



Fable Kitchen, Kitsilano, Vancouver, BC.



BY PETER JANIS

There is nothing more frustrating than going to a social event and not being able to hear what is being said over the PA system. More often than not, the PA system or operator is blamed when in fact the problem lies in the room itself.

Most golf and country clubs encompass a number of rooms that are used for various functions. These include the clubhouse, dining room, boardroom, meeting room, a large event space for weddings or tournaments, and an open lobby. These spaces are used by staff and club members on a daily basis or

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rented out to generate revenue. Following typical construction practices, most of these are surrounded by highly reflective hard surfaces such as gypsum-board walls, tiled or hardwood floors, concrete slabs with thin industrial carpet, immense windows for viewing and high ceilings covered with stipple, drywall or hardwood.

When people fill the room, conversation levels rise and sound ricochets off the various hard surfaces, reflecting back into the room, ping-ponging from floor-to-ceiling, wall-to-wall – creating a dense series of echoes called reverberation. The energy has nowhere to go – ultimately elevating the noise level.

The problem is further exacerbated by the background music, noise from the HVAC system, sounds from the TV monitors in the clubhouse and clanging of the dishes in the kitchen. To overcome the problem, club members and guests elevate their voices in an attempt to “out-volume” the ambient noise and the subsequent cacophony self-amplifies to the point where you can no longer sustain a conversation.

We have all been in a restaurant where the noise is so intense, you cannot even converse with the person across the table. Zagat – the restaurant review and rating organization – recently conducted a survey asking patrons about their biggest complaints with restaurants. Not

surprisingly, the number 1 concern was service. Number 2 was noise. Yes, noise rated as a higher irritant than bad food! For most people, going out for dinner is about enjoying a relaxing meal mixed in with good conversation. When confronted with these harsh environments, most patrons simply refuse to return.

When a PA system is brought into play, the sound from the loudspeakers does the exact same thing. It reflects off the hard surfaces, back into the room as there is no place for the energy to dissipate. When you cannot hear what is being said, the natural reaction is to turn up the PA in an effort to compensate. This only escalates the problem. The sound emanating from the loudspeaker disperses in the room, reflecting off nearby surfaces. This in essence creates two sounds – the direct and the reflected one.

As these two sounds arrive at the listener at slightly different times, certain frequencies will collide “in-phase” causing them to increase in amplitude while other frequencies that are “out of phase” will cancel each other out. The effect, known as comb-filtering, is that a flat frequency response now looks like an upside-down comb. For the listener, when certain frequencies or parts of the sound are eliminated, information is lost and comprehension is affected. Intelligibility or our ability to communicate effectively is lost. As we age, our hearing range diminishes and the problem becomes even more acute.

The solution is simple: you need to introduce a release valve for the acoustic energy in the room so that it does not interfere with what is important. The release valve in this case is acoustic treatment in the form of absorptive panels.

Absorptive acoustic panels are typically mounted on available wall space or

suspended from the ceiling and distributed throughout the room. Depending on the size, most rooms can be treated with between 15 percent and 25 percent of the wall surface area or by combining wall treatment with clouds. Placement is not critical as sound echoes everywhere.

Acoustic panels are made from various materials. Care should be taken when selecting a panel as there are many options and issues to contend with. For instance, cheap open cell foam is often used for acoustic treatment in home recording studios but should never be used in commercial spaces. The first problem with foam is that it has a very



Lure Restaurant in the Delta Hotels by Marriott Victoria Ocean Pointe Resort in Victoria, BC.

low density – often as low as 0.5 lbs per cubic-foot, thus is only effective at absorbing high frequency sounds. More to the point, urethane foam is not class-A fire rated thus will pose problems with your insurance company should a fire break out.

A much better solution is high-density 6 lb. per cubic-foot glass wool. These panels absorb sound evenly across the audio spectrum and are very effective in the all-important mid range where the human voice lives. Primacoustic Broadway panels go a step further by coating each surface with micromesh and then resin hardening the edges to fully envelope the panel and prevent

dusting. Absorptive wall panels are typically wrapped in an acoustically transparent polyester tweed fabric and panels are mounted to the wall using Impalers. This makes them as easy to put up as a painting, thus making it possible for golf club maintenance staff to do the installation.

