

HERB REICHERT

Wattson Audio Madison LE Streamer

D/A PROCESSOR

fter it was delivered, I weighed the box containing Wattson Audio's DAC-equipped Madison LE Streamer on my bathroom scale. It was hardly bigger than a shoebox. It weighed 8.3lb.

When I opened the main box, I found two smaller boxes. The little brown one contained a fist-sized power supply in a chassis of extruded aluminum, with a label attached that said "AC/DC Hybrid Adaptor" next to a circle containing a sun cross symbol and the words "Designed, Engineered and Built in Switzerland" in capital letters circling its top edge. Below the circle was more writing: "Wattson Audio – a CH Precision company."

The Wattson Madison LE's 2.3lb chassis was inside a larger white box with black block letters saying "Madison." Under that, written in cursive, were the words "Lounge Edition." The L in LE is for Lounge, not Limited as you might expect.

I've reviewed a few DACs but never one this small, light, and elegantly formed.

Not knowing much about Wattson Audio, I asked the patient, personable Kevin Wolff, head of Wattson's and CH Precision's international sales, to tell me the company's origin story.

"Our journey began as design consultants for some of the most prestigious and well-known brands in the audio world—the kind of brands whose owners might spend more on a single component than the cost of a European sports sedan. This experience honed our expertise and gave us a front-row seat to how established engineering and manufacturing practices were being applied to



The Madison LE displayed a clarity I associate with today's most elite DACs.

emerging technologies, formats, and musical media. Over time, our continued advancements in digital and streaming technologies revealed a deeper opportunity—a way to fully express our innovations through a product line of our own.

Thus, Wattson Audio was born.

"CH Precision's acquisition of Wattson Audio marks the union of two innovative forces in high-end audio, combining CH Precision's expertise in ultrahigh-performance systems with Wattson's commitment to accessible, efficient, and forward-thinking audio solutions."

Before I started writing this report, I thought of CH Precision as a suave Euro-company with engineers in nice suits peddling expertise and sophisticated manufacturing practices with an emphasis on leading-edge mixtures of digital and analog technology. I knew that Michael Trei uses their P1 phono stage, and that the late Andy

SPECIFICATIONS

Description Two-channel D/A processor, streamer, and headphone amplifier. Digital inputs: one electrical (S/PDIF on RCA), one optical (TosLink), and one Ethernet. Analog outputs: stereo pair balanced (XLR), stereo pair singleended (RCA); single-ended headphone (¹/₄" stereo).

THD: <0.001%. S/N ratio: >120dB (A-weighted). Headphone amplifier maximum output power: 150mW into 32 ohms, 50mW into 150 ohms, 10mW into 600 ohms. Supported formats: PCM to 384kHz, DSD to 256×. Control protocols: UPnP/DLNA, AirPlay, Tidal Connect, Roon Ready, Audirvāna. Control app: Wattson Music for iOS. Wattson Remote for Android. **Dimensions** 6.9" (174mm) W × 7.3" (185mm) D × 2.1" (52mm) H. Weight: 2.37lb (1075g).

Serial number of unit reviewed W0X66040006. Designed and manufactured

in Switzerland. **Price** \$4995. Number of US dealers: 11. Warranty: 2 years. **Manufacturer**

Wattson Audio SA, ZI Le Trési 6B, 1028 Préverenges, Switzerland. Tel: (425) 314-1324. Web: www.wattson.audio. Singer used a CH Precision DAC in his home system.

As they should at their price points, CH Precision products come in thick, CNC-crafted chassis with simple, attractive faceplates and an army of features packed inside. I've never much cared for extensive feature lists that come with touchscreens and menus. So naturally, I appreciated the modest "accessible, efficient, forwardthinking" position Wattson Audio is taking in the marketplace. I've been angling for purist-quality plug'n'play digital since streaming began to upstage CDs. And now, here it was, at a reasonable price.



Description

The Wattson Madison LE streamer-DAC costs \$4995. It has three inputs: 100Mb/s Ethernet, S/PDIF on RCA, and TosLink—no USB, no I²S, no AES3, no external clock sync. There are no analog inputs, but there is a volume control. So, with digital music, the Madison can make music with just a streaming connection and a pair of headphones, or a pair of speakers and a power amplifier.¹ Those who want to add a turntable or tuner to the system will need a separate preamp.

