Outdoor Music System

When Quantity Does Matter

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In this report:

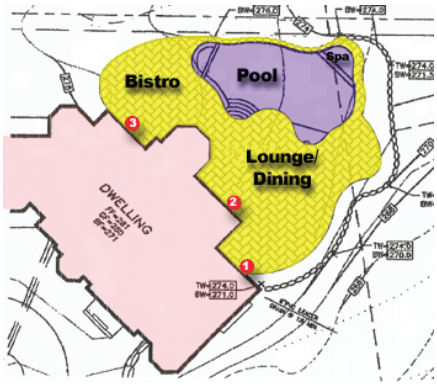
Overview

There is no mistaking the difference between awesome outdoor music systems and the occasional pair of speakers installed in a few locations. The acoustics of outdoor spaces differ greatly from indoor spaces. Outdoor spaces typically have few or no boundaries; therefore, they require a greater number of speakers to provide proper sound coverage.

Think about walking around the pool and outdoor dining areas of a luxury resort. The music is always with you, and the volume is at a reasonable level. Therefore, designing an optimum outdoor sound system requires more thought than just placing a few speakers around your backyard. The proper design begins with a clear understanding of the project plans and optimal use of the space.

Considerations

In this case study, we have a backyard layout that consists of a large patio with a bistro area to the left and a large dining and lounge chair area to the right. The pool is at the back of the patio with a spa in the upper right.



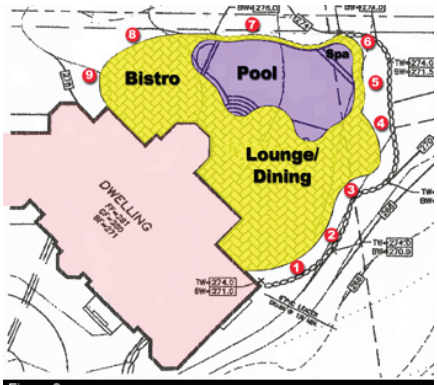


Figure 2

Example 1:

In the first example (Figure 1), there are three speakers mounted to the back of the house. If these speakers are to provide coverage for the patio and pool area, the volume level will have to be fairly high, especially to reach the pool. As you sit or walk near the loudspeakers, the volume will be much too loud. Of course, lowering the volume will make it difficult to hear the music from the pool area and the upper right lounge chair areas. While this design is cost effective, it is not the ideal approach.

Example 2:

In the second example (Figure 2), the planters at the perimeter of the area were utilized to mount the speakers at ground level. A total of nine speakers, three times as many as were used in Example 1, optimize this area's design. The speakers have been strategically placed in various locations throughout the backyard to optimally disperse the music.

Two speakers are located in the bistro area, three speakers service the lounge and dining areas, and four speakers surround the pool area with one of the pool area speakers located behind the spa. Additionally, three volume controls work to coordinate the appropriate volume level in each area. The spa is noisy while the jets are running, so the volume in this area must be slightly higher than in the other areas. The lounge and bistro areas can utilize their own volume controls for just the right sound level at times when the spa is in use and when it is not. This example requires more speakers however the result is the perfect volume in all areas of the yard.

Design Stage

The areas of this backyard were previously designed, and the addition of outdoor speakers had to be retrofitted to serve the existing space. To plan an optimal sound system for this area, many factors were taken into consideration. The layout of the backyard and the various areas within it, as well as the size of the yard itself, were all contributing factors to the selected design. The number of speakers was decided upon as a result of the size of the backyard and the size and number of areas to be serviced. Since there are three virtually separate areas to the layout of this yard, it was decided to use three different volume controls so that each area can have the appropriate volume level depending upon various circumstances.

Placement of the speakers around the perimeter of the spaces created a "surround-sound" level and quality of sound distribution. Focus on each area as a separate space with its own volume control helped to maximize the performance of the sound system. Spatial differences and a range of existing sound levels resulted in varying needs for each space. The aforementioned volume level in the spa area required separate volume control.

Equipment

- Sonance SoundHenge Redux
  Finish: Sandstone
  3 were used in the pool area,
  1 used in the bistro area, and 2 in the dining area
- 14-gauge wire 30 pieces used
- Conduit (PVC piping) to protect wires underground
- Standard amplifier for connection of speakers

SoundHenge Redux speakers were selected for installation in this particular backyard for the simple fact that they are designed to look like rocks and they become camouflaged within the existing landscape design. While there are many choices that can be made when selecting outdoor speakers, this product line provided both aesthetics and sound quality. Placement within the established landscaping creates aesthetic appeal while providing an optimal sound system.

Two types of speakers were used: wide coverage, which are single point stereo speakers that contain single left and right speakers within one rock enclosure, and sub, which is a "system" including a shelf-top amplifier and a rock enclosure containing a subwoofer.

Sources

There are a variety of sources that can be used for outdoor audio. Typically, outdoor audio is driven from inside the home from an existing stereo system or through a control system which is sourced directly from its residence in a rack. The difference between the two options is a Zone 2 system, the more simplistic of the two, consists of one large zone for outdoor audio. This option would generally be sourced through the existing stereo system and provides limited options for sound control. (In Figure 2, all speakers would be turned on at the same time) A control system consists of three separate zones that can all be controlled separately.

