



**PHOTO 1:** Focal 8K5412 in 0.9ft<sup>3</sup> sealed box.

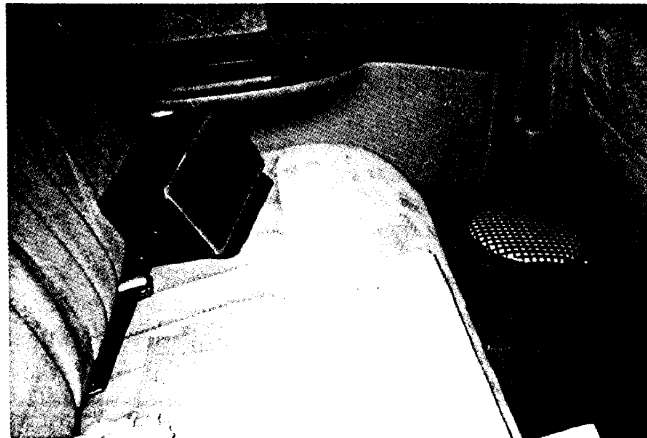
rear floor to be the most ideal spot in my car that could accommodate a 1ft<sup>3</sup> box. (I use a stereo pair of woofers, even though some claim not to hear stereo bass; pity them!)

Photos 1 and 2 show my 0.9ft<sup>3</sup> sealed boxes with Focal 8K5412 8" Kevlar woofers with first-order CO at  $\approx 300\text{Hz}$  to a 20-year-old, mostly functional pair of a/d/s/ 300C units in the rear seat corners.

Figure 5 shows the combined response, both channels driven. Interestingly, the 10dB drop from 300–400Hz is not that noticeable. Besides, the single-channel responses (Fig. 6) show different anomalies, as does Fig. 7, where the drive signals to the two channels are 90° out of phase (simulating typical stereo phase differences).

But the sound is very clear, without audible resonance, and transients—including bass—are very solid and realistic. Note that Fig. 8 shows only a 3dB pk-pk variation from 12–320Hz! By the way, some of the 300–400Hz dip may be due to the lower sensitivity of the a/d/s/ re the Focal. With biamping, the use of a more efficient mid/high unit, or a good front mid/high installation, you could probably get  $\pm 3\text{dB}$  response from 12Hz–20kHz, with good time adjustment facilitated by the close-to-driver woofer location. Bear in mind this is “room” response, at the listener’s ear. Try that in a living room!

About that a/d/s/ 300C: Fig. 9 shows its close-miked and IM room responses. Note the high-frequency smoothness and its good pulse response (Fig. 10); the square-wave is close to a textbook third-order response (Fig. 11). I’ve used these speakers for 20 years since I purchased them while working at a/d/s/. I have yet to hear more real-sounding instruments from any other car speaker, or almost any home speaker. I don’t work



**PHOTO 2:** Focal and a/d/s/ in car.

for a/d/s/ now, so this is a testimonial, not an ad.

### SOUND OF THE FOCAL and A/D/S/ SYSTEM

Figure 12 shows the 41Hz (low E) square-wave response of the rear floor/seat Focal and a/d/s/ system. There is no comparison to Fig. 3! (Neither does Fig. 13 compare to Fig. 4)

With this system, the bass guitar and drums not only sound real, but you can feel the transients and string vibrations solidly, as you would at a live performance. Absolutely none of the “whumpiness” you hear when trunk-sub rappers go by.

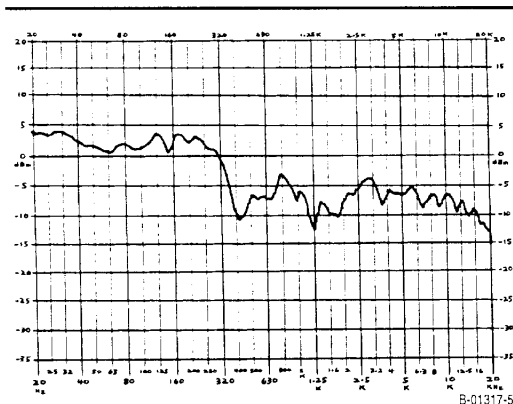
I should mention that my trunk/deck setup can sound nice with some vocals, since its resonance adds a warm “theater” effect. But because I must have my reproduced tonality sound natural, I now use only the floor/seat system (plus a/d/s/ front-door speakers). Believe me, if you like bass, once you hear it reproduced with  $\pm 1.5\text{dB}$  flatness and timing accuracy down to 12Hz, there’s no turning back.

Two cautions about this system: First, if you use the rear-seat location for mid/high

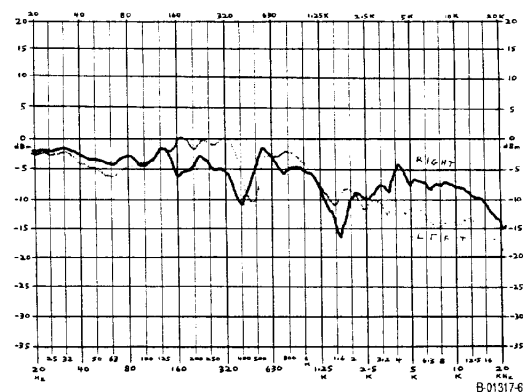
lasted about 15ms, corresponding to about 16 feet of equivalent acoustic smearing.

### THE SIMPLE FIX

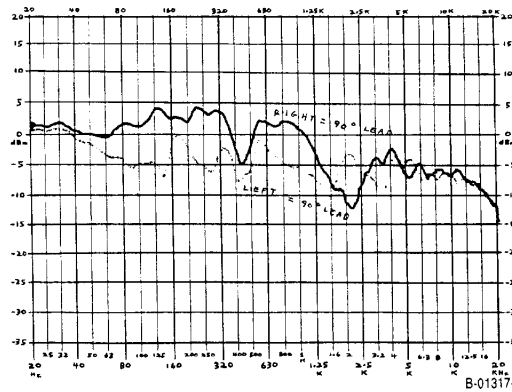
The three most important criteria for woofer success are the same as in real estate: location, location, location! Well, I found the



**FIGURE 5:** Focal 8K5412 (0.9ft<sup>3</sup> sealed box) on rear floor, plus a/d/s/ 300C on rear seat, both channels driven, mike at driver’s ear location.



**FIGURE 6:** Focal and a/d/s/, separate channels.



**FIGURE 7:** Focal and a/d/s/, both channels driven, 90° phase difference between drive signals.