The Madison LE has two kinds of analog line outputs: singleended RCA (2.0V RMS max output) and balanced XLR (4.0V). The volume control incorporates "lossless" LEEDH Processing.² Nevertheless, the volume control can and should be disabled when using a separate preamplifier. I used it some with my HoloAudio Serene preamp, but I enjoyed it most by itself, driving one or the other of my three power amplifiers.

The output of the Madison's headphone amplifier is specified

as 150mW into 32 ohms, 50mW into 150 ohms, or 10mW into 600 ohms.

The LE version of the Madison is upgraded from the regular Madison streamer, with a redesigned output stage and a "much-improved, in-house-manufactured power supply"—the quote is from Kevin Wolff. The Wattson website adds, "The Madison LE uses an external, energy-efficient, switch-mode power-supply, but we were able to engineer it for reduced noise levels with the addition of an AC input filter, and greater stability by adding linear regulation." The Madison LE has twice the capacitance of the standard

1 Wattson will soon launch a companion power amplifier, the Madison LE. 2 See processing-leedh.com.

3 It's not that the Madison draws on CH Precision designs. It's that the two companies share DNA, going back years—study the two companies' histories and the same names pop up again and again—and this common DNA manifests in similar design philosophies. —**Jim Austin**

MEASUREMENTS

performed a full set of measurements on the Wattson Madison LE using my Audio Precision SYS2722 system,¹ repeating some of the testing with the magazine's higher-performance APx555 analyzer. I used network data streamed with Roon and optical S/PDIF data. (The TosLink input accepted data sampled at rates up to 192kHz.) I adjusted the processor's settings with the Wattson Music app, installed on my iPad mini.

The Madison preserved absolute polarity from the balanced and unbalanced line outputs, and from the headphone output. The volume control operated in steps that varied between 0.6dB and 1dB. With the volume control set to the maximum, the output levels with a full-scale 1kHz signal

-20

40

-80

-120

-140

d -60

В

A -100



were 4.42V balanced, 2.25V unbalanced,

1 See stereophile.com/content/measurements-mapsprecision.



Fig.2 Wattson Madison LE, wideband spectrum of white noise at -4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan) into 100k ohms with data sampled at 44.1kHz (20dB/vertical div.).



Fig.3 Wattson Madison LE, frequency response at -12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), and 192kHz (left blue, right red) (1dB/vertical div.).



Fig.1 Wattson Madison LE, impulse response (one sample at 0dBFS, 44.1kHz data, 4ms time window).

Madison and higher-quality capacitors. The power supply attaches to the LE with a 36" umbilical cord, allowing it to be placed out of sight, leaving the plucky, 2.3lb, 6.9" wide, 7.3" deep, 1.9" high Madison to rest in plain sight, to be admired for its unique, touchscreenfree industrial-chic design.

The Madison LE is a streaming DAC. Its D/A processor shares DNA with D/A Processors from CH Precision.³ From the website: "A Sharc DSP chip is employed to implement our sophisticated upsampling and spline-filtering algorithm. The short-tail filter profile ensures superb time-domain performance, while independent left and right channel WM8742 DACs preserve channel separation and spatial information."

The Wattson iOS app, called Wattson Music, is bare bones but functional. The app allowed me to wrangle UPnP/DLNA, Tidal, and Qobuz. Airplay, Roon, Tidal Connect, and Audirvāna are accessed by their native apps, which integrate seamlessly with the Madison LE. The Wattson Music app allows you to change inputs, control volume, adjust the brightness of the front-panel lights, and perform some DSP equalization for "acoustic correction of speaker placement."

Setup

Barely containing my DAC-installation anxiety, I followed the directions in the Madison's online owner's manual. Getting it running was a 10-minute operation, including time spent downloading and installing the "Wattson Music" iOS app on my iPad. The Android alternative is called "Wattson Remote."

