Installing an Outdoor Sound System

12-volt marine audio equipment is a perfect match for a deck

by Jason Russell

Your clients have just spent $75,000 to build the deck of their dreams, and to celebrate, are grilling up the perfect meal on their new outdoor kitchen. The table is set and their guests are salivating, but something is missing—music. So, do they drag out a boom box and plug it in to supply the audio, or do they have a high-quality built-in audio system to enjoy? If you're a smart deck builder, you will have integrated this upgrade into the deck's design from the very beginning.

Start With Car Audio Components

Several years ago, I owned a small car-audio shop, and I've always been amazed at how advanced the technology is, especially when compared with components intended for home use.

There are several reasons why car audio components are ideal for decks. First and foremost, most quality manufacturers offer marine-grade speakers, amplifiers, and source units that

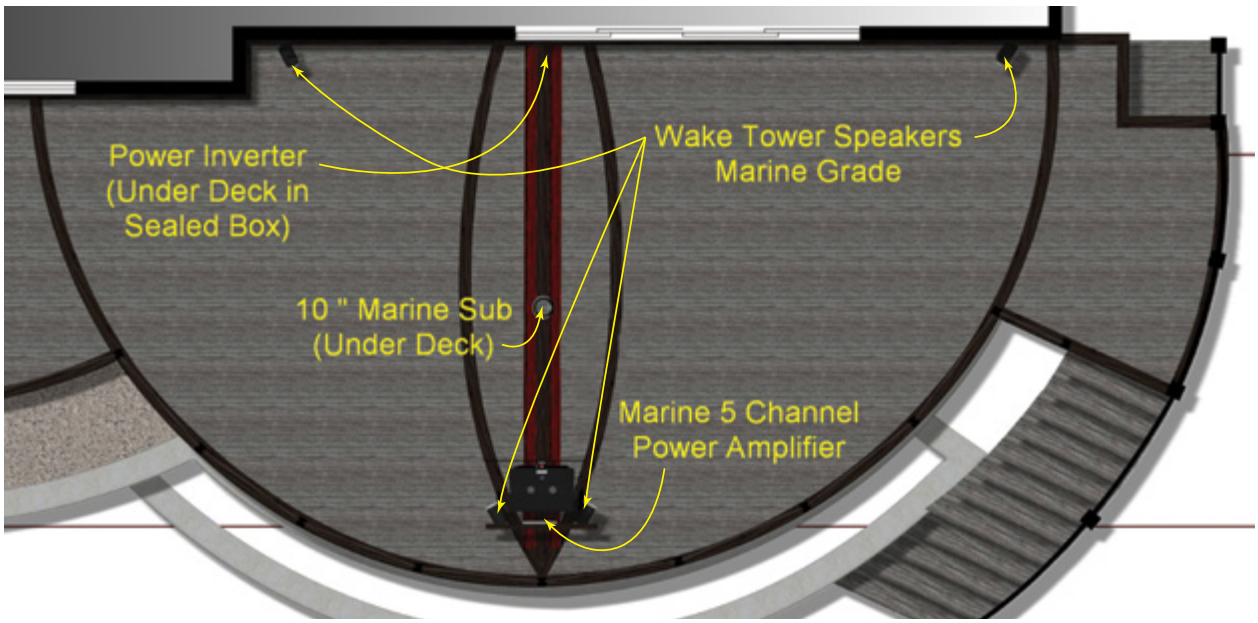

Figure 1. The author marks the location of speakers and electronic components on a scaled drawing of the deck to determine the gauge and quantity of wiring needed, and the type, size, and placement of the subwoofer enclosure.

are designed to take the abuse of a wet environment, and still perform well year after year.

Another compelling reason is that because car audio is based on a low-voltage platform, a licensed electrician isn't required to do the wiring and provide power to the system. That said, I would recommend having a qualified technician do the installation if you are not savvy about consumer electronics or don't have a clear understanding of how to make positive and negative low-voltage connections in a wet outdoor environment.

Finally, the low-voltage car-audio market is very competitive. Dollar for dollar, you can obtain a better-quality sound system—and yet have more of the coolest features integrated right into your electronics than you could with most other types of audio systems.

Design

I like to start with a sketch of the layout that includes details about what the components and speakers will be, and where they'll be located (**Figure 1**). When designing a system, my main goal is for the listener to be able hear the words or feel the mid-range, highs, and lows as the musician originally intended. If the sound quality is bad, music becomes fatiguing background noise.

