"... SUPERB ... wonderfully full ... an intense presentation ..."

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LA Audio File

BULLETIN FOR THE AUDIO AND HOME THEATER COMMUNITY

"... tremendous bass output ... excellent bass extension ... low frequency definition was superb ... never seemed to run out of steam ... never sounded fatigued ..."

by Kevin Nakano

After four long years of extensive research and development, Paradigm unveiled their new Seismic™ 12 Subwoofer under their Reference products. The new design comprises a downward firing 12-inch high-excursion polypropylene bass driver fitted within a high-pressure die-cast aluminum chassis. The company uses a special cooling system to dissipate the heat generated by the bass driver. The highly efficient Ultra-Class-D (tm) amplifier design is capable of delivering 1200 Watts RMS (FTC rated) and 4500 Watts of peak power. We've seen a lot of subwoofers over the years, but few designs have impressed us to the degree of this new product. The entire subwoofer is contained within a relatively small 14-inch cube. It's quite deceiving because this subwoofer produces an enormous amount of bass and is claimed to have a low-frequency extension down to 17 Hz at -3dB. Subwoofers this size are usually fairly easy to pick up, but not this one, as it weighs almost 70 pounds. The magnet structure of the bass driver alone weighs 29 pounds.

The exterior of the Seismic™ 12 is rather attractive looking despite the two fully exposed 10″ passive radiators located on opposite sides of the cabinet. The unit is actually small enough to fit under a table with an internal volume of only 1.1 cubic feet. If you're concerned about easily damaging the exposed radiators, don't worry. They are made from some tough material that doesn't appear to be easily damaged. Not to say that anyone should poke at them. The subwoofer cabinet is covered with a black ash finish and is complemented with an attractive gloss black top. The bottom facing driver has a metal grill covering the speaker cone to protect it from potential damage.

BASS DRIVER

The design of the bass driver is truly impressive with a peak-to-peak cone excursion of over 2 inches, enabling the Seismic™ 12 to move large volumes of air, which translates into tremendous bass output. The long excursion is accomplished by using a dual travel suspension (one

progressive and one linear). The proprietary voice coil wire guide allows for unrestricted cone movement that prevents the cone from bottoming out. The large 29 pound magnet structure generates an enormous magnetic flux for the motor assembly. Both sides of the mineral-filled co-polymer polypropylene cone are ribbed to increase stiffness when driven hard. The high-pressure die-cast aluminum chassis minimizes flexing of the structure. The enormous amount of power that can be produced by the amplifier must be properly dissipated from the voice coil to prevent damage. Paradigm accomplishes this by using their proprietary AVS™ (Airflow Ventilation Cooling System) in conjunction with a large heatsink. Heat is transferred to the cooling fins by force when the cone is being driven hard or by convection under less demanding times. Temperature sensors provide feedback to the amplifier to prevent overheating of the driver's voice coil.

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AMPLIFIER

The Seismic™ 12 produces an enormous amount of power (1200 watts RMS, 4500 watts peak) to the massive bass driver. This quantity of power is only possible with the highly efficient (90%) switching design of the Ultra-Class-D™ amplifier. Rather than dissipating an enormous amount of heat from a conventional linear power amplifier, the Seismic™ 12 leverages from high efficiency switching amplifier technology. The design uses an adaptive PWM (Pulse Width Modulation) power processor that is said to minimize distortion and maximize efficiency. No power is wasted using a power transformer with large heatsinks for the output devices, but instead the amplifier's output stage is directly connected to line power through the switching circuits. This amplifier also senses the voice coil temperature to prevent overheating by reducing the output that could potentially damage the driver. In the event the voice coil does short, the protection circuits react within 10 microseconds to prevent frying the internal electronics.

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CONTROL FEATURES

The rear panel of the Seismic™ 12 offers the user a wide variety of options for optimal setup. Powering the subwoofer can be automatic, based on the audio signal sensing circuit or it can be triggered remotely by a receiver or preamplifier. For those who prefer to keep the unit always powered for sonic reasons, that option also exists. Both balanced (XLR) and unbalanced (RCA) inputs are provided and selected with a simple toggle switch. There are four adjustable controls for Level, Upper-Frequency-Cutoff, Phase-Alignment and Bass Contour. The Level control offers additional flexibility to the level adjustment found in most receivers and preamplifiers. The Upper-Frequency-Cutoff control is basically a variable low-pass filter ranging from 35 Hz to 150 Hz. In our setup, we used the highest frequency and let our THX controller and bass management unit take care of the crossover frequencies. There is no bypass for the Upper-Frequency-Cutoff control, so when using an outboard crossover, there will be some interaction with the built-in low-pass filtering. This subwoofer does not have a crossover circuit for your main speakers, so you'll have to use an outboard crossover or rely on your receiver or preamplifier. The Phase-Alignment control adjusts the phase of the subwoofer signal between 0º and 180º to help eliminate low frequency cancellations and modes that sometimes occur in installations due to phasing problems with real-world room acoustics. Finally, the Bass Contour control provides a variable boost of up to a 6 dB at 60 Hz to increase the effective bass impact, particularly in movies. We set this to the minimal position since much of our listening included music. We liked the detachable IEC power plug on the unit as it made it easier to maneuver the heavy subwoofer without tripping over the power cord.

