HARMAN
A SAMSUNG COMPANY

DESIGN GUIDE

LIMITING SOUND TRANSFERENCE IN GUEST ROOMS AND STATEROOMS

AKG AMX BSS CROWN dbx JBL PROFESSIONAL lexicon Martin Soundcraft

THE PERFECT GUEST EXPERIENCE

One of the reasons people love going on vacation is the ability to 'get away" and create lasting memories. Even guests traveling on business want to mitigate the need to be away from home with entertainment and comfort. Hotels and cruise lines cater to this need by providing guests with a memorable and engaging experience.

Elements throughout the hotel or cruise ship come together to deliver this experience, from architectural lighting on building or ship exteriors that create a signature, immersive look to the various vital on-site destinations such as restaurants, casinos, shops, nightlife, and more. Every part of the hotel or ship is designed to be part of this unified experience.

One of the most vital parts of this experience is the hotel guest room or cruise ship stateroom. This is the part of the experience that the guest calls their own for privacy and peace away from the worries of their business trip or the excitement of their travels.

That's why guest rooms and staterooms are all about comfort and elegance. The goal of the guest room or stateroom is to be a home away from home—but better. Every element in the room is selected to be comfortable, simple, and high quality. This includes the furnishings, linens, and even the technology.

One of the most important technology elements in a guest room or stateroom is the television. Providing a quality viewing experience is important to guests, who often like to watch TV in the evenings before bed or during the day on a break from their various activities. With the right television solution, guests can have a premium in-room experience that offers an at-home feel. Televisions like the Samsung 690 Series allow guests to watch movies and TV shows from streaming services, check online services, and push content from their mobile devices to the big screen.

However, the sound portion of the television viewing experience offers a bit of conflict for the guest room or stateroom. Guests expect a quality audio experience as well as a visual one. However, the same technology that provides guests with this excellent audio experience can also hinder the experience for other guests. When something sounds great for the hotel guest, it can often also be heard in surrounding rooms, creating a negative impression on neighboring guests that often ends up reflecting badly upon the hotel or cruise line. In this white paper, we'll look at what causes this issue and ways it can be resolved.

While a building's walls may have some amount of sound absorption, noise from a television can still transfer from one room into neighboring rooms.

THE IMPACT OF SOUND TRANSFERENCE

The source of this issue is sound transference. As we have all observed at one time or another, sound from a source travels in all directions unless something hinders its movement. While a building's walls may have some amount of sound absorption, noise from a television can still transfer from one room into neighboring rooms.

Negative Impacts of Sound Transference

- **Disturbs peace and rest (feels noisy)**
- **Reminds guests of neighbors (feels crowded)**
- **Increases claustrophobia (rooms feel small)**
- **Gives impression of poor construction (thin walls, etc.)**

When this occurs, the most direct impact on neighboring guests is annoyance, as the sound disturbs the privacy and peace the guest room or stateroom was designed to deliver. However, the impact can actually be greater than that, and ultimately reflect badly not just on the neighboring guest causing the noise but on the hotel or cruise line itself.

