

# Zanden

## Model 5000 Mk.IV/Signature & Model 2000 Premium

D/A CONVERTER & CD TRANSPORT

Michael Fremer

**DESCRIPTION** Four-box, 16-bit/44.1kHz CD player with separate transport and DAC, each with separate power supply. DAC power-supply tube complement: two 6CA4, one 6X4. Formats supported: CD, CD-R, CD-RW. Transport output: 16-bit/44.1kHz via S/PDIF, AES/EBU, I2S; word clock. Transport output jacks: S/PDIF BNC, AES/EBU XLR, I2S; word clock BNC. DAC input jacks: S/PDIF (RCA and BNC), AES/EBU (XLR), I2S. DAC input frequency: 44.1kHz. Total harmonic distortion: not specified.

**DIMENSIONS** Transport: 15.6" (400mm) W by 5.4" (140mm) H by 15.6" (400mm) D. Power supply: 13.9" (355mm) W by 2.4" (60mm) H by 15.6" (400mm) D. DAC: 15.7" (403mm) W by 4" (103mm) H by 10" (255mm) D. Power supply: 6" (154mm) W by 6.4" (164mm) H by 13.2" (338mm) D.

### SERIAL NUMBERS OF UNITS

**REVIEWED** Transport: 033. DAC: 023.

**PRICES** \$27,970 transport, \$15,470 DAC. Approximate number of dealers: 3.

**MANUFACTURER** Zanden Audio Systems, Ltd., 6-6-2-101 Shinmori Asahiku, Osaka-city, Osaka 535-0022, Japan. Tel./Fax: (81) 6-6953-6511. Web: [www.zandenaudio.com](http://www.zandenaudio.com). US distributor: Zanden Audio North America. Web: [www.zandenusa.com](http://www.zandenusa.com).



Zanden Model 5000 Mk.IV

**W**e were driving to a friend's house to celebrate her dad's 92nd birthday. Halfway there, a bright yellow, ground-hugging insect pulled in front of my car from across the street. "Wow, that's a Lamborghini Countach!" I exclaimed. You don't often see one of those in my neighborhood—or in any neighborhood.

"What is?" my mother-in-law responded without irony. "That car!" I squeaked, staring transfixed at the car's least dramatic angle. My childlike tone had my wife and mother-in-law chortling until, still mesmerized, I missed a familiar turn and began involuntarily following the Lamborghini down the wrong street.

"Michael!!" they shrieked simultaneously, as if I'd followed the Countach off a cliff. Good for them: had they not yelled and forced me to snap to, I would have just kept following. When you're going to a 92nd-birthday party, late is not good.

I don't know who owned that car, but I do know that, unlike some envious audiophiles I meet online, I didn't resent the guy driving a car of my desires that I'll never be able to afford. Good for him is not the same as bad for me. I'm thankful that such a machine exists and that there are people able to afford it. In other words, I begin this review still feeling somewhat defensive about the response to my January review of Continuum Audio Labs' \$100,000 Caliburn, Cobra, Castellon combo.



Zanden won't play SACD or DVD-Audio discs. Nor does it oversample or upsample. Its digital architecture is strictly 16-bit. In that regard, it's more like some of the "legendary"-sounding \$69 boomboxes you may have read about that supposedly offer superior, even magical sound precisely because they don't dick around with the digits.

Please don't be mad at this Zanden assemblage or resentful of the folks who can afford it, and for God's sake don't get on my case for reviewing it.

Try to be thankful that an artisan and inventor like Kazutoshi Yamada would consider investing his time and talent in conceiving and executing such a visual wonder. (I'm not giving away the sonic store in the introduction.)

### Model 2000 Premium CD transport

According to importer Eric Pheils of Zanden Audio North America, the Model 2000 Premium transport uses "the world's most accurate crystal clock in consumer audio." For now, I can only take his and

Yamada-san's word for that. Later, there will be John Atkinson's measurements. I love that *Stereophile* does that.

Pheils claims that "others" use rubidium clocks. All others? Some others? I don't know. Zanden uses crystal because, while its temperature stability is not quite as high as that of rubidium, Yamada-san thinks it sounds better. That's partly because Zanden's clocks are custom-designed to output 8.4672MHz, which is the internal clock setting of the custom-modified, die-cast, Philips

## MEASUREMENTS

First, it must be noted that Zanden doesn't have enough dealers to qualify for a full review in *Stereophile*. At the time the review was organized I was under the impression that the Zanden gear was available from five US dealers, the minimum we require. But as we went to press, we were informed that Zanden has just three US dealers. It wasn't possible that late in the production to abort the review. My apologies to the magazine's readers for this inadvertent exception to our rules.

For almost all of my tests, I drove the 5000 Signature D/A processor from the 2000P CD transport using the supplied I<sup>2</sup>S datalink, though I did perform some tests using audio data sourced from my PC with an AES/EBU link from an RME soundcard with a digital output. (Peculiarly, though the 2000P has a word-clock output on a BNC jack, the 5000S doesn't have a separate word-clock input and there is no mention of using the word-clock connection in the manual for either unit.) But whether driven by the Zanden 2000P transport or by an external digital source, the Zanden 5000S put out a maximum of 1.6V at 1kHz, almost 2dB below the CD standard's 2V RMS. This was the left channel; the right channel was 0.5dB higher in level. The output impedance was a high 2.5k ohms at 1kHz, this dropping a little to 2k ohms at 20kHz, and rising slightly to 2.6k ohms at 20Hz. As the owner's manual recommends, loads below 10k ohms should be avoided.

The Zanden DAC inverted signal polarity with the front-

panel switch set so that the green LED was illuminated, and preserved absolute polarity with it illuminated red—the opposite of what I would have expected. Assessed with the Pierre Verany Test CD, the 2000P's error correction was superb, the transport not flagging uncorrectable errors until the gaps in the data spiral were 2mm long.

