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RECORDS TO DIE FOR



Features

45

Records to Die For

The 2004 edition of Stereophile's listing of the recordings our writers will take with them.

71

Close to You: The Return of the Beloved Burt Bacharach

One of America's greatest songwriters talks with Robert Baird about his past, his new album Here I Am, Isley Meets Bacharach, and his future (maybe) collaboration with Dr. Dre.

Equipment Reports

78

B&W 705 loudspeaker
(John Atkinson)

85

Theta Digital Generation VIII D/A converter
(Kalman Rubinson)

95

Cary SLP-98P tube preamplifier
(Art Dudley)

105

Monster Cable Sigma Retro Gold speaker cables & interconnects
(Brian Dinkroger)

115

Klipsch RB-15 loudspeaker
(John Atkinson)



p. 85

Stereophile

February 2004

Vol. 27 No. 2



Columns

5 As We See It
Barry Willis makes a plea to manufacturers to join forces with retailers and ride that video wave for the betterment of hi-fi.

9 Letters
Our readers (and writers) add more fuel to what's become the great Art Dudley-J. Gordon Holt fire, as JGH is described as "venomous"; more come to Art's defense; JGH strikes back; and one serving of bullshit suffices for now. Get on your Soapbox! Visit www.stereophile.com

13 Industry Update
High-end news, including dealer-promoted seminars, plus: audio criticism loses a legend—the passing of Julian Hirsch; RMA hi-end 2003 stays two-channel; big media merges as BMG and Sony Music join forces, while Warner is acquired; Sonus Faber shows off its new premises and Stradivari loudspeaker; shopping-mall A/V retailers hit a slump in 2003; and ESP returns. Want to know more? Go to the "News Desk" at www.stereophile.com for up-to-the-minute info.

25 Sam's Space
Sam Tellig takes a bite out of Focal-JMLab's not-so-behemoth Micro Utopia Be loudspeaker and samples ProAc's new, improved Tablette Reference 8 Signature.

31 Analog Corner
Michael Fremer test-drives the new Thorens 850 turntable, picks up the Linn Adikt MM and Garratt Brothers P-88 MC cartridges, then sits back and relaxes with S.A.P.'s Relaxa magnetic levitation platform.

37 Listening
Classics are not to be found in early CD players, claims Art Dudley, but Sony's first two SACD players—the SCD-1 and SCD-777ES—are a different story.

43 Book Reviews
John Marks reviews a thought-provoking and sobering history of Quad electronics in a lavish new book by Ken Kesler.

127 Record Reviews
Jon Iverson looks at the tangled history of The Beatles' Let It Be and listens to February's Recording of the Month, Let It Be...Naked.

129 Manufacturers' Comments
Fun reading "aloha" from Hawaii, digital deductions, and real love—Legacy, S.A.P., **Thera** and Cary respond to recent reviews.

138 Aural Robert
It's been 30 years since Sir Elton said goodbye to the Yellow Brick Road. Robert Baird talks with the producer of the album's new reissue.



P. 43

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Information

- 136 Audio Mart
- 122 Manufacturers' Showcase
- 132 Dealers' Showcase
- 135 Advertiser Index

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 Printed in the USA



Theta Digital Generation VIII D/A converter

We audiophiles are ever hopeful that, however satisfying our present equipment and setup, we can achieve even greater enjoyment with a tweak or an upgrade. And we never stop: It was only 16 years (and three turntables) ago that I bought what I declared would be my last turntable, and there's no doubt that this "dead" format has improved substantially since then. Now, even as we make another (but less paradigm-shifting) format transition, from CD to SACD and DVD-Audio, new two-channel DACs continue to appear that show us how far we still are from wresting all the music from the original "Red Book" 16-bit CD format. I reviewed the wonderful Weiss Medea DAC in February 2003, and on my auditioning rack there are still two more Swiss DACs that might redefine the category: the Orpheus I and the Nagra DAP.

Although Audio Alchemy was probably responsible for popularizing the standalone DAC, back in the early 1990s, Theta pioneered the use of proprietary software running on DSP engines rather than on off-the-shelf digital chips with their DS Pre from 1988. We continue to see rapid decreases in the cost of processing power; increasingly sophisticated processing can be incorporated into consumer products at prices that, only a year or two before, seemed impossibly low. Not only has



Theta Digital Generation VIII D/A converter

this freed Theta to modify their algorithms at will as advances are made, it also permitted them to upgrade their existing products. Still, it has been about 10 years since the introduction of Theta's DS Pro Generation V; only now is Theta Digital releasing its successor, the \$10,000 Generation VIII.

Theta showed a prototype of the Gen.VIII two years ago, and have skipped Generations VI and VII altogether—by which, clearly, they mean that the Gen.VIII is more than a mere incremental advance over the Gen.V. Actually, they'd be remiss if the

Gen.VIII turned out to be just another revision, and could not accommodate multibit inputs from 32kHz to 96kHz as well as DSD input at 2.8224MHz for SACD.¹ Moreover, multichannel operation has also been provided for, with the stacking of three Gen.VIIIs controlled from a single Theta Casablanca or Casa Nova processor.