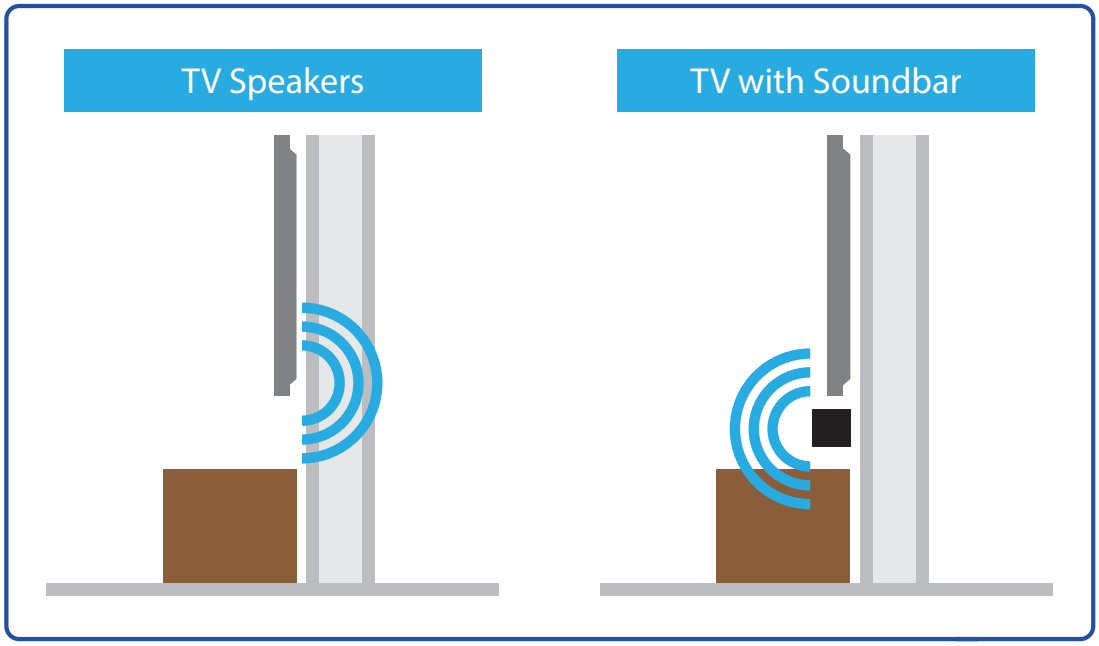
One of the particular goals of a guest room or stateroom is to distract guests from remembering that they are sharing close quarters with hundreds of other people. With elegant and purposeful design, guests don't think about this. However, when noise from neighbors intrudes and reminds guests where they are, the room can end up feeling crowded and disturbing rather than relaxing.

Thankfully, there are ways of designing guest room audio to address this issue and minimize the impact. The heart of this solution is by using a commercial soundbar such as the JBL Pro SoundBar. Designed specifically for hospitality applications, this commercial soundbar has a range of robust features that can help limit sound transference and improve the experience both for the guests listening to the soundbar and those in surrounding rooms as well.

THE DIRECTIONALITY OF SOUND

I mentioned earlier that sound travels in all directions. While this is true in the abstract, the majority of sound from a speaker is output in the direction the speaker faces. Someone standing behind a speaker can hear some sound directly from the speaker (how much will depend on how the specific speaker is designed), much of the sound the listener will hear is sound reverberating off other surfaces.

It is this difference between direct and indirect sound that plays an important part in sound transference. In most televisions, the speakers are typically located on the bottom or back of the device. Modern television designs typically favor small bezels (the hardware surrounding the actual screen), which forces the speakers onto the back of the television, "bouncing" the sound off the back wall before reaching the listener in front. However, in hospitality applications, this can cause significant issues. While some sound will bounce off the hard surface and reverberate back into the room, some of the sound will transfer through the wall and disturb neighbors.



It's important to remember that direct sound is typically louder and clearer than reverberated sound. In a guest room or stateroom environment, this means the loudest portion of the sound is focused directly on the wall. The sound that is reverberated back to the television viewer is quieter and less clear. Because of this, the guest often turns the volume up so they can hear what is being said more clearly. This increases the volume of the sound being directed into the other room, further exacerbating the issue.

With a soundbar like the JBL Pro SoundBar, speakers are front facing, pointed toward the listener. Because the soundbar features legendary JBL sound directly output from the speaker, they are able to hear what is being said more clearly, even at lower volume levels. This results in more sound directed at the listener as opposed to other rooms, and because they can hear more clearly, viewers set the volume to lower levels as well.

MANAGING LOW FREQUENCIES

We stated before that sound is capable of transferring through solid surfaces like walls. However, some frequencies react to those solid surfaces differently than others. In particular, low frequencies output by subwoofers more easily travel through walls and disturb other guests than higher frequencies. This is why guests often hear neighboring sound as a muffled, headache-inducing thumping.

Generally speaking, subwoofers are a vital part of great sound. They have the particular physical mechanics to deliver the thumping impact that often defines a great audio experience. That's why they are so popular in consumer soundbars. In a home setting, having that all-important rumble is a great benefit.

