

“ONE OF THE BEST”

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the audiophile voice

“The Paradigm Reference Servo-15 is one of the best subwoofers I have ever used, whether for music or home theater. It performs as well or better than others costing considerably more and is equipped with enough features to satisfy most users and fit in the requirements of most systems.”

by John Gatski

Paradigm is often referred to as a cost/performance leader in hi-fi speakers. From tower speaker to mini monitors to the acclaimed Active (self-powered) 20s, the products always seem to garner good press from critics and good user response from customers.

You can consider me one of the believers. During the several months that I auditioned the Paradigm Reference Servo-15 subwoofer, it became my main subwoofer for a high-end Dolby Digital surround system. With a 400-watt amp, flat response to 20 Hz at high SPLs, and plenty of other desirable features, it takes a jump of nearly \$800 to find a competing subwoofer that is anything like a match for the Servo-15's audible performance.

In the time that I used it, I found Paradigm's Servo-15 quite capable of producing the low bass for music, any kind of music. A sub relieves the strain on the main speakers, which consequently do their job more cleanly, produce more accurately the under-50-Hz bass contained in music



from instruments such as tympani, organ, bass guitar, synthesizer, etc.

FEATURES

Paradigm Reference Servo-15 is now in its second design. The sealed-cabinet subwoofer features an improved 15-inch, Kevlar-treated paper driver with a bifilar voice coil and an even larger surround than in the first version, helping to increase output while lowering distortion. Peak to peak woofer excursion is said to exceed an inch. The large magnet woofer is said to be more impervious to stray magnetic fields to prevent TV screen distortion. The internal amp is a Class-AB, 400-watt design with a large toroidal transformer and external heat sink.

The closed-servo operates in a system that uses an accelerometer to measure the output of the driver. A comparator circuit

then checks the measured output of the subwoofer versus the input at the amplifier. If excessive distortion is detected (more than 10 percent), the servo corrects for the anomaly by sending a “fix it this way” signal to the amplifier. This can result in a reduction of distortion by as much as 28 dB, and the same technique is used to ensure accuracy of low-frequency extension. The result is consistently clean bass to as low as 14 Hz.

“The first thing I noticed was how seamless and integrated the system was . . . I tried a number of older classical CDs that have always been reliable for plenty of low end — Guess what? The Servo-15 handled the “in the chest” feeling of the cannon shots without any strain at loud levels.”

The Servo 15’s cabinet is made from medium density fiber board (MDF) and is interior-braced to isolate it from audible colorations and resonances. The subwoofer measures 20-inches high by 18-inches wide by 22-inches deep. Optional spikes can be attached to reduce room coupling if necessary. The unit weighs 78 pounds.

The Servo-15 controls are simple: The on/off switch, which includes standby mode that automatically turns on when audio is detected, and a volume control. A fixed 150-Hz crossover is built-in and is not switch defeatable. Thus, this sub cannot be used with an external crossover without keeping the internal one engaged. Normally, I don’t like stacking crossovers, since noise can be increased. In this case, however, Paradigm says that because they designed both the subwoofer and the external crossover, they can achieve “increased accuracy and stability of the servo mechanism with no increase in noise due to cascading.”

My evaluation unit was sent with Paradigm’s top-of-the-line X-30 external crossover now with a third-order slope. A Paradigm spokesman told me that the new design

adds more control of the mid and upper bass. The 18-dB-per-octave crossover is adjustable, with the turnover point ranging from 150 to 35 Hz. It also includes a volume and an absolute-phase control. A 30-foot line-level cable is included. The X-30’s crossover inputs and high-pass outputs are RCA-only with no speaker-level jacks. As with most small outboard audio devices manufactured these days, the X-series uses a “wall-wart” a.c. supply.

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SET UP AND LISTENING

To get optimum performance, subwoofers need careful consideration for placement. Using a handheld meter and a Real Time Analyzer (RTA) can greatly facilitate set up and verify performance beyond just turning the knob until you hear it.

I used a CD test tones, an AudioControl Richter Scale EQ and warble tone generator and an AudioControl R130 RTA to properly set up the sub for my basement room. After some initial measurements with the warble tone generator and a measurement microphone and built-in meter, I found the sub produced the most 20- to 40-Hz bass in the front-left corner of my room so that is where I placed it. However, a room assisted boost at about 40- to 50-Hz required me to notch down the frequency by 4 dB with the subwoofer EQ.

