

# Marine Stereo 101



## It's Not a Car Stereo Painted White!

Over the past few years there has been an explosion of interest in high-end audio electronics by the boating enthusiast, and for good reason. Whether you're just cruising or laid-back, beached or docked, a great sound system has proven to be a worthwhile investment.

Of course, having a stereo in a boat is nothing new, but until fairly recently the only products available were car stereo products. But boaters today desire more performance in their boats, and audio entertainment is no exception. High-power, multi-amp and multi-speaker systems are now the norm and even come as standard equipment on

some boat models.


A true "marine" high-end audio system takes more than just using car stereo products. Performance boaters demand the same level of performance from their audio system as they do from their engine/drive system, and car stereo products just won't cut it any longer.

To learn more about how a high-end marine audio system is achieved, we consulted with Carmen Porco, president of Access Technologies (805/545-8295, [www.access-tech.net](http://www.access-tech.net)), one of the leaders in high-performance marine audio systems.

"We have been building the Access Technologies Advanced Marine Audio products since

1998 and previously for other brands since 1990. In those years we have learned an awful lot about what it takes to manufacture quality marine audio products. The fact is that anything not specifically designed for marine use will fail prematurely or will not perform up to expectations. At Access Technologies we took the holistic approach to designing our products. Everything is designed from the ground up to perform beyond our customers' expectations. We use high-tech material such as our titanium-plated cones, which have a vacuum-deposited micro-thin coating of titanium that not only adds to the speaker's sonic performance but is inherently

impervious to environmental damage, and of course it looks great. Our standards are set as high or higher than any boat manufacturer's, so our products will perform beyond most expectations and will continue for many, many seasons. It's what makes us comfortable standing behind our slogan, 'It's not car stereo product painted white.'

"Boaters of all types—recreational, performance and yachters—all demand the highest quality, and we deliver it to them. We get a lot of e-mail on product and system design, so I thought I would share with you of the most commonly asked questions and our answers." 

# Commonly Asked Questions



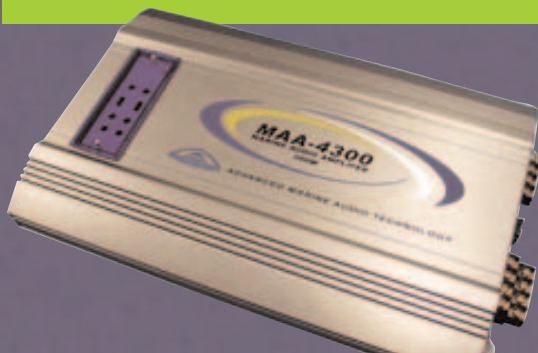
**Q:** Will car stereo speakers work in my boat?

**A:** The short answer is yes, but only for a short period. No matter whether your boating is lake or offshore, the marine environment is very tough. The exposure to moisture in the air, water spray, salt-water spray and direct sunlight can effect severe damage to speakers that are not designed to take it. Most car stereo speakers are designed for the average environmental exposure as seen by a car. Moisture and water spray are never planned for, so they aren't designed to handle it. Even exposure to sunlight is not as extreme as in a boat. The combination of these environmental exposures will cause most car stereo speakers to fail from any one or more of these common ailments: warped or water-logged cones, rusted and corroded frames and magnet assemblies, dried-out, sun-damaged cones, and (although not directly affecting the performance of the speaker, but still important) the yellowing or discoloring of the speaker's exposed surfaces.

**Q:** What is the difference between car stereo speakers and marine speakers?

**A:** In addition to what was mentioned above, there is a fundamental difference in the performance environment. By that I mean that the automotive environment is an enclosed interior space. For a boat, that space is wide open. A typical car stereo speaker is designed to produce a given amount of music volume in the enclosed space of a car. A marine speaker (and by this I mean a real marine speaker) would be designed to produce a given amount of music volume in the open space of a boat. Example: In an automotive environment, the user sets the volume to a certain level of comfort. The speaker is expected to produce that level with acceptable levels of distortion. To do this, a certain amount of amplifier power is required. Now take that same product and install it in the open deck of a boat. To produce that same comfortable listening level, more than double the amount of amplifier power could be required. If your tastes run toward gentle background music, no problem. But if high volume is what you're after, then this additional volume demand will cause the speakers to begin to distort dramatically, which will damage the speaker. If the speakers are powered by larger power amplifiers, then the speaker will be damaged by more power than it was designed to handle.

A properly designed marine speaker takes into account the open environment. The speaker would be designed to produce higher music volume at lower distortion levels and also be able to handle more power input. And of course it will also be designed to resist the damaging effects of the marine environment.





**Q:** Are all marine speakers created the same?

**A:** Definitely not! Until recently most marine speaker manufacturers were primarily manufacturers of car stereo products. Generally speaking, their marine product offerings were basically either existing car stereo designs that were barely altered for marine, or worse, just car stereo products painted white. However, that is now changing and some of these manufacturers are investing in good designs that are able to handle the extremes of the marine environment. Some, such as Access Technologies, are designed to exceed the standards of most boat manufacturers for environmental damage and also produce very high levels of sonic quality in the open areas of boats.

**Q:** What about amplifiers: will a car stereo amplifier work?

**A:** What we have discussed concerning speakers also applies to amplifiers. Except for audio equipment used in the salons of yachts, marine amplifiers are only similar to car stereo amplifiers in that they both run off of +12Vdc. provided by the battery and charging system.

