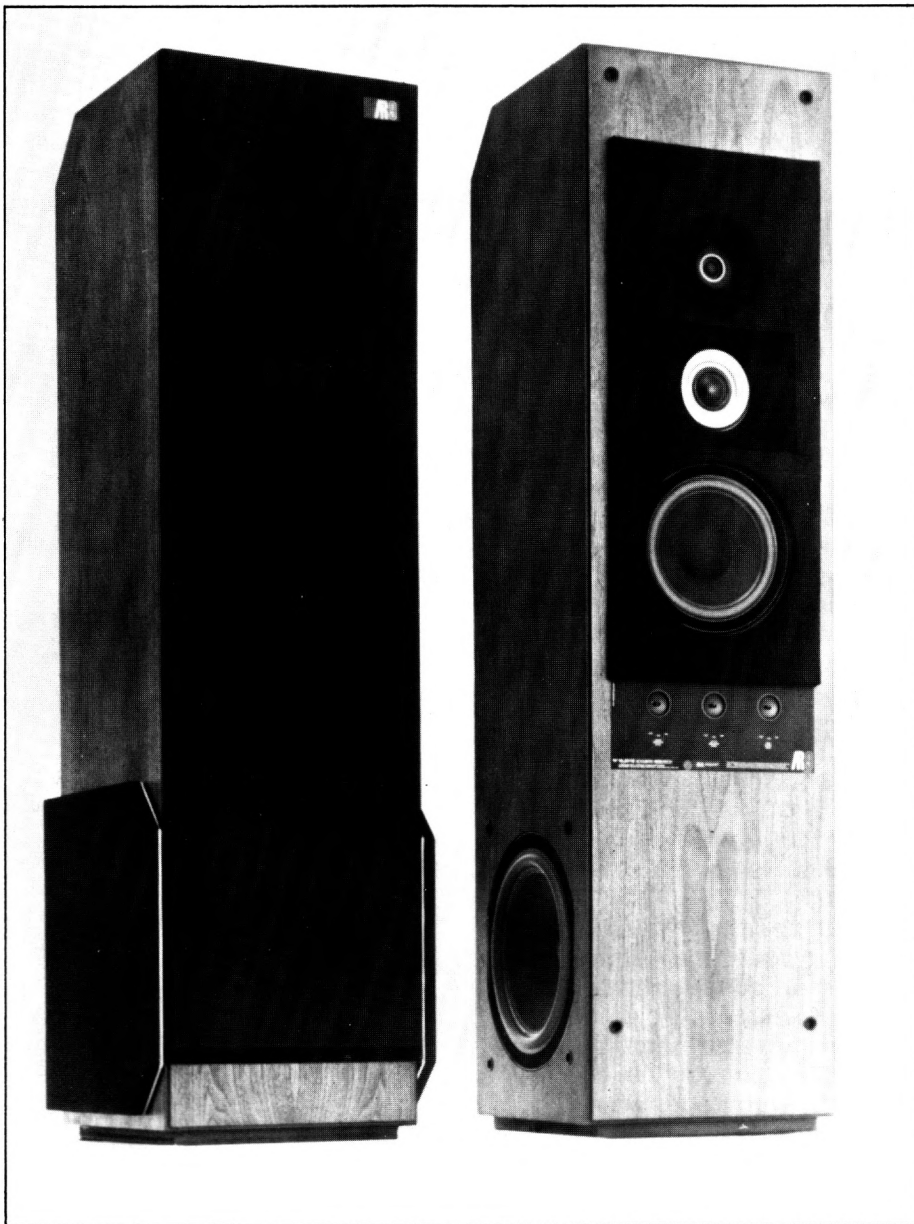


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Acoustic Research AR-9 Loudspeakers

Reviewed by Ralphe Neill



Whenever a loudspeaker manufacturer makes claims suggesting a "breakthrough" in loudspeaker design, I get more than somewhat suspicious — even when the company concerned is Acoustic Research. And I have a great deal of respect for AR — a company that developed, among other things, the acoustic suspension woofer now used by so many other manufacturers as a means of getting good bass out of small boxes.

