Listeners described the subjective effect as a hollow and recessed midrange coloration, which explains, in part, why it scored lower. The qualities of the indirect and reverberant sounds are evidently important [!] since this coloration would not have affected the direct sound heard by the listener. It is important that manufacturers pay attention to these details and have the ability to measure and characterize the complete off-axis performance of loudspeakers accurately.”

’Bout time.

It was gratifying also to see confirmed that the preferences of untrained listeners were in general the same as of trained listeners, albeit slower to form, and it was highly amusing to read that the second-most-acute listeners were retailers — followed by reviewers, who are, uh, about equal to marketing and salespeople.

(Now if only we could figure out what Olive’s tested loudspeakers I, P, B, M are, in order of preference. Assuming the initials are telling, it is most likely a model from Harman’s Infinity, then Paradigm, PSB, or ProAc [not Polk, I bet], B&W, and Martin-Logan [probably not Magnepan]. We are told, tantalizingly, that the MSRP “ranges from approximately \$5,000 to



\$11,000. The loudspeakers were chosen because they are all widely available and compete against each other in the marketplace. Given the relatively high prices of the loudspeakers, they should in theory represent 'state-of-art' designs in terms of technical and sonic performance. Indeed, all four models have received high accolades and recommendations from the audiophile press. In one magazine, two of the models (P and M) have received the highest performance category status possible (class A) for the past three years, and loudspeaker M was declared a 'product of the year.'" *Stereophile* readers should be able to figure it all out.)

Which brings us at long last to Canton.

Founded 30 years ago, Canton Elektronik is the largest manufacturer and best-selling brand of loudspeakers in Germany. While influential in Europe, it has not been that big a name in this country (the US HQ is in Minneapolis). But based on my measurements and auditioning, Canton's top models, at least as represented by the Ergo RC-A, may be approaching the level where they deserve to be included in discussions of the top models from Revel, B&W, NHT, the new Allison, Infinity, Genelec, and B&O's new BeoLab 5, to name some of the extraordinary designs I'm familiar with. (Full disclosure: I've been paid to write copy for Genelec.)

Certainly the Ergo RC-A (room compensation, active) is a powerful, versatile, unusually smooth and wide-range, wide-dispersion performer. But it sure looks like nothing fancy, being simply a big, heavy (73 lb), floorstanding tower unit, 10" w x 14" d and almost four feet tall (and yes, tippy). The black-ash, cherry, or beech cabinet contains a 3-way design comprising two vented, nominally 9" polypro woofers powered by a 350W amp featuring a little LF EQ with savvy infrasonic highpassing; a nominally 7" mid; and the 1" tweeter (both aluminum-manganese). The tweeter has a disperser. Crossovers are at 180 Hz and 3.2 kHz. On the cabinet back are beefy heat sinks, ac jack with standby switch, fuse, speaker-wire connectors (big, gold, multiway, nicely knurled, non-US spacing), and LFE input. Nothing too unusual so far in any of this, although one potentially suboptimal sign is that Canton has the mid cover almost two decades and also takes it up awfully high, and it furthermore is located above the tweeter.

Finally, there are bass and treble tone controls, about which more later.

Whether mostly conventional in design or not, when I fired up the Ergo RC-As in my large peaked-ceiling family room and listened to a wide range of classical and rock material, I immediately remarked

about two pleasing things. The first was a noticeably easy, unstrained quality to the sound at all levels, including when driven hard; I even noticed this when measuring outdoors with pink noise. This impression is almost surely due to the built-in hefty power amp driving and filtering the double woofers. The second quality was an unexpected airiness to the sound, and again I noticed this outside as well with pink noise, as I moved my measurement mike around the tower eight feet or so away from it.

I do not normally hear much of either of these qualities with speakers sent for review, and certainly did not when listening critically to the last two high-end designs I covered for *T&S*, from Eggleston and Buggtussel, which were themselves worthy accomplishments and not all that dissimilar to the Ergo RC-A.

A new policy: I am going to try to say even less than I usually do about the playback I heard from the Cantons. The reason is that reading the Sean Olive article made me feel less defensive about something I've actually believed as a reviewer for years — that it doesn't matter much what I say. Don't take this the wrong way, as throwing up my hands. It's just that the measurements I make and display are much more important than any subjective judgments of mine. I don't pretend to have golden ears, though they're pretty educated by now; good speakers sound more and more similar at least as to overall tonal (timbral, spectral) balance, and nothing I write impressionistically should make that big a difference anyway, to you the prospective consumer, or should even be trusted necessarily to align with your values, much less your sonic tastes.

The Cantons sounded quite smooth, but I say something like that about all good speakers, because they do too. These Ergos sounded especially fetching — natural — in the treble and upper bass, and at all levels, which is rare; any ear-educated listener would notice that. If they struck me once or twice as a tad recessed in the midrange and hence a touch hard in the treble, or a smidgen much in the bass overall, this was easy to fix.