¹ Current-production Gen.VIIIs have no SACD hardware connector. However, Sony has begun to offer its SACD players with a FireWire-based digital output (see John Atkinson's review of the Sony SCD-XA9000ES in the December 2003 issue), so this will surely come soon.

Description: Digital-to-analog converter and analog line controller with remote control. **Digital section:** 5 digital inputs (2 S/PDIF RCA, 1 S/PDIF BNC, 1 S/PDIF TosLink, 1 AES/EBU XLR). Sampling rates: 32, 44.1, 48, 88.2, and 96kHz. 8x oversampling with Theta proprietary FIR filter running on 24-bit DSP processor with 56-bit accumulator (Motorola 56362). **Analog input section:** 2 stereo, RCA and XLR. Maximum input levels: 10V RMS (RCA), 20V RMS (XLR). Input impedance: 10k ohms. Frequency response: DC–20kHz,

±0.2dB. Dynamic range and signal/noise ratio: 125dB ref. 18V balanced input. **Analog output section:** Volume/balance control via switched resistor network. Frequency response: 20Hz–20kHz, ±0.01dB, ref. 1kHz. Output impedance: 25 ohms balanced, 12 ohms single-ended. Maximum output: 18V RMS balanced, 9V RMS single-ended. THD+noise at 1kHz, maximum output: <0.0012% balanced, <0.0035% single-ended. Dynamic range and S/N ratio: >115dB balanced, >112dB single-ended, A-weighted. Crosstalk:

>140dB.

Dimensions: 17.625" W by 5" H by 17.75" D. Weight: 29 lbs.

Serial number of unit reviewed: 26355.

Price: \$10,000. AT&T optical input adds \$300. Sample-rate lock board adds \$499. Approximate number of dealers: 75.

Manufacturer: Theta Digital Corporation, 5330 Derry Ave., Suite R, Agoura Hills, CA 91301. Tel: (818) 597-9195. Fax: (818) 597-1079. Web: www.thetadigital.com.

As attractive as that is to me, Theta sent me only one unit, which meant that I could review the Gen.VIII only as a two-channel DAC, albeit one with promise for the future. It almost goes without saying that the Gen.VIII oversamples all inputs to as much as 384kHz, depending on original input, and that it buffers and/or reclocks the signals. Full details are offered at www.thetadigital.com.

The New Generation

Unpacking the Theta Generation VIII, I was immediately impressed with its weight: At 29 lbs, it outweighs many power amps! Its appearance is distinctively Theta, with a swooping, satiny

aluminum panel on the left front that serves as a surprisingly convenient handle in concert with the more obvious pillar on the extreme right. On the right, more than half of the front panel is occupied by the controls and a bright, distinct, vacuum-fluorescent digital display. Beneath the VFD display are the five selector buttons and the Setup button. These buttons are normally used to select the source. In Setup mode, the five buttons switch among the various setup options. To their left and beneath the Theta logo are the remote-control receiver and the Standby button/LED.

To the right of the VFD are four buttons, arranged as segments of a circle, which provide Up, Down, Left, and

Right operations for volume/balance and for the setup menus. Finally, there are Mute and Display buttons. All front-panel controls are duplicated on the remote, which is large enough that the buttons are logically grouped and, after a little experience, easily operated without the user having to look at them. The Gen.VIII is fully balanced in both digital and analog domains, and the remote includes a handy phase-switch button.

The central portion of the rear panel is a power input/control section that separates the analog from the digital connections. Immediately to the right of the power panel are digital control inputs and outputs, which allow the Gen.VIII to be smoothly integrated into

Measurements

Continuing a Theta tradition, the Generation VIII's maximum output level was very high, at 9V single-ended and 18V balanced. Its volume control, which operates in accurate 1dB steps, will therefore tend to be used around its -20dB setting in systems with typical gain architectures. Both sets of outputs preserved absolute polarity and featured very low source impedances: 11.5 ohms for the unbalanced RCA jacks, 23 ohms for the balanced XLRs.

Fed CD data, the Gen.VIII's frequency response was absolutely flat (fig.1, top pair of traces), and its de-emphasis error was negligible (fig.1, bottom traces). The processor had no problem locking on to high-sample-rate PCM data, though its response showed a touch of passband ripple before dropping off rapidly above 45kHz (fig.2). Channel separation (not shown) was astonishingly good below 2kHz, at better than 120dB in

the L-R direction, 130dB R-L, and worsening only slightly at the top of the audioband.

The top pair of traces in fig.3 shows a $\frac{1}{3}$ -octave spectral analysis of the Theta's analog output while it decoded dithered data representing a 1kHz tone at -90dBFS. The noise floor's smoothness is entirely due to the 16-bit dither noise in the signal. Increasing the word length to 24 bits dropped the noise floor by 15dB in the midrange and treble, suggesting that the Theta's DACs have almost 19-bit true performance, which is excellent. The lowest two traces in fig.3 show a similar spectral analysis for dithered 24-bit data representing a 1kHz tone at -120dBFS. These peak only slightly above the -120dB level and can be clearly distinguished from the background noise. Though the Theta gets a helping hand in these measurements from its high output level, it does offer truly extraordinary

dynamic range. Repeating the spectral analysis with a digital "black" signal (not shown) revealed the Gen.VIII's noise floor to rise above the audio-band, reaching -75dB at 200kHz, due to the noise-shaping used to wring such high audioband performance from the DAC chips.