At first, I was vexed by the Madison's lack of a USB input. All my downloaded files are on USB drives, and I just wanted to push one in and start listening. Why no USB? At the core of the Madison is a streaming interface developed for OEM applications in the pre-Wattson days. In assembling the Madison, Wattson added what it considered the necessities: a TosLink input for TV connectivity and a coax S/PDIF input for transports. Those who wish to play local music files can connect from a computer using, eg, Roon or Audirvāna, or turn their computer into a UPnP server with a program like AssetUPnP.⁴

I connected the Madison to my router via LAN and to the TEAC VRDS 701T CD transport with Kimber's D65 S/PDIF cable, and it fired right up. I haven't turned it off or listened to an LP in four weeks.

Listening

When I audition a new DAC, the main things I listen for are the liveliness of musical forms (flow, action, jump, vibrancy) and materiality. I used to think these important-to-me audio-sonic traits went out with wringer washers, flushed away in limp digital streams, or buried under layers of signal processing, but exceptional flow, presence, and vibrancy (!) were the first traits I noticed streaming Qobuz via Wattson's control app.

I was hoping to get a quick read on the Wattson's streaming app. Was it as transparent as dCS's Mosaic? I played the remastered 1965 Georg Solti–conducted *Wagner: Die Walküre* (24/192 FLAC, Decca/ Qobuz). Normally, I'd hate to see a great classic recording like this venerable Decca "enhanced" by plug-in trickeries. I've known and loved this recording on Decca vinyl, so I was prepared to cringe at this punched-up-for-streaming remake. Instead, halfway into the second act, I froze.

Somehow this recording's mastering engineer and the Wattson Madison LE's engineering team conspired to make this newfangled Solti-Wagner into an attention-gripping audio-iMAX experience. Images of the performers were almost luridly vivid, right in front of me, very distinctly outlined. The Madison LE displayed a clarity I associate with today's most elite DACs. The sound was

measurements, continued

20Hz-20kHz.

Fig.1 shows the Madison's impulse response with data sampled at 44.1kHz. This is typical of a very short linear-phase reconstruction filter, with one cycle of ringing before and after the single sample at 0dBFS. The magenta and red traces in fig.2 show the Wattson's wideband spectrum with 44.1kHz white noise data at -4dBFS. As expected from the impulse response, a gentle rolloff starts at the top of the audioband with full stopband attenuation not reached until 41kHz. With this slow rolloff, the image at 25kHz of a 19.1kHz tone at 0dBFS (cyan, blue traces) is suppressed by just 10dB.

The Madison's frequency response with 44.1kHz data (fig.3, green and gray traces) is flat up to 10kHz but is then down by 3dB at 20kHz. With data sampled at 96kHz

+0 AP) -20 -40 -60 d В -80 -100 А -120 -140 -160 200 400 600 800 Hz

Fig.5 Wattson Madison LE, spectrum of 24-bit 1kHz tone at 0dBFS, DC-1kHz, with volume control set to the maximum (left channel blue, right red) and to -12dB (left green, right gray) (20dB/vertical div.). (cyan, magenta) and 192kHz (blue, red), the response is –3dB at 38kHz and 70kHz, respectively. The frequency response was identical from all three output types and was not affected by the volume control setting. Fig.4 shows the effect of the equalization set to "free field" (left blue, right red), "near a wall" (left cyan, right magenta), and "in a corner" (left green, right gray). There is no low-frequency



Fig.6 Wattson Madison LE, left channel, 1kHz output level vs 24-bit data level in dBFS (blue, 20dB/vertical div.); linearity error (red, 1dB/small vertical div.).



Fig.4 Wattson Madison LE, frequency response at -12dBFS into 100k ohms with data sampled at 192kHz with equalization set to "free field" (left channel blue, right red), "near a wall" (left cyan, right magenta), and "in a corner" (left green, right gray) (1dB/vertical div.). so vivid and compelling, I was forced to enjoy what I thought I would hate.

After the supercharged Wagner, I moved on to the curiously irony-tinged charms of Jordi Savall and Hespèrion XX playing *Music for the Spanish Kings* (16/44.1 FLAC, Erato/Qobuz). Here once again I was struck by the clarity and vibrancy of the musical presentation.