The combination's frequency response was disappointing, with a noticeable rolloff of low frequencies that reached -3dB at 65Hz and -9dB at 24Hz. The top octave also rolled off prematurely (fig.1, top traces). With a pre-emphasized CD, the treble rolled off even lower in frequency (fig.1, bottom traces). This is simply poor engineering. Crosstalk was buried under the noise floor below 1kHz (not shown), but channel separation decreased to 72dB at 10kHz, due to the usual capacitive coupling. The noise floor was higher than I usually find with 16-bit DACs, as can be seen from the spectral analysis of the 5000S's analog output while it decoded data representing a dithered 1kHz tone at -90dBFS (fig.2). You can also see relatively high AC-supply components at 120Hz and 240Hz in both channels and at 60Hz in the left channel. No matter how I arranged the grounding between the 2000P, the 5000S, and my Audio Precision System One, I couldn't eliminate these spurious.

Note that the peak representing the 1kHz, -90dBFS tone rises above the -90dBFS line in fig.2, suggesting the presence of some positive linearity error. This was confirmed by fig.3, which plots the level of a dithered 16-bit/500Hz tone as it drops in level from -60dBFS to -120dBFS. Linearity

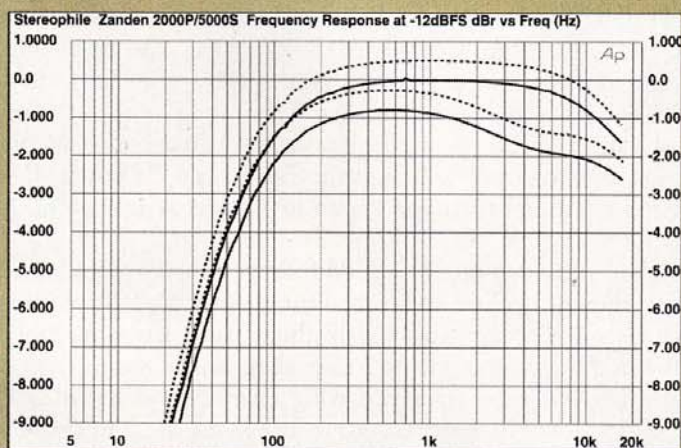


Fig.1 Zanden 2000P-5000S, frequency response at -12dBFS into 100k ohms (top), with de-emphasis (bottom). (Right channel dashed, 1dB/vertical div.)

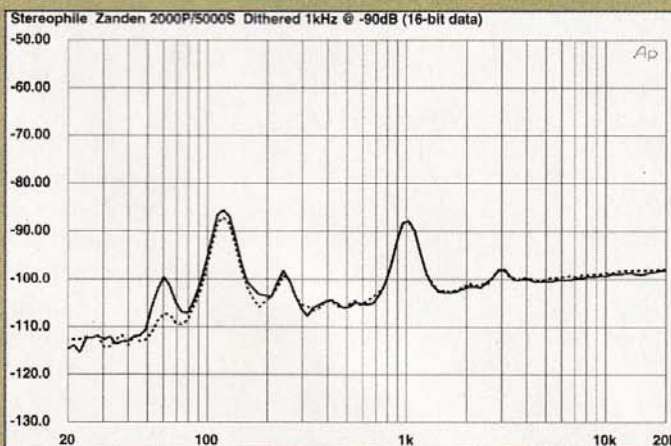


Fig.2 Zanden 2000P-5000S, 1/2-octave spectrum with noise and spurs of dithered 1kHz tone at -90dBFS (right channel dashed).



PRO-2M mechanism on which the 2000P transport is based, and that is said to maintain the digital data's musical integrity by eliminating the need for direct digital synthesizer (DDS) interfaces. Jitter, phase noise, and clock errors are said to be eliminated.

The throne-like, top-loading transport is mounted on an acrylic platform that rests on four specially damped feet of highly polished stainless steel. It's a thing of beauty. Zanden claims that its sandwich construction of brushed aluminum and acrylic gives it great structural integrity as well.

To play a disc, you lift off the 2000P's heavy top cover as you would the lid from a pot, then gently drop a CD into a

## THE **5000 MK.IV** DOESN'T INCLUDE DIGITAL BRICK-WALL FILTERING OR ANY **OVERSAMPLING** OR UPSAMPLING.

well precision-machined out of the solid aluminum chassis. Replace the lid and it activates a tiny contact embedded in the spindle. The disc then automatically boots up and its ToC appears on the familiar Philips screen.

The transport gets its power from two multipin umbilicals connected to a low-profile outboard supply, this exquisitely finished on all sides (including the bottom plate) in Zanden's aesthetic specialty: cur-

vaceous, gleaming stainless steel polished to a mirror finish. The standalone power supply and the transport's extensive use of noise damping and exclusive RF blocking materials are said to help make the 2000P physically and electronically quiet and clean in operation.

The rear-panel facilities include AES/EBU, S/PDIF, and I<sup>2</sup>S outputs, as well as a BNC word-clock output, along with 7- and 10-pin power-supply

### measurements, continued

error is low down to  $-85\text{dBFS}$ , but then increases to a maximum of  $+7\text{dB}$  at  $-100\text{dBFS}$ ; *ie*, a tone at this level actually reproduces at  $-93\text{dB}$ . The error is then increasingly dominated by noise. I haven't seen a DAC behave this poorly for many years; in fact, I remember Philips' TDA1541 as being rather better in this respect.

With its poor linearity and high noise, it's not surprising that the 5000S didn't fare well at the task of reproducing an undithered 1kHz tone at exactly  $-90.31\text{dBFS}$  (fig.4). Instead of the three clearly defined voltage levels you can see in the graph elsewhere in this issue showing how the Cary CD-306 did with this test, the Zanden produces a dirty, indistinct waveform, the AC noise introducing an overall slope to the oscilloscope trace. Feeding the D/A processor a 24-bit version of this signal via its AES/EBU input produced an identical waveform, showing that the 5000S truncates incoming hi-rez data to 16 bits. (To be fair, Zanden doesn't claim otherwise.)

