JASON VICTOR SERINUS

Pass Laboratories XA200.8

MONOBLOCK POWER AMPLIFIER

It was almost seven years ago that Nelson Pass, whose talks and exhibits I'd covered at many a Bay Area Burning Amp DIY event and audio show, surprised me with a loan of two Pass Laboratories' XA160.5 class-A monoblock amplifiers. Ten months later, after I'd commented that my system had challenged the XA160.5s in the bass department, he sent me a pair of XA200.5 monos. I connected those bigger babies to Wilson Audio Sophia 3 loudspeakers and some now-discontinued digital components with Nordost Odin 1 interconnects and speaker cables. Then came my way, toward the end of 2016, the XA200.8 monoblocks ($42,000/pair).

My joy at the arrival of the solid-state XA200.8s was tempered by their weight, which seemed only to increase with time. In fact, a day after we removed them from our amp stands and packed up one to ship to John Atkinson to be measured, I was wearing a back brace and moving with care. Thank goodness for chiropractors.

That joy was also tempered by the fact that two XA200.8s consume lots of power even at idle, and put out enough heat to require air-conditioning in spaces where music through open windows might disturb neighbors. The spouse, on receiving our electric bill, has more than once complained about my leaving the amps on for long periods.

However . . .

My joy at the arrival of the solid-state XA200.8s was tempered by their weight.

Description

The XA200.8 measures 19" wide by 11" high by 27.5" deep and weighs 157 lb. Except for a bottom plate of heavy-gauge steel, its case is made of extruded, machined aluminum, with extra-large, side-mounted heatsinks to dissipate the energy of the output stage, which is deeply biased into class-A. A decorative faceplate of thick aluminum, available in silver or black, is dominated by a single large, blue-lit analog meter

showing the bias current that includes a tiny Standby LED that glows a brighter blue. When the amp is fully on, the Standby LED goes dark and the meter glows.

Below the meter is a large On button, which complements the master power toggle on the rear panel. (That

SPECIFICATIONS

Description Solid-state, monoblock power amplifier. Inputs: 1 balanced (XLR), 1 single-ended (RCA). Power output: 200W into 8 ohms, 400W into 4 ohms (both 23dBW). Frequency range: 1.5Hz–100kHz. Voltage gain: 26dB. Input impedance: 50k ohms single-ended, 100k ohms balanced. THD (1kHz, full power): 1%. Damping factor: 200. Output noise: 200µV. Input CMRR (common-mode rejection ratio): 60dB. DC offset: 0.05V. Current draw at idle: 6.3 amps. Power consumption: 760W. Temperature: 53°C. **Dimensions** 19" (480mm) W by 11" (280mm) H by 27.5" (700mm) D. Weight: 157 lb (71.2kg) net, 177 lb (80.3kg) shipping. **Finishes** Black, Silver. **Serial numbers of units reviewed** 29555, 29556. **Price** $42,000/pair. Approximate number of dealers: 20. Warranty: 3 years, parts & labor, transferable. **Manufacturer** Pass Laboratories, 13395 New Airport Road, Suite G, Auburn, CA 95602. Tel: (530) 878-5350. Web: www.passlabs.com.

toggle also serves as a thermal magnetic circuit breaker.) Also on the rear panel are: balanced (XLR) and single-ended (RCA) inputs; widely spaced pairs of locking speaker binding posts whose big tabs make them easy to tighten; an IEC power-cord inlet; a white Signal Ground terminal intended solely for active subwoofers; two binding posts labeled "12V External Turn-on"; and handles for lifting. Thank God for those handles.

Once I'd got these very heavy amps positioned on our Grand Prix Audio Monaco stands—they need a good amount of space to dissipate all that heat—setup was easy. Because I use balanced interconnects, there was no need to insert the supplied gold shorting pins into the XLR input sockets' negative and ground holes (1 and 3). (A little stencil on the rear panel illustrates how to correctly insert the shorting pins.) After the speaker cables were connected in correct polarity, and carefully separated from the interconnects and power cord, I was ready to go.

