## Review: Aurender W20SE Music Server

*Words and photos by Rafe Arnott - Resistor Magazine*



Network players – a hard drive, CPU and RAM in a chassis to stream computer audio – are simple affairs with a straightforward job description. That said, there are network players, and there are network players. Much like there are cameras and there are Leicas.

Aurender have been perfecting their network music servers since 2011 – long enough to be recognized as a design leader in this newest sector of high fidelity. The W20SE represents the current state of the art for the company, replacing the seven-year-old W20 in 2019 as their top-tier caching music server. It has no DAC, does not rip CDs, and offers no wireless abilities. But, what it does offer is a peek into ultra-fi. So called, for a price-no-object approach involving high-grade materials and fetishist-level attention to design and construction. Which in this case center around addressing a specific set of issues inherent to playback of computer audio.

The W20SE moves audio data from the cloud, a local area network (LAN) or network attached storage (NAS) and then on to a DAC via digital output. While this, in and of itself, is not particularly onerous, extracting the highest level of fidelity from that data is. To maintain the most silent background possible it requires components than can not only effectively shield the data stream from

electromagnetic induction, electrostatic coupling, and conduction from an external source, all known as EMI (Electro-Magnetic Interference) or RFI (Radio Frequency Interference), but also isolate it from polluted AC power. EMI, RFI and sub-optimal AC all generate electrical noise which veil signal resolution, which is where the silent part plays a role. EMI and RFI are an issue for both analog and digital signals, but is particularly problematic for digital, which has no inherent noise floor. Hence, the forensic-engineering attention to detail in the signal path to ensure data passed through the W20SE maintains integrity.



*The W20SE features AES/EBU, COAXIAL, BNC or optical output, shielded/isolated USB Audio Class 2.0 output, and a 2x shielded/isolated Gigabit Ethernet input along with two USB 2.0 data ports.*

By utilising a battery/power supply arrangement on the W20SE, Aurender removed AC current from the sonic equation entirely. The company says employing two banks of LiFePO4 batteries to separately power the audio circuitry off-grid "provides a dramatically lower noise floor for a totally silent background…" and that "this technique completely isolates the audio components from ground noise and also reduces jitter and the distortion often incurred in the conversion of AC to DC." A third bank of LiFePO4 batteries comprise an uninterruptible power supply (UPS) which shields the circuitry from power outages. A newly designed, low-noise, linear power supply is used for powering non-audio related sections of the W20SE circuit topology (CPU, SSDs, LED screens, etc.).

Further EMI/RFI isolation of the meticulously-routed internal cabling and daughterboards along the signal path is achieved through a complex chassis design featuring extensive built-in shielding comprised of thick aluminum-alloy partitions. Two internal SSD – 4TB for file storage and 1TB caching drive (updated from the W20's 2x6TB HDD storage and 240GB SSD caching drive) – are encased in what the company describes as "a vault of machined aluminum." The W20SE also employs an "FPGA-based All Digital Phase Locked Loop system with Oven-Controlled Crystal Oscillator (OCXO) clock" because this is considered a far more accurate hardware-based calculation platform for decoding than software, which is CPU dependent and must run filter calculations in parallel.

