"... EXTRAORDINARY ...

... effortless ... exceptionally clean ...

... A SERIOUS SUB ..."

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"... effortless power and deep bass reach ... extraordinary extension ... one of the best and most compact subwoofers I've enjoyed ..."

by Andrew Marshall

The new Seismic Series of subwoofers from Paradigm is the result of years of research into high excursion driver technology and a host of other related concerns. It used to be that a sub had to be big to go deep, but that's been less and less the case in recent years, as Sunfire has shown in leading the way in compact models.

The Seismic 12 has "tremendous peak-to-peak cone excursion (over 2 inches in our Seismic 12)", producing "incredibly deep bass response with equally incredible speed and power." An "AVM Airflow Ventilation Cooling System and Huge Heatsink Fins provide forced air cooling during extended cone excursion and convection cooling at all other times", according to the Paradigm web site. The chassis for this heavy driver is die-cast aluminum.

The driver material is "mineral-filled co-polymer polypropylene, with resonance control ribs", and "dual spiders and dual ultra-long-travel suspensions". An identical passive radiator occupies the facing side of the cabinet, of course, without the voice coil and magnet structures.

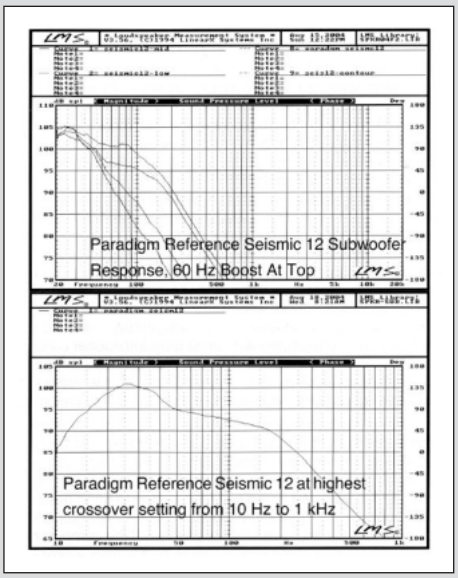
Speaking of which, the 13 Kg (29 lb) magnet uses computer optimized "focused field geometry" designed to "generate an enormous magnetic force field while minimizing inductance distortion."

The "super-efficient switching amplifier" claims over 90% efficiency with an output of 1200 watts rms and 4500 watts peak power. "The advanced output stage increases switching speed and efficiency. Unlike conventional Class-D designs, which use the slow built-in diodes of the output MOSFETs, our Ultra-Class-D™ design steers circulating currents to ultra-fast diodes (ten times faster)."

Inputs include balanced XLR and unbalanced RCA, but not speaker- level inputs or outputs, both of the former optically coupled to the digital amplifier. A trigger input is provided for systems with automated control. Controls are provided for the typical level, crossover setting, and phase. There is also a Bass Contour control to boost levels around a 60-Hz knee up to 6 dB, about which I'll have more to say below.

"… I guarantee it will improve virtually any high end audio or home theatre system, providing deep bass and ambient space."

In our measurements, the Seismic 12 showed extraordinary extension, its highest levels centred around 30 Hz, with response that looked to extend to well below 20; therefore I did a measurement of this sub between 10 and 1000 Hz, as well as the standard 20 Hz-20 kHz. Let's look at that isolated curve, which shows the Seismic at its highest crossover setting. The peak (in our room, which has generally offered quite flat response for subs with our standard measuring position) centres at 25 Hz, which is a good thing for sheer bass impact, up 8 dB over 100 Hz response, but 2 dB higher at a very low 15 Hz, meaning that with this subwoofer, we're into Servo 15 territory at 1/3 the size. In fact, there is appreciable response to 10 Hz, so vinyl lovers may be a little concerned with respect to arm/cartridge resonances causing feedback, something we experienced with an earlier version of the Servo 15. However, I ran into no such problems with the Seismic, so the attenuation below 15 Hz (about 9 dB to 10 Hz) is sufficient to put turntable lovers' minds at rest.



Looking at the 20-20 chart (top), we see the three crossover settings, from bottom, minimum, middle, and highest crossover settings, with the full available 60-Hz boost shown at top, which, oddly enough, is the flattest response for the Seismic 12, +/-3 dB from 20 to 100 Hz.

However, this is a serious sub (at a serious sub price), meant for systems where you can intelligently set a lower-than-usual crossover point to make the subwoofer disappear acoustically, except when reproducing deep bass. My guess is that the 60-Hz boost feature is intended to make the Seismic 12 work with smaller speakers where you do have to cross over nearer 100 Hz.

In listening, I found that the Seismic 12 integrated into my system at a lower 50-60 Hz crossover setting, and had effortless power and deep bass reach with very low harmonic distortion. It's pretty much a given that cheaper subwoofers exhibit quite high distortion, but the Paradigm engineers have managed to minimize this by good driver and passive radiator design, as well as a very acoustically inert enclosure. As you can see from the driver cutaway picture above, the stiff cone, double spider, and powerful magnet structure are major contributors to providing exceptionally clean deep bass. The Paradigm Reference Seismic 12 is one of the best and most compact subwoofers I've enjoyed, and I guarantee it will improve virtually any high end audio or home theatre system, providing deep bass and ambient space.