A satellite box or cable box is an ideal source because both music and television broadcasts can be accessed and the audio distributed to your outdoor sound system. XM Radio, Sirius, DirecTV, Pandora, and Rhapsody are also options that offer excellent sound quality and can be streamed to your outdoor audio system. An iPod can also be connected to your outdoor audio system and is an ideal way to bring your favorite playlists directly to your backyard.

Control

iPhone

Waterproof Handheld Remote

Dependent upon the type of sourcing system that is chosen, control can be performed in various ways. With a Zone 2 system, the start-up and volume is mainly controlled with one remote that operates the entire zone so that the same music can be heard, at the same volume, in all areas of the outdoor system. With an entire control system, each area can be operated with a separate remote control through which different music and volume levels can be experienced in each of the different zones. For instance, suppose you are floating in the pool and you decide you would like to change the CD or music station. With a wireless remote control you could change the station and/or volume in the pool area, or in any other area that you chose to. Additionally, if you wanted to enjoy your spa late in the evening, the ideal would be to have the option to control your music so that it is only turned on in the pool/spa area instead of the entire yard.

The ideal way to control outdoor audio is with a waterproof remote control. A waterproof remote eliminates the potential problems that can be caused if an ordinary remote control were left outside and it happened to rain.

Wiring

When wiring the speakers to connect to the amplifier, each speaker requires a different process. The wide coverage speaker have 4 conductors each which require a wire for connection to the amplifier. The sub speaker require 2 wires each.

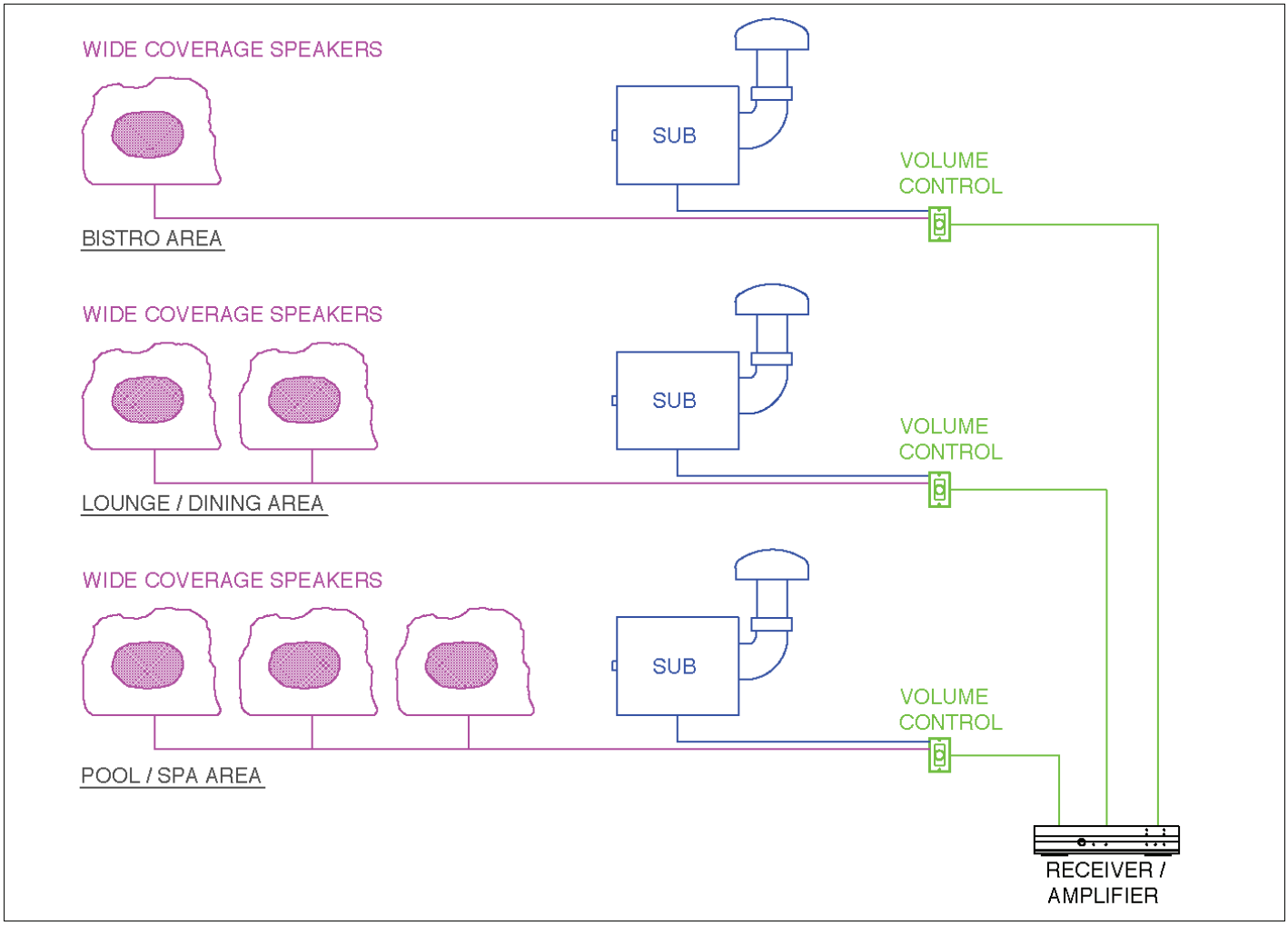
The connection sequence is as follows: Receiver (any type) -> Zone 2 Output -> Amplifier -> Subwoofer/Speaker.

