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Momentum amplifier

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MICHAEL FREMER

Dan D'Agostino Momentum

MONOBLOCK POWER AMPLIFIER

What better way to celebrate the expiration of a noncompetition clause than to debut a product that *has* no competition? That's what Dan D'Agostino appears to have done with his Momentum monoblock amplifier (\$55,000/pair)—his first new product since leaving Krell, the company he cofounded more than 30 years ago.

First shown a year and a half after the split, the Momentum has created something of a sensation in the audio world, due in equal parts to D'Agostino's long history of innovation in the design of high-performance audio circuitry and the amplifier's stunning looks. Visually, the Momentum is a complete break with D'Agostino's previous efforts. Does anything out there right now compete with its gleaming, jewel-like elegance? It manages a high bling factor without ostentation, and while the look has broad aesthetic appeal, enthusiasts of mechanical watches in particular must have been wiping away the drool at first glance. I drooled, and I couldn't care less about watches.

Compact yet powerful

Unlike the often large, boxy Krells of yore, the 5"-high, 95-lb Momentum is remarkably compact for an amplifier rated at 300, 600, or 1200 watts into, respectively, 8, 4, or 2 ohms. While the central power meter dominates the faceplate, the thick copper side panels draw equal attention. And they're bolted to a chassis machined from a single aluminum billet.

In addition to his nearly lifelong dedication to high-performance audio, D'Agostino is a wine enthusiast, a watch collector, and an automobile buff, and he's managed to include elements of each passion into the Momentum's design. The Momentum's large, round, uptilted power meter, with its 19th-century-style

needle, is clearly based on classic watch designs, as are the tight tolerances to which the case is machined and assembled, and the seamless fit that challenges you to find a gap or a join, let alone a bolt or screw. Hmmmm. Could there be a sonic metaphor there?

Instead of cooling fins, double-funnel-shaped holes are machined into the top edge of each side panel to act much as a carburetor venturi, or an air-infusing wine venturi—but instead of sucking air in to mix it with gasoline or wine, these venturis allow expanding hot air to vent upward, pulling in the cooler air below. The uses of venturis and copper, a far more efficient conductor of heat than the usual aluminum, mean that the Momentum can be both compact and run remarkably cool in class-AB, even when pressed to pump out the power. At idle, it consumes less than 1W.

The low-feedback, fully complementary, balanced design uses 1% metal-film resistors and two dozen 69MHz output transistors in a direct-coupled, discrete, bipolar output circuit with a claimed frequency response of 1Hz–200kHz, –1dB, or 20Hz–20kHz, ±0.1dB. Like darTZeel's NHB-458 (\$144,500/pair when reviewed last August)—which it sonically resembles, particularly in its top-to-bottom consistency in every performance parameter—the Momentum is a low-feedback, not a zero-feedback design. I wonder if, like darTZeel designer Hervé Delétraz, Dan D'Agostino has sacrificed the lowest possible level of harmonic-distortion for a slightly higher number more consistent across the audioband, and if he's done likewise with the signal/noise ratio. Both of those claimed specs are good, but, as with the darTZeel, I've seen lower. The specifications listed for the Momentum on D'Agostino's website are scant.

SPECIFICATIONS

Description Solid-state monoblock power amplifier. Inputs: 1 balanced (XLR). Output power: 300W into 8 ohms, 600W into 4 ohms, 1200W into 2 ohms (all equivalent to 24.8dBW). Voltage gain,