How? Because the Canton Ergo RC-A has really good (precise) and useful (euphonic) bass and treble tone controls on the back of the cabinet. The bass control works as specified in company literature, starting around 500-700 Hz, and is pleasantly mild but effective all the way down to the upper 30s, by which point the total swing is +3/-5 dB. Very useful for tonal "warmth" balancing, to counteract extra-bright or extra-absorbent listening rooms, or other

Figure 1

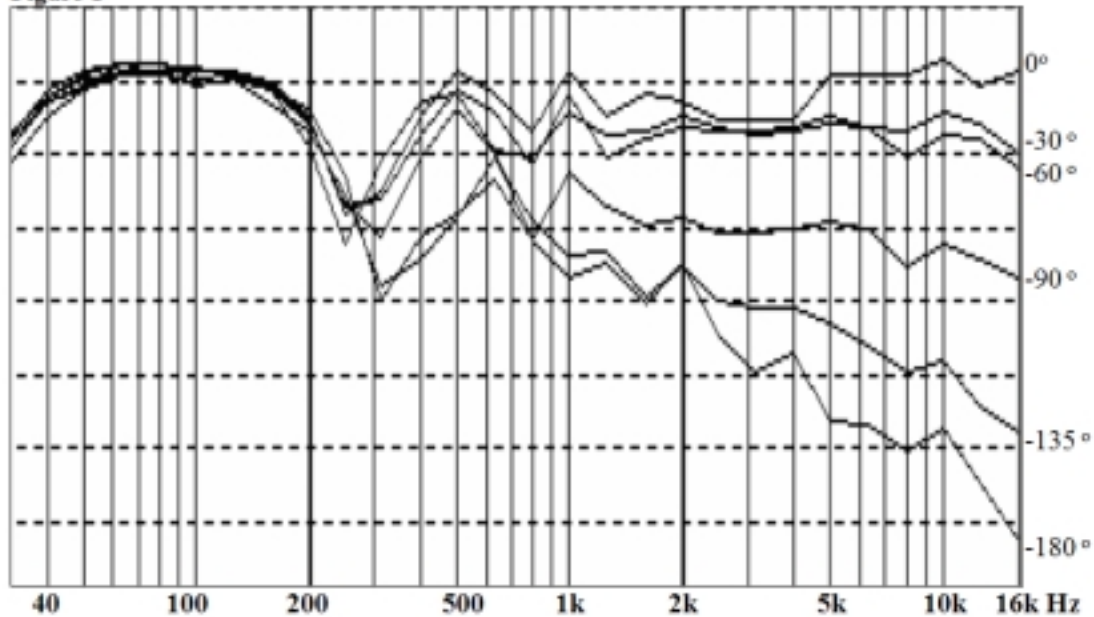
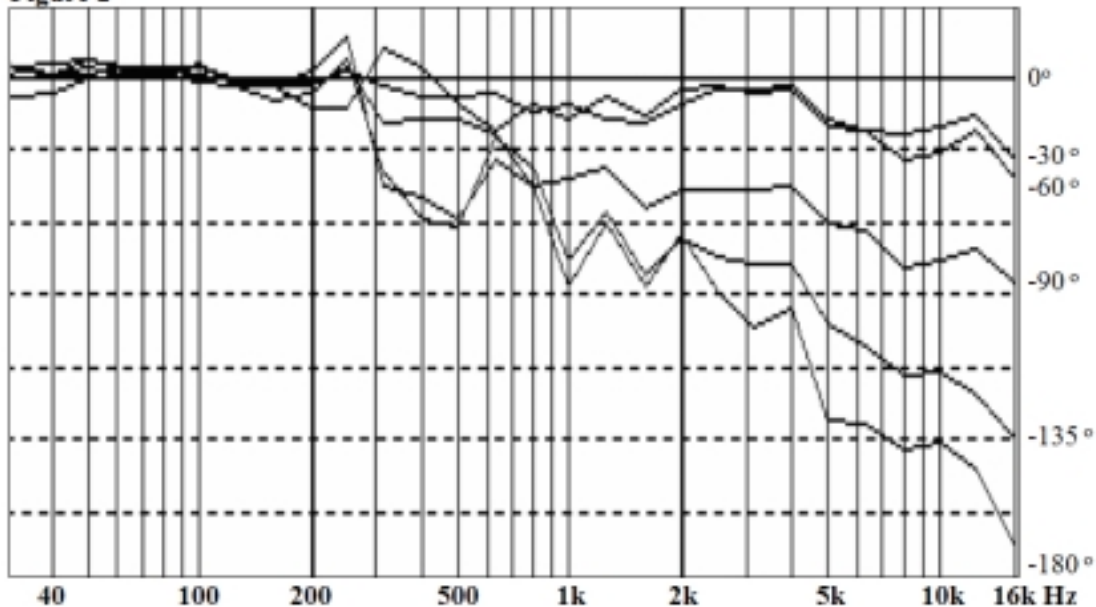


Figure 2



deficiencies. (My measurements, shown later, were taken with the controls at their nominal centers.) The treble control is, rightly, even more judicious, apparently beginning somewhat lower than specked, around 3 kHz (remember that musical fundamentals other than percussion typically end by 4 kHz, with only harmonics above) and reaching +1/-2 dB by 10k Hz and beyond. These are unusually well-gauged, nice-sounding options.