Measurement of the Zanden combination's distortion was made problematic by the high level of ultrasonic energy present in its output, this due to the images of the audioband signal present at either side of the multiples of the sampling

frequency. I got consistent results with two different measuring systems, however, so I believe the results shown are representative of the products' intrinsic behavior, and not to any interaction between this energy and the analyzer. Fig.5

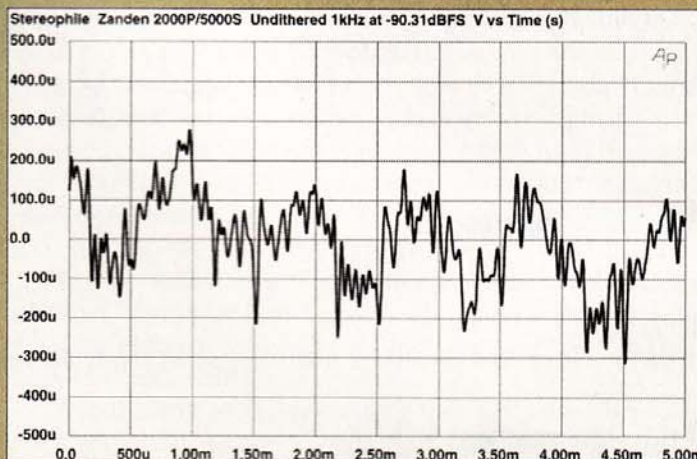


Fig.4 Zanden 2000P-5000S, waveform of undithered 1kHz sine wave at  $-90.31\text{dBFS}$ , 16-bit data.

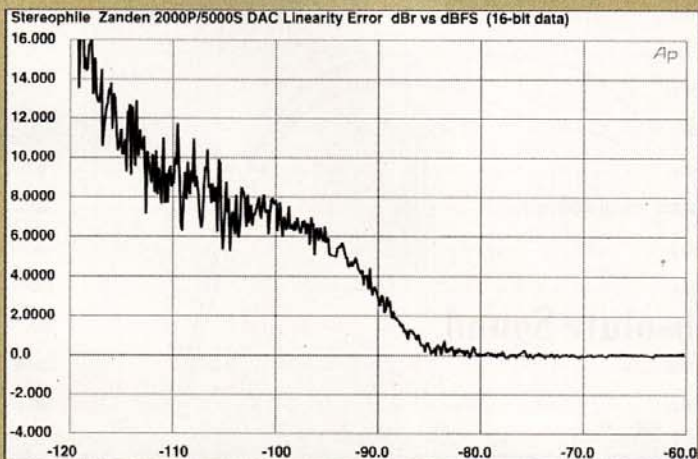


Fig.3 Zanden 2000P-5000S, right-channel departure from linearity, 16-bit CD data (2dB/vertical div.).

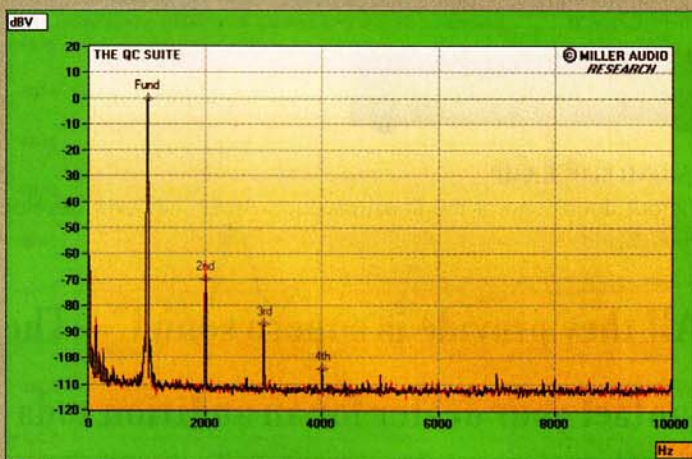


Fig.5 Zanden 2000P-5000S, spectrum of 1kHz sine wave at  $0\text{dBFS}$  into 8k ohms (linear frequency scale).



inputs. The build quality, ergonomics, and functionality of the remote control, which is smoothly machined and finished in brushed-satin aluminum and semitranslucent acrylic, is commensurate with the high price tag, though backlighting would be a nice upgrade.

All that, and a CD transport that exudes the sexiness of (dare I say it?) a turntable, is what \$27,970 will buy you.

### Model 5000 Mk.IV/Signature 16-bit D/A converter

The Model 5000 Mk.IV/Signature was designed to achieve "Linear full bandwidth phase," something the Zanden literature claims is an area where all other digitally filtered DACs fall

short. Do they? Does the Zanden achieve it? Zanden's approach is to use its own, patented analog filter, which the company claims has the best phase characteristics of any filter on the market. The 5000 Mk.IV doesn't include digital brick-wall filtering or, as I've already pointed out, any oversampling or upsampling. This DAC is strictly premium "old school" (ca 1985): Philips' TDA-1541A "double crown," which Zanden feels is "the best sounding chip ever made," and which hasn't been made since the late 1990s. The output is tube-driven via a single 6922 using Zanden's patented single-stage, zero-feedback circuit. Needless to say, Zanden claims to use the highest-quality

parts and construction throughout.

Like the 2000P transport, the 5000S DAC is a two-box design. The chassis base and the rear and front panels are made of 16mm-thick aluminum, while the curving cover of polished stainless steel causes headshakes of admiration from competitors and lust from my friends.

A tube-rectified power supply using one 6X4 and two 6CA4 tubes provides an unbridgeable vacuum gap that is said to block noise from entering the system—the same rationale Brinkmann uses for its vacuum-tubed motor drive. The power supply, housed in yet another case of exquisitely mirrored stainless steel, is meant to be displayed,

shows an FFT-derived spectrum of the 5000S's output while it drove a full-scale 1kHz tone into 8k ohms, this a little lower than the load recommended by Zanden. Even so, the THD (actual sum of the harmonics) is respectably low, at 0.03% left channel and 0.066% right, and the subjectively benign second harmonic is the highest in level in both channels. Dropping the signal level to -90dBFS (the same test tone used to generate the  $\frac{1}{3}$ -octave smoothed graph in fig.2) gave the spectral analysis shown in fig.6: the third harmonic is now the highest in level, and the distortion is higher in level than I see with the best DACs. (The TDA1541 chip clearly shows its age on this test.)

