

TEST
REPORT



a/d/s/ 325is Component Speakers

A Legend in Its Own Time

By Edward Foster

PHOTOGRAPHY BY DAVID A. GAUTREAU/THE CONTROL ROOM

Analog and Digital Systems, better known by its logo a/d/s/, has been involved with car audio electronics and speakers for as long as there's been an aftermarket and, arguably, even before. Well before cassettes made it into automobiles, a/d/s/ tied in with Nakamichi, the premier cassette deck company of the time, to concoct a Rube Goldberg affair that married a Nakamichi portable player with a/d/s/ electronics. Elegant it was not, but it did bring top-quality sound on the road.

The a/d/s/ 325is speaker system (\$599) is an update of the 320i/s, one of the legends of its time, as the ad people (and a/d/s/) are wont to say. The 325is is built around a 5.25-inch (131 mm)

woofer and a 1-inch (25 mm) dome tweeter, both of which have been upgraded from similar devices in the 320i/s. The new woofer has a curvilinear co-polymer cone suspended on a butyl rubber surround. The curvilinear cone shape is new, and the woofer's low-profile frame reduces the clearance needed above the mounting panel. The 325is tweeter also uses a co-polymer radiator, but this one's formed as a dome rather than a cone. Co-polymers are relatively impervious to humidity, which makes them a good choice for road work.

The voice-coils of the new drivers are wound on heat-resistant Kapton formers using oxygen-free copper wire. The curvilinear cone used in the woofer is said to deliver tighter bass, a smoother

midrange and better dispersion throughout its operating range. Experts agree, the latter is extremely important in car applications because when a woofer is mounted in a door panel (the usual location), you're listening far off axis, and it's difficult to get a smooth acoustical crossover if the woofer is too directional, or "beamy."

The tweeter magnet is neodymium, the hot thing in tweeter design, and is said to be 25 percent larger than its predecessor. Larger probably means more powerful because neodymium packs more magnetic energy per unit size than alnico or ferrite material, so a little bit goes a long way. The magnet is claimed to provide smoother high-end response than the previous design, although improvements in that area are more a re-

sult of the tweeter's single-layer voice-coil and new dome than to the magnet *per se*.

The 325is crossover networks are unusually adaptable and can be used either conventionally (with one amplifier channel powering both

The 325is is theoretically capable of pumping out a whopping 111 dB SPL with a 100-watt amplifier.

der (12 dB/octave) network with low-resistance high-current inductors (one air core, another with a laminated iron-alloy core); a pair of close-tolerance, high-Q, 100-volt polypropylene capacitors; a pair of 50-volt 10 percent tolerance elec-

SPL at 1 meter from a 2.83 volt rms pink-noise signal, the 325is is theoretically capable of pumping out a whopping 111 dB SPL with a 100-watt amplifier.

INSTALLATION

The 325is woofer mounts in a 3.75-inch (96 mm) cutout and is anchored with six No. 8 sheetmetal screws, symmetrically spaced around a 5 $\frac{5}{32}$ -inch (131 mm) circle. When the snap-off grille is in place, a/d/s/ recommends a



woofer and tweeter) or in bi-amped arrangements (separate amplifiers for woofer and tweeter). Out of the factory the crossover is set for a normal install; conversion for bi-amping merely involves snipping two jumpers.

The nominal crossover point is 2.5 kHz with the equalization in the crossover region adjustable by a Car/Demo switch in the network. The Demo position provides a slightly more powerful midrange than the Car position, which permits a/d/s/ to achieve good sound on a demo board and to have the system test well under laboratory conditions. The Car position provides a smoother, softer midrange in real cars. In addition to the Car/Demo switch there's a three-position (low/mid/high) tweeter-level switch that lets you tailor the high-end response to compensate for differences in car acoustics and damping.

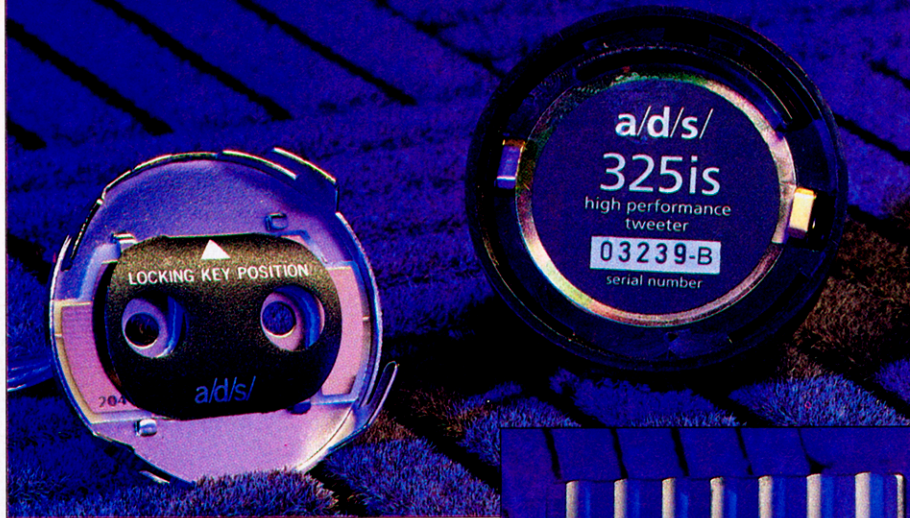
The crossover is a passive second-or-

trolytics and four 5-watt power resistors. A solid-state device (presumably a varistor) interrupts the drive to the tweeter should it rise to a dangerous level and resets itself when the signal drops back to a safe area. Although there wasn't a circuit diagram to check the specifics, the crossover's construction and component quality are impressive. Connections are made through screw terminals that handle bare or tinned wire and reasonable lengths of speaker-grade 16-gauge zip cord are packed with the system.