Vibrancy is that rare quality of audio system sound that grabs listeners' attention, prickles their need for excitement, and steers them deeper into the music's content. It is the main trait that music streaming struggles to deliver. Here, via the Madison LE and Qobuz, it was boiling off these courtly processionals. The Madison's vitality made this music livelier and more accessible than it was with Denafrips's Terminator Plus DAC and Roon's Nucleus+ streamer.



Madison's streaming sonics were more transparent and microdetailed than those emerging from that Denafrips-Roon combo. Transients were more naturally preserved. Leading and trailing edges of notes felt complete. Rhythms bounced, percussion hit just hard enough, and *vivo* ruled.

4 Running a UPnP server on a networked computer will allow you to access locally stored files via the Wattson Music app or any other UPnP client. An Asset UPnP license costs \$37 and allows you to run the program on up to five devices including Apple, Windows, Debian Linux, and Raspberry Pie computers and NAS devices from Synology and QNap. Asset UPnP is from the folks behind the powerful dBpoweramp suite of products. See dbpoweramp.com.

rolloff in the "free field" setting; "near a wall" rolls off the midrange and bass by up to 3dB; "in a corner" rolls these regions off by up to 6dB.

Channel separation was superb, at >120dB in both directions below 3kHz and still 111dB at the top of the audioband. The low-frequency noisefloor was free from power supply-related spuriae (fig.5). The blue and red traces in this graph were



Fig.7 Wattson Madison LE, spectrum with noise and spuriae of dithered 1kHz tone at -90dBFS with 16-bit data (left channel green, right gray) and 24-bit data (left blue, right red) (20dB/vertical div.). taken with the volume control set to the maximum; lowering the volume by 12dB (green, gray traces) reduced the level of the noisefloor by close to the same 12dB, which implies that the LEEDH volume control topology preserves resolution at its lower settings.

The red trace in fig.6 plots the error in the analog output level as a 24-bit, 1kHz digital tone stepped down from 0dBFS to



Fig.8 Wattson Madison LE, waveform of undithered 1kHz sinewave at –90.31dBFS, 16-bit data (left channel blue, right red).

-140dBFS. The amplitude error is <0.8dB down to -135dBFS, which implies superbly high resolution. When I examined the spectra with 16- and 24-bit dithered data representing a 1kHz tone at -90dBFS, the increase in bit depth lowered the noisefloor by 30dB (fig.7), which suggests a measured resolution of 21 bits. When I played undithered data representing a tone at exactly -90.31dBFS, which consists



Fig.9 Wattson Madison LE, waveform of undithered 1kHz sinewave at -90.31dBFS, 24-bit data (left channel blue, right red).

Jordi Savall and the Hespèrion XX ensemble, and the sublime Montserrat Figueras, sounded tone truthful as they conveyed the Iberian feeling and sensual pleasures inherent to this music. The Madison and its Wattson Music app were delivering streamed 16/44.1 files with a sound quality similar and possibly superior to what I'd been experiencing with CDs via the TEAC VRDS 701T and Sparkler S515t transports. Streaming via the Madison LE displayed that same type of high-action vividness I found so appealing with the Sparkler transport.

In my drag-racer mind, the only way the sound of streamed music will ever engage and excite like LP or CD is if it adds some nitro methane to its processing fuel. Streaming needs to sound more vibrant and intense—with a vital, attention-grabbing clarity. That's what I was hearing with the Madison LE playing Jordi Savall.

Via S/PDIF from a transport

I assumed that the vibrancies described above were a result of the Madison LE's streaming mechanism. I was curious what would change when I took that part out of the chain and played CDs with TEAC's VRDS 701T transport, connected by coaxial S/PDIF.

La naissance de la Polyphonie (CD, German Harmonia Mundi HMX2908167) is a spectacular recording that needs to come through cleanly and crisply, but also smooth and sensuous with tangible touch factor. Besides a chronology of choral practice in Christian Europe from the 12th through the 20th century, this recording offers incredible dimensionality, with groups of singers divided into distinctly separate choral voices at different distances from the microphone. On most of these tracks, I need to hear a little of the venue walls, or at least some artificially induced suggestion

ASSOCIATED EQUIPMENT

Analog sources Dr. Feickert Analogue Blackbird turntable with EMT 912-HI tonearm and EMT JSD 6 moving coil cartridge, Sorane SA-1.2 tonearm with a Nagaoka MP-200 moving Permalloy cartridge, plus Audio-Technica ART20, Benz Micro Gullwing SLR, and Hana Umami Blue moving coils. MoFi MasterPhono and Prima Luna EVO 100 phono stages.