I got a surprise when I repeated these tests using a full-scale low-frequency tone: Even though the test load was now a benign 100k ohms, the FFT spectrum was littered with distortion harmonics (fig.7) and the THD+noise was ridiculously high at 25.4%. This was for the left channel; the right channel was somewhat better, at 21%. Even so, the Zanden 5000S seems incapable of reproducing high-level low frequencies without introducing high levels of distortion, though the fact that the response is down almost 5dB at 50Hz might reduce the distortion's audibility. I did wonder if the 5000S was one of those rare products

that is actually more linear into low impedances than the 100k ohms of my analyzer. I therefore repeated the test into impedances ranging from 50k ohms down to 1k ohm and got the same results, other than the lower levels into the lower impedances.

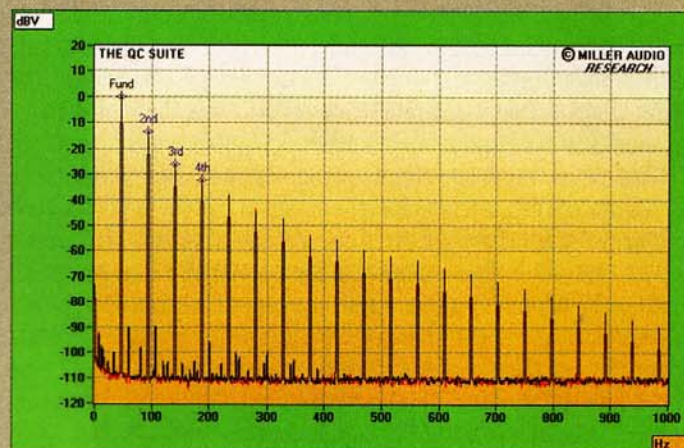


Fig.7 Zanden 2000P-5000S, spectrum of 50Hz sine wave at 0dBFS into 8k ohms (linear frequency scale).

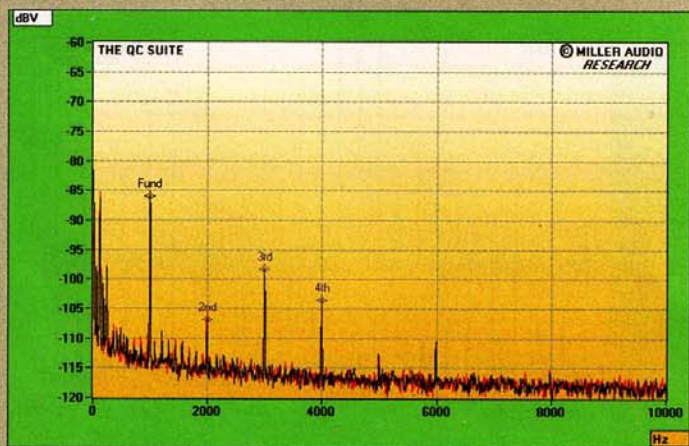


Fig.6 Zanden 2000P-5000S, spectrum of 1kHz sine wave at -90dBFS into 8k ohms (linear frequency scale).

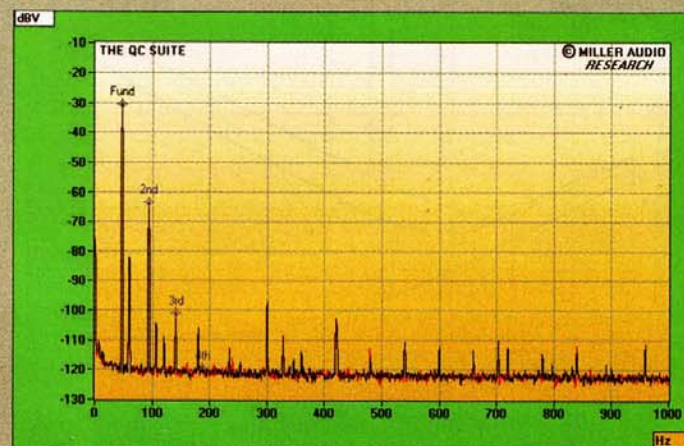


Fig.8 Zanden 2000P-5000S, spectrum of 50Hz sine wave at -30dBFS into 8k ohms (linear frequency scale).



not hidden away on a bottom shelf, as I was forced to do.

Three front-mounted knobs control On/Off, absolute polarity, and input choice. The rear panel features I<sup>2</sup>S, AES/EBU, BNC, and RCA S/PDIF inputs, analog outs, and a multipin power-supply jack. And that's what \$15,470 buys you.

### Put them together and what do you get?

The Zanden combo is not brand new. The 5000S DAC has been around in various iterations for a few years, the 2000P transport was introduced two years ago, and the I<sup>2</sup>S link between them, which separately sends the clock information and each musical channel, was used a decade ago by the now-defunct Audio Alchemy between its DAC and transport. But believe me, the

2000 Premium and 5000 Mk.IV/Signature are still worth writing about.

I linked them using Zanden's supplied I<sup>2</sup>S cable (which is fitted with what look like Ethernet connectors housed in XLR shells) because that's the way Zanden's instructions said it would sound best. I also tried various RCA/RCA digital cables, none of which sounded remotely as good as the I<sup>2</sup>S connection.

Using analog source material recorded to the Alesis Masterlink's hard drive, I compared the hard disk's playback using the Masterlink's D/A with CD-Rs burned from the Masterlink and played back through the Zanden transport and DAC connected first via the S/PDIF connection then by I<sup>2</sup>S. Direct A/B comparisons of the Masterlink's HD and the CD-R via S/PDIF demonstrated the clarity of the Zanden's transient resolution and

its utter freedom from grain and edge (which Zanden claims is a result of the phase-linear analog reconstruction filter). This superior performance was not due to tube output-based "softening"—there was nothing soft or rolled-off about the upper octaves, which were fast, extended, and airy. Yet impressive as the Zanden sounded overall, both sources still sounded slightly hardened, coarse, and "digital," in the cliché'd sense of that word.

However, switching the Zanden DAC to the I<sup>2</sup>S input took the sound to an exalted level of clarity, suppleness, transparency, and precision. Now the CD-R recorded from analog sounded almost as good as analog, and certainly better than any digital I've heard here.

