

## Bass tuning tips:

Bass tuning the installed CDT SystemPreface:

The car is the container for the system. Check out the vehicle. Is it a large Van or Limo or a small sports car. Needless to say the bigger the vehicle the more amplifier power and speaker volume you will want. In the drivers seat how does the windshield wrap around. Is it a smooth curve with a strong slant back or an older vehicle with a small upright windshield. The front glass in our system controls and distributes the image through the use of a pair of pillar mounted front tweeters. These tweeters are placed very close to the glass and are cross-fired.

Examine the rest of the interior. The upholstery, door construction and over body integrity determines the ultimate sound you can achieve. Custom work in these areas will almost certainly be required. Internal cabinets for the cleanest bass and midrange as well as a custom subwoofer cabinet and mounting are standard procedure. Nothing new except the best current practice should be used here.

Lets assume you have taken care of all the above regular good stuff. The doors are worked the interior is solid and the sub is righteous.

Now comes the critical part; making it all work together.

The CDT Up-Stage setup requires the tweeters find a virtual ground-plane in the windshield. The tweeters are right up against the glass but not touching - probably mounted on the A pillars. The CDT module required to interface these things is the M500XT. One of the CDT crossover modules or perhaps an existing installed passive crossover for the speakers you have are setup somewhere appropriate in the car. You have an electronic crossover for high-pass and low pass you can adjust either in the Amp or mounted in a separate unit. You can adjust the woofer level and the upper cutoff frequency. The slope is probably 12dB per octave but may be as steep as 24dB per octave. Theoretically an 18dB per octave crossover will work about the same regardless of phase reversal. This is something to remember if you cannot find a setting for the two cutoffs and the level mentioned above. It is assumed that you know what you want to hear and can tell when your system is right on. If not have a "golden ear" take a seat during the adjustment process. The adjustment process: The approach here is to find the right bass level to match the midrange and highs, this is pretty simple. Just play a known good recording and focus on balancing the lows, not the mid-bass, to the midrange. The lower-midrange and mid-bass will probably not sound right. Now switch to a recording that has a lot going-on in that range with a known accurate balance. Exaggerated recordings exist that should not be used for setting up this part of the system. Now lower the cutoff of the front so there is bass coming from the front. Then raise the crossover frequency of the sub so the ranges overlap. Vary or switch the phase of the sub so the mid-bass level drops. Note that very close to the sub the bass will always be strong regardless of phase. The cancellation is to be set-up in/for the driver's seat and the passenger seat. One phase is almost always less than the other or there is a maximum dip if the phase is continuously variable. Stay with the lesser bass phase setting. The next step is to listen for one frequency that hangs way out above the rest. Choose a recording that stimulates this to the max. Now while playing this recording gradually lower the sub cutoff and raise the front high-pass till you hear a "suckout" begin to appear. This may not be at the loud midbass "boom" frequency. Take it back a little. Now move these low-pass/high-pass settings together relative to where they are until they go after the bass "boom" maximally. Once this is found the boom should disappear and these frequencies can be fine tuned for overlap to get the right overall setting for the vehicle. A little too much overlap will move the bass to the front. The bass should come from everywhere equally. Spend some time running through a number of recordings to find the best compromise. The last settings will be on the sub level and cutoff. Any high-pass on the sub should be low enough not to interfere with these three upper adjustments. A note is in order on crossover slopes. Generally the most common 12dB slope will work the best. A mixture of 12 on the front and 24 on the sub or even 18 on the sub may be OK also. There is no hard and fast rule here except never use under 12dB per octave to low-pass the sub. A simple 6 db may be OK for the front but certainly will be poor for the sub. The system will now display slam and power without smear. Finally you would want to fine-tune the windshield tweeter levels using top-quality recordings. Thanks for using CDT speakers @ tweak devices  
CDT Audio, Inc.