The XA200.8 requires an hour to fully warm up, and that hour made a huge difference in the sound. Long ago, I owned a Pass Labs Aleph 30 stereo power amp. (I wish I still did, now that I finally have a front end good enough to let me fully appreciate its gifts.) One evening, I brought home a new friend who, on seeing my system, immediately wanted to hear music. I explained that the electronics wouldn't sound good until they'd fully warmed up, but nonetheless put on an LP of Otto Klemperer's recording of Brahms's *A German Requiem*.

Thirty-five minutes later, in the middle of a grand chorus, the soundstage suddenly went *whoom*—everything opened up. What before had sounded somewhat small, flat, and colorless seemed to double in size as it blossomed with color and radiance.

"What was *that*?" my guest asked, somewhat shocked.

"The amps just reached an internal temperature of 125°," I said with a knowing smile.

Let the XA200.8s warm up for an hour.

Delving Deeper

I don't think the audiophile wants technical perfection. He wants to be happy.

—*Nelson Pass*

Nelson Pass may be remarkably open and generous in sharing experimental designs, and even old product casings, with do-it-yourselfers, but he keeps the details of his commercial products close to his vest. As he explains in the XA200.8's owner's manual, "Since the release of the X.5 series . . . we began working on what has now become the X.8 amplifiers. They embody everything we know, and while I can't divulge all the details, I can tell you about some things which might interest you."

Among those things: Each XA-series model is unique, with sonic characteristics determined by its number of devices, heatsinking, supply voltage, bias currents, and output-stage transfer curves. The XA200.8's DC-coupled front-end circuit contains its input and voltage gain stages, and uses a mix of four each of complementary, discontinued Toshiba JFET, MOSFET, and bipolar devices. The only capacitors are across the shunt-bias regulators and in the power supplies. Those supplies, larger than in the .5 series, include additional RF filtering in the AC primary circuits, paralleled fast/soft rectifiers, and very large, toroidal Plitron transformers.

Pass prefers to answer questions by e-mail; I sent him a bunch. In describing his goals and process in moving from the .5 to Xs to .8 series, he wrote:

> The two-box Xs 300 came first, and in many ways the rest was the key turning in the lock. Since any hardware differences will affect the sound, we see a series of compromises between cost, power, size, consumption. We made the hardware bigger. The banks of output power MOSFETs already being overkill, we concentrated on the power supplies and the heatsinks. This allowed greater bias current for greater class-A operation into lower impedance loads,

MEASUREMENTS

Before performing any measurements, I ran one Pass Labs XA200.8 (serial no. 29556) for an hour at one-third its measured maximum power into 8 ohms—thermally, the worst case for an amplifier with a class-AB output stage but not for a true class-A amplifier, which runs at its hottest with no signal. By the end of the hour, the top panel was warm, at 99.4°F (37.4°C), and the side-mounted heatsinks were hotter, at 118.1°F (47.8°C). Although Pass Labs specifies the XA200.8 operating in class-A, I suspect that even with its massive heatsinking, the amplifier, doesn't have sufficient bias current to allow class-A operation up to its specified maximum power.

I performed a full set of measurements using my Audio Precision SYS2722 system (see the January 2008 "As We See It"[1]). The voltage gain at 1kHz into 8 ohms was slightly lower than the specified 26dB, at 24.85dB for the balanced input and the expected 6dB lower for the unbalanced input (for unbalanced drive, sockets 1 and 3 of the XLR jack were connected with a jumper). The amplifier was non-inverting (*ie*, it preserved absolute polarity) with both inputs. Its balanced input impedance was the specified 100k ohms at 20Hz and 1kHz, dropping slightly to 93k ohms at 20kHz. The unbalanced input impedance is specified as 50k ohms; my estimate was 55k ohms at 20Hz and 1kHz, 38k ohms at 20kHz.