At last year's *Hi-Fi News* show in London, the Audiofreaks room fea-

## measurements, continued

So what level of low frequencies will the Zanden reproduce in a clean manner? Fig.8 repeats the spectral analysis shown in fig.7, but with the signal level dropped by 30dB. The THD level was 2.5% left and 1.1% right, and the second harmonic is the highest in level, at -33dB/-39dB, respectively. It's possible that this THD level and this harmonic content will slip below the ear's threshold in this region.

Fig.9 plots the THD+N percentage against digital input level at two frequencies, 50Hz and 1kHz, for the left channel; and at 50Hz for the right channel. The decreasing percentage of THD+N in the 1kHz trace below -20dBFS suggests that the distortion harmonics are buried in the noise below this level. (A constant amount of noise becomes a larger proportion of the total as the signal decreases in level.) There is a slight rise in THD between -10dBFS and full scale, but at 1kHz, at least, the Zanden is a quite linear device. At 50Hz, however, the picture is quite different: the noise dominates the analyzer reading only at very low signal levels; the

5000S's circuit becomes increasingly nonlinear above -35dB. Looking at the waveform on the oscilloscope screen revealed that the negative-going halves of the waveform become increasingly rounded off as the signal level increases. Perhaps the DAC's interstage transformer is inadequately specified, but whatever the reason, this is pathological behavior.

The Zanden 5000P's behavior on the high-frequency intermodulation test was also disappointing. Not only was the second-order difference product relatively high, at 0.2% left channel and 0.09% right, but the graph was dominated by a slew of audioband intermodulation and aliasing products (fig.10), and the image of the 20kHz tone at 24.1kHz was almost as high in level as the fundamental!

As usual, I checked the Zanden combo's rejection of word-clock jitter by playing a CD on which had been recorded a high-level tone at exactly one quarter the sample rate, over which had been laid the LSB toggling at approximately 230Hz, which is the sample rate divided by 192. Because

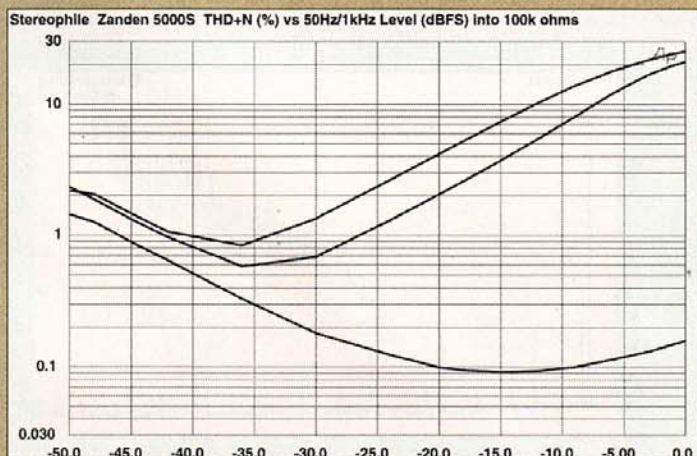


Fig.9 Zanden 5000S, THD+N (%) vs digital signal level (dBFS) into 100k ohms for (from top to bottom): 50Hz, left channel; 50Hz, right channel; 1kHz, left channel.

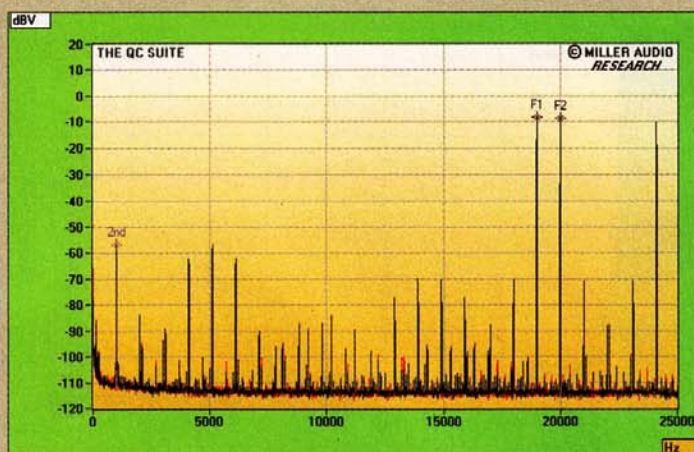


Fig.10 Zanden 2000P-5000S, HF intermodulation spectrum, 19+20kHz at 0dBFS peak into 8k ohms (linear frequency scale).



tured an all-Zanden system driving Avalon speakers. Compared to most of what I heard that weekend, that room was an oasis of smooth, musical flow and utter ease and grace. I lingered there a long time listening to CD-Rs I'd recorded from analog and brought along. The Zanden system's sound was warm and refined, with none of the grain and edge that I usually (and correctly) associate with CD sound. Nor was it at all soft or rolled-off on top, or the bass thick or too ripe. In fact, the Zanden's crisp, extended top end could exhibit a hard edge when called for. The system could rock without ever sounding harsh.

But while enjoyable and impressive overall, the sound in that room was not what I'd want for long-term satisfaction, given my musical and sonic tastes. However, thinking about the sonic

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character of my system and of what I like, I figured if the Zanden transport-DAC combo could stamp my system with some of what I heard at the *Hi-Fi News* show, the results could be spectacular. That hunch proved correct.

Until now, I've never used the clichéd phrase about "rediscovering" my music collection with the insertion in my system of a new piece of digital gear. Not even the dCS triple stack I reviewed in April 2003 had me saying that. What's always distracted me

about even the best digital reproduction I've heard is the jittery sensation it induces in me (as opposed to *digital jitter*, though the two may be related), often accompanied by boredom—a deadly combination.

But the Zanden combo had me pulling out CD after previously dismissible CD and finally hearing a compelling presentation that excited my auditory and visual senses while producing the feel of musical continuity and delicacy that, heretofore, only good analog has

both signal frequencies are exact integer fractions of the sample rate, the signal is free from quantizing noise, and any artifacts other than random noise that appear in the analog output of the device being tested will be due to its misbehavior. The two Zandens were joined by the I<sup>2</sup>S cable, and I examined the 5000S's analog output with the Miller Jitter Analyzer, a software suite that runs on a PC fitted with a National Instruments DSP card.

