

## **Setting up Amplifier gain in an auto-sound system**

In general for best signal to noise ratio the head unit should output the maximum amplitude that the amp or amps can handle before clipping on the lowest level recorded or broadcast signal you may encounter.

This can also minimize overdriving the speakers by setting the amplifiers gain(s) to a point where the head unit volume control reaches full rotation (or maximum position) first. There will be some program sources that are louder than others so the setting can never be perfect for all sources.

Play a CD that is recorded at the lowest level to which you will ever listen. If the radio is attenuated compared to the CD player or perhaps an external input and you want to play the radio or that input at the maximum volume the speakers can handle, then some CD's may overdrive the speakers if the volume control is set too high.

Turn the amps all the way down at their inputs and turn the head unit all the way up. Start the player with the selected CD. Turn up the amps to medium volume watching that they are balancing well. The crossovers should be preset to around 100 Hz high and low pass to the front amp and sub amp respectively.

Reduce the front volume to about half – if the sound is staying clean and clear from half to full setting you are fine. Now adjust the crossover points and levels on the amps to tune in the total system sound. Raise and lower the crossovers and relative levels until the sound is perfect – change the sub amp phase also as required – some have two phase choices others are continuously variable. Doing this with a test disc and instruments and then fine-tuning by ear using music is best.

Once the system sounds good it's time to optimize the gain. Activate that lowest level source material and take it as high as the front speakers or sub will tolerate. Turn up the head unit gradually.

Now turn the amps up (together if possible) until either the front speakers overload when you have the head unit all the way up – signaled by a "boomy" quality usually in the door speaker or until you are satisfied that this is all the volume you want.

This is the lowest amp setting combination that will give you the volume level you want with the weakest possible source. This is done with the system crossovers set-up for optimum balance.

Exercise caution with high-level sources as these can overdrive the system. If you install better speakers and have adequately powerful amps the new maximum volume can be higher.