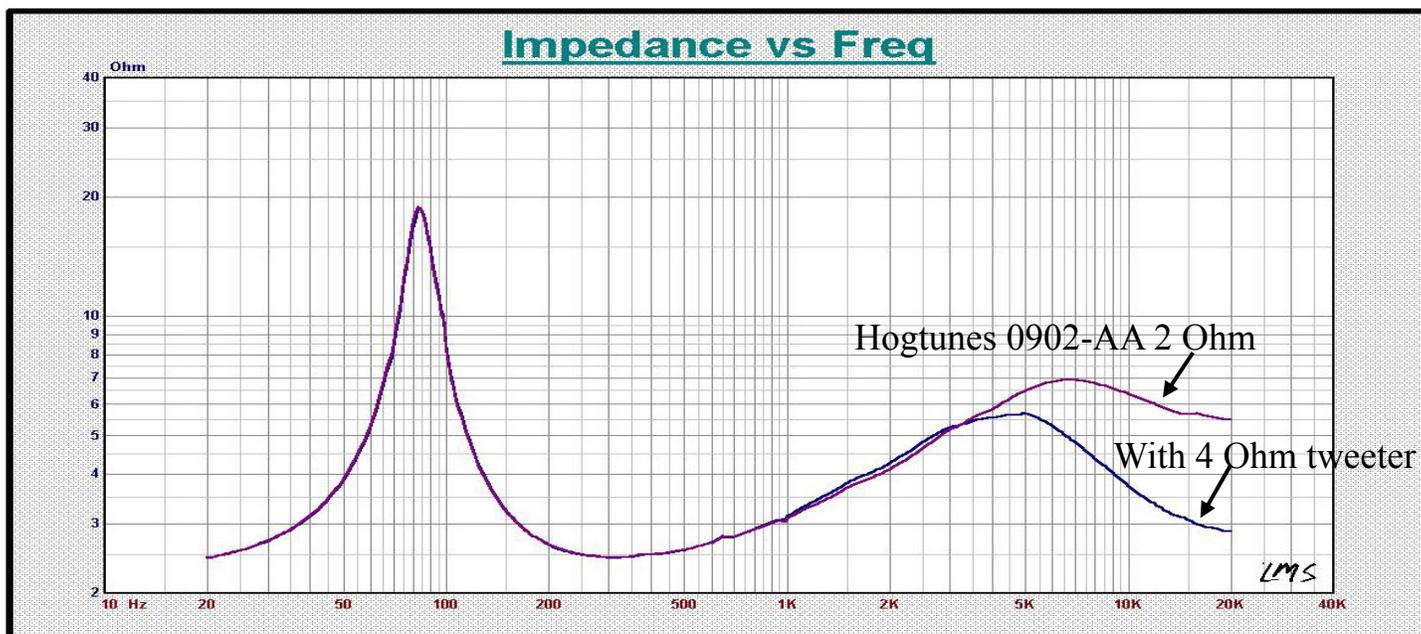


# HOGTUNES

*Audio Solutions For The Great American Cruiser*

## Why 4 Ohm Tweeters Can Be Used With H.K. “Advanced Audio” Radios



Sort of like a horsepower curve, the “actual” horsepower radically changes depending on what the RPM of the motor is. The same goes for a speaker. The actual ohms the radio or amp sees can radically “swing” depending on the frequency it's playing. In the above graph, we show a Hogtunes 0902-AA 2 ohm speaker (purple line) playing from 20hz (lowest frequency a human can hear) to 20 kHz (highest frequency a human can hear), represented by the numbers along the bottom of the graph. Along the left side of the graph is the ohms. As you can see, the lowest ACTUAL ohms the radio would see is approx 2.5 ohms between 250 and 450 hertz (revolutions or “cycles” per second). This is in the area of sound most would call the lower end of the midrange.

A typical car audio tweeter will be “filtered” or only allowed to play from 3500hz and up (12 db/octave) using an external passive crossover. This means no extra “load” will be shown to the radio or amp at 3500hz and down...right? Well not really—the cross over gradually “shuts” the tweeter off at 12db per octave. This means one octave down from 3500hz which is 1750hz, the tweeter will play 12db quieter, and one octave down from that (875hz) is will be another 12 db down again. This is what protects the tweeter from trying to play lower frequencies. If a tweeter is shown any real power in lower frequencies, it will fail (throw it away)—this is why a crossover is so important!

The blue curve above shows the Hogtunes 0902-AA with the addition of a 4 ohm car stereo tweeter with its crossover. In this case the actual impedance does not start to be effected till just below 1k (1000hz). The lowest ohms the radio or amp sees in this deal (sound where tweeter plays) is just below 3 ohms at 20,000 hz (20k)

When talking ohms, zero ohms is a dead short, and the closer the number of ohms gets to zero, the closer to a dead short it is. This means, the higher the number of ohms, the “lighter” the load is. Since the HK radio looks for, and is rated for 2 ohms, and since from the lowest point we can hear to the highest point we can hear the ACTUAL impedance does not go below 2.5 ohms, adding a set of 4 ohm tweeters to your HK radio using a proper x-over is perfectly OK!

All testing was done at Hogtunes lab at approx 72°F. As the speaker(s) warms up from playing, and as ambient temperature raises, the actual impedance typically goes up, making the overall load even “lighter”!

**Written By Hogtunes Inc. Owner Mike “PEZ” Pesdirz March 2008**