As I read through the advertising blurb — seeing such phrases as "electronic automatic transmission," "the finest, most truthful" and "bending the laws of physics" — my suspicions mounted. I hoped that the blurb was just the outpourings of a copywriter's imagination but, even with the great confidence I have in AR, I approached this review with no small amount of cynicism.

Suffice it to say at this point that my healthy cynicism (something all reviewers should have) was quickly changed to healthy respect.

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The Loudspeaker

The AR-9 is a massive beast — far larger than we are used to seeing from AR, and, at first glance, it might be thought that the AR-9 has pretensions towards being an omni-directional speaker (heaven forbid!).

There are two side facing 300mm (12") acoustic suspension woofers. Why? It's actually a rather simple and elegant solution to an old problem — that of room reflections. We'll explain them and their effects first.

If the distance from a woofer to a reflecting surface and back again is one half the wavelength of sound being reproduced there will be severe cancellations. In other words, a drop in bass response at that frequency. This effect is present with all loudspeakers no matter how designed or how the woofers are placed.

What AR has done is to place the two woofers (we'll explain why two in a moment) on the sides of the cabinet so that they will be as close as possible to a rear wall.

Assuming the cabinets are placed right against the wall, the distance from the woofer to that wall and back again will be about 0.3 metre (1 foot). This is the half-wavelength of a frequency of about 600Hz so that's where the cancellations will take place. *But* the two woofers operate only up to 200Hz where the half-wavelength would be 1 metre (3 feet). So the cancellations occur *outside* the normal operating bandwidth!

Aha, you say. What about frequencies above 200Hz which are obviously handled by a front firing lower midrange unit — a 200mm (8") unit. The same principle applies. The unit handles frequencies from 200Hz up only and the distance from the driver to the rear wall and back again produces a cancellation at a frequency lower than 200Hz. Smart, huh?

Now back to those two drivers — it's all tied up with the problem of Q!

In case that sounds like something out of a second-rate spy novel, we'd better explain. Q is simply the term for the damping of a loudspeaker system. The problem is that damping can be adversely affected by normal attempts to extend bass response.

This is where the "electronic automatic transmission" and bending the laws of physics comes in. What AR has done is to create a crossover network which has characteristics which vary in sympathy with the applied frequency. Thus, at the resonance frequency the two woofers are connected in parallel effectively *doubling* the sound output in that region. As the frequency rises the impedance of the circuit goes up and the sound output goes down to match the natural increase of a driver above resonance. The result says AR is useful and full response down to 28Hz.

The upper-bass/lower midrange unit handles frequencies up to 1.2kHz where it crosses over to a 38mm (1½") dome driver. At 7kHz a 19mm (¾") dome tweeter takes over.

All these front mounted speakers are arranged vertically to keep interference effects in the vertical plane where they will not affect the stereo image.

The lower midrange unit has its own acoustic suspension enclosure within the main enclosure. Incidentally, the fact that it does not have to handle the low bass means a virtual absence of any Doppler effects.

The upper midrange unit is surrounded by what AR calls a "semi-horn" which helps to maintain the level of the upper part of its frequency range. Below 3kHz the "semi-horn" has no effect.

Both the upper midrange unit and the tweeter are immersed in AR's heat conducting magnetic fluid to increase power handling.

They are also mounted on an acoustic "blanket" — a layer of absorbent material which prevents the sound being reflected and reflected. This also improves the stereo image.

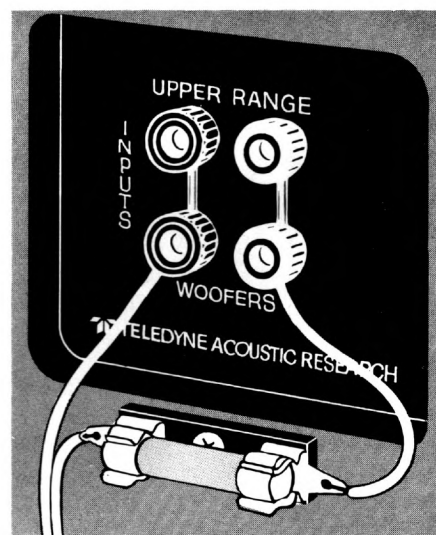
There are three level controls on the front panel for adjusting the three front panel speakers.