Once simple wire connections are made, installation can take place.

Termination of the wire at the speaker should include protection from the elements – all exposed copper should be protected by either wrapping with black electrical tape or using a heat-shrinking wrap. This will protect them from water seepage.

While the traditional 8Ohm system works well in a small to average sized backyard, the ultimate experience can be achieved through the use of a 70 volt system. The 70 volt system is ideal for the larger backyard or commercial applications. An example of this type of system would be a Disney-like experience.

Wiring



Basic Outdoor Wiring Diagram

Installation Process & Pointers

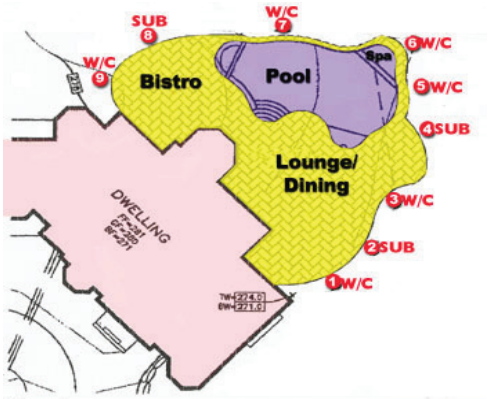


Figure 3

Once wiring is connected to the amplifiers, it can be run from the receiver and amplifier (inside the house) to the backyard for connection to the speakers. Therefore, different lengths of wire are necessary for each speaker due to the variations in proximity of each speaker to the house.

The two types of speakers should be interspersed within each space for optimal performance. In this particular backyard (Figure 3), one wide coverage speaker was used at each end of the coverage area with sub speaker interspersed to provide additional bass. In the noisy and spacious pool and spa area, wide coverage speaker were used alone.

Wiring should run from the amplifier in the most direct route to the outdoor speakers. It is advisable to avoid power cables because this will cause interference within the speaker and a buzzing noise may become present. If it is impossible to avoid power cables, the best way to circumvent this obstacle is to run the wire in a 90 degree angle across the power cable. It is best not to run these wires parallel to each other.

To hide the wiring as it runs across the yard to the speakers, a shallow channel can be dug in the surface. Conduit can be used to protect the wires underground and to contribute to concealing them.

Once the wires reach the speakers, connections can be made to the speakers.

Equipment Performance

SoundHenge Redux Enclosure

Dimensions (WxHxD) 18 x 14 x 14
Finish Granite or sandstone

SoundHenge Redux rock enclosures are designed to house any of the Mariner 50-series and 60-series outdoor speakers while complementing landscape designs. SoundHenge Redux offers a uniform size rock enclosure that blends into the background. Each enclosure is weather resistant and is designed and textured for a natural look. Available in granite or sandstone finish. Made with lighter and more durable construction with a resin enclosure and stainless steel and aluminum hardware. The frequency provided by these speakers disperses fairly quickly; therefore these are ideally used in an important area, such as a patio, where they can be both heard and felt by the listener.

Features

- Built with UV-, chip- and weather-resistant materials to withstand demanding outdoor environments
- Grille design allows for optimum speaker performance while maintaining a natural appearance
- Upgraded mounting system allows for easy installation of Mariner 50-series and 60-series speakers
- Resin enclosure with stainless steel and aluminum hardware ensure protection of enclosed speaker.

Recommendations

While these speakers are designed to withstand the outdoor elements, it is ideal to bring them indoors during the winter in cold climates. To terminate the wire where it connects with the speaker, a banana plug can be used to fill the void and to protect the wire throughout the winter.

Additionally, it may be tempting to place the speakers in a position where they are facing upwards in an attempt to direct the sound towards its listeners however this is not an optimal position to keep them in. The bottom of the speakers should be placed level on the ground to prevent water from collecting on the drivers inside. Water will cause damage to the speaker if it is permitted to collect and remain inside the speaker. Contrary to what one may believe, the speakers will provide optimal sound quality even when they are not directly facing their audience.

Conclusion

The end result is a complete, aesthetically pleasing appearance combined with ideal sound quality and distribution within the specified areas for an integrated backyard space. The last thing left to do is to make the margaritas, sit back, and listen to the music.

About EDG

For more than 24 years, EDG has been a one-stop provider of home theater and technology consulting services, engineering and implementation. We deliver solutions to clients making critical decisions on home theater construction, and design innovative solutions incorporating the latest software and control system technology. EDG provides expertise in all aspects of residential and corporate environments, including whole-house audio/video systems, home automation, home theater acoustics, media room design, lighting control systems, HVAC, telecommunications and motorized control of shades, lifts, gates, and other mechanical devices.

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