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Paradigm Persona 9H Loudspeaker

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Anthony H. Cordesman

Photos by Dennis Burnett



Paradigm Persona 9H Loudspeaker

Let me begin with the conclusion. The Paradigm Persona 9H is a new assault on the state of the art in speaker design by one of Canada's leading companies. It may cost some \$35,000 a pair, but it's one of the best speaker systems I have ever had the opportunity to listen to or review.

The Paradigm 9H has superb upper-octave and midrange response, and it can deliver flat, detailed, and room-corrected bass that normally requires a massive separate subwoofer. Soundstaging and imaging are equally excellent. As is the case with every top speaker, the nuances of its voicing and physical style are matters of taste, but this is a truly exceptional product that merits high praise.

Why begin with the ending? Because it is all too tempting to focus on the Paradigm 9H's exceptional bass and room-correction features, and this would be distinctly unfair to the speaker. The Paradigm 9H joins the Legacy V and Legacy Aeris in showing that room correction can really work and provide truly accurate deep bass, even in a speaker that is relatively small by reference-quality standards.

In recent years I have been steadily more impressed with the fact that today's speakers have improved to the point where the average real-world listening room is more of a problem than flaws in the transducer. Really demanding experimentation with speaker placement, room treatment, and the use of separate subwoofers can get around this, but often at the cost of letting the audio system dominate the décor, making a dedicated listening room a necessity, and still living with significant problems in the mid-low to low end.

Features and Technology

Paradigm describes the 9H as a "6-driver, 3-1/2-way hybrid floorstanding system with active-bass acoustic suspension. Its room correction only applies below 500Hz, and there is no room correction or active circuitry that plays any role in affecting the sound of your system in a range from some 40kHz to 500Hz."

On the face of it, the Paradigm 9H's frequency specifications seem almost too good to believe: ± 2 dB from 19Hz–45kHz on axis, and ± 2 dB from 19Hz–20kHz off axis. My limited home test gear isn't close to the level of confirming whether such specifications are accurate, but the 9H does have better in-home RTA, pink noise, and warble tone measurements, once it is room corrected, than any other speaker I have reviewed. Paradigm also has very advanced test facilities, and a good reputation for making honest claims.

More importantly, listening tests also show that the 9H is a superbly integrated speaker without any audible peaks or colorations at any point in its frequency range—and not simply at low or moderate listening levels. It easily deals with complex dynamics up to listening levels that go far beyond my taste and tolerance.

While it may or may not matter in your system, the 9H is also exceptionally efficient. Its sensitivity is rated at 96dB in-room—which is high enough to allow you to use certain low-powered triode tube amps for the treble and midrange (and let the 9H's active electronics handle the bass). The room correction in each of two pairs of woofers is used in conjunction with separate DSP-controlled 700W amplifiers—providing a total of 1400W RMS (2800W dynamic peak).

In the mids and treble, the Paradigm 9H is rated for use with amps from 15 to 500 watts, and could take all the power my ears could stand from a pair of PS Audio BHK Signature 300s without coloring the peak passages from music like Saint-Saëns Third Symphony. As for rock, this is a speaker where you would have to push even bass synthesizer and guitar sound to ear-damaging levels to hear coloration in anything approaching a normal listening room. Its combination of power and efficiency helps give the Paradigm 9H outstanding life and dynamic realism even in very loud, complex passages.

The treble and midrange drivers are also exceptional and as important to the 9H's success as its bass drivers, power, and room



Paradigm Persona 9H Loudspeaker

correction. The speaker has a 1" beryllium tweeter and a 7" beryllium midrange driver, crossed over with third-order slopes at 2.4kHz and 400Hz. It is the first speaker I've heard with a beryllium midrange, and while I've come to be extremely cautious about singling out any given driver material or technology as uniquely better, these particular beryllium drivers do provide remarkably clean and detailed sound over an unusually wide, stable listening area. They are as good at keeping solo instruments and "small music" natural in imaging and depth as they are at resolving the soundstage details of complex operas and choral music.

Once again, I've found that enclosure design tends to be like driver design; individual designers may favor one choice over another, but the execution of a given approach tends to be more important than the particulars. In the case of the Paradigm Persona 9H, the manufacturer states that "completely inert enclosures begin with seven layers of wood composite material and viscoelastic adhesive placed in a custom press. The enclosures are treated with radio-frequency energy to accelerate the curing process, which takes almost a week to complete. The result is a strong,



speakers—or pair with separate subwoofers—that did have room correction. It measured better; it did a better job with a wide range of bass warble tones; and, most importantly, it sounded better with organ, jazz, rock, and the kind of sonic spectaculars you may hate as music but can't resist using to test your system.