The XA200.8's output impedance was 0.11 ohm at 20Hz and 1kHz, rising to 0.15 ohm at 20kHz. The modulation of the amplifier's frequency response, due to the Ohm's law interaction between this source impedance and the impedance of our standard simulated loudspeaker,[2] was just ±0.1dB (fig.1, gray trace). Into an 8 ohm resistive

1 See www.stereophile.com/asweseeit/108awsi/index.html.

2 See www.stereophile.com/content/real-life-measurements-page-2.

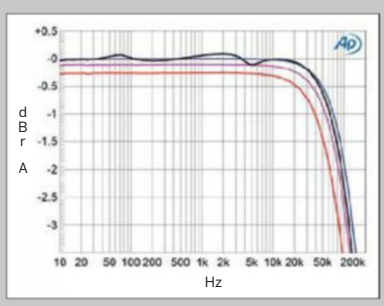

Fig.1 Pass Labs XA200.8, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (blue), 4 ohms (magenta), 2 ohms (red) (1dB/vertical div.).

which improved performance at lower power levels as well. The weight is almost entirely chassis, heatsinks, and power-supply transformer.

The lesson of the Xs and SIT amplifiers was that a small amount of second harmonic of a particular phase character gives a desirable sonic result. To get that effect, we altered the arrangement of the constant-current sources in the output stage to better duplicate the sound of the Xs output stage. While the .8 amplifiers still have low distortion, they do not suppress second harmonic as much as the .5 series, giving a mostly second-harmonic character at ordinary listening levels and segueing into third harmonic at higher power.

The front end was altered to let the input stage operate with CFA-type feedback instead of VFA. VFA is where feedback is introduced through high-impedance networks, and CFA is an alternative approach with low-impedance networks. The terms VFA (voltage feedback amplifier) and CFA (current feedback amplifier) are misnomers, as both types actually have voltage feedback. As with the Xs, it sounded a little better.

By the time I left ESS. I was convinced that the best path was Bart Locanthi's dictum: An amplifier should be designed for low distortion and wide bandwidth without feedback. Negative feedback is then added to make an already good design perform even better; it is not used to 'clean up' problems in the basic design.

Sound

I've now spent so many hours listening to the XA200.8s alone and comparing it with other amplifiers that I know their sound inside out. When some members of the Pacific Northwest Audio Society commented, after an extended listening session, that they preferred the "organic" sound of the XA200.8, they were on to something.

Just as many inspired musicians invest their sound with a soulful glow that can grow in brilliance, the XA200.8s seemed to illuminate music from within in a way that complemented that artistic brilliance. In contrast with some tube amplification, the inner glow I heard with the XA200.8s sounded like something that arose organically from within the music. At the beginning of Mahler's Symphony 2, in the recording by Iván Fischer and the Budapest Festival Orchestra (SACD/CD, Channel Classics CCS SA 23506), the impact of the ominous march of cellos and double basses, the cries of the brass, and the merciless roll of drums were in no way sweetened, softened, or prettified by the Passes, but the beauty of the sound allowed the emotional truth behind the notes to come through in spades.

The XA 200.8s compounded joy and beauty with more joy and beauty.

The XA200.8 didn't deliver the fattened midrange I've heard from some components—its midrange was unique in radiating color and beauty. Midrange-rich voices—*eg*, those of Lorraine Hunt Lieberson, Anne Sofie von Otter, Ella Fitzgerald, the mature Sarah Vaughan, Matthias Goerne, Gerald Finley, Billy Eckstein, Kurt Elling—or an instrument with a full midrange core, such as the cello, didn't sound unnaturally beefed up or altered.