Fig.4 shows the Gen.VIII's linearity error measured with a dithered 16-bit signal, which remains below ± 2 dB

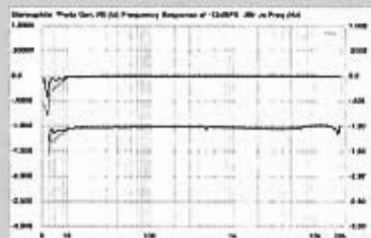


Fig.1 Theta Generation VIII, CD frequency response at -12dBFS into 100k ohms, with de-emphasis (bottom) and without (top). (Right channel dashed, 0.5dB/vertical div.)

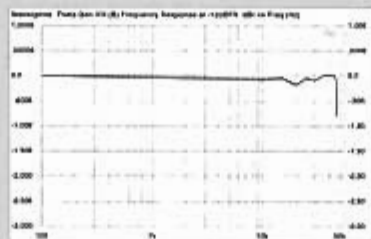


Fig.2 Theta Generation VIII, 96kHz frequency response at -12dBFS into 100k ohms (right channel dashed, 0.5dB/vertical div.)

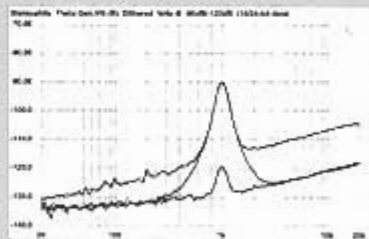


Fig.3 Theta Generation VIII, $\frac{1}{3}$ -octave spectrum of dithered 1kHz tone at -90dBFS, with noise and spurs, 16-bit CD data (top) and external 24-bit data (middle), with 24-bit dithered 1kHz tone at -120dBFS (bottom). (Right channel dashed.)

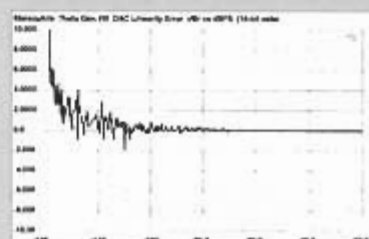


Fig.4 Theta Generation VIII, left-channel departure from linearity, 16-bit CD data (2dB/vertical div.)

more complex systems. The rest of the right side is occupied by a bank of digital inputs: three S/PDIF (two RCA, one BNC), one AES/EBU, one Tos-Link, and, optionally, one AT&T. Above these is a removable panel, similar in size to the panel space occupied by the inputs, to accept future options. Right now, the only available option is a Sample Rate Lock Board to accommodate low-precision digital sources, but I suspect that SACD/DVD-A input options can't be far off. The left side of the panel bears analog inputs and outputs, both RCA and XLR.

There are no digital outputs, which is significant: Although I've been speaking of the Gen.VIII as a D/A converter (even Theta refers to it as such), it is also a serious two-input (three, if you consider the built-in DAC) analog line preamplifier. In the past, Theta distinguished their DACs without volume controls (DS Pro) from those with (DS Pre), but I see no such designations in their literature or on the website. I do note that my Gen.VIII's shipping carton indicated that the unit had a volume control, which implies that one can buy,

or upgrade to, a Gen.VIII without.

The Gen.VIII's analog circuits are fully balanced, differential, discrete, and class-A. All signals—the digital after conversion, the analog directly—are handled by the output stages and controlled by banks of switched resistors in the analog domain, for volume and balance. Only two analog inputs? In this century, that's just enough for my phono preamp and FM tuner. Everything else comes in as ones and zeros.

I won't subject you to the intricacies of reprogramming the Gen.VIII except to say that, with the aid of the explicit menu display, it wasn't difficult. You can set which inputs are directly accessible from the five buttons, which processing (reclocking or Theta's Jitter Jail) each of the digital inputs is subjected to, startup volume level, which external power triggers the Gen.VIII will respond to, and the protocols for the RS-232 control interface. You can also select whether or not the Gen.VIII responds to external volume control instructions for multichannel use and invoke the Gen.VIII's built-in white-noise generator for burn-in.

The noise generator is an intriguing option. Theta recommends breaking-in the Gen.VIII for a week, using music and/or the internal burn-in signal. However, Theta also states that, after assembly and before testing, each Gen.VIII is put on a burn-in torture rack for 100 hours at the factory. Because the noise generator is right there in the machine, I used it for a week or two, usually when I was out of the house. However, I couldn't discern any change during the course of this uncontrolled experiment. One could also feed the burn-in signal to other components.

Plug it in!

Because I'd been shown the prototype of Theta's Generation VIII at the 2002 Consumer Electronics Show and been regaled with its blandishments by Neil Sinclair, I was not exactly panting for its arrival as 2003 began winding down. However, when the Gen.VIII was inserted into my system, I was stunned. The Gen.VIII seemed so much more dynamic than anything else that I immediately thought the ghosts of

Measurements

to below -110dBFS . In fact, by looking at fig.3, it should become apparent that this error is entirely due to the

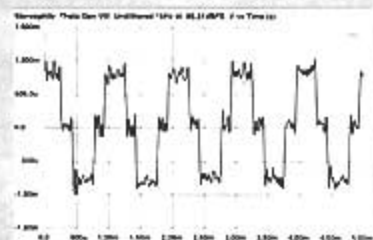


Fig.5 Theta Generation VIII, waveform of undithered 1kHz sine wave at -90.31dBFS , 16-bit data.