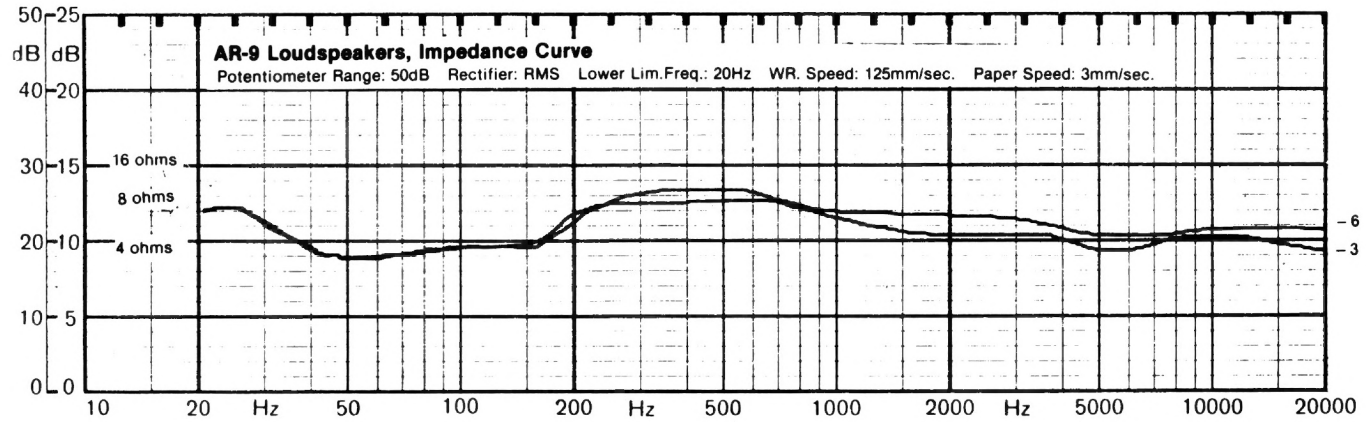
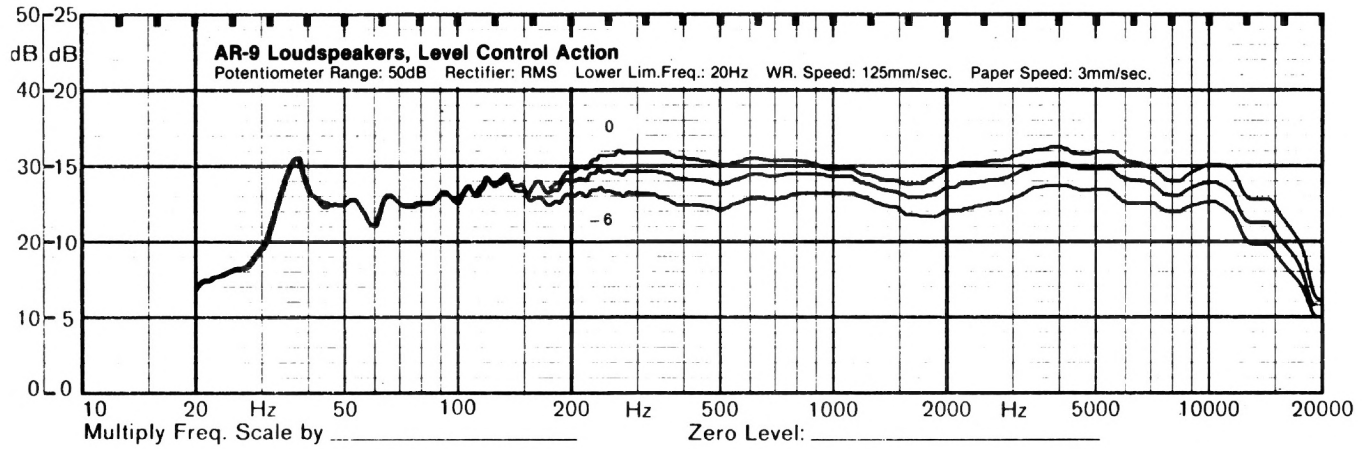
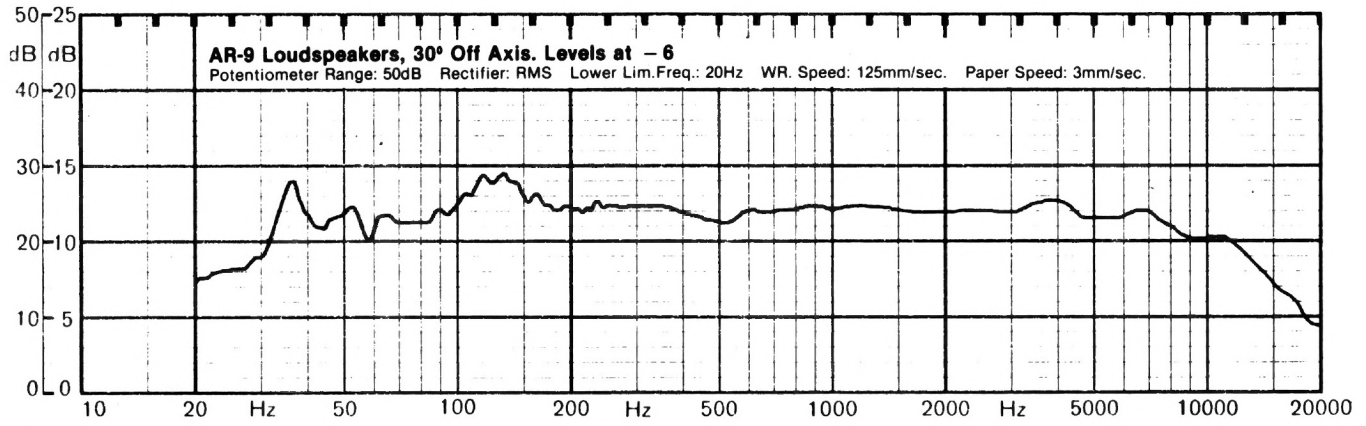
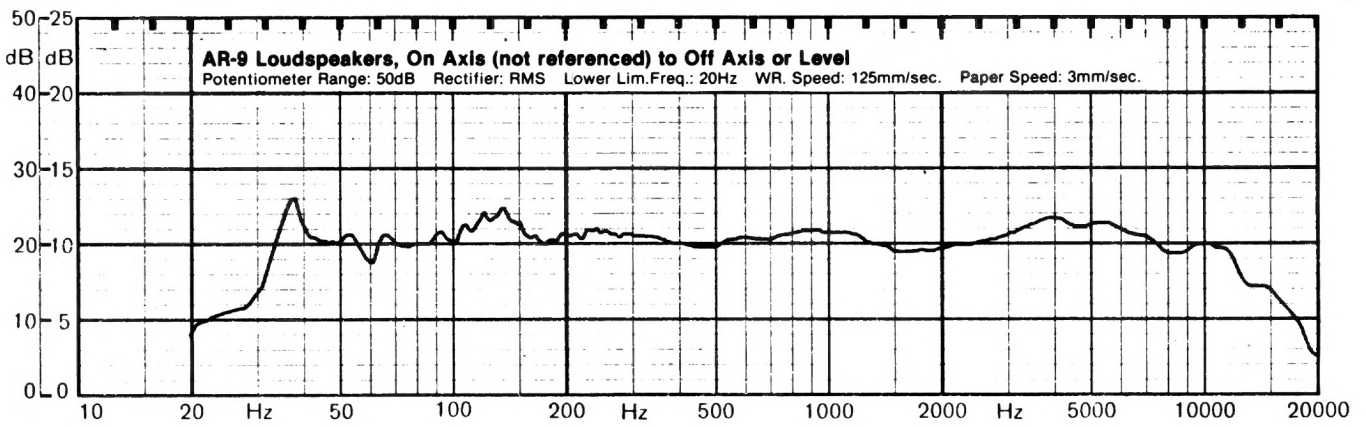
Now on to the basic specifications. The power handling is stated in DIN terms as 175 watts nominal and 275 watts maximum. Or, in AR's words, the unit may be used with amplifiers capable of delivering 400 watts continuous per channel being driven to clipping on 10% of the normal musical material. That speaks volumes for the ruggedness of the HF units. It must be remembered when looking at these figures that the AR-9's nominal impedance is 4 ohms and it will, thus, tend to draw more power from an amplifier than an 8 ohm unit. So you should check your amplifier's 4 ohm load capabilities.