The result is shown in the narrowband spectral analysis in fig.11, plotted on a linear frequency scale symmetrically about the central spike, which represents the 11.025kHz tone. Correlating with the results of earlier measurements, the noise floor in this graph is 8–9dB higher than the best 16-bit D/As I have measured. The jitter level was high, at 1018 picoseconds peak-peak, which is more than four times the jitter of the best-performing components on this

test. Most of the jitter comes from sideband pairs at  $\pm 230\text{Hz}$  and its odd-numbered harmonics (red numeric markers). However, there are also sideband pairs at the AC supply-related frequencies of  $\pm 60\text{Hz}$  (brown "2") and  $\pm 120\text{Hz}$  (blue "3"). Considering that the I<sup>2</sup>S connection is supposedly jitter-free, as the word-clock signal is not multiplexed with the audio data, this is poor performance.

Turning to the AES/EBU connection, driving the 5000S with data sourced from the PC gave a significantly worse result: almost 4.4 nanoseconds! Again, this was due to major data-related sideband pairs and some AC supply components at  $\pm 60\text{Hz}$  and  $\pm 120\text{Hz}$  (not shown). Concerned that there was some unexpected interaction between the Zanden and my test gear, I repeated the test using a more recent version of the Miller Jitter Analyzer, running on a different PC with a different National Instruments card.

The result, taken with 48kHz-sampled data, is shown in

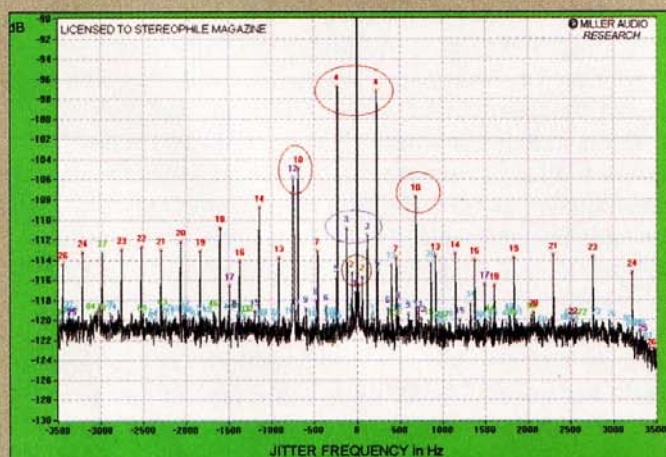


Fig.11 Zanden 2000P-5000S, high-resolution jitter spectrum of analog output signal (11.025kHz at  $-6\text{dBFS}$  sampled at 44.1kHz with LSB toggled at 229Hz), CD data. Center frequency of trace, 11.025kHz; frequency range,  $\pm 3.5\text{kHz}$ .

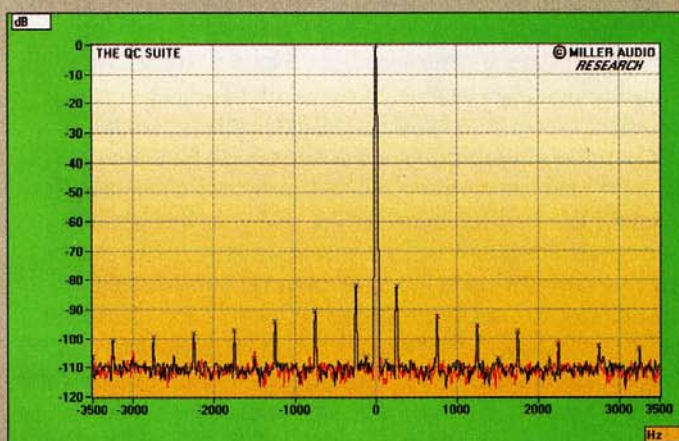


Fig.12 Zanden 5000S, high-resolution jitter spectrum of analog output signal (12kHz at  $-3\text{dBFS}$  sampled at 48kHz with LSB toggled at 250Hz), external 16-bit data. Center frequency of trace, 11.025kHz; frequency range,  $\pm 3.5\text{kHz}$ .



provided (for me). For the first time, I actually *looked forward* to playing CDs.

I've been playing Keith Lockhart and the Utah Symphony's superb-sounding if somewhat unadventurous *Symphonic Dances* (Reference RR-105CD) since it arrived, and while I immediately appreciated engineer Keith O. Johnson's recording, it was only through the Zanden combo that the picture convincingly coalesced and began making sense to me the way even inexpensive analog always does.

Prof. Johnson's recordings remind me of a kid who sneaks into the hall during a rehearsal and stands right inside the door. He prefers a distant perspective, lots of room sound, and an unusually wide soundstage, usually as heard from the *front* of the hall. Through the Zanden duo, with the lights out, I convincingly felt as if I were sitting way back in the empty hall, the orchestra in the distance, spread across the stage and reproduced with palpable transparency.

From this difficult-to-reproduce perspective, edge, etch, and typical

"digititis" can easily overwhelm the instruments' textures, timbres, and harmonic delicacy. The Zandens' ability to produce transparency and air without edge or etch created the most realistic and convincing images I've heard from an orchestra recorded from such a distant perspective. The three-dimensionality of the picture brought the hall's sidewall boundaries well to the sides, enveloping me in the space the way only analog usually does.

Compared to analog, CDs almost always sound two-dimensional and "smooshed" to me. The Zanden transport-DAC breathed honest three-dimensionality into recordings that have this in their analog counterparts but have never managed to exhibit it when digitally reproduced.

I pulled out what I'd always thought were good-sounding CDs that had nonetheless never sounded as good as their analog counterparts, such as the Bee Gees' astonishingly well-recorded *Trafalgar* (go ahead, laugh), which Mobile Fidelity issued on both gold CD and 200gm vinyl. The vinyl still

sounded more real and managed to project more of the performances' emotional "physicality," but for the first time, the CD's transparency, three-dimensionality, and—especially—its microdynamic resolve made it a credible rival to the vinyl.