Music was also reproduced with grace. In her irreplaceable recording of Sondheim's "Send in the Clowns" with Count Basie and his Orchestra, from *A Little Light Music* (CD, Pablo/JVC-XRCD VICJ-60246), Sarah Vaughan sings with a refinement and spirit that differentiate her from some of the great belters—*eg*, Bessie Smith, Ethel Merman, or the early Barbra Streisand. When soprano Elly Ameling delivers an exquisite turn of phrase topped with radiant highs, or one of soprano Elisabeth Schumann's golden highs seems to

measurements, continued

load (fig.1, blue trace), the XA200.8's response was flat up to 20kHz, then rolled off to reach –3dB around 120kHz. The response rolled off a little earlier into lower impedances, but was still just 0.5dB down at 20kHz into 2 ohms (red trace). With this wide a small-signal bandwidth, the amplifier's reproduction of a 10kHz squarewave into 8 ohms featured short risetimes and a well-squared shape (fig.2).

The unweighted, wideband signal/noise ratio, ref. 1W into 8 ohms and taken with the input shorted to ground, was an excellent 83dB. This improved to 88.2dB when the measurement bandwidth was restricted to the audioband—and was even better, at 92.1dB, when the measurement was A-weighted. Like the other Pass Labs amplifiers we have reviewed, the XA200.8 is quiet. As with the XA60.8 monoblock that we reviewed in December 2017,[3] both the odd and even harmonics of the 60Hz power-supply frequency were present in the amplifier's noise floor, though these all lay at or below

3 See www.stereophile.com/content/pass-laboratories-xa608-monoblock-power-amplifier-measurements.

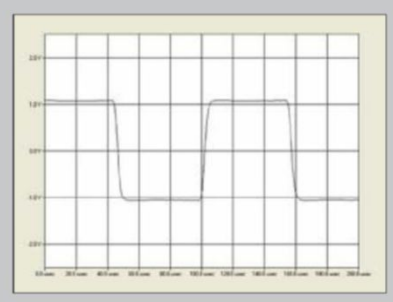

Fig.2 Pass Labs XA200.8, small-signal 10kHz squarewave into 8 ohms.

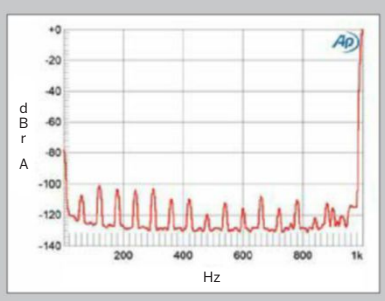

Fig.3 Pass Labs XA200.8, spectrum of 1kHz sinewave, DC–1kHz, at 1W into 8 ohms (linear frequency scale).

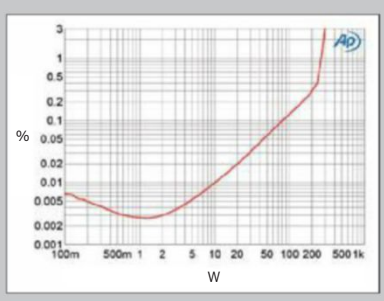

Fig.4 Pass Labs XA200.8, distortion (%) *vs* 1kHz continuous output power into 8 ohms.

pop out of nowhere, their heart, soul, and intelligence are palpable. The XA200.8 opened a window on such points of creation and, without editorializing on them, let me hear great art in all its subtlety and splendor.

Listening to how music sounded through the XA200.8s, I thought of Glinda (Billie Burke) introducing herself to Dorothy (Judy Garland) in *The Wizard of Oz:* "I am a witch. I'm Glinda, the Good Witch of the North."[1] The bubbling smile in Burke's voice complements her sparkling, star-tipped magic wand and jeweled crown with a special glow that defines her as a magical being of light. Similarly, the XA200.8s invested music with a special glow that let me feel its inspired essence.