The speaker is of only moderate efficiency with 1 watt producing 86dB SPL at 1 metre on axis. But it can, of course, be driven to extremely high levels within its operating range.

Performance

We placed the speakers flat against a wall as instructed. And we used very powerful amplifiers. The main signal source was records using a Linn-Sondek LP-12, Fidelity Research FR-1 Mk. III moving coil cartridge and an ML-1 preamplifier.





The sound can best be described as typically AR-plus. And if you're familiar with the AR sound, you'll know what I mean. AR speakers are never offensive, they're always smooth and detailed with commendable bass. The AR-9, however, has more of everything — especially bass. And I do not mean obtrusive, make-you-sit-up-and-take-notice bass. I mean bass only when bass is present in the recording and frequently bass that can be felt. Even at very high levels there was no sign of distress and no loss of balance. It was very like the effect of adding a superior sub-woofer to an already superb system.

There were just no peaks or dips evident *anywhere* in the range. And the stereo image was quite superb.

One thing was very clear — the AR-9 demands the very best in ancillary equipment. In particular, the turntable must be as free as possible from untoward effects in the bass region. If there are any, the AR-9 will probably reproduce them. There is little doubt that the overall design aims have been achieved with this speaker system.

Test Results

The lab tests simply confirmed all the subjective impressions. Take a look at the frequency response. It was taken in an average listening room situation

and no particular effort was made to optimise performance. And yet the response is flat to $\pm 4\text{dB}$ damned near down to 30Hz. Corrected for measurement technique it was also within that range up to the 20kHz mark. What more can be said.

The off axis response showed very little change while the level controls provided subtle tailoring effects. Note that they do not change the curve shape within their respective pass bands — they merely raise or lower the level. The impedance plots clearly show the effects of the tailoring in the crossover networks but there are no problems.

We just continued to be impressed. THD was always below about 1% — even for very high level bass. Tone burst response at any frequency, and even with the number of drivers involved, was good with minimal overhang. It was even good at the crossover frequencies.

Efficiency was as stated.

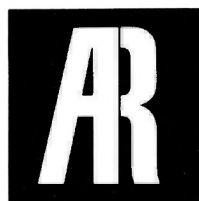
AR has not bent the laws of physics — rather it has used them to create a truly superior loudspeaker.

The AR-9 is simply stunning in its performance and joins the small ranks of very best. It can properly be called State-of-the-Art. ■

Frequency Response:
Nominal Impedance:
Sensitivity: 1kHz @ 1 watt @ 1 metre
300Hz @ 1 watt @ 1 metre
Power Handling Capacity:

Manufacturer's Specifications
18Hz – 30kHz
4 ohms
87dB
Not stated
275 Watts

Test Results
See graph
See graph
86dB SPL
90dB SPL
Agreed



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AR-9 Loudspeakers, Impedance at 0dB

Potentiometer Range: 50dB Rectifier: RMS Lower Lim.Freq.: 20Hz WR. Speed: 125mm/sec. Paper Speed: 3mm/sec.