I matched the Paradigm with a set of medium-sized Westlake Lc 8.1 two-driver speakers. They are great smaller audiophile speakers with good bass down to 60 Hz and a nice open, midrange and treble. I used the X-30 to highpass the frequencies from 90 Hz and up to the Westlakes, routing the sub 90 Hz bass to

the Servo-15. The levels were matched by adjusting the volume on the sub so its 40 Hz output matched the 400 Hz output from the Westlake speakers. Using the RTA at the listener position, I measured a fairly flat, smooth response from 20 Hz to 15 kHz with the combined system of Servo-15 and the Westlake Lc 8.1s. Accompanying the speakers and sub were a Legacy amplifier, a 200-watt-per channel Class A/AB design, using minimal negative-feedback with bi-polar output devices. The amp received its signal from an Audio by Van Alstine EC tube and FET hybrid preamp, and the source was a Panasonic A300 DVD player, which has a nice D/A converter for quality audiophile music listening. For interconnects, I used single-conductor, Alpha-Core Goertz 10-gauge speaker cables and MIT interconnects. The speakers were mounted on 23-inch Apollo speaker stands.

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I cranked a lot of music through the system including classical, jazz, pop, and big band anything with some bass muscle in its performance. The first thing I noticed was how seamless and integrated the system was; the sub was an ideal match for the Westlakes and vice versa.

The second observation was that the set up paid off in terms of no localization of the low bass. I had hit the bulls-eye in choosing both the crossover frequency and the placement of the speakers.

I tried a number of older classical CDs that have always been reliable for plenty of low end; these included “The 1812 Overture” by Eric Kunzel and the Cincinnati Pops Orchestra (Telarc) from 1978.

You remember that one. (We used to play the record version at the hi-fi store where I worked during college, blowing out woofers on various speakers as they tried to handle the cannon blasts at loud levels.) Guess what? The Servo-15 handled the “in the chest” feeling of the cannon shots without any strain at loud levels.

“... we who enjoy both worlds can doubly appreciate the Servo-15. ... a viewing and listening session with the DVD version of the movie ‘The Arrival’ was simply amazing. ... the bass sound effect will literally knock down your walls it’s so intense.”

Another Telarc CD from the same era, Frederick Fennel’s Cleveland Symphony performing Handel, Hoist, etc., contains percussion that features some pretty intense bass drums. Again, the Paradigm Servo-15 relayed those hits with quick, clean delivery that were real sounding without any overhang or boom. Man, do I like this subwoofer!

With jazz, big band and pop, the verdict was as consistent. On Cassandra Wilson’s *Blue Light ‘Til Dawn* (Blue Note) the bass lines are big and full without sounding exaggerated. The kick drum on John Scofield’s *Time On My Hands* (Blue Note) is extended through the Paradigm with a sense of really feeling the drum kick you in the chest. The same goes for several of the cuts on the dmp Big Band *Carved In Stone*. Those 20-bit recorded drum whacks never sounded more live. Reproduction of music from other instruments that also benefits from a quality subwoofer like this include pipe organ, cello and synthesizer. So if you like these instruments, try the Servo-15.

Although many audiophiles may look down upon the home theater phenomenon, we who enjoy both worlds can doubly appreciate the Servo-15. On my Dolby Digital reference surround system, a viewing and listening session with the DVD version of the movie *The Arrival* was simply amazing. The scene where a bathtub falls through three floors of

an old hotel, the bass sound effect will literally knock down your walls it’s so intense. For me, that should be the intent of building a great subwoofer: Bass as life-like as possible no matter what the source of the audio is.

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CONCLUSION

The Paradigm Reference Servo-15 is one of the best subwoofers I have ever used, whether for music or home theater. It performs as well or better than others costing considerably more and is equipped with enough features to satisfy most users and fit in the requirements of most systems. Put on a crossover defeat switch for me, and it would be perfect.

Is that an endorsement? Yeah, but one based on experience.

John Gatski is Editor-in-Chief of *Pro Audio Review* magazine, and has way too many audio gadgets for his own good.