

Overture™

RPG is proud to announce Overture™: The Next Generation of Acoustical Shells and Canopies, using RPG's patented Aperiodic Modulation of a Single Optimized Asymmetric Base Shape™

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"While attempting to achieve uniform coverage, most commercial acoustical shells have limited diffusivity. RPG is proud to announce a new generation of rollable and flown acoustical shells, based on RPG's patented Aperiodic Modulation of a Single Asymmetric Base Shape™."

For up to the minute information, we invite you to visit RPG's acclaimed web site: <http://www.rpginc.com>.

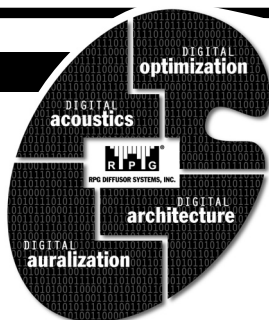
DIFFUSE NEWS



Dr. Peter D'Antonio
President and CEO

Everything Acoustic!

In 1992, RPG developed the Variable Acoustic Modular Performance Shell. Since then, VAMPS® has been successfully used in prestigious performance facilities all across the country. Most recently at the Orpheum Theater, in Phoenix, AZ. As part of RPG's Next Generation effort, we have developed completely new rollable and fully flown acoustical shell towers and canopy systems, called Overture™. The flown system can be rigged, using conventional counter weights or the Vortek® remotely controlled, computerized hoist system. We have also developed new composite, damped materials for the facade, which offer a rigid, damped and lightweight surface. We invite you to inquire about the specification, implementation and performance details and request a free animation of this exciting new product. *This is only the beginning.....*



CONTINUALLY EVOLVING.....

OVERTURE: THE NEXT ACOUSTICAL SHELL

Most commercial acoustical shells are formed from simple, periodic arcs. We have created a white paper available at www.rpginc.com/whitepapers/waveform.pdf, which explains the limitations of this approach. Simply stated, periodicity produces grating lobes, which constrain the scattered energy in a limited number of diffraction directions, regardless of the uniform scattering capabilities of the repeat unit. While attempting to achieve uniform coverage, most commercial acoustical shells have limited diffusivity. RPG is proud to announce a new generation of rollable and flown acoustical shells, based on RPG's patented Aperiodic Modulation of a Single Asymmetric Base Shape™. The new Overture Shell, consisting of overhead canopy elements, rear wall and side towers, is offered in two options: rollable counterweighted towers and flown canopies and a fully rigged and flown system, illustrated in the Figures at the right. The flown system can be rigged with conventional counterweighted systems or remotely controlled, using the Vortek® automated hoist rigging system. The shell facade is fabricated from a new damped, lightweight, wood or fiber-reinforced gypsum composite. Several systems are in production and we look forward to describing this new Performance System to the acoustical community.

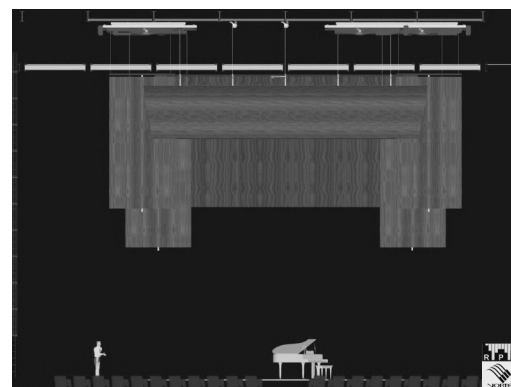


Figure 1. Overture in stored flown position (Two side towers not fully flown for clarity). Canopy, rear wall and side towers store parallel to battens.



Figure 2. Overture in play position. Canopy elements are lowered and tilted. Rear wall is lowered. Side towers are lowered and rotated into position. Access doors are open.

BASS MANAGEMENT

Our shallow (4") Modex™ Plate and Broadband, along with the room dimensional optimization software, Room Sizer™, virtually eliminate modal effects in small rooms. Let's look at the benefits that can be derived for speech intelligibility and music fidelity.

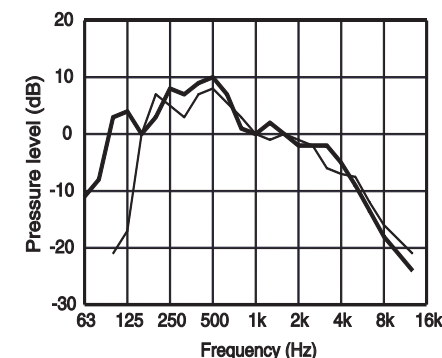


Figure 1. Speech spectrum for a male (dark line) and female (light line) voice.