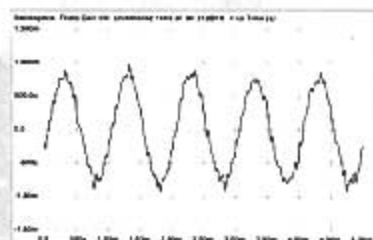


Fig.6 Theta Generation VIII, waveform of undithered 1kHz sine wave at -90.31dBFS , 24-bit data.

dither in the incoming data. The Theta's true linearity error is minimal to below -120dBFS . As a result, its reproduction of an undithered 16-bit, 1kHz tone at exactly -90.31dBFS is perfect (fig.5), with the Gibbs Phenomenon "ringing" at the onset of each

of the three discrete DC voltage levels clearly defined. Increasing the undithered bit depth to 24 bits gives a pretty good sine wave (fig.6).

The Gen.VIII's output stage is extremely linear (fig.7), with the harmonic spurious associated with a full-

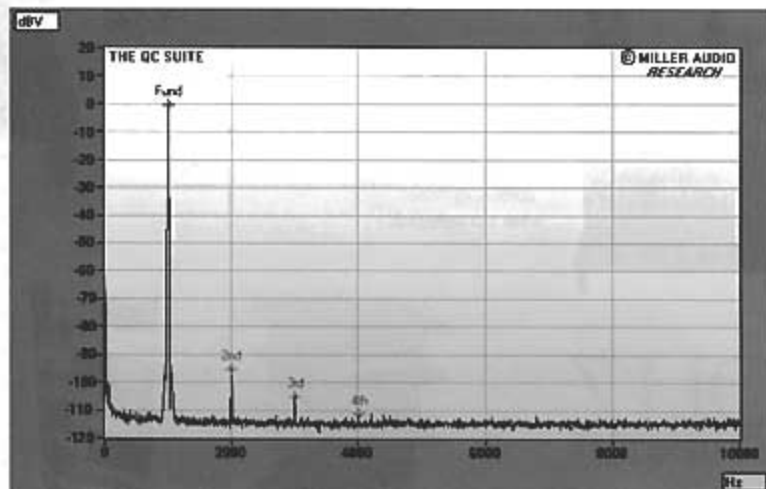


Fig.7 Theta Generation VIII, unbalanced output, spectrum of 1kHz sine wave, DC-1kHz, at 0dBFS into $8\text{k}\Omega$ (linear frequency scale).

Fletcher and Munson must be abroad and haunting.

However, even when I'd carefully matched output levels with an audio-frequency voltmeter, and had substituted the Gen.VIII for other DACs or players, the Theta still made a distinctive difference—much as a 2–3dB difference in volume would fool the unsuspecting in a showroom. Digital inputs came from a variety of sources (see sidebar, "Associated Equipment"), but the Gen.VIII played no favorites among them or among its various digital connectors—as it should not, assuming the DAC is doing its job in buffering and reclocking the input data. The Gen.VIII's Jitter Jail option of buffering digital inputs played an important role in this, which can be easily tested by switching the option in and out while listening. There's a small hiccup as you make the switch, but the superiority of Jitter Jail buffering over mere reclocking should be apparent to any careful listener.

The Gen.VIII's sound was so open and grain-free, yet so unaggressive, that it seemed to invite me to turn up the volume. Having been satisfied so long

with the Mark Levinson No.360S, and with the Weiss Medea and MSB Platinum Plus before it, I was more than a bit disturbed to think that the Gen.VIII could sound so different yet still be accurate. Yet, over the span of months, that's the conclusion I could not avoid.

The Gen.VIII's sound was so open and grain-free, yet so unaggressive, that it seemed to invite me to turn up the volume.

The Gen.VIII offered as uncolored and transparent a representation as the Weiss Medea (which I thought a paradigm of neutrality a year ago, and still do) and the Levinson No.360S, but with an even more detailed presentation in

the midrange and high frequencies. Not brighter, to be sure, but with a more discrete definition of each instrument (and voice) harmonically and in space. At the bottom end of the frequency spectrum, I was hard-pressed to hear any difference between the Theta and the Levinson, though the Weiss seemed a bit firmer with some recordings. Of course, this is very much dependent on the relationship of the speakers to the room. In a leaner system than mine, which includes the Revel Ultima Studio speakers, the tables would have been turned. Nonetheless, I found the Theta Gen.VIII consistently livelier and more engaging, even with recordings made in large, resonant spaces.

With the opening of the ambient noise at the start of the Cowboy Junkies' *The Trinity Session* (CD, RCA 8568-2-R), a huge space rolled out in front of me even before the music began. Then I did something I hadn't done for years: I listened to the whole damn disc, and was ravished by the sound all the way through. Quickly, I pulled out CD after familiar CD and found that each was better than I had recalled. I thought I

scale 1kHz tone lying at -94dB or below (0.002%). The second harmonic is the highest in level; at low frequencies, the third and second swap places. Intermodulation distortion is also very low (fig.8), with the 1kHz difference tone resulting from a full-scale

mix of 19 and 20kHz tones lying at -96dB (0.0017%). None of these distortion components will have any audible effects.