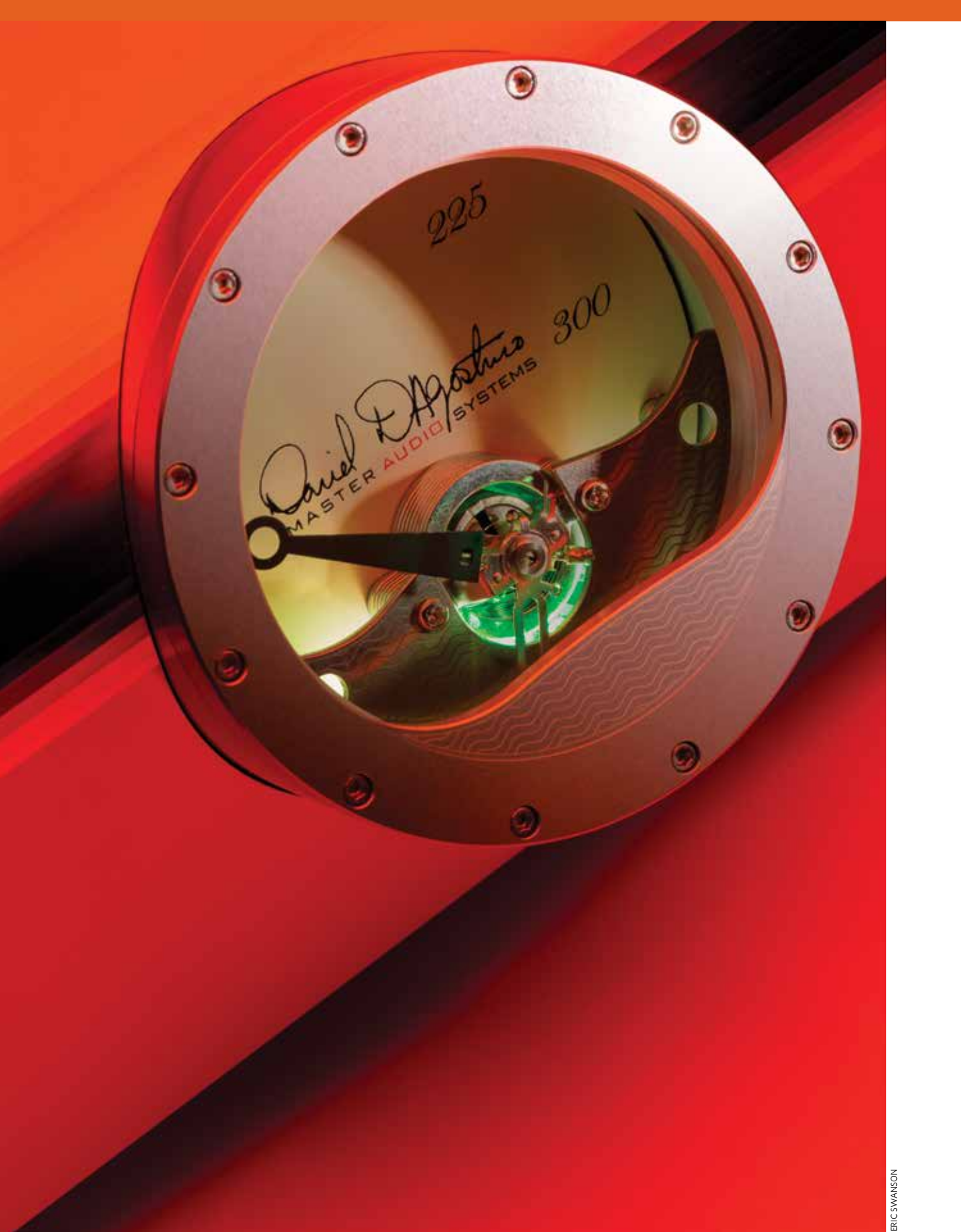
input impedance, output impedance: all not specified. Frequency response: 1Hz–200kHz, –1dB; 20Hz–20kHz, ±0.1dB. THD (300W at 8 ohms): 0.1% at 1kHz. Signal/noise: 105dB, unweighted (no reference given).

Dimensions 12.5" (317.5mm) W by 5" (127mm) H by 21" (533.4mm) D. Weight: 95 lbs (43kg).

Serial numbers of units reviewed 0265, 0266.

Price \$55,000/pair. Approximate number of dealers: 9.