This glowing sound in no way diminished the impact of music that is about things very different from goodness and happiness. The low, multilayered rumble and churning at the beginning of Alban Berg's often brutal *Three Pieces for Orchestra*, in the superb recording by Michael Tilson Thomas and the San Francisco Symphony (24/192 WAV, SFS Media/HDtracks), or the terror in Maria Callas's voice in the bloodcurdling Sleepwalking Scene of Verdi's *Macbeth*, in the 1958 stereo recoding with Nicola Rescigno conducting the Philharmonia Orchestra (24/96 WAV, Warner Classics 634015/HDtracks), were enhanced by the special illumination that the XA200.8 brought to them. It was as if I were listening from a prime seat in the orchestra section where maximal color evoked maximal emotional response.

Comparisons

By now you may be wondering if I'm about to claim that the Pass Labs XA200.8 is the sun, moon, and stars, and better than Peter Pan or Beyoncé. Hardly. It had limitations, and one of those was in the bass. As much as the $42,000/pair XA200.8 delivered copious deep bass, it lacked the speed and slam of the Dan D'Agostino Master Audio Systems Progression Mono ($38,000/pair)[2] and some of the other monoblocks I've reviewed—*eg*, the Audionet Max ($30,500/pair).[3]

When it came to the speed and impact of the slamming bass of "Electrified II," from Yello's *Toy* (24/48 WAV, Polydor 4782160/HDtracks), or the stereo remix of "Lucy in the Sky with Diamonds" from the Beatles' *Sgt. Pepper's Lonely Heart Club Band* (24/96 WAV, Apple/Parlophone B0026524-02/HDtracks), the XA200.8s sounded a bit soft and unfocused next to the D'Agostino Progression Monos. I played through the Progressions a recording of works by J.S. Bach arranged for mandolin, cello, and double bass and performed by Chris Thile, Yo-Yo Ma, and Edgar Meyer (24/96 WAV, Nonesuch 558933/HDtracks), and couldn't help noticing how much tighter and more defined Meyer's bass sounded through the D'Agostino amps.

The Progression Mono may lack the XA200.8's special glow, but it scores major points in bass, detail, and honesty. If I wanted to hear the differences among the sounds of major orchestras, or compare the tones of Daniel Hope's and David Oistrakh's violins, I think I'd turn first to the Progression. Its sound is more straight-ahead and naked in its honesty.

The XA200.8s' reproduction of air around individual instruments was fine, but through Wilson Audio's Alexia and Alexia 2 speakers the Progression Monos topped it in the presentation of the entire acoustic spaces of recording venues. The D'Agostino also excelled in dynamic contrast—hardly a surprise, given the Progression Mono's greater

1 See www.youtube.com/watch?v=7F8pSGOiOR8.

2 See my review of the Dan D'Agostino Progression Mono in the October 2017 issue: www.stereophile.com/content/dan-dagostino-progression-mono-monoblock-power-amplifier.

3 See my review of the Audionet Max in the July 2017 issue: www.stereophile.com/content/audionet-max-monoblock-power-amplifier.

measurements, continued

–100dB ref. 1W into 8 ohms (fig.3).

The XA200.8 is specified as delivering 200W into 8 ohms (23dBW). Using our definition of clipping—*ie*, when the output's percentage of THD+noise reaches 1%—the Pass Labs amplifier clipped at 258W into 8 ohms (24.1dBW, fig.4), 480W into 4 ohms (23.8dBW, fig.5), and 700W into 2 ohms (22.4dBW, fig.6). The THD begins to rise above the noise floor at powers greater than a couple of watts, but remains at or below 0.1% below 100W into any of these impedances. As with the XA60.8, the percentage of THD+N in the XA200.8's output slowly rises with increasing power, suggesting that the amplifier uses only a small amount of corrective feedback.