All of this appears to have been accomplished not by somehow softening the analog output to mask the harshness and edge of CD reproduction, as is often done, but by attacking the problem at its root. This seemed to be supported by the fact that soft, delicate recordings I've always admired—such as engineer Kavi Alexander's analog-sourced *Water Lily Acoustics* CDs—were not smothered by the Zandens. For instance, the astonishing *Meeting by the River* (WLA-CS-29-CD), by Ry Cooder and V.M. Bhatt (who can be seen in *The Concert for George Harrison* DVD), not only did not sound softer than usual, it actually sounded more open, airy, and dynamic than I'm used to, with better-defined images, greater transient definition, and tighter and better-defined bass

## measurements, continued

fig.12. The jitter level was even higher than before, at 4.8ns peak-peak, and while I normally plot the effects of jitter on a graph with an expanded vertical scale, I used a full 120dB scale in this graph to show how severe the Zanden 5000S's problem is when it's fed data via its AES/EBU link. Given that this input also truncates data with a bit depth greater than 16, and won't lock on to sample rates greater than 48kHz, this might well disqualify the 5000S for use as a standalone DAC without the partnering 2000P transport.

It's hard to sum up the measured performance of the expensive four-box player. In many respects—its poor rejection of word-clock jitter, its nonflat response, its nonlinearity at low frequencies, its lack of ultrasonic image rejection, its higher-than-usual noise floor—it is the worst-measuring digital product I have encountered. Yet Michael Fremer was totally bowled over by its sound. Assuming Mikey is not deaf—and I have taken part in enough listening sessions with him to know that that is *not* the case—what the heck is going on with the Zanden pair? Is this a case of "horses for courses"? (See John Marks' "As We See It" in this issue.)

I hooked the 5000 Signature up in my regular reference system—Mark Levinson No.326S preamp and No.33H monoblocks, Revel Ultima Studio speakers—and did some level-matched comparisons with the Mark Levinson No.30.6 D/A processor, which competes price-wise with the Zanden 5000S (or would, if it were still available).

I started off driving both with the AES/EBU output of the Classé cdp-202 player. Strange. Even though I knew how badly the 5000S measured when I did the comparisons, there was nothing immediately or obviously bad about its

sound other than a slight hum that was audible at high playback levels. However, on pure, digitally generated low-frequency tones around -3dBFS, the Zanden could be heard to fur up the sound with a spray of low-order harmonics, particularly if I moved around the room to find a location that nulled the fundamental. Similarly, if I played the mix of 19kHz and 20kHz tones used to generate fig.10, I could hear both the 1kHz difference tone and a buzz of other spurious products, even though I had the preamp's volume low to avoid smoking the Revel Studios' tweeters. The Levinson produced no audible distortion spurs in either case.

But what about the Zanden's reproduction of music? The Fender Bass channel-identification tracks on *Editor's Choice* (Stereophile STPH016-2) sounded lightweight in comparison with the Levinson, but also had a bit more bite. The Mozart Flute Quartet track on this CD sounded rather old-fashioned, in that it seemed a little band-limited. It also seemed a little quieter than the Levinson, despite the levels being matched at 1kHz. Perhaps more importantly, the soundstage seemed diffuse and deep rather than focused and forward, as it did through the Levinson. This effect wasn't unpleasant, but was not what I thought I was capturing when I made the recording.

There was a similar presentation on this CD's solo violin track. There was noticeably more space around the instrument through the 5000S, but the image of the violin was a little diffuse. The presentation of Robert Silverman's piano on his Beethoven Sonatas sets (OrpheumMasters KSP830) was very similar, with more reverberation and more image depth apparent through the Zanden than through the Levin-



from the tabla and dumbek.

I've always thought JVC's XRCD reissues of RCA Living Stereo titles sounded somewhat soft and euphonic, but with an overlay of inherent digititis—the worst of both worlds. But through the Zanden combo the XRCDs opened up, harmonically, texturally, and spatially, especially piano recordings. That had me pulling out the XRCD of Bill Evans' *Waltz for Debby*, which I've always found too warm and smooshed, but damn if the piano wasn't well-defined in space, and the cymbals did *not*, for once, sound like air brakes.

I hope JA finds time to listen to his recordings of Robert Silverman's performances of Beethoven's 32 piano sonatas through this rig (OrpheumMasters KSP830). I've never heard these discs sound so open, airy, spacious, and believable—especially the delineation of the piano's physical boundaries, and the reverberant space JA captured so exquisitely—not to mention the sound of the piano itself, and JA's capturing of Silverman's touch on the keys.

## Conclusions

Over the years, I've heard from CD players sounds that have been darker, warmer, brighter, richer, softer, more veiled, less veiled versions of what in the end proved to be musically uninvolved presentations. Some of these sounds were quite accomplished, given what I'd assumed were the intrinsic limitations of the Compact Disc. So I went into this review of the Zanden player expecting to hear another digital "flavor"—a warm, perhaps low-intensity one, but not a fundamentally different listening experience.

Don't get me wrong—the analog editions of recordings I compared still sounded more realistic and believable—but for the first time I found myself not caring about the medium and more concerned with the message. And crappy recordings and transfers still sounded that way. The Zanden combo is by no means a Band-Aid solution to the problems of bad digital processing.

However, I did listen long into the night on many occasions, and found myself pulling out, rediscovering, and

becoming musically and emotionally involved in CDs I'd long ago concluded were dead meat. And CDs I'd thought were good now sounded great. The Zanden transport and DAC delivered soundstaging, imaging, dynamic nuance, tonal and harmonic purity, rhythmic flow—and especially transparency—with an effortlessness I hadn't thought possible from digital, not to mention 16-bit/44kHz digital, while being *totally*—I mean, *totally*—free of digital artifacts.

If, much like the Rockport System III Sirius turntable, the dCS triple stack I reviewed a few years ago was worthy of great respect for its groundbreaking resolve and analytical abilities, the Zanden 5000 Mk.IV/Signature D/A converter and 2000 Premium CD transport is the Continuum Audio Labs Caliburn-Cobra-Castellon of digital playback. It draws out both the detail and the emotional content of recorded music and presents it to you with an effortlessness that lets you relax into the music as you might at a live performance.