Manufacturer Dan D'Agostino Inc., 139 Steep Hill Road, Weston, CT 06883. Tel: (203) 227-9099. <http://dagostinoinc.com>.





The compact, dense chassis is flanked by copper heatsinks.

On the rear panel are XLR input and IEC AC jacks, a bayonet fuse holder, toggle switches for meter sensitivity and illumination, 12V trigger jacks, and a pair of custom-machined speaker terminals that don't accept banana plugs. The panel is uncluttered, which made hookup easy, but my system is single-ended—I used RCA-to-XLR adapters. Dan D'Agostino told me that the Momentum “likes” a balanced input signal, but when I tried running it balanced from the MSB Platinum Diamond DAC IV D/A converter's variable output, bypassing my darTZeel NHB-18ns preamplifier, the Momentum needed more drive. Then I remembered:

authority, and *control* that allowed the speakers to disappear. We've all experienced speakers that, when we sit before them in the sweet spot, have seemed to vanish as the actual sources of the sound—but how many of you have heard speakers that *tonally* “disappeared” from wherever in the room you stood—let alone in a hotel room at a hi-fi show?

That's what I heard as I stared down that pair of Sashas driven by Momentums, and I was hardly alone. It was the buzz all over that CES: “Dan is back!” Everyone I talked to mentioned the sound's seamless, which was simultaneously ultratransparent *and* velvety rich.

D'Agostino had also told me that his amp is a “low-gain” design. I went back to single-ended.

Warmed up before warm-up

I first heard a pair of Momentums at a Consumer Electronics Show, driving a pair of Wilson Audio Specialties Sasha W/P speakers. Looking at the difficult-to-drive Sashas, I saw not the multiple drivers of a pair of loudspeakers, but a pair of open troughs from which flowed an effortless wall of musical honey.

You could easily turn that into a sticky negative, but that's not how I mean it. When the familiar music required sparkle, the Momentums delivered it—and particularly when there was bass energy, the amps produced weight,

MEASUREMENTS

To measure the Dan D'Agostino Momentum amplifier, I used *Stereophile's* loan sample of the top-of-the-line Audio Precision SYS2722 system (see www.ap.com and the January 2008 “As We See It,” www.stereophile.com/asweseeit/108awsi/index.html). Before I test an amplifier, my usual procedure

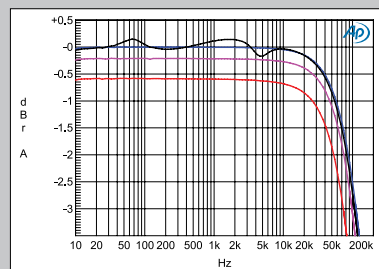


Fig.1 Dan D'Agostino Momentum, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (blue), 4 ohms (magenta), 2 ohms (red) (0.25dB/vertical div.).

is to run it at one-third power into 8 ohms for an hour. With a conventional amplifier using a class-A/B output stage, this level results in the maximum heat dissipation in the output devices. Unfortunately, after running at this level for 50 minutes, serial no.0265 turned itself off, with its heatsinks way too hot to keep my hand on. Those drop-dead-gorgeous, lacquered-copper heatsinks may not, therefore, be as efficient at dissipating heat as more conventional, finned heatsinks. I let the amplifier cool down, but it wouldn't power up again, although neither the 7.5A fuse on the rear panel, nor the fuse under the bottom panel access plate, had blown. I therefore subjected the second sample, serial no.0266, to a shorter preconditioning time, 30 minutes. Even so, at the end of that time, my infrared thermometer indicated that the heatsinks were 119.6°F (48.7°C), and the chassis a

warm 105.2°F (40.7°C). All measurements refer to this second sample.