Music also can be irritating to neighbors, especially if the sound isn't evenly distributed to every corner of the deck. In this case, the tendency is to turn the volume up to have the sound to travel to those far-off corners. This leaves guests who are closest to the speakers unable to communicate with the people nearest them without raising their voices, which creates more noise. So the volume is turned up again, making matters even worse.

My approach is to distribute clear, high-quality sound evenly throughout the entire space. That way, everyone can hear the music while the overall volume stays at a reasonable level. To do this, I incorporate spaces within the deck design to locate components, speakers, and subwoofer enclosures.

Components

While marine equipment is weather-resistant, most of it is not waterproof. So I usually isolate the power supply, amplifier, and Bluetooth receiver in a

weather-resistant location, either in an enclosure or in a dry area. But I also like to give my clients the option of showcasing their components, in which case I help them choose equipment that comes with waterproof covers and can be installed in a fully exposed location. I particularly enjoy working with clients who give me artistic freedom to focus on the visual aspect of the installation.

There are a number of quality marine audio components and speakers to choose from, but I now exclusively use Rockford Fosgate equipment for all of my outdoor installations. Not only is it well-built to strict tolerances, but it also looks great. On a recent project, I installed Rockford Fosgate's RFBTRCA Bluetooth receiver connected directly to a Rockford Fosgate Prime M600-5 5-channel amplifier, both of which have coated circuit boards to prevent corrosion (**Figure 2**). A smartphone or other wireless device can be used as a music source for the system, because the receiver has a Bluetooth adapter. A device can also be connected to the receiver using a standard ⅛-inch audio cable.

A 110-volt-AC-to-12-volt-DC power converter is needed to power the system. To match the DC power supply to the components being used, I find the maximum current amperage draw needed by the amplifier (typically specified in the manufacturer's printed or online documentation), and use that to size the converter. For example, this amplifier was rated at 70 amp max at 13.8V, and 35-amp average, so I chose a Progressive Dynamics PD9270 70-amp converter/charger to power the system. You can contact the amplifier manufacturer if you are not sure of how to determine the power requirements.

I also installed four 6-inch two-way Rockford Fosgate M262B-Wake M2 wakeboard-tower marine speakers (**Figure 3**). I like to be creative when installing speakers. I mounted these in the eaves, but sometimes I'll mount them in a hollow post and drill hole patterns that allow the sound to escape. Because the grilles of these speakers look so good, I often leave them exposed.

I concealed the Rockford Fosgate PM210S4B 10-inch marine subwoofer in its own waterproof enclosure, centrally located under a bench (**Figure 4**). To help calculate the proper amount of

Figure 2. At the heart of the sound system is a Rockford Fosgate Prime M600 marine-grade 5-channel amplifier, paired with a matching Bluetooth receiver. Since the components operate on 12-volt DC power rather than 110-volt house current, a converter/charger sized to match the amp is also required to power the system.

Figure 3. The author installed speakers designed for mounting on a wakeboard boat tower. The speakers are rated for full exposure to weather, with high-density polyethylene enclosures, and are equipped with adjustable aluminum hardware so they can be clamped to round rails.

Figure 4. The subwoofer is mounted in a waterproof enclosure underneath the deck. The author built the enclosure with Nylosheet, a waterproof material made of fiberglass and recyled carpet (nyloboard.com).

Figure 5. To make weatherproof electrical connections, the author joins marine-quality cable with heat-shrink butt connectors (top left). After making the connection (top right), he then protects the joint with another length of heat-shrink tubing (above).

air space required in the enclosure for optimum performance, I used the manufacturer's sizing app, called Woofer BoxWizard (rockfordfosgate.com/rftech/box_wizard.asp), which I downloaded to my smartphone.

Installation

For best sound quality and reliable performance, I use quality 12- to 16-gauge direct-burial low-voltage wire or marine-speaker wire. Sizing information can be found on the Rockford Fosgate website.

I make connections using heat-shrink butt connectors. For a bulletproof connection, I then apply more heat-shrink over the joint (**Figure 5**). All you'll need to add to your tool kit are a good set of wire strippers and crimpers, and a heat gun to shrink down the connections and tubing.

Cost

The total installed cost for the installation shown in this article was about $4,000, which included about $2,500 in components, connectors, and wiring. ❖

Jason Russell specializes in custom heat modification of PVC decking and railing products, automation, and custom audio installation, and owns Dr. Decks, in Tacoma, Wash. therebelcarpenter.com