The spectra for male and female speech are shown in Figure 1. Maximum speech energy is contained in the 250 and 500 Hz octave bands and 75% of speech intelligibility is contributed by the 1 - 4 kHz octaves. It was thought that energy below 125 Hz contributes little to speech intelligibility, so most of the initial effort to improve speech intelligibility focused on the high frequency intelligibility bands. However, there is recent evidence by the Fraunhofer Institute that low frequency reverberant energy, which can be significantly emphasized by room modes, causing amplification of more than 20 dB, tends to alter the timbre of speech and psychoacoustically mask higher frequencies, thereby interfering with intelligibility. The Speech Interference Level, which is the numerical average of the sound pressure levels of the background noise in a room within the 500, 1000, 2000 and 4000 Hz octave bands, ignores the noise levels in the lower octaves. Now that the Modex™ Plate and Broadband are available, recent observations have shown that controlling the octave bands below 500 Hz, has a profound masking effect on speech intelligibility.

Another interesting effect observed when controlling low frequencies is that speech levels tend to drop, as there is less of a reason to

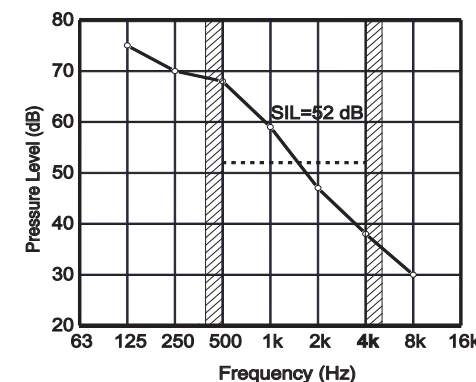


Figure 2. Determining a Speech Interference Level (SIL) from an external noise

raise one's voice to compensate for interference, as described in the Lombard effect. These findings may help reduce the use of artificial noise masking approaches, which can only treat the symptoms and not the cause. Thus, by decreasing low frequency reverberation, we simultaneously lower background noise to reduce the masking of intelligibility and lower conversation loudness levels to improve speech privacy in open space environments.

Controlling low frequency interference can improve the learning process in classrooms and lecture halls. A recent international comparative trial of student performance in reading comprehension, calculus and natural science called PISA (Programme for International Student Assessment) ranked the United States in the middle of the group. While there are many factors contributing to this poor performance, acoustics is clearly one of them. Much effort is now being directed at improving the acoustics in learning environments and we suggest including attention to the Forgotten Octave. In Figure 3, we show the improvement in the reverberation time of a small room in which 23 m² has been applied to the ceiling corners, behind a suspended absorptive ceiling. The benefit to small rooms like recording control rooms (Figure 4), broadcast studios, musical rehearsal rooms, band rooms, choral rooms, orchestra pits and home theaters is clearly obvious, yielding low frequency extension without the modal effects of boominess and excessive decays.

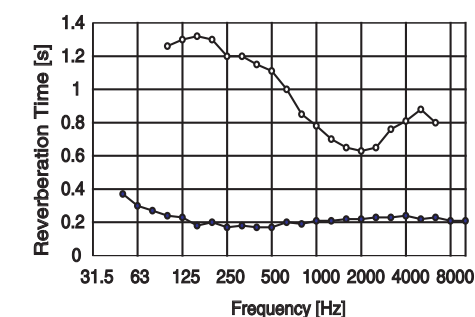


Figure 3. Reverberation time measured in a small room before (open circles) and after (closed circles) application of 23 m² of Modex Plate.

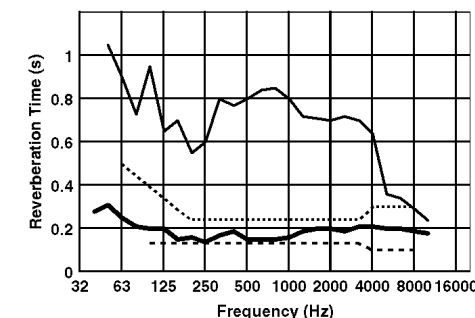


Figure 4. Reverberation time before (thin line) and after (thick line) in a mastering control room. Upper (dots) and lower (dashes) refer to the ITU recommendations.

In addition to small rooms, low frequency absorption can improve large performance auditoria. Traditionally folded velour drapery is used to provide variable acoustics. However, the absorption characteristics of drapery is not ideal, providing more high frequency absorption than low. Modex panels can be attached to rollable tracks and inserted as needed to control reverberation in the frequency band of interest.

In conclusion, the ability to extend effective absorption down into the Forgotten 63 - 125 Hz octave with the Modex™ Plate and Broadband offers a level of control previously not available in small and large rooms.