

“...this system is destined to become
A LEGEND.”

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by Tom Nousaine

So what's the newest, hottest thing in sound these days? Most people would say DVD, DVD, and DVD. However, I also see a small revolution brewing that will radically alter the entire topology of modern sound systems: powered loudspeakers. Whoa, wait a minute! We've had powered speakers for years. Nobody bought them. What's different now? Paradigm's Active loudspeaker series is what's different. By "active," Paradigm means that the power amplifiers and associated electronics are built into the speaker itself. One obvious design bonus is a reduction in component clutter, but this particular system is also ten leaps forward in terms of performance. The Active package is the powered version of the highly regarded Paradigm® Reference speaker series. This set includes a pair of Active/20 main speakers, an Active/450-C center channel speaker, a pair of Active/450-ADP bi-directional surrounds, and the Reference Servo-15 bass driver.

All benefit from the common gene pool. Each of the five 2-way main channels

The New ACTIVE/20

(Improved over version reviewed for even better sound.)

contains a 110-watt power amplifier for the 6-1/2 inch woofer(s), a 50-watt amplifier for the 1-inch aluminum dome tweeter, an electronic 1.5 kHz crossover, a defeatable 100-Hz high-pass filter, plus level and high- and low-frequency contour controls. The left and right front channels use a single 6-1/2-inch polymer cone woofer with die-cast basket and inverted rubber surround. The Active/450-C center and Active/450-ADP surrounds use two similar drivers per enclosure. The center channel arrays them to either side of the tweeter while the surround format places a woofer and tweeter on each end of the bi-directional enclosure. The center channel is also available as the Active/450-LR where the drivers are vertically aligned in classic topology.

All of the 1-inch tweeters feature a die-cast aluminum chassis and ferro-fluid cooling. The Active/20 and the Active/450-C are



vented with rear-mounted ports while the ADP is sealed. All the operating controls, RCA and XLR balanced input jacks, and an AC power cord socket are located on the back panel of each enclosure. The speakers all feature raised mounting plates so the drivers are flush with the front panel when the grilles are snapped on. That feature is especially clever. The speakers also feature switchable auto on/off capability. The Reference Bass Driver uses a servo-controlled 15-inch Kevlar®-reinforced cone, an instrumentation-grade accelerometer and a 400-watt amplifier in a 4.53-cubic-foot sealed enclosure. The 78-pound unit sports an AC socket and the defeatable (toggle-switched) auto on/off control on its rear. There is no internal crossover. That function must be provided by your A/V processor or Paradigm's X-20 or X-30 outboard units. The subwoofer has a 6-foot power cord and the five main channels come with 12-foot power cords. All the speakers are delivered with fat 23-foot RCA patch cables.

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Each Active/20 measures 14-1/2 x 8-1/4 x 12-5/8 inches (h/w/d) and weighs 40 pounds. The Active/450-C is 21 x 8 x 11 inches (h/w/d) and weighs 44 pounds. Each Active/450-ADP measures 14 x 13 x 9 inches (h/w/d) and weighs 43 pounds. All speakers are available in Black Ash. The main, center and surrounds also come in Gloss Cherry while the sub-



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woofer is available in Light Cherry or Rosenut. All models come with a 3-year limited warranty that covers the electronics.

The Active/20 main speaker may be the best overall loudspeaker I have ever measured. On axis, it was ± 2.6 dB from 50 to 20,000 Hz. The main anomaly was a small depression at 150 Hz; this was caused by sound bouncing off the floor when the speaker was positioned on the supplied Premier stand. At 30 degrees off-axis, it remained ± 2.7 dB to 20,000 Hz but the tweeter started to roll off above 17,000 Hz. Amazingly, at 60 degrees off axis, the Active/20 retained the same smooth shape with a gradual roll-off above 300 Hz. Still, the speaker was only 4.5 dB down at 10,000 Hz, and overall remained ± 4.2 dB from 50 to 10,000 Hz. The important thing here is flat, direct response and smoooooth off-axis directivity; this translates to good, clean sound even when room reflections are added to the mix. Credit for the performance goes to excellent drivers, flush mounting, solid electronic crossovers, custom equalization, and overall attention to detail.