Again, we go back to the extremes of the marine environment: moisture, heat and vibration, or in the case of performance boats, extreme shock load. All take a huge toll even on the best car stereo amplifiers. Each requires a specific solution.

Moisture is a major cause of failure in all electronics used in the marine environment. The lead/tin solder joints and copper circuit traces are very susceptible to corrosion, which leads to shorted or lost connections. Most quality marine electronics protect the circuit board and components by coating them with an epoxy material commonly called "conformal coating." This is not done with car stereo products.

In addition to the electrical parts and connections, moisture can corrode the metal surfaces, which can cause premature failures. Quality marine electronics will use nonferrous metals such as stainless steel or aluminum with a non-corrosive plating wherever possible. Although most car stereo amplifiers use plated aluminum for the chassis, the internal metal parts are usually just plain steel.

Last is shock or vibration. There is a big difference here. The automotive environment is mostly full of vibrations but very little in shock. In the boating world, especially the performance boating world, large shock force is the norm.

Since car stereo amplifiers are not designed for large amounts of shock force, they then tend to fail due to parts that literally fall off. A good example is the power transfer used to produce the power. These are usually the heaviest components on the circuit board. With most car stereo amplifiers (even the big, high-performance ones), the transformer is only secured by the solder joints of the wire leads to the circuit board. On a quality marine amplifier, the transformer and any other heavy component would be securely mounted to the circuit board.

While you wouldn't necessarily mount a car stereo amplifier or other electronics where it could possibly be subject to water spray, a good marine amplifier would be able to handle this. Not necessarily waterproof, good chassis sealing is essentially to protect the internal components. However, most installations require the amplifier to be mounted in an out-of-the-way compartment. Sometimes there may not be adequate ventilation. Good marine amplifiers are able to handle this where car stereo amplifiers would fail.

Access Technologies has addressed each of the areas in the design of its marine amplifiers by using conformal coatings on both sides of the circuit boards and all component parts, nonferrous metals only, stainless steel or plated aluminum construction, heavy component parts that are bolted or epoxied to the circuit board and a fully gasketed chassis that (while not waterproof) can take a splash-down without failing.



## Q: Can I use a car stereo radio?

### A:

A high-quality marine radio would be best. However, there are only a few true marine radios on the market that have a fully waterproof front panel and chassis. And since the radio is usually mounted on the dash for convenience, let's face it—it's going to get wet! Not only that, but there can be instruments or other items mounted above the radio location that could possibly leak water on top of the radio chassis. If you can find a good marine radio with the features you want, great—but if not, you can get by with a car stereo radio. One feature that is mandatory is a good anti-skip system for the CD player. Without this feature, the CD will skip whenever the boat hits even a little chop. In addition, a good radio cover is necessary to keep the water away from the front panel and chassis.

At Access Technologies, we developed the first patented marine radio covers. Our MRCV-300 cover not only has a splash-resistant rollback door to protect the front panel, but it also has a top shield that will prevent water from entering the top of the chassis, and it also has a back-strap feature to hold the radio up in the back. In all, it provides the best water protection and secure mounting of any cover on the market.

Even with a radio cover, do not expect a car stereo radio to last many seasons, depending on use and care given, since car stereo radios are just not designed to handle the environment. You can expect to replace it rather soon.



## Q: How much power and how many speakers do I need for my boat?

### A:

We do not have enough space to go into the system design of all boat configurations. So let's set aside the yachts with large salons, since these usually use 115-Vac systems. Assuming a boat with fore and aft open decks and a small cabin or cutty, the following system configurations may be helpful.

First we can look at the open deck areas. With a small open-bow deck and a larger open main deck, you have what are essentially two listening zones. Each zone should be addressed separately.

The bow deck area is smaller and so may need only one to two pairs of speakers. Generally a good-quality marine 6.5-inch coaxial speaker would do very well. An option would be what is termed "separates" or "component" speakers. A subwoofer could also be added for more bass presence. The power required will be partially dependent on the speakers selected. High-power-handling speakers generally like more power. A good rule of thumb is 25 to 50 watts per channel—more if your tastes run toward louder music.

For the main deck, minimum would be two pairs of the same 6.5-inch coaxial or component speakers. One set should be mounted near the driver's and passenger seating area and the other toward the aft seating area. Depending on the size of the boat, you may need to add additional pairs. In either case a subwoofer is a good idea. It will supply the bulk of the bass notes and relieve some of the power demands from the coaxial speakers. More speakers means more sound, so if your tastes are for loads of tunes, then plan for more speakers. Power requirements are similar to the foredeck system, but in this case more power is helpful. You may need to plan on more than one amplifier as the system gets larger.

A note of caution: unless you are very comfortable installing electronics and tuning an audio system, it is best to leave the installation to professionals. Boats are expensive investments and are usually covered by insurance. U.S. Coast Guard regulations should be followed. Most insurance companies will not cover damage caused by products that are not Coast Guard approved. Primarily, this concerns electronics installed in the enclosed engine bay. All items installed in the engine bay should be Coast Guard approved. That fancy gold-plated car stereo fuse block may add "bling" to your engine bay, but if it fails and causes an engine fire, will your insurance pay? Maybe not. Leave the installation to a qualified marine electronics professional.