This exquisitely built, four-box

son. The Bösendorfer did sound a little "smaller," however. In fact, while the 5000 Signature's lightweight low frequencies didn't sound unpleasant, the bass guitar on Sting's *Mercury Falling* (CD, A&M 31454 0483-2), which I was listening to while writing the article on the making of the new Cantus CD to appear in the next issue, had significantly more weight through the Levinson and less of a furry quality. The deep organ pedals in the finale of the BBC recording of Elgar's *Enigma Variations* with Tadaaki Otaka conducting the BBC National Orchestra of Wales (CD, BBC Music 250) were missing in action compared with the Levinson, and the big bass-drum smack at the very end sounded a bit furry.

But I must say that the Zanden's presentation was not unpleasant, and was even rather seductive. When music had no low-bass content, I didn't notice the lack, and the midrange did seem very clean. Only in the highs did I consistently become bothered by a pervasive grain. Not only did Richard Lehnert's voice on the spoken introductions to the test tracks on *Editor's Choice* acquire a tad extra sibilance, but Art Baron's plunger-muted trombone on "The Mooche" had a bit more "bite" through the Zanden, and the massed strings on the *Enigma Variations* sounded too wiry.

But this was all with the Zanden 5000S used as a stand-alone DAC, and I might have been hearing the effects of the poor rejection of word-clock jitter. When I drove the 5000S with the 2000P transport using the I<sup>2</sup>S connection, as MF found, the treble grain was much reduced in level, leaving me with the clean midrange, the spacious soundstage, and the lightweight, but rather furry, low frequencies.

So how come Mikey loved the Zanden pairing's sound,

and even I was not too bothered much of the time with what I *knew* was going wrong?

All I can surmise is that the apparent discrepancy comes from the fact that the 5000 Signature actually performs quite well in the critical midrange. When you play music with strong midrange content, that quality is what you will hear. Yes, its measured shortfalls in performance below 100Hz and above 10kHz are relatively severe, but music with strong content in those regions is relatively rare. Yes, synthesizer-based rock and organ music will expose the Zanden's bass limitations, but even in rock music, low-frequency tones peaking much above -20dBFS are not common. At the other end of the spectrum, perhaps it doesn't matter that loud cymbal crashes will be accompanied by bursts of what also sound something like cymbal crashes.

Personally, I wouldn't recommend the Zanden pairing. Both psychologically and practically, I need to use components that neither editorialize nor are on the verge of misbehaving. And the Zanden's positive impression could be punctured by playing the system too loud. While the Mark Levinson DAC's presentation became more magnificent when played at high levels, the Zanden just sounded more fuzzy. But again, I was surprised by how approachable the Zanden's presentation was at moderate playback levels, by how seductive this transport and DAC could sound. Score another one for the subjectivists, I suppose. —John Atkinson

<sup>1</sup> All my auditioning was performed with the correct absolute polarity (red LED illuminated). This turned out to be significant, as you will read in this issue's "Manufacturer's Comments" (p.144).



combo costs well over \$40,000 and uses a chipset rarer than Unobtainium, so it won't be flying off the shelves—nor are there that many audiophiles who could put it on their shelves in the first place. I hope it measures well, but, as with vinyl, I'm more interested in how it *sounds*. And from what I hear, the Zanden combo of Model 5000 Mk.IV/Signature and Model 2000 Premium proves that the holy grail isn't necessarily greater resolution, but better reconstruction of the music. Perhaps Humpty-Dumpty *can* be put back together again. With billions of 16/44.1 Dumpty-sans out there, that's good news, even for audiophiles who can't afford this Lamborghini Countach of digital playback. ■

## ASSOCIATED EQUIPMENT

**ANALOG SOURCES** Continuum Audio Labs Caliburn, TW-Acoustic Raven turntables; Continuum Cobra, Graham Phantom tonearms; Lyra Titan stereo & mono, Blue Angel Pink Ivory, Transfiguration Orpheus cartridges.

**DIGITAL SOURCE** Alesis Masterlink BPT-modified hard-disk recorder.

**PREAMPLIFICATION** Manley Steelhead, Oracle Temple phono preamps; Musical Fidelity kWP preamplifier.

**POWER AMPLIFIERS** Musical Fidelity kW monoblocks.

**LOUDSPEAKERS** Wilson Audio Specialties MAXX 2.

**CABLES** Phono: Cardas, Hovland Music Groove 2. Interconnect: TARA Labs Zero. Speaker: TARA Labs Omega. AC: JPS, Shunyata Research Anaconda Helix.

**ACCESSORIES** Continuum Audio Labs Castellon magnetic isolation stand, Finite Elemente Pagode equipment stands; Audiodharma Cable Cooker; Shunyata Research Hydra 2 & 8 power conditioners; Oyaide AC wall jacks; ASC Tube Traps, RPG BAD & Abffusor panels; VPI HW-17F, Loricraft PRC4 Deluxe record-cleaning machines.

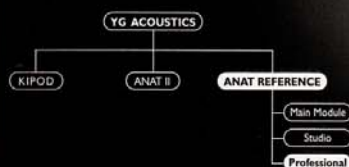
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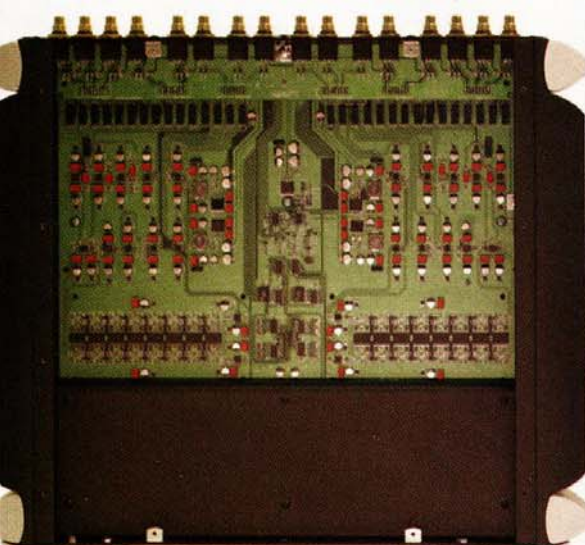
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