Its size is also remarkably easy to live with. The 9H isn't small, and each enclosure does weigh 190 pounds. Its measurements of 11.875" x 51.75" x 20.5" are also scarcely petite. At the same time, this is still a size that is compatible with most real-world listening rooms, most decors, and most partners and roommates. Its form factor is particularly critical when so much bass power has to be delivered in a relatively small package.

Talking about a speaker's wife acceptance factor (WAF) is now deservedly "DWM" and politically incorrect. At the same time, most of us are going to appreciate having a speaker that does not dominate the room but does have the ability to use its room correction to equal or outperform far larger integrated speakers and systems with separate woofer towers or pairs of properly located subwoofers, *and* avoid highly visible room treatment. Unless

constrained-layer-damped enclosure that's the perfect acoustical foundation to build upon."

It is well worth looking at the Persona 9H brochure on the Paradigm website to get an idea of just how complex the enclosure bracing and subwoofer layout is. This is critical in a speaker that utilizes four ultra-high-excursion 8.5" woofers and relies on a balanced vibration-canceling configuration (two front-firing, two rear-firing) to go so low in the bass, uses full room correction, and delivers even the lowest bass at high levels when the musical dynamics require it.

I got better and smoother bass out of the Paradigm Persona 9H in a variety of room locations than I have with any other system that did not have room correction. Moreover, it outperformed any other pair of

It also has exposed drivers with mildly psychedelic grilles over its tweeter and midrange.

Paradigm Persona 9H Loudspeaker

you like being a hermit (hermitess?) in your sound room or audio cave, there is real merit in being able to listen casually to music, and demonstrate your system to non-audiophiles as if the music were what matters, and you hadn't turned the system into an object of pagan worship.

About the only caveat I can think of in this respect is that the Paradigm 9H has good techno styling, but it also has exposed drivers with mildly psychedelic grilles over its tweeter and midrange driver. Exposed drivers are scarcely uncommon in high-end speakers, but some of us work, live, and play with non-audiophiles. Many visitors liked or ignored the 9H's physical design, but were more than mildly amused by the tweeter and midrange's unique driver grilles. These grilles' unusual design and appearance, however, serve an important technical function, as explained in the accompanying interview.

The Music

Let me again stress that the Paradigm 9Hs have far more going for them than superb bass performance. I used them as well as my own reference speakers—the Magico S7 and Legacy Aeri—in trying the new PS Audio Directstream Memory Player. I had some initial doubts about the ability of any new disc player to reveal more of the music on CDs, SACDs, and high-resolution discs like the Reference Recordings HRx series of 176.4kHz/24-bit discs—as well as some high-resolution discs made by my friends.

The tweeter and midrange in the Paradigm 9Hs did a superb job of revealing fine transient details in the midrange and highs, and making it immediately apparent that the PS Audio Directstream Memory Player did make real—if subtle—improvements in the sound of virtually every type of disc, in a direct comparison with transports like the Oppo BDP-105D and the earlier PS Audio. The improvement in life, detail, and upper-octave clarity was most striking with CDs, but it was also apparent with SACDs and even with the 24-bit/176.2kHz versions of number of Keith Johnson's (and other Reference Recordings) discs that will be familiar to many audiophiles—*Exotic Dances from the Opera* [Reference Recordings HR-71], Rachmaninoff *Symphonic Dances* [Reference Recordings HR-96], *Arnold Overtures* [Reference Recordings HR-48], and *Crown Imperial* [HR-112].

I'm not sure that rediscovering the sonic improvements made by today's most advanced digital transports will lead to a rebirth of optical and digital discs in the way that better hardware and software have led to the rebirth of the LP. Nevertheless, it did make me think hard about shifting fully from disc to digital storage. More importantly, the ability to make these nuances audible showed just how good the Paradigm 9Hs could be in resolving depth (when the recording has such data), preserving soundstage integrity and image size, and handling the full range of instruments—strings, brass, woodwinds, percussion, and organ. There is no way to adequately describe the differences in nuance and voicing between three great speakers like the Paradigm 9H, the Magico S7,



No audiophile can ever really ignore the importance of bass.

and the Legacy Aeri without writing a whole new review, but even if one ignores the bass, the 9Hs are clearly competitive. And no audiophile can ever really ignore the importance of bass or the impact of a listening room. The Magico S7 has truly excellent and deep bass, but it does not have room correction. I have to use them with a pair of carefully calibrated Golden Ear XXL subwoofers so I can place them where they provide the best soundstage and midrange and treble performance. The Legacy Aeri has a separate DAC/preamp/room correction system called the Wavelet that provides both bass and full-range correction and equalization features. It does provide a wider range of correction that includes room reflections, but the speaker does not go as deep with as much power as the Magico or the Paradigm. Life is filled with trade-offs.