The Generation VIII has two choices for rejecting word-clock jitter on its data inputs, Reclock and Jitter

Jail, the latter said to achieve the highest performance. Even so, assessing the Gen.VIII's jitter rejection with the Miller Audio Research Analyzer, I got a mere 230 picoseconds peak-peak of jitter driving the TosLink input from a WAV file on my PC with Reclock engaged. Switching in Jitter Jail dropped this already-low figure to 180ps. Fig.9 shows the spectrum of this jitter. The central spike is the 11.025kHz tone, which is used as the carrier for the LSB-level low-frequency squarewave that exercises the DAC's bit transitions. The sidebands spaced at 229Hz and its odd harmonics to either side of the spike (indicated with red numeric markers) are due to word-clock jitter. They are very low in level. The highest-level sidebands, at ± 15.6 Hz (purple "1" markers), contribute 59ps to the total.

This graph indicates more random noise spikes than I usually see. More interesting, when I drove the Theta with an electrical S/PDIF connection from a PS Lambda transport, although the jitter level dropped even further, to 168ps, the central peak

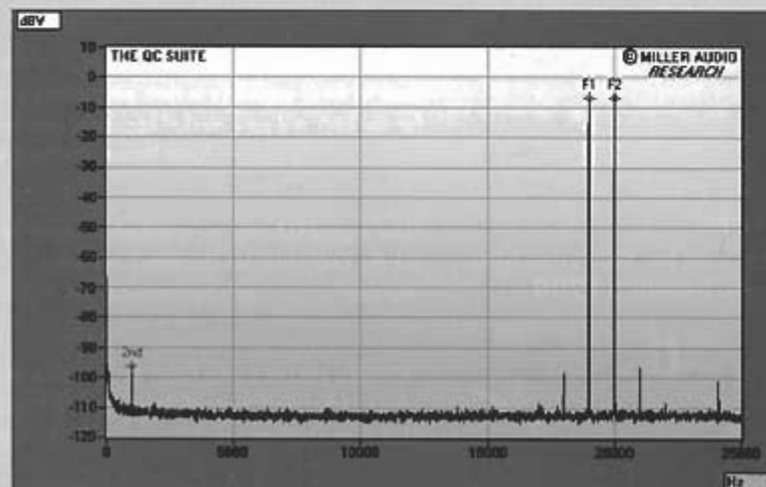


Fig.8 Theta Generation VIII, unbalanced HF intermodulation spectrum, DC–25kHz at 0dBFS into 8k ohms (linear frequency scale).

knew and loved Odetta's rendition of "America the Beautiful" on *Strike a Deep Chord* (CD, Justice JR 0003-2)—now it was sweeter, a bit less stentorian, and oh! so much more human.

Male voices, too, were less "electronic" and better-defined, without losing any weight or resonance. I have three versions of Dire Straits' *Brothers in Arms*: the LP (Warner Bros. 25264-1), the remastered CD (Warner Bros. 47773-2), and the Hong Kong XRCD CD, imported by May Audio (Veritas

5483572). (Because I already had the LP, I never bought the original CD release, about which I've heard nothing flattering.) First, only the LP and the XRCD capture the same balance of breathiness and resonance in Mark Knopfler's voice, and the XRCD did so only through the Gen.VIII DAC. Second, although I haven't made scrupulous auditions of these discs with every DAC that's passed through, it's my impression that only with the Gen.VIII did every other aspect of the

sound of the CD match or exceed that of the LP.

The bass was tighter and firmer, and imaging was stable, as demonstrated by the giant mosquito (!) in "Ride Across the River." The recorded levels are a bit lower on the remastered CD and the balances a bit more restrained, as if in reaction to what I've heard about the original CD release. As a result, the remastering is a little too sedate, and Knopfler's guitar doesn't billow out as it should. In comparison to the LP and

Measurements

broadened (grayed-out trace in fig.9), which suggests the presence of very-low-frequency random jitter components with this source.

Finally, as the Gen.VIII has analog inputs, I tested it as a conventional line preamplifier. Its balanced input impedance at 1kHz was a respectable 20k ohms, but only 7k ohms unbalanced, which will give lightweight low frequencies with some tubed source components. The maximum gain was 5.8dB for both inputs with the volume control set to "86"; the unity-gain setting was "80." Neither input inverted absolute polarity.

The frequency response was the same for both unbalanced and balanced inputs, and had a very wide bandwidth: -1dB at 200kHz (fig.10,

top pair of traces). This was with the volume control at its maximum; set to -20dB, which is more likely where it will be used, the Theta's bandwidth was a little wider: -0.75dB at 200kHz (fig.10, bottom traces). Channel separation (not shown) was excellent, at around 100dB across the audioband, though this is not quite up to the standard of the digital inputs.