Unfortunately, in hospitality situations, it's often other guests who must endure that rumble, and so having a subwoofer in these situations aren't often ideal. This isn't to mention the fact that subwoofers also cause installation issues, as staff struggle to find a way to suitably position the subwoofer and run the cabling.

However, it's also possible to use full-frequency speakers such as those in the JBL Pro SoundBar. The speakers in the Pro SoundBar are capable of generating frequencies down to 56 Hz. This ensures that the sound is sufficiently full but without the low end disturbance (or setup complexity) of consumer soundbars with separate subwoofers.

Different rooms are built with different materials and construction methods, meaning the amount of sound transference varies depending on the particular situation.

LIMITING MAXIMUM VOLUME

Sometimes, no matter what you do, guests will turn up the volume. Unruly guests are certainly a problem, but things get worse when there is not a lot of sound dampening between rooms. Different rooms are built with different materials and construction methods, meaning the amount of sound transference varies depending on the particular situation. As such, there is no single definition of "too loud."

To provide hoteliers more control over volume, the JBL Pro SoundBar includes volume limiting capabilities. The Pro SoundBar's four-position "volume" switch has settings for "Low," "Medium," "High," and "Max." This allows hotels and cruise lines to set the maximum output of the soundbar to a level that is appropriate for the particular application. To prevent guests from tampering with the setting, the volume switch can be covered by an included security plate.

HOW GUESTS CONTROL VOLUME

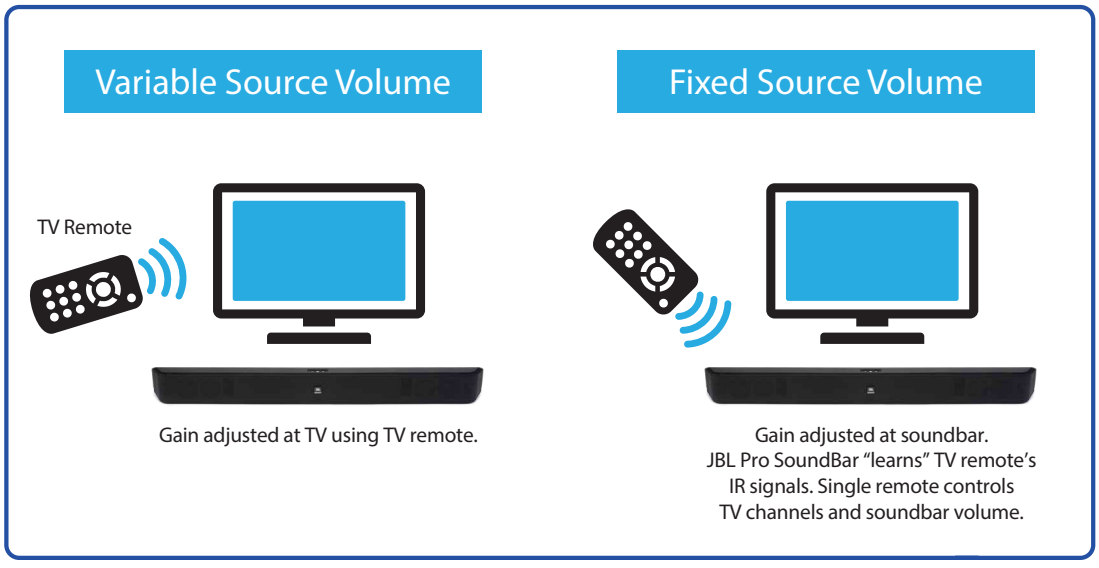
Once you have managed sound transference, you still need to give your guests a means of controlling the volume on the soundbar. With a second device in the solution, controlling volume can seem a bit daunting. Fortunately, it's not as complicated as it sounds.

There are typically two different ways you can control volume in situations where you have a television and a soundbar, and which method you choose depends on the way the television is designed. In some situations, the volume is controlled at the television (meaning it is the audio processor in the television that adjusts the volume). The signal is then sent to the soundbar, which has volume at a fixed level (the soundbar doesn't adjust volume up and down).

When guests turn the volume up on the TV, it goes up on the soundbar, but it is the processor in the television that is doing the adjustment. This approach is fairly straightforward from a user perspective, because guests operate their television remote as normal to adjust volume, but have the added benefit of improved sound through the soundbar.

