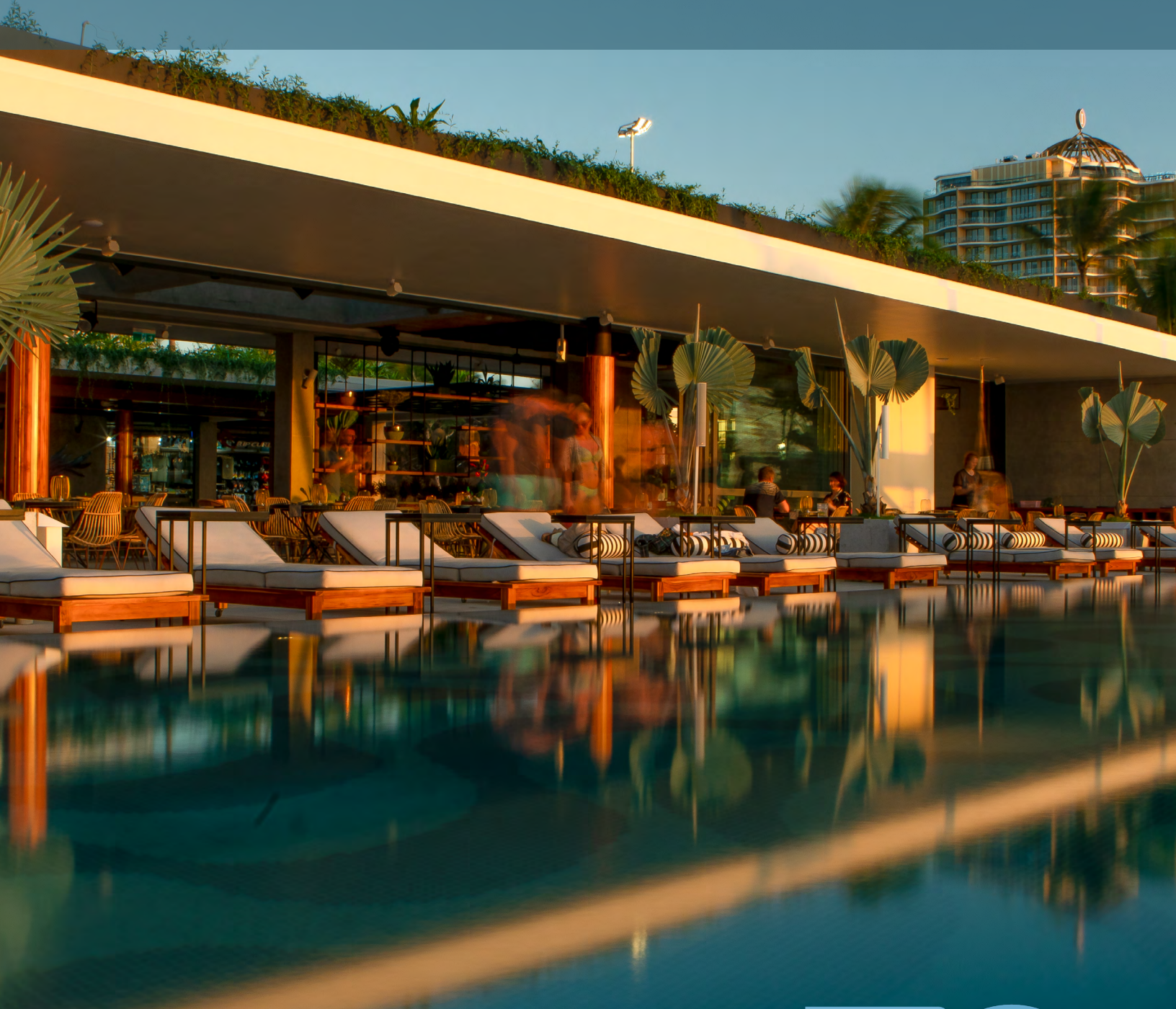


CASE STUDY

Vietnam Beach Club Installation

2019



Zero-Ohm Systems
Transforming the laws of sound





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About Zero-Ohm

The Zero-Ohm Multispeaker system is a passive device that interconnects between any amplifier and multiple loudspeakers without worrying about amplifier speaker loads, impedance and extremely long cables runs. This device allows users to connect 20, 30, 40 or more speakers in parallel to one amplifier without the use of transformers.

Up until now, the ability to connect multiple speakers in parallel was confronted by the issue of operating the amplifier at a safe impedance. Although there are amplifiers that operate at 4 ohms and 2 ohms safely, any effort to drive them below the rated resistance load led to device failure.

The system is ideal for major audio applications: arenas and stadiums, amusement parks, bars, cinemas and theatres, reception halls, airports, cruise ships, hotels, outdoor malls, restaurants, water parks and more.



Project Overview

The Sailing Club on Phu Quoc island is a picturesque destination on the southwest coast of Vietnam. In realizing this project, the owners gave a clear mandate to all parties involved to create a superior ambiance and to prioritize the overall client experience. This attention to detail is perfectly exemplified in the choices made for the audio infrastructure.