The manufacturer rates the 325is response as 50 Hz to 21 kHz, ± 3 dB. Obviously, that will depend upon the installation. Its rated impedance (4 ohms, nominal) is standard for car speakers. The company recommends amplifiers with power ratings from 15 to 100 watts rms to drive the 325is, which they'll be happy to supply. Now, with a rated sensitivity of 91 dB

1 $\frac{1}{16}$ -inch (30 mm) clearance above the panel (a little less might do in a pinch) and 1 $\frac{7}{8}$ inch (48 mm) behind the panel. The tweeter snaps into a cup that surface-mounts to the dashboard or any other appropriate location. The cup is 2 $\frac{1}{8}$ inches (54 mm) in diameter and stands 1 $\frac{1}{8}$ inch (29 mm) above the panel. You only need enough room behind the panel to accommodate the two .75-inch No. 8 mounting screws and the connecting wire that emerges from the rear of the cup.

If you want to recess the tweeter or angle-mount it, you'll need the optional AK3 recess-mount kit. In this case, you'll need a 2.25-inch (58 mm) cutout and $\frac{7}{8}$ -inch (23 mm) of space behind the panel. The crossover is 3 $\frac{3}{16}$ inch (90 mm) wide by 3 $\frac{1}{16}$ inch (100 mm) deep by 1 $\frac{1}{16}$ inch (39 mm) high and mounts with two screws. Ideally, it should be located near the drivers it controls and be accessible after



● this size will need a subwoofer.
 ● Enough about the bass; the upper midrange and treble were super in this installation, too. That's partially due to the Audio Coupe install and the adroit balancing of the system. Still, no installer can get a silken high end out of a sow's gut tweeter, but there's no worry here when it comes to the a/d/s/ 325is treble driver. It's silky smooth and has great attack, qualities that are

● installation so you can try various switch combinations. If you choose to install the 325is yourself, you'll find the manual first-rate.

PERFORMANCE

● The manufacturer arranged for a demonstration to road-test the 325is system installed in a 1985 Audi Quattro 4000. Audio Coupe of Fairfield, Connecticut, installed a Clarion 5680 CD head end and an a/d/s/ 425X power amp. No sub, no rear speakers, no tricks, no expensive gear. It was really a remarkably simple installation that lets us hear the 325is drivers on their own, which is the only fair way to audition a system for review.

● Micah Sheveloff and his co-workers at Audio Coupe did a fantastic job on the installation and left us alone with the system for as long as we wanted. After the tryout we learned the details behind the install.
 ● Micah used the 4x25-watt a/d/s/ 425X power amp to bi-amp the drivers and confirmed what was apparent from listening: He spent considerable effort positioning the tweeters for the best stereo in the driver's seat. The woofers were mounted relatively low and forward on the front door panels with the tweeters mounted just below the window and angled toward the driver.

● Micah said the balance was set by ear using only the gain controls on the 425X. We believe him; a good



pair of ears will beat a microphone any time in our book and, apparently, they have some nice ears at Audio Coupe. After listening to everything from McBroom to Mozart on the system, we wouldn't set the balance a tad differently. Smoothness through the cross-over region was superb. Even pianos (and piano reproduction can be difficult) sounded pretty much like pianos, which is rarely the case.

There was a bump in low-bass response in the system because the bottom end of the piano was just slightly thumpy. Not bad, just slightly thumpy, and without a sub in the system to take the low end really far down, that was undoubtedly the right way to go. In the Quattro the 325is sounded much bigger than it is and very musical. Of course, if you really want to get down there on a big bass drum, any system of

often at odds with each other. There are too many fast tweeters that sizzle the ears with their peaky high end. Some folks may like them; we don't. When female vocalists start to rasp and strings sound like steel wire run over a hand saw, we can do without the tweeter, thank you, and we don't care how fast it is.

Has this system no faults? Of course it does. We haven't heard a system yet that was perfect in every regard, but this one's flaws are more due to the physical size of its drivers than to poor technical implementation. There's a limit to how much oomph you can get out of a nominal 5.25-inch woofer whose cone diameter is just under 3.75 inches. There's also a limit to how much drive you can get out of a 25-watt/channel-amp, the one used in the Quattro installation. When we cranked up the volume on heavy choral passages, the sound thickened somewhat, but what can you expect? Whether the amp was giving up or the woofer had reached its limit is hard to determine, but until it hit the stops, the system was beautifully musical. It's one we'd be happy to have in our own car, and we can recommend it enthusiastically to anyone who wants good sound on the road without devoting every square inch of space to drivers and amplifiers.

AJF

In the Quattro the 325is sounded much bigger than it is and very musical. The upper midrange and treble were super in this installation too.