Digital sources Denafrips Terminator Plus, HoloAudio Spring 3 LTE, dCS Lina DAC with Master Clock; TEAC VRDS-701T and Sprinkler Audio S515t CD transports.

Preamplifiers HoloAudio Serene line preamp.

Power amplifiers First Watt SIT-4, Parasound Halo A 21+, Elekit TU-8900.

Loudspeakers Falcon Acoustics Gold Badge LS3/5a, Voxativ Hagen2 Monitor.

Headphones Beyerdynamic DT-1770 Pro MKII. Meze Elite. Cables Digital: Kimber Kable D60 coaxial. Interconnect: Audio-Quest Pegasus. Speaker: Cardas Clear Beyond. AC: AudioQuest Tornado, manufacturer's own.

Accessories AudioQuest Niagara 1000 power conditioner; Harmonic Resolution Systems M3X-1719-AMG isolation platform for Parasound A 21+, Sound Anchor Reference speaker stands, Musical Surroundings V2 Fozgometer; Riverstone Audio VTF gauge, Dr. Feickert cartridge alignment protractor, Record Doctor disc cleaning brush, plus MoFi and Audio-Technica stylus cleaners.—Herb Reichert

measurements, continued

of data at –1LSB, digital zero, and +1LSB, the waveform was symmetrical, and the three DC voltage levels described by the data were clearly defined (fig.8). With undithered 24-bit data, the Madison output a superbly clean sinewave (fig.9).

The Wattson Madison LE produced primarily third-harmonic distortion, this lying at -104dB (0.0006%) with a 1kHz signal at 0dBFS. With the volume control set to the maximum, the second and higher-order harmonics were present at lower levels;



Fig.10 Wattson Madison LE, spectrum of 24-bit 1kHz sinewave, DC-1kHz, at 0dBFS into 200k ohms, volume control set to -12dB (left channel blue, right red, linear frequency scale). repeating the spectral analysis with the control set to -12dB lowered the level of the third harmonic by 3dB and the other harmonics were now negligible (fig.10). Intermodulation distortion with 24-bit data representing an equal mix of 19 and 20kHz tones, each at -6dBFS, was low in level, even into 600 ohms (fig.11). Though a large number of aliasing products were present, other than images of the signal tones at 24.1kHz and 25.1kHz, these all lay below -120dB (0.0001%).



Fig.11 Wattson Madison LE, HF intermodulation spectrum, DC-30kHz, 19+20kHz at 0dBFS into 600 ohms, 24-bit, 44.1kHz data (left channel blue, right red; linear frequency scale).

The Madison was immune to jitter with all its inputs. Fig.12 shows the spectrum of its output when it was fed 16-bit J-Test data via my network. The odd-order harmonics of the undithered low-frequency, LSB-level squarewave lie at the correct levels; the spectrum was similarly excellent with the S/PDIF and AES3 inputs.

The measured performance of the Wattson Audio Madison LE is state of the digital art, at a relatively affordable price.





Fig.12 Wattson Madison LE, 16-bit network data, high-resolution jitter spectrum of analog output signal, 11.025kHz at -6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz. of a room, to keep me listening in a prayerful spirit. In my system, the Madison LE found and organized all the pulsing reverb molecules, an ability I regard as proof of the Madison's excellent management of the time domain.

The Madison's vital clarity was more easily recognized through the full-range, crossover-less Voxativ Hagen2 Monitors than it was through the two-way, crossoverequipped Falcon LS3/5a speakers. When a sound system is phase coherent from source to speaker cones, images achieve an extraordinarily focused presence. When audio signals combine in phase, their presence and vibrancy are reinforced. When they collide out of phase, the sound becomes dull and defocused. My brain readily compensates for irregularities in frequency response, but it does not correct for time-domain vagaries.