The Momentum's voltage gain into 8 ohms measured 26.2dB, and the balanced input preserved absolute polarity, indicating that the XLR jack is wired with pin 2 hot. The input impedance was usefully high, at 200k ohms in the midrange, dropping to 160k ohms at the frequency extremes. The output impedance was moderately high for a solid-state design, at 0.21 ohm at 20Hz and 2kHz, rising very slightly to 0.23 ohm at 20kHz. (These figures include 6' of speaker cable.) The variation in response with our standard simulated loudspeaker (see www.stereophile.com/content/real-life-measurements-page-2) was a moderate ± 0.2 dB (fig.1, gray trace). Fig.1 indicates that the Momentum has a wide small-signal bandwidth, the ultrasonic rolloff into 8 ohms (blue trace) not reaching -3dB until 110kHz—though this is not quite as



A simply laid-out, functional rear panel.

That was then. And now?

How can so distinctive- and memorable-sounding a pair of amplifiers have no discernible sonic character? It sounds like an oxymoron. Surely, given more time with them, I could discover their “sound,” I thought. Now that I’ve spent a few months searching, I’m not so sure.

Wilson Audio’s Alexandria XLF speakers, which I reviewed last month, are revealing and relatively easy to drive, and about as smooth- and seamless-sounding a pair of speakers as you’re likely to hear, so once again: In what follows, will I be describing the sound of the speakers or of the amplifiers?

Fortunately, I’ve now heard the Alexandrias driven by the Mark Levinson No.53 and Ypsilon Aelius monoblocks (review

coming), the darTZeel NHB-458 monos, the Musical Fidelity Titan, and the Music Reference RM-200 Mk.II. I know what these various amps are each contributing to the sound.

Like the big darTZeel NHB-458s, the Momentums had a consistently “just right” quality in every performance parameter, though the overall sound was not precisely the same as the NHBs’. I’ve heard amplifiers that were faster, leaner, airier, and thus more *transparent*, in the way that word is usually used.

I’ve heard very fine amplifiers that produced more bass weight, and brighter and sharper high-frequency transients, than the D’Agostinos. I’ve heard amplifiers that were more billowy in the lower mids, and drier and more reserved

measurements, continued

wide a bandwidth as the specified -1dB at 200kHz . Nevertheless, the Momentum reproduced a 10kHz squarewave (fig.2) with very short risetimes and no hint of overshoot or ringing. The 1kHz squarewave was essentially perfect (fig.3).

The unweighted, wideband signal/noise ratio, ref. 2.83V into $8\ \Omega$ and

taken with the input shorted, was a good 77.2dB , this improving to 78.1dB when the measurement was restricted to the audio-band. Switching an A-weighting filter into circuit improved the S/N ratio to 81.65dB . With the amplifier driving a 1kHz tone into $8\ \Omega$ at 100W , the Momentum’s noise floor was disturbed by spurious at the AC

line frequency and its odd-order harmonics (fig.4), these spurious most likely due to magnetic interference from the power transformer. Nevertheless, the spurious all lie close to or below -100dB (0.001%) and thus can be considered negligible.

Specified as having a maximum power of 300W (24.8dBW), the Momentum

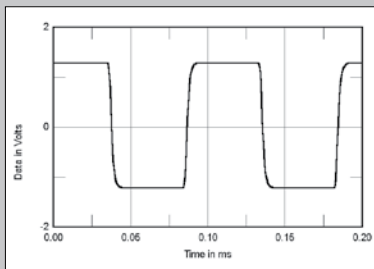


Fig.2 Dan D’Agostino Momentum, small-signal 10kHz squarewave into $8\ \Omega$.

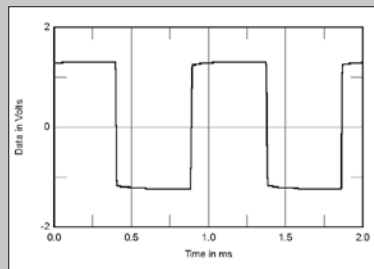


Fig.3 Dan D’Agostino Momentum, small-signal 1kHz squarewave into $8\ \Omega$.