I examined how the percentage of THD+N changed with frequency at 20V, which is equivalent to 50W into 8 ohms, 100W into 4 ohms, and 200W into 2 ohms. The THD+N was extremely low in the midrange into 8 and 4 ohms (fig.7, blue and magenta traces), and still below 0.1% into 2 ohms (red). It rose linearly as the frequency increased, the three traces converging in the high treble—which suggests that,

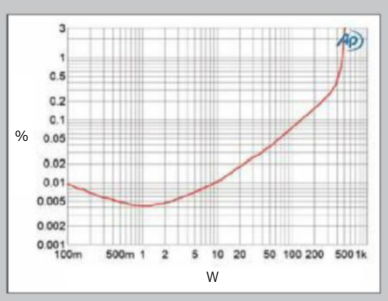

Fig.5 Pass Labs XA200.8, distortion (%) *vs* 1kHz continuous output power into 4 ohms.

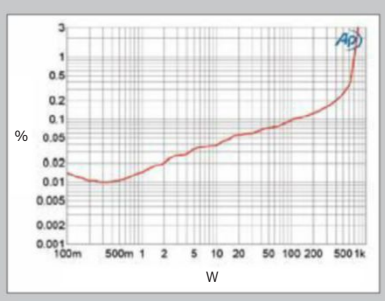

Fig.6 Pass Labs XA200.8, distortion (%) *vs* 1kHz continuous output power into 2 ohms.

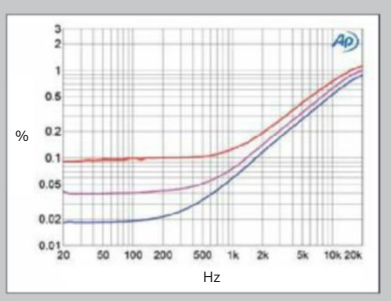

Fig.7 Pass Labs XA200.8, THD+N (%) *vs* frequency at 20V into: 8 ohms (blue), 4 ohms (magenta), 2 ohms (red).

power into these 4 ohm Wilson speakers: 1000W *vs* the XA200.8's 400W.

Which led to another observation: The Pass Labs amp was really challenged by the original Alexia's impedance dip in the bass, which rendered its low bass flabbier than I have heard from any other XA.8-series amps of my experience. The Progression's bass, on the other hand, sounded impressively tight through the original Alexias. Through the Alexia Series 2 speakers, although both amps delivered more bass—and bass that was better integrated with the midrange and treble—the Progression Monos retained their supremacy as the tighter, faster, and more powerful bass conduit. (See my Follow-Up on the Alexia 2 elsewhere in this issue.)

But I can easily overlook the XA200.8's shortcomings because I would never want to be without the drop-dead gorgeousness of its sound. I'm not sure I'd be equally enthused were my daily fare jazz, rock, souped-up pop, etc. But it isn't. For the music I love, from grand opera to chamber music, listening through the Pass Laboratories XA200.8s compounded joy and beauty with more joy and beauty.

Conclusion

Few power amplifiers I've heard have sounded as beautiful as Pass Laboratories' XA200.8 monoblock. Having to stick to *Stereophile*'s policy of not commenting at length on a product's sound quality until that product has been reviewed in our pages, when all I wanted to do was wax ecstatic about the sound of these amps, has been frustrating indeed.

Now I can say it: I love the sound of the Pass Labs XA200.8 monoblock. It is the most beautiful-sounding, color-rich amplifier ever to grace my system, and its ability to illuminate music from within with subtlety and finesse puts it in a class all its own. It's a big beast, heavy and expensive and room-heating, and it's not the last word in bass slam, bass speed, and other things. But it sounds so gorgeous that all music lovers, regardless of financial means, owe themselves the gift of hearing it in a system that will show it to its best advantage. The XA200.8 is a masterpiece of amplifier design, and proof of Nelson Pass's genius and unfailing commitment to musical excellence. ■