The second way that volume control can be configured with a soundbar is essentially the opposite approach to the one just described. The signal sent from the TV is fixed (the processor in the television doesn't adjust volume up or down). The soundbar receives the signal, and then volume adjustments are made by the processor in the soundbar.

Volume control in this situation is often more complicated, because there are now two devices to control (one for channels and one for volume). Typically, controlling devices in this situation requires programming a universal remote to control both devices. However, the the JBL Pro SoundBar, offers IR learning on the soundbar. This allows the soundbar to "learn" the IR pulse from the TV manufacturer's remote. This way, when the guest presses the volume up or down button on the TV manufacturer's remote, the volume on the soundbar adjusts, making the final implementation seamless.



As previously stated, which volume control method you choose often depends on the television manufacturer. Different TVs support different approaches, so you will need to be sure the soundbar you choose is capable of supporting the volume control method from the television. If the television only outputs a fixed-volume signal and the soundbar does not have volume control (meaning it expects a variable signal from the TV), then you will not be able to control volume using the soundbar. Similarly, if the signal from the television is variable and the soundbar is also variable, you run into situations where you have two devices that can turn volume up and down. This often leads to a lot of guest confusion.

This is why your television selection and soundbar selection needs to be aligned. Fortunately, the JBL Pro SoundBar is able to support both fixed and variable signals. This allows it to work with most television manufacturers. The setting is adjustable by a "Source Volume" switch, which, like the volume limiting knob, can be hidden behind the security plate to prevent tampering.

The all-in-one design of the JBL Pro SoundBar provides full-range sound without the need for a separate subwoofer, providing excellent quality audio while minimizing sound transfer to neighboring rooms.

INTRODUCING THE JBL® PRO SOUNDBAR

The JBL Pro SoundBar is a cost-effective commercial-grade active soundbar designed specifically for use in hotel guestrooms and cruise ship staterooms, as well as corporate meeting spaces and other commercial applications. With an optimized feature set targeting the unique requirements of these applications, the Pro SoundBar reduces the cost and complexity found in consumer-grade soundbars while providing excellent sound quality, security, and reliability.

The all-in-one design of the Pro SoundBar provides full-range sound without the need for a separate subwoofer, providing excellent quality audio while minimizing sound transfer to neighboring rooms. For further volume management, the Pro SoundBar offers a 4-position volume limiting switch to control the maximum volume output of the soundbar. The Pro SoundBar supports both fixed and variable source volume for maximum TV compatibility. Controls for the volume switch and source volume selection can be covered by a lockout plate to prevent tampering by anyone other than the support staff.

Front-Facing Speakers
Improved clarity over internal television speakers, which are typically rear or downward facing.

Auto-Standby
Saves energy when not in use.

Premium Materials
No cloth is used on the speaker grill, making it easier to clean and maintain and less prone to damage.

Clarity at Any Level
Better clarity at low levels allows users to hear without increasing volume to intrusive levels.

Volume Limiting
Control maximum volume output, limiting support calls and complaints

Security Lockout Plate
Prevents guests from tampering with advanced settings meant only for technical AV staff.

SPECIFICATIONS

System:

Frequency Response (±3 dB):	56 Hz – 20 kHz
Crossover:	4300 Hz, 1st order LF, 1st order HF
Maximum Peak SPL (0 dBV):	90 dB*
Maximum Peak SPL (0 dBV):	94 dB* (Both Channels Driven)
Input Connectors:	RCA
Input Sensitivity (-10 dBV):	85 dB / 1 m
HF Driver Size:	19 mm (0.75 in) Soft Dome Tweeter
LF Driver Size:	51 mm (2.0 in) Low Frequency Loudspeaker
Power Amp:	20 W Per Channel, Class D
Enclosure Material:	Injection-Molded ABS
Enclosure Finish:	Black
Dimensions (H x W x D):	90 x 900 x 65 mm (3.54 x 35.4 x 2.55 in)
Weight:	1.8 kg (4.0 lbs)

**Full bandwidth pink noise measured C-Weighted*

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