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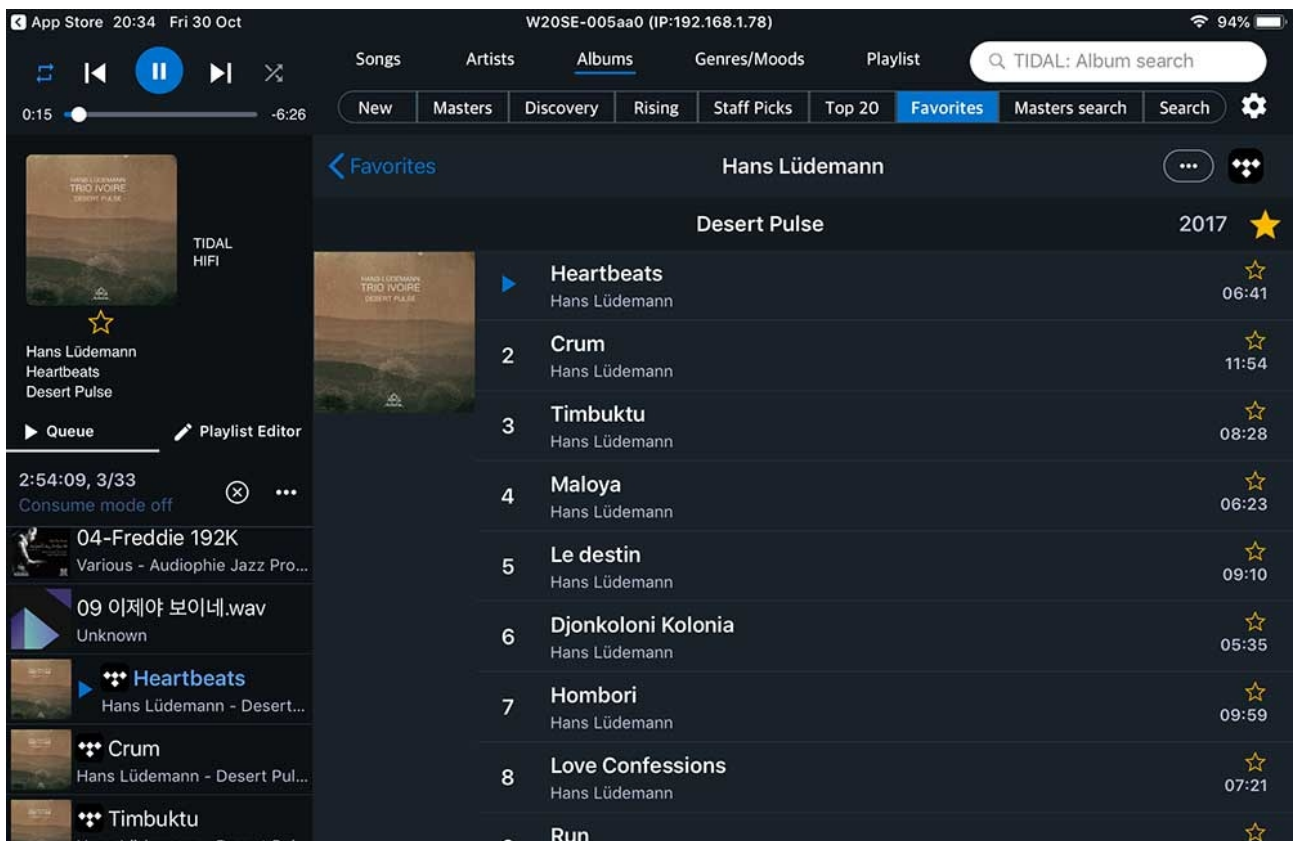
*The Aurender Conductor app is excellent and offers intuitive
browsing and the addition of streaming services is easy.*

Multiple SPDIF outputs mark the W20SE as a studio-ready component, as does PCM upsampling 44.1kHz or 48kHz to two/four/eight times original frequency (88.2kHz/96kHz, 176.4kHz/192kHz, and 352.8/384kHz). This new feature denotes the upsampled frequency as integer multiple of the base frequency (352.8kHz and 384kHz require the dual-wire connection into a dual-wire-capable DAC). This, according to company nomenclature, offers further improvements in playback, but is limited to AES/EBU, COAXIAL, BNC or optical output as the FPGA in charge of this upsampling does not feed the shielded/isolated USB Audio Class 2.0 output module. A 2x shielded/isolated Gigabit Ethernet and two USB 2.0 data ports round out the I/O. The W20SE can handle standard PCM files up to 24-bit/384kHz, and DSD512 (output dependent). For this review, only the USB output was used.

Digital audio acolytes will refer to simplicity of set up, or how intuitive the integration of components and software are into an existing network. Experience shows that properly setting up streaming hardware can be problematic for the uninitiated or computer illiterate. At worst it may necessitate a degree in network engineering and at best a reasonable knowledge of how a network functions. Much of the ease of setup depends on how well the software and hardware speak to one another. Unlike a CD player, hooking-up streamers, DACs, computers and iPads or tablets as controllers entails more than plugging in an AC cord and interconnects.

Fortunately, setting up an Aurender device is not altogether a head-scratching affair compared to some other manufacturer's offerings. The ethernet connection makes hook-up a no-brainer and the supplied Conductor application to access/collate local files or run TIDAL, Qobuz and Spotify through sets up quickly and easily. Unlike their other models, the W20SE comes with the optional MQA Core Decoder

pre-installed (enables MQA Core or first unfold, allowing playback of MQA files at up to 88.2kHz or 96kHz for passing along data to non MQA-enabled DACs). If for some reason things do go sideways during set-up, users can directly connect with Aurender technical support personnel to diagnose and correct issues in-app with a "remote support request." Getting the W20SE up and running TIDAL takes about 15 minutes without hiccups.



*Photos above: Aurender W20SE (left), and Shindo Mr.T power conditioner.*

A W20 with totaldac d1-direct was in-system for several months before swapping in the W20SE, so familiarity for context/comparison in this review was reasonably straightforward. Several changes in the sonic presentation were of note right away: a further drop in the perceived noise floor, the ability to 'see' further into music, a more resolved, or focused, spatial placement of players and instruments in the mix and more air and space around notes. Changes which became apparent over the next few hours of listening included a larger soundstage in all axis, an increase to the delicacy of tonal and timbral shading, an uptick in the immediacy and drive of tempo, a refinement of textural cues, further pitch stability on sustained notes – particularly in electronic music – and more visceral living/breathing presence to vocal performances. These improvements build on what was already a world-class, reference-level offering in the W20.