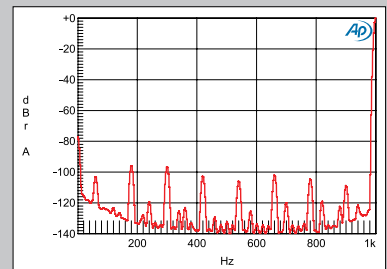


Fig.4 Dan D’Agostino Momentum, spectrum of 1kHz sine wave, DC- 1kHz , at 100W into $8\ \Omega$ (linear frequency scale).

in the upper mids. I've heard some that were more polite, some that were more brash. I've heard amplifiers with faster attack and more generous sustain. All of these are noticeable qualities that, once you hear them, you *always* hear, like it or not—or you work around them with associated gear.

After spending a great deal of time listening to the Momentums, I kept coming back to their overall seamlessness, their tube-like midband delicacy, their bottom-end authority. They fully gripped the Alexandrias' woofers, but with a light, delicate touch timed and executed to produce just the right blend of speed, texture, weight, and tonality. They produced an airy midband effervescence, and a top end that, while not exactly white light, perfectly complemented everything below.

The overall result was the production of an all-enveloping "sonic aether" in which all of the notes swam with equal ease and at just the right time. In short, I heard at home precisely what I'd heard through the Wilson Sashas at CES: pretty much nothing. Or everything.

Overall, the Momentum's sonic personality resembled that of the big darTZeel, though the very top was a bit more reserved, its high-frequency transients somewhat more relaxed, its bass performance ever so slightly less muscular. That, of course, added up to an equally seamless picture, just on a more reserved scale.

In musical terms

In Grant Green's version of "My Favorite Things," from *The Complete Quartets with Sonny Clark* (2 CDs, Blue Note CDP 8 57194 2), recorded by Rudy Van Gelder and withheld for years in favor of more commercial outings, the guitarist is accompanied by Clark on piano, Sam Jones on bass, and Louis Hayes on drums. It's a more swinging, breezy, jazzified version than Coltrane's better-known one, but Green, probably playing his Gibson hollow-body, whose treble and bass he liked to turn down, liquefies his single-note lines, exuding woody warmth as he fingers the lower half of the fretboard.

The D'Agostino Momentums reproduced Green's warmth, which is the easy part, while preserving the subtle, three-dimensional aura of sound around each pluck that pulses, blooms, and decays with the notes. That's the not-so-easy part—but when it's done correctly it reproduces an aural image of the physical instrument in a stable, three-dimensional space.

A faster, more clinical-sounding amp might emphasize the transient at the expense of the aura; a slower, softer-

sounding one might get the aura but fail to cleanly delineate it. Given that choice, I'd go for clinical over mush—but it's better to hear it all correctly drawn. That's what the Momentums did.

There's probably a bit more sparkle to be had from Hayes's cymbals, but the drums otherwise sounded so "together," from floor toms to snare, and the attack and decay were so clean and well organized, that it didn't matter.

That said, you wouldn't want to run a pair of soft- and/or "burnished"-sounding cables between the Momentums and your speakers, unless the latter sound really bright and clinical. These amps need a wide-open path to perform best. Speaking of wide-open paths, digis were serviced by an MSB Platinum

Diamond DAC IV D/A converter, which I'll be packing up and returning after this review. It's easily the best digital sound I've ever heard.¹

¹ The MSB was favorably reviewed by Jon Iverson in October 2012; see <http://tinyurl.com/dyctoth>.—Ed.

measurements, continued

comfortably exceeded that rating, clipping at 405W into 8 ohms (26.1dBW), with clipping defined as the point when the percentage of THD+noise in its output reaches 1% (fig.5). Fig.6 reveals that the amplifier clips at 640W into 4 ohms (25.05dBW), while into 2 ohms (not shown), the amplifier puts out 1115W (24.45dBW). As with Dan D'Agostino's

earlier amplifier designs for Krell, the Momentum is a powerhouse!

