How I built my first Tower Speaker Syste

by: KG

Home

Features pg

Email - KG

"For as long as there have been groups of people, there have been super loud stereos blaring at them"!!!

Boating, and more specifically Wakeboarding is no exception to this rule. It seems that Wakeboading and Music go hand-in-hand. Lately it seems (read the last few years) boat owners have been mixing the two on a level that no one has ever seen before. Since the advent of the Tower for Wakeboarding, people have begun to build themselves a Tower Speaker System. I too got caught up in that maley and built a tower speaker system. I'll admit, if it weren't for the 3 and 1/2 years I spent in the autosound competition circles of IASCA and USAC, I might not have pulled this off as well as I did, winging it my first time around.

Going at a project like this is no easy task. You have to submit additional money over the cost of boats, boards, bindings, and other equipment, let alone the vast amounts of fuel that most of us week-end-warriers burn rippin it up to impress, and a good chunk of your personal time putting it all together! This situation though is usually a win-win, you get the tunes, and a sense of accomplishment, plus something loud to brag about!

So what does one have to do to put such a system together? Well below I have written up my personal experiences building my first Tower System. I have also incluede a few related links to some of the many products that are available to consumers, should you want to take a 'less-messy' route, or do not posess the skills, time or tools to create such a system.

My personal experience was pretty simple. I had a boat, lots of audio equipment lying around, and some motivation to hear some tunes whilst I wakeboard!!!

Here is the Skinny:

I set out to build my Tower system, for two reasons, one, I love music and wanted to be able to enjoy it while wakeboarding. Two, to make a statement. That statement is being really loud and obnoxious on the channel that me and my friends wakeboard in. Ok yea so not everyone was to thrilled about #2, but I still raise the hairs on the back of my neck when I power it up and let the tunes fly!!!

I took several approaches with this project. The first and foremost was "execution". One of the many valuble lessons that I learned in the Car Audio competition lanes was that it is not always in the equipment, but in how you make

it all work together. The speakers I choose for the tower were JL Audio TR650-CX's. These are the middle-of-the-road line for JL. I made the choice based on the environment they would be in. I board 99% of the time in Salt water. I couldn't justify the higher priced JL speakers in salt water, and the possibility of salt spray, and general abuse they would receive, (already dropped the box (speaker face down) on the dock.....ScArY!!! The cones are Polypropylene, the ONLY material I would go with in the salt environment that I am in. The speakers also have Butyl rubber surrounds which hold up better than the foam surrounds in water type environments.

I drive the tower system with 40-50watts per channel each depending on the amperage given from the battery/alt. I had a Coustic Amp lying around so I decided to put it to use. This is not the best amp on the market, but surely not a beginner grade either. It produces clean wattage, low distortion, and is easy to setup. Other features that helped the decision were its built in X-over and ability to run 40watts RMS at 12.5 volts.

Building the box…

I made the decision to go with a full box that would hang from the underside of the tower based on information I got from Joe Boyle. (I got inspiration from his system and he helped jump start the plans by providing some insight as to his design, and why he did what he did.) By building a box, I was able to give the speakers the correct amount of air-space based on Manufacturers specs. This is a crucial step to getting the speaker to perform the way they were designed by the manufacturer, especially in the open air environment that they would be residing in.

I started by buying the speakers and measuring their size. This gave me a minimum width & height. Next I measured the Tower to size it all up. I then began to draw out the box on paper till I got an acceptable size, and would fit the Tower, but not look to out of place.

For material, I used 3/4" MDF. This is a inexpensive and very dense wood material. Dense building material is crucial to help reduce enclosure vibrations. The more an enclosure vibrates, the more it will degrade the sound of the speaker, and overall performance. Next I added Dynamat sound-deadening type material to the interior of the box to help further reduce vibrations on the walls of the enclosure. To help further tune the box, I added Poly-fill (the stuff you fill pillows with) as well as standing waves in the interior of the box, but also to give the speaker the illusion that it is in a bigger box (a trick I learned in the Car-Audio Competition Circles, and a trick they use very often in Sub-Woofer boxes, but works equally well for smaller speakers). The poly-fill also helps the speaker play lower freq's without sacrificing sound quality.

One very important part of box construction, whether it be for sub-woofers or smaller speakers, is that you make sure that the box/enclosure is fully and properly sealed. In my situation, I

was building a sealed enclosure. Sealed enclosures help to control cone movement, reducing distortion, and provides (in my opinion) a cleaner sound from nearly any speaker. I additionally sealed the outside of the box with Fiberglass resin. MDF will absorb some resin and strengthen the box while providing a waterproof exterior for protection. Lastly I sanded and painted the box using an exterior enamel spray paint.

It should be mentioned that this construction material is heavy! My speaker box weighs in about 20-25 lbs w/speakers.

I initially wanted to build a common enclosure for all 4 speakers, a technique they call “Acoustic Coupling”. Acoustic Coupling in a nutshell is when you place 2 or more speakers in a common chamber on the same face/side. When the music plays, the speakers essentially connect together and become one regardless of minor signal and wattage differences.

The problem I faced with one chamber for all 4 speakers was that I planned to setup the tower system to play in stereo, not mono. To correct the situation and gain that “Acoutic Coupling”, I decided to place a divider inside the enclosure to create two different chambers. This allowed the two left speakers play left signals, and opposite for the right. Minor issues resolved and I was moving on!