The Gen.VIII's analog inputs were basically overload-proof—it took more than 12V to drive the balanced input into clipping, 6V for the single-ended input. Fig.11 shows how the measured THD+noise percentage changed with output voltage into both 100k ohms and 600 ohms: the distortion level actually lies at the limit of the Audio Precision System

One, revealed by the sawtooth effect in the traces as the AP changes its gain. Even into the punishing 600 ohm load, the Gen.VIII will put out 19V RMS at clipping in balanced mode; the corresponding figure for the unbalanced output was 10.5V.

As inexpensive digital products get better and better, it takes superb engineering skill to justify the price of a high-end digital processor. The Generation VIII's extraordinary measured performance demonstrates that Theta Digital's design team has that skill.

—John Atkinson

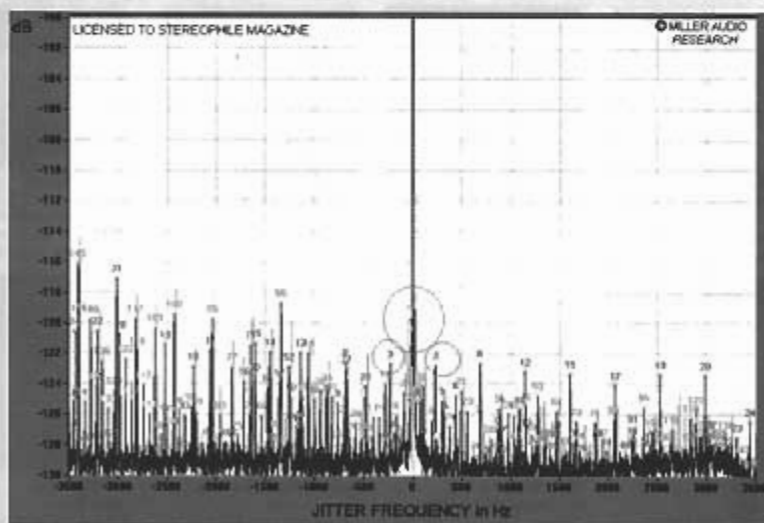


Fig.9 Theta Generation VIII, unbalanced output, high-resolution jitter spectrum of analog output signal, WAV source on PC via RME Digi96/B Pro and TosLink connection, Jitter Jail connected (11.025kHz at -6dBFS sampled at 44.1kHz with LSB toggled at 229Hz). Center frequency of trace, 11.025kHz; frequency range, ± 3.5 kHz. (Grayed-out trace is data from PS Lambda via S/PDIF connection.)

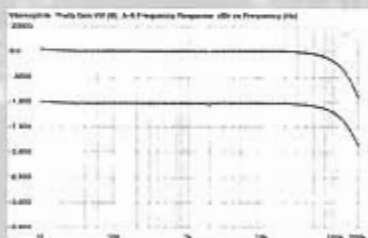


Fig.10 Theta Generation VIII, balanced analog input/output frequency response at 1V into 100k ohms, with volume control at +6dB (top) and -20dB (bottom). (Right channel dashed, 0.5dB/vertical div.)

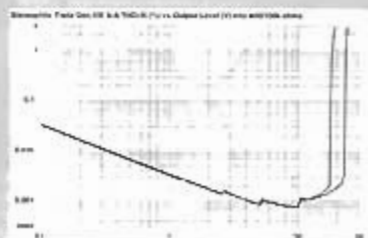


Fig.11 Theta Generation VIII, balanced analog input/output, THD+N (%) vs output voltage into 100k ohms (right) and 600 ohms (left).

XRCD, the remastered CD is also soft on top. Listen to the cymbal crescendo about five minutes into "Ride Across the River." On the XRCD, it sounded appropriately bright and glittery and equally realistic as it was panpotted back and forth; on the remastered disc it sounded filtered and dulled. Overall, the Theta Gen.VIII not only let me hear such very small differences between media, but also let me, after many years, say that the XRCD version is my preferred choice.

Concomitants of the Gen.VIII's non-aggressive nature include a slightly more distant soundstage of extraordinary depth and detail, and the potential for extremely loud playback levels free of ear fatigue, as long as the associated equipment is up to it. I clearly preferred the CD track of the Rosalyra String Quartet's new multichannel SACD/CD of Shostakovich's String Quartets 2 and 8 (Artega ART 1002), as DAC'd by the Gen.VIII, over the two-channel DSD track fed directly from the Sony SCD-XA777ES to one of the Theta's analog inputs. They were harmonically pretty much indistinguishable, but I risk heresy in saying that I heard better detail from the 16-bit track. Each instrument was etched in place, and the lowest levels of marginally audible sound were discernible. In the opening of the Largo movement of Quartet 8, the viola plays a low-pitched drone before making a slow *Dies Irae* statement, then joins the other instruments in the musical argument. That first, barely audible tone anchored those bars to great musical and emotional effect via the Gen.VIII, but was nearly missing and less effective on the DSD track. (In defense of this SACD, the effect is subtle and more successful in multichannel.) It's not that one can't hear this with the other DACs, but that such distinctions are effortless with the Gen.VIII.

With really big stuff (he says, whipping out yet another Mahler disc), I could turn up the volume to glorious levels without concern. I could play Michael Gielen's neo-Brahmsian version of Mahler's Symphony 1 (CD, Hänssler HAN 93097) at levels that revealed the sweet felicities of the quietest moments in the second movement, and then I could revel in the size and power of the finale's fortissimos as they rolled over me, free of strain. It just got bigger, and better.