VG Pro contracted system designer and engineer, Rudolfs Busmanis, to design and oversee the installation of the Sailing Club PQ sound system to meet these high standards. An integral part of the final solution was the integration of Zero-Ohm Systems technology. In fact, VG Pro decided to use the MS-4R, which is a 4000 watt per channel unit, to provide sound reinforcement in the outdoor lawn and



dining area as well as the sea front terrace for the restaurant. Harmonic Design loudspeakers were selected for their high output sound, precise directivity, sonic quality and sound integrity. In addition, their small form factor fit the vision set forth by the architect and the interior designer since the visual aesthetics of the venue were prioritized.

Problem Statement: Examining New Possibilities

The mission to optimize all elements of the project led to a very important question that was central to the project. ***How can we maximize the sound quality while respecting budget constraints and delivering a superior experience for the patrons of the Sailing Club PQ?*** To answer this question, we looked beyond the standard traditional approaches:

- 1) a limited number of speakers connected in parallel requiring more amplifiers or
- 2) the use of 100-volt (70V) transformers

It is well documented that utilizing 100V (70V) lines, compared to LowZ, significantly narrows the frequency spectrum reproduced at the low and high frequencies. That is where using the Zero-Ohm technology really factors in. We turned to a solution that was not possible in the past. Zero-Ohm allows the installer to connect 30-40 speakers or more in parallel without sound degrading transformers. With the implementation of the MS-4R in the signal chain we essentially achieved the best of both worlds. Standard laws





of physics would dictate that the ability to connect speakers in this fashion is not feasible. However, Zero-Ohm's patented technology permitted us to achieve a desirable result. NST audio DSP was also deployed to meet the processing and zoning needs required by the client.

As for the speakers, Harmonic Design provides installers with the option to order 100V versions; however, in this case, C1CX loudspeakers were selected to play optimally in LowZ to highlight their sonic quality. PowerSoft amplifiers were used to run the set-up. Multiple remote zone volume controls were requested with the option to host club nights on the dancefloor, when needed, with the ability to attenuate all other zones to match the dancefloor output. Since the main scope was to design a sound system for a restaurant we had to consider the number of C1CX loudspeakers as well as the placement and distance between each one. This was done to achieve a full frequency coverage dispersion pattern at a height of 120-140cm from the floor (average ear height for a seated person). At that height, the loudspeakers blanket the selected

seated areas with full frequency spectrum (with a supplemental low-end speaker deployment implemented in a discrete manner).

Given its unique ability, the MS-4R was deployed to meet and enhance the demanding needs of the lounge area; it now has the ability to flawlessly transition and drive higher volumes when the dancefloor expands.

The system was aligned to ensure that the sound waves travel efficiently from the DJ's position. Of course, when deploying a long mono line, and considering optimal listener position, time alignment must be considered. The alignment chosen for the Zero-Ohm lines matched the irregular venue and asymmetrical design. As a result the club/restaurant/lounge has received exuberant praise for sound propagation in the venue. In fact, the installers and designers have been complimented repeatedly upon





subsequent visits by management, staff and patrons familiar with the set-up.

- Zero-Ohm was inserted in between two outputs of a PowerSoft OttoCanali 8k4 amplifier and two lines of LowZ speakers C1CX from Harmonic Design.
- Zero-Ohm Ch A: 7x C1CX (40w 8-Ohm) speakers with a total line length of about 35m run on a 2 core 1.5²mm copper speaker cable.
- Zero-Ohm Ch B: 13x C1CX (40w 8-Ohm) speakers with a total line length of about 80m run on a 2 core 1.5²mm copper speaker cable.

Plug N'Play Efficiency

The main reason to use the Zero-Ohm MS-4R in this specific project was to save on amplifier and DSP channels. This made the project execution more cost effective and helped assure the winning bid by meeting the clients budget while exceeding expectations in terms of sonic quality. In addition, the convenience and simplicity afforded by the Zero-Ohm set-up enabled the installers to avoid utilizing amplifiers in multiple locations in the venue therefore decreasing the cost of cable infrastructure and maintenance costs for the client.



Final Word from the Sound Designer/Engineer

"There is no distinguishable auditory difference between the speakers run in parallel lines routed through the Zero-Ohm unit despite the fact that the line lengths vary greatly (35m vs. 80m) and the amount of LowZ speakers is not balanced (13 vs. 7). Moreover, it exceeds all standard assumptions and practices. By my estimate, the cost

savings to the client for the purchase and installation of the lines in question, utilizing Zero-Ohm's MS-4R unit, saved them approximately 7% which is a substantial amount for a project of this scale." (Rudolfs Busmanis)



Benefits

Zero-Ohm is a **passive unit**; it was applied to achieve:

- Cost effectiveness
- Less amplifiers (less need for maintenance)
- Eliminates the need for traditional 100V lines that can compromise the audio signal (especially at low and high frequencies)
- Less wiring and labor costs for cable infrastructure installation
- Amplifier rack location can be chosen without the standard limits for speaker signal, cable length, and cable gauge



Conclusions

After completing the installation while using Zero-Ohm in the restaurant/lounge venue:

- Reduction in amplifier channels (if no individual processing is required)
- Less amplifiers (and channels) leads to reduced electricity consumption, therefore, the client saves money in long-term operating costs while improving their ecological footprint
- Fewer amplifiers means less powered audio equipment, therefore, less chance of electronic equipment failure (longer life span)
- Superior sonic signal compared to the use of a sound degrading 100v line



Transforming the laws of sound