Two-Way Component Speakers

Two Way component speakers are the staple of the car audio installer. A good quality aftermarket set will utterly eclipse the quality of those fitted at the factory and will outperform a pair of 'regular' coaxial speakers that use just a single capacitor instead of a passive network to direct the signals to the right driver.

In order to make up for deficiencies in cheap speakers, car manufacturers often deliberately remove important parts of sound. The missing parts tend to be high frequencies responsible for delivering clarity and directional information and low frequencies, which provide much of the fun! They use single components or simple networks to do this in a fairly brutal and unsympathetic manner, focussing mainly on cost rather than performance.

When a specialist manufacturer designs speakers with more than one drive unit, they need to decide how frequencies are to be shared in order to get the very best from each drive unit. The separation of specific frequencies is carried out electronically via a device known as a crossover. The crossover needs to cope with many variable parameters such as temperature, listening level (thus power in watts) and many others. The only way to compensate for these variables is by careful design of the crossover using multiple, high quality components. Crossover design needs to take into account the specific characteristic of the drive units used as well, to ensure a stable and pleasing result.

As a rule of thumb, the larger the diameter of a speaker the better it is at reproducing bass and less good it is at handling high frequencies whilst the far smaller tweeter is specifically designed to handle higher frequencies and doesn't like bass at all! A 2-way set is usually designed to work with a subwoofer this is because the large amount of physical cone movement required at frequencies below 80 Hz adversely affects mid frequencies coming from the same speaker. Therefore, manufacturers strive for a stable performance between the frequencies 80 Hz to 20Khz, the latter being the upper frequency that humans can hear.

In domestic hi-fi where space is less of an issue, the benefits of separating high frequencies from mid and bass frequencies has been exploited for many years. The home environment also allows the use of less rugged materials than those required for use in a car and cabinet design also massively influences the final sound reaching your ears.

In a car however, space is at a premium and many attempts have been made to make as much sound from as little space as possible. Coaxial speakers were seen as the answer to the problem. These are effectively two-way components with the tweeter permanently mounted at the very centre of the woofer cone. These still provide a useful part-solution and are always a cost effective upgrade on factory installed speakers but are far from perfect.

The main problem with coaxial speakers, apart from a lack of a proper crossover, is positioning. In many cars, the speakers are set low down in the door panel. This is OK for lower frequencies, as we tend not to be able to pinpoint the direction of these sounds too well. However, at high frequencies, our directional sense is very good and as we don't listen with our knees (unlike grasshoppers, check it, quite true!) it is preferable for high frequencies to be reproduced where the resulting sound can reach our ears directly and this is another important factor when deciding on what speakers to buy.

Fortunately, many modern vehicles can accommodate the use of two-way speakers although even here, manufacturers tend to make choices of convenience when it comes to placement. In many cars you will see tweeters mounted on either side of the dashboard facing each other for instance, which is far from ideal. Aftermarket speaker manufacturers have gone to great lengths to provide tweeters that can be mounted on any flat surface and directed toward the listener's ears. Fortunately your FOUR MASTER is at hand if a convenient position cannot be found and will fabricate a custom pod for the tweeters to mount in and install it seamlessly into your car at the correct height and pointing in the right direction for you. You'll get what's called the On-Axis response.