It does analog, too

Implied in most of the above is that the output stage of the Theta Generation

VIII is as good as, if not better than, my reference Sonic Frontiers Line-3 preamp, and that either alone is better than the pair in series. So, after my experiences with the Gen.VIII as a DAC, I distilled them by eliminating the Sonic Frontiers and running the Gen.VIII, via its own volume and balance controls,

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or made such an
emotional impact on me.

directly into the balanced inputs of the Classé CAM-350 or Sonic Frontiers Power-3 monoblocks. I also spent much time using the Gen.VIII as an analog preamp with, as sources, my turntable and FM tuner—and, of course, the Gen.VIII's own and other DACs.

It was tight and clean, and could depict a very deep, wide soundstage. The phase switch came in handy for comparing discs and sources, because it let me optimize each one with ease. Drive was excellent from both the bal-

anced and single-ended outputs with my 30' interconnects and any of the power amps. The only characteristics I could ascribe to the Gen.VIII when used as a line stage were that it was not warm or forgiving but revealing and dynamic. Deal with it.

In my search for complaints, I reach for straws: I wish the Gen.VIII DAC's bass, good as it was, was as good as that of the Weiss Medea or, indeed, of the Theta's own line stage. I wish, too, that there was a knob for volume control—making large, fast changes is difficult with the Gen.VIII's incremental buttons. I'd also like a readout of input frequency and bit width. Finally—I feel like *Oliver Twist* pleading for "More, please, Sir"—would a third analog input be too much to ask for? Of course, I'd not trade off anything the Gen.VIII does now to fulfill any of these wishes.

Conclusions

For the past months, I have been beguiled by multichannel music and have become very casual and content with my two-channel listening. The Theta Generation VIII has changed all that. With the exception of a handful of speakers—the B&W Signature 800, the Revel Ultima Studio, the Apogee Studio, and the sainted Stax ELS-F81 come to mind—no component, and certainly no electronic component, has so transformed my stereo system, or made such an emotional impact on me. Through the Gen.VIII, I have discovered how much more information, music, and enjoyment my stereo CDs contain. I now rush back from my multichannel weekends anticipating new delights. The prospect of stacking three Gen.VIIIs for multichannel is almost overwhelming.

The Gen.VIII's glory is in how it opens up the music, particularly in the midrange. It's only a little better than everything else I've heard, but that small increment is like cool water to the thirsty audiophile. Everyone who reads this should give it a listen, just to hear what the "Red Book" CD technology can deliver now, 20 years after its debut.

The Gen.VIII costs \$10,000; buying one will not be a snap decision for anyone. But it is, at that price, the most revealing and engaging DAC I've heard, and a cutting-edge line controller. Theta Digital's Generation VIII may have been a long time coming, but it's not going back so fast: I've still got thousands of CDs to rediscover. ■

Associated Equipment

Analog source: Heybrook TT2 turntable, SME III tonearm, Ortofon SME30H cartridge.

Digital sources: California Audio Labs CL-20 DVD-V/CD player, Orpheus 0 CD player, Linn Unidisk 1.1 universal player, Sony SCD-XA777ES SACD/CD player; Mark Levinson No.360s, Weiss Medea DACs.

Preamplification: Sonic Frontiers Line-3 preamplifier, Audiolab 8000PPA phono stage.

Power amplifiers: Sonic Frontiers Power-3, Classé CAM-350 monoblocks; McCormack DNA-1 Rev.A.

Loudspeakers: Revel Ultima Studio.

Cables: Interconnect: AudioQuest Anaconda & Python (both balanced), Digital Precision X-60 digital interconnects, Cardas Cross (single-ended). Speaker: AudioQuest Gibraltar. AC: PS Audio Lab, JPS Aluminate. — Kalman Rubinson

seems to flow much more naturally.

Vertical vibrations have a surprisingly large negative impact on the performance of many audio and video components. For example, the higher densities of information contained in SACD and DVD-Audio discs make the players even more sensitive to reading errors due to external vibrations. It is easy, therefore, to understand how it is even more critical to detect the high-density data on SACDs and DVD-A's, without the intervention of the error-correction system.

The same is true for video sources such as DVD-Video and LCD projectors. By placing your video equipment on a Relaxa, you will gain a dramatic improvement in resolution, most noticeably in the form of more vivid colors and blacker blacks. The improvements are very easy to demonstrate. Insert a DVD in your player, then pause during a scene that has considerable black in the frame. Study the image. Then, with the disc still in pause mode, place your DVD player on the Relaxa. The "snow" will either disappear or be much less evident. Again, error-correction devices are believed to be blamed for poor image quality. With the Relaxa, you can enjoy your DVD library to its fullest potential!

Finally, please note that the Relaxa line includes the Relaxa Stand (speaker stand), Relaxa Rack, and Relaxa Feet. In addition, S.A.P. offers a complete line of loudspeakers, tube electronics, and cables. More information is available on our website: www.sapaudio.com.