I spent a fair amount of audition time listening to 19th-century piano music (I was writing CD liner notes on Brahms intermezzi and Chopin etudes),

plus Wagner for string sound, plus the Cranberries, Fleetwood Mac, Phish (one child is a near-addict), old Stones, and even "Smoke on the Water" (oh, the shame). Everything was notably unstrained, clear and, when appropriate, loud as hell. Very, very nice. Never hard or forced or driven-sounding, just easy and powerful and properly balanced, with plenty of easy bass, which actually makes you want to turn everything up to just the right point. The airiness also helped, in fact it even contributes to, that easeful quality when the music wants to be very loud and powerful. And I gladly used the built-in

tone controls for slight rebalancing of mixes and mixings, as you should. Disdain for such controls is just nuts, and harmful to your playback enjoyment.

Imaging was hallucinatory. Again, I have remarked markedly floaty imaging with the previous high-end designs mentioned, but this was airier, and even less cabinet-connected, while just as stable. Really something. I can hardly imagine how good these Cantons would sound and image if the baffle were smaller and/or if they would stick a tweeter on the back (à la Revel).

Let's look at what the outdoors measurements reveal (5 dB/vertical div).

Figure 1 is curves are of the frequency response of the Canton Ergo RC-A taken at a typical domestic listening distance and at seated ear height, spatially averaged over a cubic foot or less, on axis and also at 30, 60, 90 (directly to the side), 135, and 180 degrees off-axis (the last measurement is directly behind the cabinet and would be the response reflected off the front wall if it's very hard).

Notice first that the tweeter is slightly hot on-axis from 4k and up, but smooth. Notice next that the -30 and -60 responses are not only identical but also flat and extended — over a decade! So is the rather cabinet-shadowed -90 response, almost like a ruler for two octaves. Where is the big-mid-to-tweeter crossover stitch?

Notice now the flat bass that extends over two octaves very strongly (believe me), down to 32 Hz or so. It is not widely appreciated that very loud 35-40 Hz bass capability will suffice for almost all LF situations, including movies, bass drum, and pipe organ. You read reviewers going on about their great delight in 16 Hz, but I believe they are not watching an accurate sound analyzer when they say that, and/or have not tested themselves by blindly switching in and out a steep infrasonic (20 Hz or 30 Hz highpass) filter.

What's with the dip at 250-300 Hz? That is caused outside by the ground reflection; Canton, like almost everyone else, puts driver(s) covering the lower midrange up high on the cabinet, which ensures cancellation. You can mostly fill in this dip in your listening room by not locating the speakers the *same* distance from the front wall as from the side wall (in this case in the 2/3/4-foot range). The physics are nicely complicated by the fact that the woofer center is at 23" and the midrange is at 41" and their crossover is at 180 Hz, all of which serve to make the suckout less stable, meaning easier to modify via speaker positioning. For most of my listening I put the Canton Ergos fairly close to the front wall (and far from side walls) and measured

strikingly flat averaged room response broadband, with no major dips and very few minor ones (or peaks).

In **Figure 2** the on-axis response has been made a straight line, and thus the curves below it are of the changes or deviations in horizontal radiation as a function of angle, at seated ear height and at a typical listening distance. The frontal radiation of this speaker is something: it is practically half-omni within a dB or two all the way to 4 kHz, and nearly so to 13 kHz. Pretty uncommon — the 1" tweeter's disperser ("diffuser lens") appears to work perfectly; indeed I do not think I have ever seen such an implementation succeed as effectively as this one does. The output to the sides and rearward is also smooth, with some cabinet-shadow lumping and interference centered on 400 Hz and 1 kHz-plus. Nothing too egregious and nothing to ruin image size and stability. But the frontal output measurements above fully account for the marvelous and float-in-space soundstaging.

With my fairly close-to-wall placement (which I recommend), the powerful bass was often slightly rich and warm, so I turned down the RC-As' bass control a little bit, after which everything really snapped into place, in tonal balance as well as imaging. How very adaptable!

I jotted down that maybe these were pricey, sure, but you got an considerable amount of high-level performance for your dollar. *Sehr gut!*

-DRM

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