ASSOCIATED EQUIPMENT

Digital Sources dCS Paganini SACD/CD transport, Scarlatti clock, Rossini & Vivaldi DACs, Network Bridge; Intel NUC7i7BNH computer with 8GB RAM, 128GB SSD, running Roon; Linksys router with two TP-Link gigabit Ethernet media converters & multimode duplex fiber-optic cable; external hard drives, USB sticks, Apple iPad Pro.
Power Amplifiers Dan D'Agostino Master Audio Systems Progression Mono monoblocks.
Loudspeakers Wilson Audio Specialties Alexia 2.
Cables Digital: AudioQuest Diamond (Ethernet), Nordost Odin 1 & Odin 2 & Valhalla 2 (USB), Wireworld Platinum Starlight (Ethernet). Interconnect, Speaker, AC: Nordost Odin 2.
Accessories Audience aR2p-TSSOX, Tweek Geek Dark Matter Stealth (with High Fidelity & Furutech options) power conditioners; Nordost QB8, 2 QX4, QK1 & QV2 AC power accessories; Greenwave EMI filter; AudioQuest NRG Edison outlets; Grand Prix Monaco rack & amp stands, 1.5"-thick Formula platform; Nordost Sort Lifts (speaker cables); Marigo Clear Transformation mat; Stein Music Super Naturals, Signature Harmonizers, Blue Suns/Diamonds, Quantum Organizer; Bybee Room Neutralizers; Absolare Stabilians; Resolution Acoustics room treatment; Stillpoints Aperture panels.
Listening Room 20' L by 16' W by 9' H.—**Jason Victor Serinus**

measurements, continued

again like the XA60.8, the circuit has limited open-loop bandwidth.

Fortunately, the XA200.8's distortion is predominantly the subjectively innocuous third harmonic (figs. 8 and 9). Still, at low frequencies into lower impedances, the second harmonic rises to equal the level of the third, and some higher-order harmonics appear (not shown), though the latter all lie at or below –100dB (0.001%).

As with the other Pass Labs XA-series amplifiers we have reviewed, the XA200.8's top-octave decrease in linearity (fig.7) is associated with some higher-order intermodulation products that were fairly high in level when the amplifier was asked to drive an equal mix of 19 and 20kHz tones at high power into 4 ohms (fig.10). Even so, the second-order difference product at 1kHz, which will be more audible than the higher-order products, lies at a low –74dB (0.05%).

The measured performance of the Pass Laboratories XA200.8 reveals some well-balanced audio engineering.
—John Atkinson

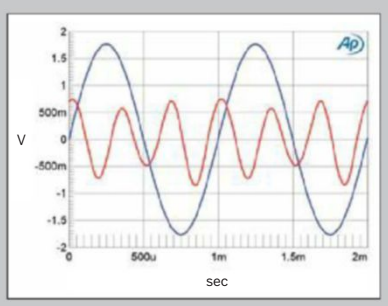

Fig.8 Pass Labs XA200.8, 1kHz waveform at 50W into 8 ohms, 0.06% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

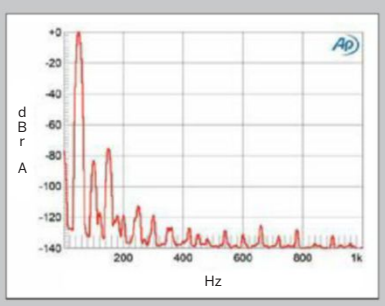

Fig.9 Pass Labs XA200.8, spectrum of 50Hz sinewave, DC–1kHz, at 50W into 8 ohms (linear frequency scale).

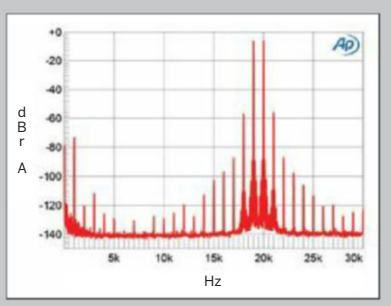

Fig.10 Pass Labs XA200.8, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 100W peak into 4 ohms (linear frequency scale).