We look forward to Michael's comments regarding the Relaxa's effect on his Manley Steelhead and ASR Basis Exclusive phono preamps. We also hope Michael uses a digital source; we predict he will be pleasantly surprised! Mahalo! ("Thanks" in Hawaiian)

Terry Hart

President, S.A.P. Audio International

Theta Digital Generation VIII

Editor:

Kalman Rubinson deduced correctly that the Generation VIII is much more than "just another revision" 10 years after the Gen.V. It is a complete restatement of our art.

John Atkinson wrote a paragraph that summed up all the hopes and fears that we had about the Generation VIII project: "... it takes superb engineering skill to justify the price of a high-end digital processor." We are terribly gratified that he concludes that "Theta Digital's design team has that skill!"

As alluring as new formats can be, we knew we had to address the needs of all of us who have vast libraries of 16-bit PCM compact discs. There are millions of titles — more than anyone could listen to in a lifetime. We aren't going to throw all of them away just because a flurry of multichannel DVD-Audio and SACD discs came on the market. (Music lovers didn't throw away their LP collections as soon as Sheffield released its direct-to-disc offerings.)

Some of us at Theta have been concerned about inherent limitations of DSD, as have others.¹ We have been doing our own listening tests: Dr. Rubinson is not alone in hearing superior resolution from PCM over SACD, given revealing equipment and a recording that has not had its CD track subjected to a reduction in sonic quality. I think that the tests Gen.VIII owners will be able to make once they have our High Speed Digital Input Card will be quite interesting.

This board, which brings in SACD and DVD-A, is very nearly ready. It will be available within weeks of the publication of this magazine, to deliver these signals from Theta's own Compli Universal player/transport to the Gen.VIII, and soon after to Theta's multichannel controllers. The Gen.VIII already has everything inside needed to process both DVD-A and SACD signals; we have had this ready for a long time, actually.

A major delaying factor for the Gen.VIII's release was that we were docilely awaiting the "universal standard" that, four years ago, Sony promised would soon be forthcoming. Like Dr. Rubinson, when we saw Sony's FireWire-out SACD component earlier this year, we thought, "Ah — the long-awaited standard interface has come." It still hasn't.

We are constrained by intellectual

1 Although sampling at 44,100 times a second at a 16-bit depth yields a datastream of 705,600 bits per second, and SACD's 1-bit sampling whizzes along at 2,833,400 times a second (theoretically yielding four times as much data), the quantity of data points needed to find any one average data point means that a 1-bit system actually requires more than four times as many data points per second to approximate the accuracy of the 16-bit PCM system used in conventional digital recording. Peter Moncrieff has written in depth explaining SACD's dependence on averaging.

Technical papers detailing the limited resolution (and other inherent problems of SACD) have been presented at recent AES conventions by Professor Malcolm Hawksford of the University of Essex, UK, and Professors Stanley Lipshitz and John Vanderkooy of the University of Waterloo, Canada. Professor Lipshitz said in an interview: "It's an inherently flawed system... a format which is intrinsically worse than the one we've got." Ing. Olman wrote, in the *Stereophile Audio Technical Society Journal*, "SACD... has lower real resolution than the CD-system in the highest octave."

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property law from sending a raw SACD digital signal out of any of our components. Sony's FireWire signal is encrypted, and is readable by other Sony equipment. Ours is unique to Theta equipment.

We are very excited about these soon-to-be-accessible additional capabilities built into the Gen.VIII. Multichannel listening experiences can be thrill rides of fun, and movies seem ideally suited to the surround-sound experience. But inherent in the Gen.VIII is a serious devotion to two-channel music. Not only do we still have just two ears; the finest stereo speakers, when set up properly, can and will deliver all the phase information for a fully immersive listening experience, from all of those thousands upon millions of CDs we all still have.

Further two-channel subversion: Lurking stealthily in Theta's Casablanca controllers, a function called Center Spread offers a way to correct theater mixes that stuff all the most important sonic information through the poorest speaker in the living room—the home

theater's center channel. Center Spread lets people recover the use of their two best speakers—the left and right front ones—for doing the work that they can do so much better than the “voice” channel. Think about it.

Perhaps a way to further test the capability of the Gen.VIII would be in conjunction with that feature; there is a possibility that this will make the perceived need for a stack of three Gen.VIIIs less pressing. (Not that we mind if someone buys three—or up to six, to feed the Casablanca's potential 12 channels—but this is something to try first.)

Last, our deep and sincere thanks for the attention lavished on this offering of ours. It is the best tool we could devise for liberating all the music that is locked up in those shining discs.

Neil Sinclair
President, Theta Digital

Cary Audio Design SLP-98

Editor:

In the words of my seven year old grandson, Hunter Charles Hammond,

“I love it, I really love it Papa D!” Well, Art Dudley and John Atkinson, I love it! You have sure placed a smile on my face with the extraordinary review of the Cary SLP-98 preamplifier. It is gratifying for me as a designer to realize my favorite preamplifier design series will now mark its 14th anniversary of continuous production. Long live the “Sweet Little Preamp.”

Thank you John Atkinson and all the good folks at *Stereophile* for your ethical reviewing process and once again for the opportunity to voice my words. I LOVE IT!

Dennis J. Had
Cary Audio Design, Inc