The review system signal path route: Aurender W20SE streamer/totaldac d1-direct DAC/Audio Note Oto Phono SE Signature integrated amplifier/Audio Note AN-E/SPe HE loudspeakers. All cabling, AC cords were Audio Note Lexus/ISIS, except for TelluriumQ AC/Interconnects used on the W20SE and totaldac. All digital components were fed AC through a Shindo Mr.T power conditioner (which had no discernable effect on the W20SE itself, not surprising considering the LiFePO4 batteries in use). A Linn Klimax DSM and Audio Note CD4.1x provided differing points of view for sonic comparisons to the W20SE/d-1 pairing. Differences, in a nutshell, were that the Klimax and 4.1x both offered more bottom-end weight, but ever-so-slightly less ultimate transparency up top. Musicality, texture, dynamics and presence being more-or-less equal depending on the album/source. YMMV.

The loose-tuned, jangly strumming of Paul Simon's six-string acoustic guitar on "Armistice Day" off his introspective 1972 self-titled album (TIDAL, FLAC, 16-bit/44.1kHz) – the first in the two years following the breakup of Simon & Garfunkel – resonates with the weight and force of his plucking and riffing over a sort of rhythm section and stabbing orchestration of horn. Through the W20 the recording's excellent production masterfully portrays the guitar body's dimensional placement in reference to the vocals on the sound stage. Add in a tactile sense of Simon's fingertips pressuring the fretboard and you have a

cut that offers up some classic Simon falsettos and scat with bare bones percussion for a sparse, melodic pop ditty. Through the W20SE there is a further realized and formed sense of melancholy propulsion: more present, more textured, more dynamic and unconstrained. The album in general feels like it has more breathing room, that there's more blackness expanding between individual notes.

The cross-pollination of Jonathan Meiburg (Shearwater), Emily Cross and Dan Duszynski (Cross Record) produced slowcore trio Loma and a S/T album in 2018. Two years of creative gestation brought Loma back with electro-textured, percussion-driven, keyboard-heavy, entropic dance rhythms via Don't Shy Away (TIDAL, MQA 24-bit/44.1kHz). Brian Eno was public about having "Black Willow" in heavy rotation and contributed keyboard-programming on "Homing," the last cut off the new LP. Through the W20/d-1 this album propels the listener forward, alternately creating rolling waves of claustrophobic anxiety and breaking-the-surface exaltation with each successive track. The sense of the recording space and mastering effects relate sweeping synthscapes and cloud-darkened horizons of bass with Cross' ethereal vocals hovering omnipotently over all. With the W20SE in place the sonic impact grows in size, scope and depth. The increased resolution of the W20SE produces deeper insights into the squalls of horns arranged over hypnotic bass licks, disconsolate electronic chirps, and shimmering percussive decay. One feels further plugged into the album's gestalt.

A complicated blower John Coltrane may have been, but Crescent (TIDAL, MQA 24-bit/96kHz) focuses more on accessibility and the talent of holding it together, which the saxophonist brought to the fore as a leader. This 1964 quartet release featuring McCoy Tyner on piano, Elvin Jones on skins and Jimmy Garrison on bass portrays post-bop more in line with what style guides expected, albeit tonally darker in intensity than his previous, or following albums. The ebb and flow of interplay between the group is exquisitely laid out on "Lonnie's Lament" as Coltrane's moody, emotive honk winds among Tyner's

sparkling and pedal-weighted key strokes. Garrison's slap-bass plucks on the big double resonate with life-size impact and beautiful tonal woodiness to the instrument's body, especially on his three-minute solo starting at the six-minute mark. While the W20 delivered enough detail to make out a rough outline of fingertips on strings, through the SE this outline resolves into sharpened definition and brings clear edges between the boundaries of string and skin. Jones is in a gravity-less well as he free falls through almost the entirety of the cut's 11 minutes and 46 seconds, and through the SE one instantly senses an increased urgency to the propulsive, dynamic syncopation he rhythmically weaves.



The problem with reviews is the amount of time spent listening for something; something the component is not doing, something it is doing, something it's missing, something which it added. The W20SE in hand with the d1-direct offered up such a musical performance that thoughts of (place audiophile metaphor here)_ faded quickly against this reality. Critical notations replaced instead with a growing desire to simply hear ever more albums through the combo because of their abilities to emotionally connect with the listener. Let's be clear, not unlike a CD transport, the W20SE on its own cannot deliver a performance to one's ears. It is one-half of a whole, the other 50 per cent coming from the DAC one curates to harness the digital stream it passes along. Contemplating artistic dialect while listening to music is open to interpretation, intuiting any intention requires emotional and cerebral engagement: these key qualities of wholly experiencing music playback are prescient traits with the W20SE connected. The W20SE should be considered an integral piece of the digital signal path if a reference system focused on computer audio is one's goal. Think of it as a psycho-acoustical portal to the recorded event, lensing the binary facts with resolution capabilities that leave no doubt to what is being translated.



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