The Active/450-C has a half power point of roughly 74 Hz; that's measured in my listening room while it sits on top of a 51-inch rear-projection TV. When measured quasi-anechoically, bass response extends into the high-40 Hz region. With the same input drive, it plays roughly 3 dB louder than the Active/20. There's a slight hump at 200 Hz and a notch at 3,000 Hz; the overall curve gently sloped downward on each side of 300 Hz. There was still plenty of output at 20,000 Hz, and overall response measured ± 4.0 dB from 74 to 20,000 Hz.

At 30 degrees off axis a deep crossover notch of about 12 dB developed at 2,000 Hz. This is a function of the horizontal speaker layout. The notch can be virtually eliminated using the speaker in the upright mode. Indeed, the Active/450-LR is the same speaker, except that it's vertically – instead of horizontally – arrayed.

I measured the Active/450-ADP surround speakers flat against a clean wall (free from pictures, etc.) on stands 5 feet above the floor. Measuring a full 60-degrees around the speaker in either direction at an angle

that would intersect with a listener's ears 39 inches above the floor, speaker response was ± 4.3 dB from its half-power point of 45 Hz to 10,000 Hz. This is nearly ideal performance for a surround speaker when you consider that room interaction will always be a major factor in a system's overall response.

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The Servo-15 subwoofer was also an excellent performer. The speaker was flat to 27.1 Hz, which was measured using a microphone positioned 2 meters away in the best corner of my new 5,700-cubic-foot listening room. (I recently moved to more spacious accommodations. For faithful readers who'd like to compare the performance stats here to those cited in earlier reviews, I've made the necessary conversions where applicable. For example, using the transfer function from my older, smaller room, the sub would have been flat all the way down to 21 Hz.) The maximum output with up to 10-percent distortion (again, referenced to my old room), revealed an average 107.3 dB SPL capability over the critical 25 to 62 Hz range and 104.5 DB SPL. This was within a half dB of the Velodyne FSR-15, my current reference subwoofer for maximum output. Near field response was ± 2.91 from 22.2 to 80 Hz, which was excellent by any standards. The limiter circuit for the system was fantastic as well. When you reach maximum, it just stops getting louder. No muss, no fuss. No bang, no clang.

“... sound tracking was excellent ... Sounds followed the course suggested by the picture. Sounds that tracked from behind the listener into the frontal action were especially well done. ... top-echelon surround sound performance ... ”

I set this system up using the 25-1/2-inch Premier stands for the left and right front speakers. The center went atop my 51-inch rear projector. The surrounds were placed directly to the sides of my main listening couch on 5-foot high stands. The subwoofer went in the right rear corner of my listening room.

Because these are powered speakers, you obviously must have an AC outlet within 12 feet of each speaker or you'll have to find a longer AC cord. You don't need traditional speaker wire, but you must have RCA patch cables on hand to connect the system. In my case, the 23-foot RCA patch cables that came with the speakers failed to reach the surrounds and subwoofer. However, it's an easy job to splice the extra length with RCA splices available at Radio Shack.

Although the extra power cords are cumbersome, powered speakers radically reduce the rat's nest behind the equipment cabinet. The RCA connectors are also extremely easy to install. Just plug one end of your RCA into the low-level output of your preamplifier for a given channel and plug the other end right into the speaker. Nothing could be easier.