The Paradigm Persona 9Hs not only provided the best overall bass response I've had in my listening room, it did so when playing back deep bass at subwoofer frequencies and loudness

Paradigm Persona 9H Loudspeaker

levels. It virtually eliminated the mountain-sized bass resonance peaks that are inevitable in most real-world listening rooms, and it filled in much of the equally deep valleys in bass response. I've been listening to room correction systems since the days when loudspeaker manufacturer Snell began to experiment with the technology and when Tact introduced full room correction. The 9Hs is the first speaker I've heard aside from the Legacy Vs that can really provide full correction of the bass and do so with extraordinary detail at almost any rational listening level.

I do have some cautions about the result. If you are not familiar with flat full-range bass, you may initially feel that room correction slightly reduces the apparent bass performance of a speaker. We are accustomed to hearing the impact of the resonant peaks in our speakers, and their sudden absence takes some getting used to. It is only when you listen to the entire range of bass music over time that you realize how much more lower-octave detail is available, and that bass peaks are no longer adding at least a slight one-note character to the low end and no longer partly masking the midrange and treble. It is also only when the bass truly extends to frequencies you sense more than hear—below about 35Hz—that you realize how much the deep bass can contribute to musical life and realism. It is only when low-



I want to listen to the music and not the equipment.

end response is truly smooth that you realize how many minor room resonances and vibrations are no longer being excited by the bass. Put simply, there is far more to the low end than 1812 cannons, bass drum whacks, excessive synthesizer and bass guitar bass lines, and organ notes that vibrate the walls and the couch.

The Realities of Bass Room Correction

There also are several points about the realities of bass room correction you should be aware of. First, it in no way affects the need to place your speakers in the best spot to provide a realistic soundstage and the best overall mix of bass, midrange, and treble. If anything, the more revealing the overall response, the more placement details matter and the better the bass response will be after room correction. Good placement without correction means less correction is required, and better results when it is applied in the bass. (The room correction software does provide a quick measurement setting to allow you to measure different speaker placements and minimize the amount of room correction.)

Second, the lack of bass peaks does affect the apparent level of midrange and treble energy, and the 9Hs have relatively flat upper midrange and treble response. This can give the impression of a slight hardness or of excessive energy in the upper midrange with violin, harpsichord, soprano voice, woodwinds, and brass—particularly with many recent recordings where the miking is too close and the production values apparent detail over natural musical warmth.

Engineering purity is all very well, but I want to listen to the music and not the equipment. This is why I like the full-range correction features of the Legacy Wavelet, although the Bohmer room correction in the Wavelet DAC/preamp/room correction electronics emphasizes different aspects of sound quality than the bass-oriented ARC-2 system used in the 9H. The Paradigm 9H does not have such options, but you can accomplish a great deal by experimenting with different placement of the mic when you set up the room correction, by finding just the right toe-in and spacing for the 9Hs, and by experimenting with minor adjustments in the distance of the speakers to side and rear walls to minimize any excessive upper-midrange energy.

A number of reviewers question whether speaker midrange and treble energy should measure flat or be rolled slightly downwards. As a classical music and jazz fan I have mixed feelings about older recordings, and many more modern recordings that emphasize natural musical warmth. Speaker voicing of any kind will favor one set of recordings, cartridge, DAC, preamp, amp, and set of wires over another.

Paradigm Persona 9H Loudspeaker

I don't believe that this is a problem that should be solved at the speaker. Loudspeaker crossovers are complex enough as it is, and a speaker designer can really only voice the non-active circuits inside in one way. It is a problem that needs to be solved by making more musically realistic recordings and/or by providing some form of equalization in the preamp or some outboard unit, rather than in the speaker. As far as I'm concerned, high-end electronics designers really need to rethink their design goals. They need to get away from the "less-is-more" approach to front ends and DACs and/or digital preamps.

I'd like to see high-end electronics designers provide the ability to "tilt" the overall frequency response up or down over the entire frequency range—or at some point from the upper bass to the highest frequencies—by at least several dBs from "flat." I'd also like to see the option of being able to slightly dip the upper midrange. Apparent musical realism, not specsmanship and simplicity, should be the real goal of high-end sound.