Figs. 5 and 6 also indicate that the Momentum offers very low distortion at lower powers, but that the THD plateaus at 0.06–0.08% at moderate powers. I therefore measured how the THD+N percentage changed with frequency at a level, 20V, where I could

be sure I was looking at distortion rather than noise. The result is shown in fig.7: THD+N remains constant with frequency below the top octave, though it does increase as the load impedance drops. However, there is very little rise in THD above 10kHz, suggesting that the Momentum has a commendably wide open-loop bandwidth.

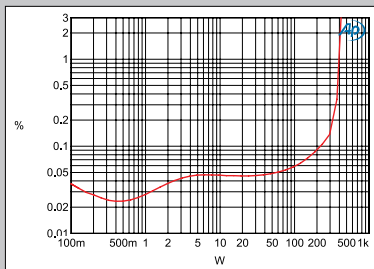


Fig.5 Dan D'Agostino Momentum, distortion (%) vs 1kHz continuous output power into 8 ohms.

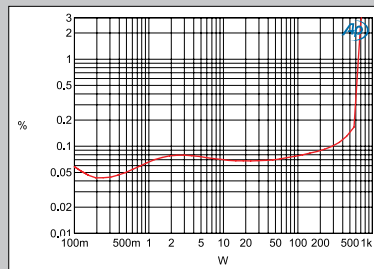


Fig.6 Dan D'Agostino Momentum, distortion (%) vs 1kHz continuous output power into 4 ohms.

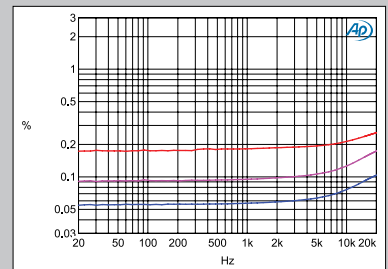


Fig.7 Dan D'Agostino Momentum, THD+N (%) vs frequency at 20V into: 8 ohms (blue), 4 ohms (magenta), 2 ohms (red).

The Meridian (formerly Sooloos) Digital Music Server just served up "Purim," from the Andy Statman Quartet's *Between Heaven & Earth: Music of the Jewish Mystics* (CD, Shanachie 64079). Statman's clarinet is in the right channel, there's a banjo at center left, and the banjo player's foot taps just to his left. You couldn't ask for a clarinet to be drawn in 3D space with any more air or perfection. You might want a bit more bite to the banjo, but again, the seamlessness of this picture, the way the Momentums subtly produced the ether

Other than through the big darTZeels, I've not heard a more convincing presentation of this recording, whether spatially, dynamically, or harmonically.

between the two instruments, as well as the space around each, was part of what made the D'Agostinos special—and spatial.

A benchmark recording for me is Endre Hegedüs's *Piano Music in a Church* (Almost Analog Digital, also available as a digital download from www.tonepearls.com) a live analog recording of solo-piano works by Chopin and Debussy. It's one man at one piano in a stone church: if you like your soundstage layered, the D'Agostinos produced layer after layer after layer of spatial information while retaining remarkable image clarity and authority.

Chopin's familiar (if it's familiar to me, it's *familiar*) Waltz in D-flat Major, Op.64 No.1 ("Minute"), dances across most of the keyboard, punctuated by dynamic thrusts that test the coherent qualities of amps and speakers alike.

Other than through the big darTZeels, I've not heard a more convincing presentation of this recording, whether spatially, dynamically, or harmonically. So stable was the sound picture, regardless of where on the keyboard Hegedüs's fingers were or how intensely he hit the keys, that the sense of being

ASSOCIATED EQUIPMENT

Analog Sources Continuum Audio Labs Calburn turntable, Cobra tonearm, Castellon stand; Graham Engineering Phantom Supreme II, Kuzma 4Point tonearms; Miyajima Labs Focus mono, Lyra Atlas, Ortofon Anna cartridges.