By now, you've got to be wondering how this system sounds. In short, it sounds very, very good. Spectral uniformity from my main listening couch was excellent. Vocals were clear and detail was fantastic. On Oscar Peterson's *We*

Get Requests, each member of the tri-piano, drums and acoustic bass, were precisely placed, and the smallest sonic details were etched in space. The only problem I came across concerned the Active/450-C, which tended to make the overall frequency balance just a tad heavier than perfect. A complete cure would be substituting the center channel with an Active/20. With that configuration, you'd have a perfectly blended and fully natural spectral presentation at any listening seat. (Caution: The Active/20s are not magnetically shielded, so if you decide to substitute one as a center channel, be sure to set it at least a few inches away from a direct-view TV.)

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With the Active/450-C as the center speaker, the off-axis notch unfortunately meant that I could hear the tweeter as a separate sound source at off-axis listening seats. Surprisingly, the timbre remained good, in spite of the notch. However, sounds that were panned across the frontal stage had a tendency to jump from channel to channel. Using taller stands for the left and right speakers is a partial cure. The Premier stands, while beautiful, are just too short to allow a seamless blend with a center channel positioned 4 feet off the floor.

In any case, the spectral character of this system in the center seating positions was excellent by any standard, using any configuration. Because spectral balance is the primary function of a speaker system, getting it right enables all the other parts to fall into place.

The Active speaker is clean, clear and well balanced as delivered – and it's close to perfect when the speaker substitutions I've suggested are made. The extended, smooth high-frequency response will not let ultra-bright sources off the hook, however. The THX EQ curve or a twist

on the high frequency contour control is de rigueur for ultra-hot program material (as on the soundtrack from *True Lies*, for example).

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The New ACTIVE/450-ADP

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Surround performance was also excellent. The front-rear soundstages blend wonderfully and the ambience covered the full width of the room. In the off-axis wing seat there was just the smallest blank zone from front to rear, and the overall ambient fill got a tad thin on the far side of the room. Another quibble involved the weak rear ambient fill behind a listener in the center seat. For example, I felt as though I were in the last row of the stadium when listening to my U2 *Rattle And Hum* laserdisc. There was no crowd behind me, and it got kind of lonely. Surround sound tracking was excellent in the main seats. Sounds followed the course suggested by the picture. Sounds that tracked from behind the listener into the frontal action were especially well done. Such action occurs with regularity in the car bomb sequence from Chapter 14 of the *Clear And Present Danger* LD. The scene where a plane flies directly out of the screen through the listener was accurately

tracked – with one exception: The plane seemed to disappear once it had passed over my shoulder. Sound tracking front to rear and vice versa was surprisingly good in the off-axis seats, even with the 450-C as the center channel speaker.

“... the spectral character of this system in the center seating positions was excellent by any standard, using any configuration. ... clean, clear and well balanced ...”

Although Paradigm claims this system can produce levels approaching 115 dB in a typical listening room, that's dependent to a large extent on the frequency content of the program. Repeated high volume levels caused both the center and right channel to shut themselves down at one time or another during extended listening sessions. One time the 450-C went dead and refused to restart. But after a day of R&R in the closet it was fine. The Active/20 also shut down occasionally, but it would return to normal following a short cool-down period. Take note that these meltdowns occurred during an extended high-output comparison test, not during ordinary day-to-day use.

The dangers associated with high SPL performance are further reduced in active systems because the front channels limit

the dynamics. You won't see it on pieces dominated by low bass (like the “It's Live” cut from my special *Bass Erotica* test CD, where 111.8 dB can be reached). But if a piece has considerable mid- and high-frequency content, the maximum output of the main system will be reached well ahead of the subwoofer limits. For example, on the “boom” scene from *Clear and Present Danger*, the front-channel warning lights flashed, indicating that they were being stressed to their maximum limit well before the subwoofer was ready to quit.

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In sum, the Paradigm Active Speaker system introduces a new level of innovation. It features a space-saving, easy-to-set-up topology with fail-safe protection circuitry. And most importantly, it delivers truly high-end sound quality. In fact, it sets a new standard for spectral uniformity. Throw in top-echelon surround sound performance and excellent dynamics, and I'd say this system is destined to become a legend.



SERVO-15