

COMPETITION CORNER

By Dave MacKinnon

Ground Control

It's the time of year when people are hard at work redesigning and rebuilding their systems to get ready for the 2002 competition season. Even I'm still working on the plans for a new system in my WRX.

Every system, be it SPL or SQ, should be based upon a first-rate electrical system. No electronic component is going to function to its maximum potential if it's not fed the power it wants and the most critical components, when it comes to feeding power, are your amplifiers.

In the 14 or so years I've been in the mobile electronics industry, I have seen all types of installs. The ones that scare me the most aren't the ones constructed from inexpensive equipment (hey, we all work on different budgets), but rather, I cringe when I see installs that are poorly or dangerously installed.

So let's take a good look at powering up your high-end audio system. For the purpose of this article, we are going to look at a basic system.

Let's start with the 'battery.' This will be the heart of your system, so make sure it is in great condition. If there are any signs that the battery is not perfect, then a replacement is in order. Something like an Optima Red-Top starter battery is a perfect choice for an audio system, since it can provide large amounts of current and is quite stable. The battery terminals you use will depend on the size of wire you're running through the car. My opinion is that you can never have wire that is too big since there is almost always more signal loss associated with smaller gauge wire.

The plan for my car is to run a pair of 0-awg cables from the battery to the trunk, with the power cable going through an ANL fuse holder, not a circuit breaker. For battery terminals, I will choose something with a 0-awg location, and perhaps a 4-awg and two 8-awg connectors to allow me to re-feed the factory electrical connections (starter, alternator and so on). In large systems, I usually replace the factory conductors with whatever brand of wire I'm using. This usually means an

upgrade in size as well, perhaps from 10-awg to 8-awg, 8-awg to 6 or 4-awg and so on.

Grounding is by far the most important aspect of installing any audio system. Electrons flow from the negative terminal, through the chassis, through the ground cable, into the product and back to the battery through a power cable to the positive terminal. So, if you have a bad ground you are severely limiting the current flow capabilities of your system.

Now, this next part is going to blow people's minds, but I swear it works. I always run a ground from the negative terminal of the battery to the back of the car. This is why I said I was going to use a pair of 0-awg cables. Trust me, you will get a better, more reliable, noise-free connection this way when compared to running wires through the half spot-welded, half glued-together, electrically noisy unibody chassis. If you're feeling adventurous (or don't trust me), you can connect the 'end' of the ground to the chassis in the trunk using a cable from your ground distribution block.

Power to all the other equipment in the system should be fed from the power cables in the trunk. Head unit power and ignition (switched through a relay), processors and so forth should all come from the trunk, through properly rated fuses in a distribution block.

Now, I know there are some people who are just dying to fight about my above grounding system, but before you run to your computer to start writing e-mails, don't bother. I have something for you folks as well.

If you are determined to ground your expensive audio system to the flimsy sheet metal in the trunk of your car, here are the steps. Forget the seat-belt or strut tower bolts. You are going to need some tools for this. A drill and sharp drill bit, a few nuts and bolts with lock washers, a tube of silicone, some Loctite 243 thread-locker and a handful of crimp-on 8 or 10-awg large ring terminals. Okay, got everything ready?

Select the largest possible portion of metal you can find. The trunk floor is

likely going to be the best bet. Choose a location that isn't exposed to too much traffic or abuse. Sand through all the paint and primer in an area of three square inches, perhaps a bit longer than wider – say one inch by three inches. Now drill three or four equally spaced holes in the clean area. Take the ground cable (let's say it's 4-awg) and strip off two inches of insulation. Spread the copper into three or four bundles and twist them together. Now, crimp a ring terminal on the end of each bundle. Using the nuts and bolts, secure each of the connectors to the chassis and make sure they are tight and secure using the Loctite.

Once you have ensured each connection is tight (wiggle it with your fingers), smother the whole mess in a thin coating of silicone to prevent rust. Seal off the bottom in the same fashion so that water and salt can't attack it from beneath. Voila! The almost perfect ground! But believe me, the two-wire method is a great deal better. **P**