Digital Sources MSB Platinum Data CD IV CD transport & Platinum Diamond DAC IV DAC & Platinum Studio ADC; BPT-modified Alesis Masterlink hard-disk recorder; Meridian Digital Media System; Pure Music software.

Preamplifier darTZeel NHB-18ns.

Power Amplifiers darTZeel NHB-458, Ypsilon Aelius (both monoblocks); Musical Fidelity Titan, Music Reference RM200 Mk.II.

Loudspeakers Wilson Audio Specialties Alexandria XLF.

Cables Phono: Hovland/Graham MG2 Music Groove, Nordost Valhalla. Interconnect: Stealth Sakra & Indra, TARA Labs Zero Gold, ZenSati Seraphim. Speaker: AudioQuest WEL Signature, Stealth Dream V10, TARA Labs Omega Gold. AC: Shunyata Research Zi-Tron Anaconda, TARA Labs Cobalt.

Accessories Shunyata Research Triton power conditioner; Oyaide AC wall box & receptacles; Finite Elemente Pagode, HRS Signature SXR component stands; Symposium Rollerblocks & Ultra platform; ASC Tube Traps, RPG BAD & Skyline & Abffusor panels; Audiodharma Cable Cooker; Furutech DeMag & deStat LP treatments; Loricraft PRC4 Deluxe, Audio Desk record-cleaning machines.—Michael Fremer

in the audience and seeing the piano in front of me was as convincing as I've ever experienced. I wish someone would license the analog tape and issue this recording on vinyl, so we could revel in the pitch instability, and beat Artur Rubinstein producer Max Wilcox to the punch. (Max, in case you're reading this: You once berated me at Avery Fisher Hall for being a vinyl fanatic.)

measurements, continued

Fig.8 indicates that the distortion is predominantly the subjectively innocuous second harmonic, though there is a suspicious-looking spike in the residual waveform almost coincident with each zero-crossing point. This spike is the result of a picket fence of higher-order harmonics (fig.9), though it's fair to note

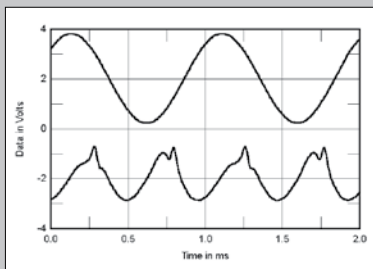


Fig.8 Dan D'Agostino Momentum, 1kHz waveform at 100W into 4 ohms, 0.084% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

that these are all relatively low in level. I was a little puzzled, given the excellent high-frequency linearity seen in fig.7, that the 1kHz difference tone resulting from an equal mix of 19 and 20kHz tones at a peak level of 100W into 4 ohms (fig.10) was moderately high in level, at -69dB (0.03%), with the spuriae at 18

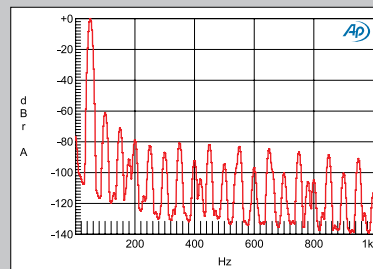


Fig.9 Dan D'Agostino Momentum, spectrum of 50Hz sine wave, DC-10kHz, at 100W into 4 ohms (linear frequency scale).

and 21kHz at -74dB (0.02%). However, all other intermodulation products lay at or below -90dB (0.003%).

There are no surprises in the Dan D'Agostino Momentum's measured performance. This is an amplifier that is as well-engineered as it is beautiful to look at.—John Atkinson

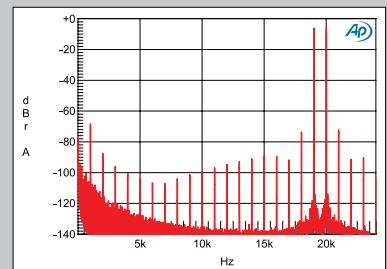


Fig.10 Dan D'Agostino Momentum, HF intermodulation spectrum, DC-24kHz, 19+20kHz at 100W peak into 4 ohms (linear frequency scale).