Wiring the Box…

Ahhh, one of the jobs I love and hate most about audio systems, but it is the most crucial part.

For any system that I have ever done, size 12ga. wire for speakers up to 8” is the only thing that will do. Subs always get 8ga. Power and ground as needed based on wattage. These are just some general rules that I follow.

The wires for the box are connected internally w/clamps and caulked (using a latex tube caulk) as they leave the box. I measured the distance from the top of the tower to where I would pass the wires thru the hull to the amp. I decided not to run the wires thru the tower tubes. This was mainly for maintenance purposes. I would then have multiple plugs (hull & box) when I only needed one for the hull. Remember I board in salt, and it eats even the highest grade connector plugs. The length of the wires coming out of the box is about 12 ft.

I ran a plug for the tower thru the factory vent tube just under the windshield on the pass side. I just twist the wires (in wire loom) down b/t the tower bars and connect to the plug. I tricked a few people by spray-painting the loom to match the tower, so it doesn't stand out like a sore thumb. I knew that I wanted to be able to take the speaker box down for safety and security.

Attaching the box to the tower…

Now that I had it all together, I need to figure out a way to attach it to the tower. My goal again was to be able to add and remove the box whenever I wanted, for weather and security. I decided that 1" web/straps with a ratchet, similar to the ones that someone would use to tie down an ATV or Motorcycle to a trailer.

The connector bars on the tower, where I was going to attach the box flush against were slightly inset, and didn't allow the box to fit flush to the underside. To remedy the problem, I cut some ¾" plastic I had to create a washer. The plastic was ¾" thick, and worked great for created a spacer. I attached the plastic blocks to line-up with the connector bars of the tower and provide a solid mounting point, and used a few "right-angle" connectors to help get the box get alignment the next time I attached it to the tower.

I fully trust this attachment meathod b/c the 1" straps are rated to 500lbs each. I can do pull-ups or hang like a monkey directly off of the box, and not worry that it will crack and fall. Another plus to this is that the strap is wrapping around the entire box, and both Tower tubes.

The boat system & Tower amp…

My boats current system is all Clarion. CD player, Amp, Speakers and Sub. A 4 channel Clarion amp powers the boat. 25x4 uses two channels for the boat speakers and 2 channels bridged for the sub. The sub is a Clarion 10" while the others are clarion 6.5" co-ax's (4), two in the bow, and two in the back. It uses the Clarion Marine HU, which works well, considering it uses the lower end components from Clarion.

I divided the HU fade to run the boat off the front, and the tower off the back (joe Boyle trick I believe). I adjust more toward the back when boarding to keep the volume down for the passengers. The tower projects just enough to catch the sound, but not have it over-power your conversations in the rear section of the boat. Again for the Tower speakers, I used a Coustic amp. It is 40x4, and is setup in stereo mode. Each speaker of the tower has a dedicated channel, all crossed over using the amp's internal x-over @ about 70hz.

I ran an additional power wire (4ga.) from my second battery straight to the amp. I used the 12V ignition trip from the Clarion amp, as well as the ground to finalize the wiring. I ran another set of RCA's from the HU to the Coustic, and mounted the amp next to the Clarion, in the storage compartment on the pass side of the boat. This is a protected area and still gets good ventilation.

The Result…

The box screams, my buddy Ryan was a good 200yards away the day I tested it and he heard it loud and clear! While boarding, you can hear everything pretty well, and it broadcasts and echo's off the houses that border the channel we ride in.

All in all it works great, and I highly ENCOURAGE anyone willing to spend the time to set yourself up with a Tower system, you won't believe you lived without one for so long.

Additional notes on the project:

- Take your time! This will come together, but be patient, and do it right from the beginning.
- Get the right materials first. You don't want to have to go back and do it all over again because you skimped on something!
- Have fun, that is what the sport is all about. If someone asked you about your setup, tell them, don't be shy, it will only make you look funny.

Hope you enjoyed this, and sorry for the delay…

Take care,
KG

Links

www.Ryno-gear.com Tower Speaker Mounting accessories!

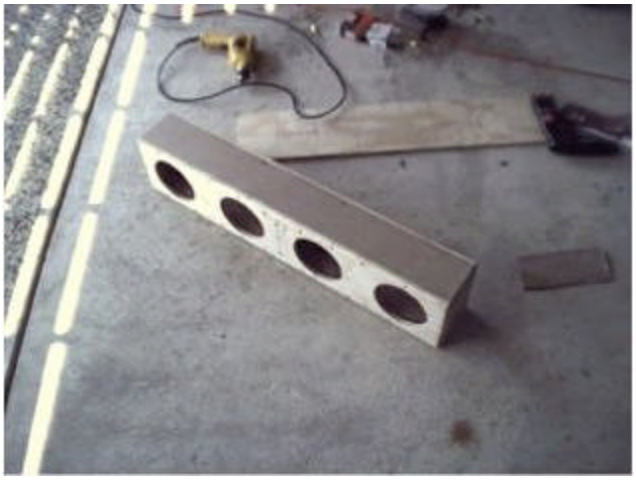
http://www.fluidconcepts.net/Pages/home.htm - Single Speaker enclosures

http://www.wetboxtowers.com/ - Box-Type enclosures (all fiberglass)

www.radioshack.com - electrical and accessories

www.boatersworld.com - electrical, fiberglass & other boating supplies

Photos:



Click the ones below to enlarge...