Credible manufacturers will provide independent tests for flame spread and smoke density (ASTM-E84, CAN/UL-S102) which are required to meet your local building code when permanently mounting acoustic panels in your building. Independent acoustic tests should also be studied to ensure the absorption characteristics will in fact

provide effective absorption. The science behind the magic is known as thermodynamics. Just as you can feel the vibrations from the loud bass coming out of your car stereo system, sound vibrations travel through the air and penetrate the acoustic panel causing the minute glass wool fibres inside to vibrate, converting sound energy into heat. These act as a release valve for the excess energy that otherwise has no place to go.

A new generation of panels is now available called Paintables that enable the

panel to be painted on-site to colour-match the room decor or to render the panel invisible. One can also transfer images to these panels using a flatbed “inkjet” printer to turn them into art.

Whether you are treating the noise problems in the dining room or your large event space, the approach is the same. Start by clapping your hands. If you hear a long trail of echo or reverberation, you can be certain that the problem exists. For large event spaces, bringing the reverb time (RT) down below one second is essential for effective communication. This is usually achieved by applying between 15 percent and 20 percent wall surface coverage.

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If available wall space is limited, suspending Cloud Paintables from the ceiling is an alternative. These horizontally “floated panels” work double-duty by absorbing sound energy coming from below while also trapping the energy that reflects off the ceiling. They are suspended using eye-hooks and easy-to-adjust Slipnotä™ aircraft suspension wires. Care should of course be taken to ensure they are not inhibiting fire sprinklers, lighting or HVAC outlets.

Today, boardrooms serve many purposes in addition to a place for private meetings. These are often outfitted with a microphone system for teleconferencing or a video camera for remote video meetings. In all cases, intelligibility is critical. When using a microphone, you are in fact broadcasting. It is well known that radio broadcasters have been treating the walls in their studios with acoustic panels for over 100 years and there is good reason for this: There is no point in transmitting a message if it cannot be clearly understood by the listener.

The problem begins with the microphone. Our auditory system (ears and brain) is a very sophisticated device that enables us to communicate in impossible environments. Imagine going to a concert where the music is blasting at over 100 dB, yet you are able to converse with your friend. The brain combines the use of our ears and the distance of message arriving at each one to localize the sound. It also uses indices such as lip movement and body language to further clarify the message as it separates what is important (the message) versus what we may wish to ignore (the ambient noise). A microphone is not so smart. It simply captures everything that arrives at the diaphragm

and reproduces it without filtering out the bad stuff. The person at the receiving end hears the transmission and is no longer able to discern the good from the bad as it is all coming from a single source loudspeaker. By treating 20 percent to 25 percent of the wall surfaces with acoustic panels, you can reduce the ambient noise in the room and deliver a much clearer message.

If wall space is limited, high-performance 6 lb. glass wool ceiling tiles are available that can be retrofitted into existing T-Bar ceiling systems without the need for special tools. These offer significant sound absorption improvement over typical fibre-board ceiling tiles that are commonly used.

Finally, keeping noise from either escaping or entering your boardroom is easily done using special ceiling tiles called Thundertiles. These unique panels

combine 6 lb. glass wool to absorb sound energy with a heavy gypsum backing board that blocks sound from traveling up through the plenum into adjacent spaces.

By improving the acoustics in your facility, you will create a more comfortable and quiet environment, enhance intelligibility and reduce communication errors between patrons and staff such as making mistakes with orders in the restaurant and bar. It will also enhance the performance of your venue for greater appeal when renting out the facility for various functions. ✳

Peter Janis is the President of Primaacoustic. The company has been involved with acoustics for over 20 years, producing acoustic panels for use in all types of installations. Primaacoustic clients include NBC Olympics, Target, Renault, Cisco Systems, US Armed Forces and Sony among others. For more information visit www.primaacoustic.com.