Third, for all these reasons, be careful if you visit a dealer to hear the 9Hs. Listen with and without room correction. Make sure the speakers are properly placed in the showroom, and—if you decide to buy—make sure the dealer has the skill and willingness to help you with an initial setup that really suits your ear and taste. Bring your own favorite bass spectaculars, but also bring at least a couple of your best recordings of music you really love. This is a remarkably coherent, detailed, full-range speaker, and you should judge it accordingly.

Fourth, if you plan on doing your own setup of the ARC-2 room correction system used in the Paradigm 9H, be aware that it requires the use of a PC—devices that approach the work of the Devil and/or embracing the dark side of the Force to a Mac user like me. The instructions in the manual also are only "acceptable," and I'd check for updates to both the instructions and the software at the Paradigm website before running the program. At the same time, downloading the software is easy, setup is quick once you get the hang of it, and the display shows you the before and after measurements. As for Mac users, many online software and black magic stores do sell an application that allows you to run Windows on your Mac.

Specs & Pricing

Type: 6-driver, 3-1/2-way hybrid floorstander with active-bass acoustic suspension

Crossover: Third-order electro-acoustic at 2.4kHz (tweeter/mid), third-order at 400Hz (mid/front bass), second-order at 200Hz (rear bass)

Amplifier: Each woofer pair is powered by a separate DSP-controlled 700W RMS amplifier

Room correction: Anthem Room Correction, with included calibrated microphone

Frequency response: On-axis, ±2dB from 19Hz–45kHz; 30° off-axis, ±2dB from 19Hz–20kHz

Drivers: 1" beryllium dome tweeter; 7" beryllium mid/bass; four 8-1/2" woofers

Sensitivity: Room/An-echoic, 96dB/93dB

Impedance: Compatible with 8 ohms

Suitable amplifier power range: 15–500 watts

Maximum input power: 400 watts

Dimensions: 11.875" x 51.75" x 20.5"

Weight: 190 lbs.

Price: \$35,000/pr.

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around its proprietary room correction system. This allows it to correct for dips of up to 6dB and peaks of up to at least 30dB.

I'd dearly love to see the Anthem aside of Anthem-Paradigm make an outboard ARC-2 unit that could be adjusted to suit any given speaker. In the interim, however, I've found that past attempts to provide universal room correction that cannot be tailored to an individual speaker's design often fall seriously short of providing the best performance in dynamics, power handling, and distortion. Both Paradigm and Legacy avoid this by ensuring the speaker's capabilities match the room correction and vice versa—although they take very different approaches. The results really pay off in superior sound quality.

Summary

One of the best around. Highly recommended.

Finally, I'm not sure that a detailed explanation of the technology behind the ARC-2 system is really needed, and many audiophiles will rely on dealer setup. But, people and speakers do get moved, and high-enders love to tweak and fiddle. Accordingly be aware that you can readily find out the technical details and get some good high-tech reviews by putting "ARC-2 room correction" into your computer search routine. (Be aware that the ARC-2 system in the 9H is designed and used in very different ways than the ARC-2 in Anthem receivers, and for home theater.)

At the same time, you should also be aware that Paradigm speakers and the manufacturers of the Anthem ARC-2 room correction system are one company, and the Paradigm is designed

Paradigm Persona 9H Loudspeaker

A Conversation with Paradigm's Oleg Bogdanov

Robert Harley

The Persona line is in some ways a radical departure for Paradigm; in other ways it is a logical progression for the Canadian manufacturer. The company is best known for its affordable speakers that combine high-end design with economy-of-scale manufacturing. In the past, creating flagship products with cutting-edge technologies just wasn't in Paradigm's wheelhouse. But Persona is also a natural step forward because it represents the culmination of everything Paradigm has learned about making speakers over the past 35 years. One could argue that the discipline of three-and-a-half decades of building speakers to strict price points is the ideal foundation for creating a much more ambitious and expensive line such as Persona.

For some background on the Persona's genesis and technology, I spoke with Oleg Bogdanov, Director of Product Development.

Tell me how the Persona project came about. What were the inspiration and the goal?

It's been about five years in the making. We wanted to create a speaker that would really make a statement, that would cover the full range of human hearing, playing at 120dB over the widest range of frequencies from below 20Hz to beyond 20kHz.

Was there a concern about a company known for making affordable, high-value speakers producing a \$35,000 product?