Another solo-piano recording that came to life through these amps was Van Dyke Parks's gutsy performance of his difficult-to-play and twice-as-difficult-to-sing "The All Golden," from *Moonlighting: Live at The Ash Grove* (CD, Warner Bros. 46533-2). (The song originally appeared on his epic *Song Cycle*, from 1968, which deserves a better-sounding reissue than the one Sundazed managed.) Again, the sense of the nightclub's space, and the way the amps separated yet naturally mixed the sounds of the room and the monitor speakers, was masterful.

But can they rock?

The Beatles' *Stereo Vinyl Box Set* (14 LPs, EMI 33809) arrived during the review. The D'Agostinos did an expert job of delineating the differences between the first and second UK pressings, the Japanese box, the MoFi box, Toshiba Pro-Use, Capitol original pressings, and CD and USB flash-drive remasterings of *Abbey Road* (yes, I spent the better part of a day doing this) and this new edition. It was cut from a 44.1kHz master—as Nancy Kerrigan screamed when Tanya Harding whacked her in the knees at the Olympics, "Why? Why? Why?"

But you know what? The equalization job for the new LPs is excellent, and overall, the tonal balance is masterful. But if you want to hear why CDs are simply inadequate, compare the 24-bit USB stick edition to the 16-bit CD. And the new vinyl's top end, even sourced from 24/44.1k, hits a wall that every other vinyl edition easily sails over. But while the Momentums' top end might be said to be ever so slightly reserved, it was nonetheless completely revealing. As I went through the Beatles' catalog with the D'Agostinos, even digitized vinyl was an absolute pleasure. When I listened to some of the most awful and bright rock records in my collection, they sounded awful and bright. And when I played my *best* rock recordings, they ... *rocked*. These amps didn't cover up anything.

**And when I
played my best
rock recordings,
they ... rocked.
These amps
didn't cover up
anything.**

Attack, sustain, decay

My favorite trio, and the D'Agostino Momentum, like the darTZeel NHB-458, flat-out nailed it. Attacks were clean and precise, but not artificial or clinical. I heard no artificial edge definition, no emphasis of leading-edge transients. If those fill your excitement cup, look elsewhere—but it's not real detail, and it's not what you hear live. A soft, warm, billowy take on instrumental attacks may be comforting in the short run, but over time it wears thin—or thick, actually. The Momentum may have been ever so slightly on this side of the attack fence, but not by enough for that to be a problem other than in the careful choosing of associated gear.

The Momentum's sustain was generous—as ample and flowing as a great tube amp's, and that's a major achievement for solid-state. Its decay was equally ample, precise, and long-tailed, fading into a natural ambience—not an artificial, antiseptic black never heard in nature.

One test of an audio component is the type of music it makes you want to hear. Looking back at what I listened to for this review, and discounting the recordings I *had* to play (a lot of Beatles, and a few other records I reviewed for AnalogPlanet.com), the playlist was all over the map. The D'Agostinos didn't do a better job with any particular kind of music, they did a masterful job with all of them.

Conclusions

Driving the big, efficient Wilson Alexandria XLFs, the steam-punk needles of the D'Agostino Momentums' power meters barely budged, no matter what I threw at them. Given their rated power output, they should have little trouble driving speakers of any efficiency or inefficiency, no matter how punishing the load. If their power ratings hold up against John Atkinson's measurements (given who designed these amps, I have no doubt they will), the Momentums *like* low impedance loads.

I've heard more clinically precise amplifiers, and ones that produced more digital-like black backgrounds, but, other than the darTZeel, none that could produce such a "meaty," well-proportioned, consistently enticing sonic picture.

Dan D'Agostino's Momentum is clearly his best design yet. With the darTZeel NHB-458, it's one of the two most satisfying power amplifiers I've ever heard. ■