Whenever I use TEAC's 701T transport, I feel like it's delivering all the low-level detail in just the right order. No blur. No generalizing. And definitely no added vibrancy. Which means that those extravivid vocal

and room excitements I enjoyed on *La naissance de la Polyphonie* were a product of the Madison's DAC. I was impressed.

With Beyerdynamic DT 1770 Pro MKII headphones

On top of the tallest blues mountain, you'll find three preternaturally talented creatures: Lead Belly, Robert Johnson, and Skip James. All three proffer dark supernatural tales backed by guitar (or piano) pyrotechnics. All three artists are worth a lifetime of study. For the millionth time, I am marveling at Skip James's amazing, cannot-be-equaled piano playing. It's 10° outside, and I'm lying on my back in the dark, listening with Beyerdynamic's 32 ohm DT 1770 Pro headphones to "Little Cow, Little Calf Blues," the second track on Mr. James's 1968 album Devil Got My Woman (16/44.1 FLAC, Vanguard/Qobuz). The Qobuz-streamed version of this song is sounding almost as good, maybe as good, or possibly better (in its own way) than the LP version. This album never sounded this clean, clear, and inner-detailed when streamed by the Roon Nucleus+. This streamed Skip James sounded different than analog, but not inferior. It came through with the same emotional intensity as the LP. I felt like I just woke up, and while I was asleep, digital reinvented itself. The Madison's server-DAC-headphone amp made Beverdynamic's easy-to-drive closed backs sound like the last headphones I, or any mastering engineer, would ever need.

Next, I played the *Devil Got My Woman* LP (Vanguard VSD 79273). I was amused by how the streamed version had shown me all these fantastic details of Skip's piano work and now there I was, looking for those details on the LP. I was grateful to see they were there, but they were presented less obviously, under a different light.

The Madison's headphone amp made Beyerdynamic's \$599 DT 1770 Pro MKII closed backs sound more liquid clear and pro-level resolving than they had any right to at their three-figure price. You'd have to be a snooty elitist audiophile to require anything better with your Madison.

Speaking of elite: When Skip performed "Look at the People Standing at the Judgement," he dropped the falsetto, picked up his guitar, and started singing like a crooner. The smoothness of his voice was haloed by the velvety refinement of Meze Audio's flagship, the Elite planar magnetic openbacks. I knew that these \$4000



headphones costs more than Wattson's DAC-streamer, but I didn't care. I wanted to see how smooth and beautiful the Madison's headphone amp could sound.

I smirked while playing "Goose Freight Train" (LP Version) off my favorite Melvins album, *Stoner Witch* (16/44.1 FLAC Atlantic/ Qobuz). The loping bass and finger snapping at the beginning felt raw, clear, and direct, as if I could see recording engineer Joe Barresi's or producer GGGarth's (Garth Richardson's) forearm, under a strong light, snapping their fingers about a foot from the microphone. Hearing "Goose Freight Train" via the Madison LE showed how Wattson's DAC-streamer was putting this track through fresh, clean, and super-textured, neither adding nor subtracting data. The Madison's streaming sound didn't sound like analog, or CD; it had its own vibe, presence, and intensity that I found equally appealing.

Because I'm me, I couldn't stop myself from trying one last headphone test, this time using *Stereophile*'s 2023 Headphone Product of the Year, JPS Labs' Abyss Diana TC (\$4495). The Diana TCs are difficult to drive, a 69 ohm load with 90dB/mW sensitivity. With the Abyss, the Melvins sounded dull and closed down, as though I was listening through a slit in a cardboard box. Weather Report's 8:30 was only a little better, under a dense, dark, heavy, low-hanging sky—no fun compared to how fresh alive and blue-sky open it sounded through Voxativ's Hagen2 standmounts. The Madison LE is best used with headphones that are easier to drive than the Diana TC.

In sum

I believe that the only way forward for music streaming is to start punching harder and sounding more movie star glamorous than its disc-based alternatives. Based on my experiences with the Madison LE, it seems Wattson's engineering team are hip to this plan and have created the Madison as a distillation of their leading-edge technologies to showcase the next level of in-home streaming sonics—in a small package, at an affordable price. In my system, the Madison LE streamer-DAC delivered a level of vibrance and vital clarity I had not previously encountered for under five figures. My highest recommendation.