We have never offered a speaker in this price range, but we're known for providing performance and value. We're not a brand that just makes it cheap. Our approach is to provide performance and features that would cost way, way more from other companies. We can do it efficiently and provide good value.

Consumers will definitely see and appreciate the value in the Persona even though the price is higher than we ever had before at Paradigm. But at the same time, it's pushing features and technologies that are not available at this price—and maybe not available at all from other companies, such as the 7" beryllium midrange driver. Beryllium is very light, very rigid, and has very good damping. There may be one or two other companies with that technology, but we're talking a six-digit price range. Beryllium diaphragms are just one of the technologies we use.

Did you develop the beryllium cone technology in-house?

We partnered with a company called Materion, which mines beryllium in Utah and processes it into 99.9%-pure beryllium foil. Based on our design, they made a tool that creates the cone's shape and thickness. We then assemble the drivers here in Canada.

Let's talk about some of the other technologies in the Persona, starting with the differential-drive woofers.

We originally developed differential-drive for subwoofers. It improves the motor design and makes the driver much more linear. We take a very long voice-coil bobbin and put two voice-coil windings



on it, wound in opposite directions. Each coil is sitting in its own magnetic gap. The magnetic fields of each coil are in opposite polarity, but the force that each coil generates adds together. This has many advantages, including lower distortion, higher power handling, and better heat dissipation, and thus less thermal dynamic compression. The long voice-coil former and dual spiders create a very stable mechanical structure that will not rock from side to side or add any extraneous noise when pushed to high excursions, as conventional drivers do. The differential-drive and woofer-suspension structures allow greater excursion, which is related to how loudly the system can play at low distortion levels. The differential-drive woofer contributes to the Persona's sense of ease and effortlessness.

Why did you make the Persona a hybrid system, combining a passive midrange and tweeter with internally amplified woofers and DSP room correction below 500Hz?

We quickly realized that achieving our lofty goals would be impossible with a passive speaker. For example, to extend the frequency response to 20Hz in a passive speaker would require a much larger cabinet. The result would have been a large box that was difficult to place in a room. We wouldn't have been able to incorporate room correction if it were passive. Without room correction the frequency response will be very different in different rooms, and with different placements in the same room. Room correction and active woofers give us the ability to have flat response in the bass down to 14Hz and consistent performance from room to room.

Also, the combination of powered woofers and a high-efficiency midrange and tweeter means that even very low power amplifiers, including tube amplifiers, can drive the Persona to sound-pressure levels that are unheard of in a less-sensitive speaker. [The 9H has a rated sensitivity of a whopping 96dB.—RH]

Tell me about the enclosure.

One of the challenges was combining all those elements into a relatively compact enclosure that was attractive. The industrial designers did a great job in creating the shape, but the next challenge was how to manufacture the enclosure. The enclosure is made from seven layers of wood composite, with layers of vibration-damping adhesive between them. It's bent into shape in a press [see photo above], and the adhesive is cured with a burst of microwave energy. The back of the speaker is curved, and that curve meets the top and bottom surfaces at an angle, which creates challenges. The solution was to use five-axis CNC machines at a level of sophistication we'd never tried before. The CNC machines do all the cutting and carving to create the complex curvatures and angles. [See Paradigm's website video showing how the cabinets are made.—RH]

One important element we haven't talked about is the Perforated Phase Alignment (PPA) lenses in front of the midrange and tweeter. These are non-removable because they are an important part of the acoustic design. The PPA lenses over the midrange and tweeter solve a fundamental problem with cone and dome drivers. As the frequency of the sound increases, at some point the sound's wavelength becomes comparable in size to, or even smaller than, the cone in the case of the midrange driver or the dome in the case of the tweeter. When that happens different portions of the dome or cone become their own point sources. This causes phase difference cancellation



due to the different distances from the ear to different portions of the cone or dome. The sound from one part of the cone or dome travels a shorter distance to the ear than the sound produced by a different part of the cone or dome. The two waves combine constructively to increase the sound's amplitude at certain frequencies, or combine destructively to decrease the sound's amplitude at other frequencies. You get a series of small peaks and dips in frequency response.

The PPA lenses block the out-of-phase sound so that it can't combine with the in-phase sound. We get flatter response, particularly off axis. Even at 30-degrees off axis the Persona response goes out to 20kHz. That means there's no limited sweet spot. There's a very wide area where you can listen and still have it sound good. The image doesn't collapse as you move off-center. Two people can sit side-by-side and still hear a good soundstage and flat frequency response. The patent-pending PPAs are a striking feature of the Persona 9H. **tas**

