

Arc Audio 8D2

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Several months back I was lucky enough to audition the very fine 4200SE amplifier from Arc Audio. So, when yet another package for testing arrived from the team at Arc Audio, I was excited to check it out. Within the compact little container was an Arc Audio 8D2 8-inch subwoofer. Let's see what this impressive looking sub is really made of.

DESIGN

The Arc Audio 8D2 subwoofer is based around a stamped steel basket with five thick spokes. The basket is essentially dome shaped, with each spoke curved as it extends from the mounting lip to the magnet mounting ledge. Two of the spokes feature large terminal blocks with chrome-plated spring-loaded terminals. These terminals are well capable of accepting 12awg conductors and will hold them securely. On the back side of the connectors are large gauge braided tinsel leads that are braided into a progressive flat Nomex spider.

At the heart of the driver is a heat resistant black anodized aluminum voice coil former. Arc Audio winds two voice coils around this former – in the case of the sample woofer, each with an impedance of 2Ω . The sub is also available as a dual 4Ω driver called the Arc 8D4. At the top of the former is two-piece injection-molded cone. The main cone features four vent holes above the mounting flange. In the center of the parabolic cone is an inverted dust cap that mounts flush for a convex shape. The Arc Audio logo and 'Arc' are reverse-embossed into the cone. At the top of the cone is a flat flange to which the one-piece moulded rubber surround is adhered. The tall surround (for the size of the driver) extends out to the end of the mounting lip.

At the base of the driver is a relatively large magnet assembly. The 40oz magnet is protected by a custom-tooled magnet boot. At the base of the driver is an extended bottom plate – allowing the voice coil former to travel through the entire range



of the suspension without bottoming out. In the center of the bottom plate is a 1/2-inch machined cooling vent that extends up the center of the T-Yoke to relieve pressure under the dust cap and aid in cooling the voice coil.

SPECIFICATIONS

Arc Audio has designed this driver to offer impressive output while balancing efficiency with sound quality. The out-of-the box specs for the driver suggest that it has an impressive one-way linear X_{max} of 15mm – better than many ten inch subs and more than some twelves! The factory

Thiel Small parameters specify an F_s of 22.7Hz, a V_{as} of 1.7 Cubic feet and Q_{ts} of 0.289.

I broke the Arc 8D2 subwoofer in over night with a 10V 22Hz sine wave before taking a full set of Thiel Small measurements of my own. My measurements are a little different than the factory specs. I actually measured a higher resonant frequency, a much lower V_{as} and a higher Q_{ts} . The result though, is that this driver specs out nearly identically in its enclosure.

The owner's manual suggests three enclosure applications. Two sealed, one of 0.2 Cubic feet net and an optimum enclosure of 0.35 cubic feet >>>



for a little less efficiency but more low frequency output. In terms of a vented application, Arc Audio suggests a 0.6 cubic foot enclosure with a 2-inch ID vent with a length of 12 inches. This tunes the enclosure to 34Hz and was the one I decided to go with. Long-time friend Mark Feeney at Sell Thru Displays custom built the enclosure for me and I took care of the speaker cutout and vent back at the test lab.

ON THE ROAD AGAIN

I connected the test enclosure to my DPX1001.1 amp and connected it first as a 4-Ohm load. My first impression was that the Arc Audio 8D2 subwoofer sounded much larger than it actually is. It had a warm bottom end like a big 12-inch sub. It also blended well into the front stage in my car – offering a nice balance.

Pondering how I could offer you, our valued readers, a closer look at the performance of this woofer, I decided that some advanced in-car measurements (as compared to my usual selection of 20, 40, 60 and 80Hz) would be enlightening. The Arc Audio 8D2 is the first driver to which I have subjected this test, but certainly not the last. The graph shows a great deal of energy is available between 40 and 55Hz – making this Arc woofer really pound! The dip at 35Hz is an anomaly associated with my car – not with the woofer. The “Listen Up” column published back in the November 2003 issue of *PAS Magazine* confirms this.

I was looking for a little more midbass from this driver, so I rewired the sub to put the pair of voice coils in parallel – this would cut the inductance by 1/4 and should increase high frequency output. To no surprise, I was right. The Arc Audio 8D2 now offered a little more punch and attack in the upper register. My car still filters high frequency output from the trunk quite aggressively, but the Arc woofer now had some snap on Metallica’s kick drums. Overall, the sound of this sub belies its size. It hits really hard down to about 35Hz. When challenged with extremely low frequency information (good old Bachbusters was the challenge here), the ability to rumble was a little on the thin side. The notes were impressively there, just not really as forceful as a bigger sub can do.

As many of you know by now, my testing always includes a maximum in-car SPL measurement. After a quick installation of my TermLAB USB, I put on my hearing protection and pumped up the volume! This sub is rated to handle 150W of power, 300W of music is also cool. Out of curiosity, I decided to supply the Arc driver with a quick shot at 500W and a very impressive result occurred. I measured a booming 130.98dB at 48Hz! The voice coil did smell a little funny – clearly showing that I have very poor memory retention and really shouldn’t have done this. Ah well, it’s still extremely LOUD! By the way, one of the reasons the Arc driver was able to produce such impressive SPL results is due to its 15mm Xmax specification. This small woofer really packs a mean punch. It’s really loud... did I mention that already?

CONCLUSION

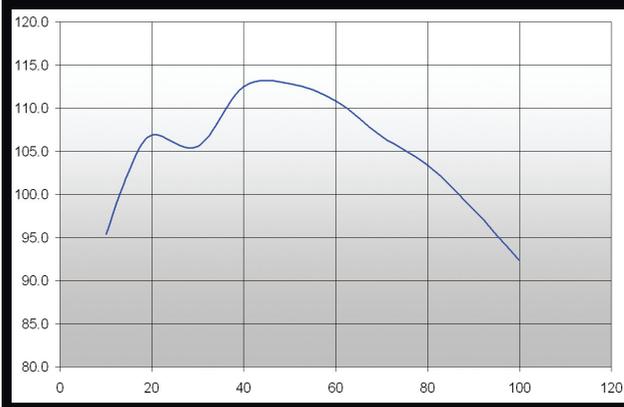
The Arc Audio 8D2 is a very cool little woofer. It offers big sonic performance well beyond its size and it’s easy to construct an enclosure that will make it sound great. This, being the second 8-inch sub I’ve reviewed this year, shows the growing industry trend towards high performance compact drivers. The Arc Audio 8D2 is a perfect choice for anyone serious about creating solid bass within a limited space. The use of multiple drivers in a system would easily result in output levels high enough to upset the neighbors. The Arc Audio 8D2 is one very cool and very loud sub. **PAS**

Electro Mechanical Parameters

Fs	32.7844 Hz
Qes	0.5315
Qms	5.6442
Qts	0.4857
Vas	0.6534 ft3
Bl	11.13 Tm
Mms	103.5g
Revc	0.9639
Le	0.8050 mH
Sens	82.72 dB at 1W/1M



Arc Audio 8D2 In-Car SPL (2.83 Vrms)



THE SOURCE

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