PERFORMANCE

There were a few important aspects of this subwoofer we were particularly interested in hearing. Low frequency capabilities, output level and accuracy were first on our list. The low frequency extension noted in the documentation was impressive, so we put it to the test with some of our favorite material. The second track 'Fire' from DTS Entertainment's *Studio Voodoo* disc fully exploits the capabilities of 5.1 audio by submersing the listener in a surreal blend of sounds that include ethnic tribal vocals and rhythms with crackling bonfires. The recording also includes synthesized sounds with deep bass extension that pushes the capabilities of the subwoofer. We drove the Seismic™ 12 fairly hard and it never seemed to run out of steam. The cone excursion on the passive radiators were extensive at high volumes and yet it never sounded fatigued, nor did we ever encounter problems such as cone slapping. The deep bass extension was very apparent in our room (14´ x 15´ with a vaulted ceiling) at surprisingly high volume levels.

Musically speaking, the Seismic™ 12 sounds wonderfully full, blending seamlessly with our satellites thanks to the Mini Bass Management unit. We are certainly used to excellent bass extension with our reference system that normally includes a large subwoofer, so it was refreshing to hear the powerful capabilities of this smaller

subwoofer in our system. We enjoyed listening to tracks from James Taylor's *Hourglass* in the SACD 5.1 format and the low frequency definition was superb with deep tight bass. Various tracks from the *Steel Pulse Earth Crisis* CD also produced excellent bass extension in our setup. It was amazing hear so much bass from such a relatively small subwoofer and movies also benefited from this high output design.

"… Seismic 12 impressed us from day one with its exceptional build quality, flexible controls and excellent sound quality … easy to integrate into practically any setting … performance will impress home theater enthusiasts and audiophiles alike … even at relatively high volume levels the Seismic™ 12 delivered deep clean bass with the authority one would expect in a high-performance subwoofer category."

We started with the recently released *X-Men2* from 20th Century Fox on the D-VHS D-Theater™ format. This movie gave the Seismic™ 12 a good workout with high-impact action and intense bass. These new 1080i high-definition tapes offer unsurpassed picture quality and with the recent addition of the DTS Digital Surround audio bitstream running at the full 1509 kbps (kilobits per second) on select movies, the DTS 5.1 audio unleashes reference quality surround sound. This and other D-Theater movies we watched were played on our VCR using the toslink output to the preamplifier, where the DTS and Dolby Digital decoding took place. Other D-Theater movies we watched included *The Mummy* (Dolby Digital) and *The Fast and the Furious* (Dolby Digital). The Seismic™ 12 had absolutely no problem keeping up with the aggressive low frequency material found on these fast-paced action movies.

The Normandy Beach invasion from the *Saving Private Ryan* DVD (DTS version) is one of the best tests for surround and subwoofer performance and the Seismic™ 12 delivered the graphic and gripping scenes with an intense presentation, making the horrors of war ever so real. Deep bass from explosions and heavy machinery were very evident in our theater room using this subwoofer. Other samples that we played on the system included a THX demo disc. This DVD had some great material that included a scene from none other than *The Phantom Menace*.

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CONCLUSION

The Paradigm Seismic™ 12 impressed us from day one with its exceptional build quality, flexible controls and excellent sound quality. The compact design makes it easy to integrate into practically any setting and the performance will impress home theater enthusiasts and audiophiles alike. Even at relatively high volume levels the Seismic™ 12 delivered deep clean bass with the authority one would expect in a high performance subwoofer category. We had the unit installed in our setup for almost three months and it never let us down. Achieving a high output subwoofer from a seemingly small cabinet design makes you wonder why anyone would put up with unsightly enclosures. The Seismic™ 12 is designed to impress not only the audiophile and home theater nuts, but those who have to see it in their living space as well.