Equipment Report

Aurender N20 High-Definition Caching Music Server/Streamer

An Innovative New Benchmark

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Within the last decade, we've seen the emergence of a market for a new type of high-end audio component: the digital-music server/streamer. Integrating the functions of a computer, music server, network bridge, and Internet gateway, the server/streamer provides the flexibility of listening to music files from a disc drive (spinning or solid-state) as well as from high-quality music-streaming services such as Tidal and Qobuz. Aurender has a been one of the pioneers and innovators in this market for some time, and as we shall see, the N20 represents a fresh, formidable, and innovative offering.

Description, Functions, Features

The Aurender N20 is an "all-in-one" digital-music server/streamer that integrates the functions of a music server, a content streamer, and a LAN port to connect to your router in a single component that can be placed in your main audio rack. Contrast the N20 to my streaming setup, where I have servers and fiber-media converters in one room, connected by a long run of optical fiber to an Uptone EtherREGEN and SOtM network bridge in my listening room. Each of these devices requires its own linear power supply, Shunyata NR power cords, and Ethernet cables. While the setup works, it's, well, *complicated*.

Unlike the Linn Klimax DSM/3 (which has virtually no support for on-board music-file storage), the N20 comes with two internal, hard-drive storage bays, which allow you to add the amount of on-board music storage that best meets your needs and budget. For example, if you listen exclusively to music from an online streaming service, there will be no need to add internal storage. If your requirements change, on-board music-file storage can be added by installing a 2.5" hard drive in one or both of the N20's hard-drive bays. At full capacity, the N20 can provide up to 16TB of storage (with SSD drives).

Another key N20 feature is its all-digital, phase-locked-loop subsystem (ADPLL), utilizing a field-programmable gate array (FPGA) in conjunction with an oven-controlled crystal oscillator (OCXO) to reduce jitter. OCXOs are among the most accurate and stable clocks for audio components—orders of magnitude more accurate and stable than the ordinary crystal oscillators found in computers and "generic" consumer-grade networking devices.

Due to the superior clock and oscillator, the N20's AES/EBU, BNC, coaxial, and optical outputs provide a superior musical presentation. As opposed to asynchronous USB connections, where the DAC *pulls* packets of information from the player, N20's SPDIF audio outputs *push* the signal to the outboard DAC, at intervals defined by the precision, on-board OCXO clock. The Aurender N20 also utilizes an Intel Quad-Core CPU to support streaming of digital file codecs, including native DSD512. All supported file types and formats are handled by this dedicated processor.

Because many DACs only support DSD decoding via a USB interface, the N20 also supports DSD-to-PCM conversion on its SPDIF interface by use of an FPGA. This permits the sampling-frequency output to be selected between 88.2kHz and 176.4kHz. Moreover, the gain is adjustable in 1–6dB steps, and a low-pass filter accommodates 24Hz, 30Hz, 40Hz, and 50Hz settings. Additionally, the N20 supports the MQA first-unfold, allowing playback of MQA files at up to 88.2kHz or 96kHz with an optional in-app purchase. It is also compatible with DACs that perform MQA rendering, thus providing full MQA decoding with those MQA-compatible DACs. The first unfold expands the 48kHz sample rate of the MQA file to 88.2kHz or 96kHz for conversion by your DAC at that higher frequency. This works with any DAC. For the full MQA experience, you'll need an MQA-compatible DAC that performs the second decoding step—MQA rendering.

The N20's SPDIF digital output employs transformer-isolated grounding that reduces the noise floor; the USB 2.0 output also bene-

fits from Aurender's latest methodologies to reduce noise and jitter. A word-clock input allows for an external word clock to be connected, which could, depending on its quality, significantly increase SPDIF digital-output performance. The RJ45 Ethernet LAN port is also double-isolated with Ethernet isolation transformers, which reduce noise components from the network or router and lower the overall system noise floor for quieter and more accurate playback of audio signals.

The N20 also has an internal uninterrupted power supply (UPS), which can perform a safe shutdown in the event of an abrupt power outage, thereby preventing system and/or disc corruption.

Setup and Use
Setting up the Aurender N20 is easy, fast, and effective: Take the unit out of its box, place it on your rack, connect power, networking, and signal cables, and power it up; flip to Page 2 of the short, printed, set-up guide that comes with the N20; use a bar-code app on your smartphone to take a screenshot of the 3-D bar code printed on that page, and the Aurender Conductor app will download to your phone; launch the Aurender Conductor app, and it will look for an Aurender on your network, and prompt you to connect to the specific model that it finds; hit the onscreen button, and…that's it! You're up and running! If you have Tidal or Qobuz, you can log into your account in the Conductor app, and, presto, you're streaming content. It took me all of eight minutes from taking the N20 out of its box to streaming music to my DAC. To say I was impressed would be an understatement.

The Aurender N20 also provides functions, features, and flexibilities that make using it and accessing your digital music simple and easy. If you have a lot of ripped or downloaded music files, simply add a hard drive to one (or both) of the bays previously mentioned, connect your music library to the N20's USB port, and easily transfer your music.

One of the other notable features about the Aurender N20 is its large, 8.8"-wide LCD display. The display shows the album cover artwork as well as the album name and artist in beautiful color. A nice touch is you can easily read it from across the room.

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Using the Aurender App
While many folks will use the Aurender Conductor app via a smartphone or tablet, because the new M1 Macs now support native iOS applications, I used my 2021 MacBook Pro *laptop* to run the iPad version of the Conductor app! This was cool as I invariably prefer using my laptop with its larger display to using a smartphone or a tablet. The larger screen on the iPad version of the Conductor app shows a set of panels that allow browsing of available ripped or streaming content on the right side of the screen. Icons at the top allow you to toggle between content on the Aurender itself or content from a streaming service.

When the Aurender icon is selected (signifying

that it will scan content on internal drives), there are two menu hierarchies: the top-row menu allows you to select Song, Artist, Album, Genre, Composer, Conductor, and Folder. Under this row is another list of choices which reflect the names of the folders on your internal storage (if applicable). There are filters to view recently added content, DSD, Hi-Res PCM, or "starred" favorite content. There is also a Search field at the top right.

When the streaming service icon (e.g., Qobuz, Tidal, Spotify, etc.) is selected, there are two menu hierarchies. At the top is Song, Artist, Album, Genre, Playlist, and Search. Underneath that row that is New Release, Streaming Charts, Download Charts, Most Featured, By the Media, Editor Picks, Qobuzinissim, The Qobuz Ideal Discography, and Purchased.

You can easily hide the right-side content panel by swiping right, showing more of the actual content being played on the left side of the app. At top is the Song Detail

metadata with its respective content and track info. Below the Song Detail pane, are the Queue and Playlist Editor panels. The features of these two panels overlap quite a bit. The Queue panel lets you play a previously saved Playlist; Save, Edit, and Shuffle the content in the playlist; and turn Consume Mode on. The Playlist Editor lets you select a previously saved Playlist, as well as Save, Edit, and Play the current playlist.

As a long-time Roon user, I found it easiest to use the Conductor app by picking an album in the right side of the display, either from the internal drive or Qobuz, and after selecting the small oval icon with three dots at the top right, simply pressing Replace Queue with the new album of choice in the dialog box that pops-up. This will remove the tracks from the previously played album in the Queue and replace them with the tracks from the just-selected album. There are some other choices in this menu that let you decide how you may want to play a given album or the
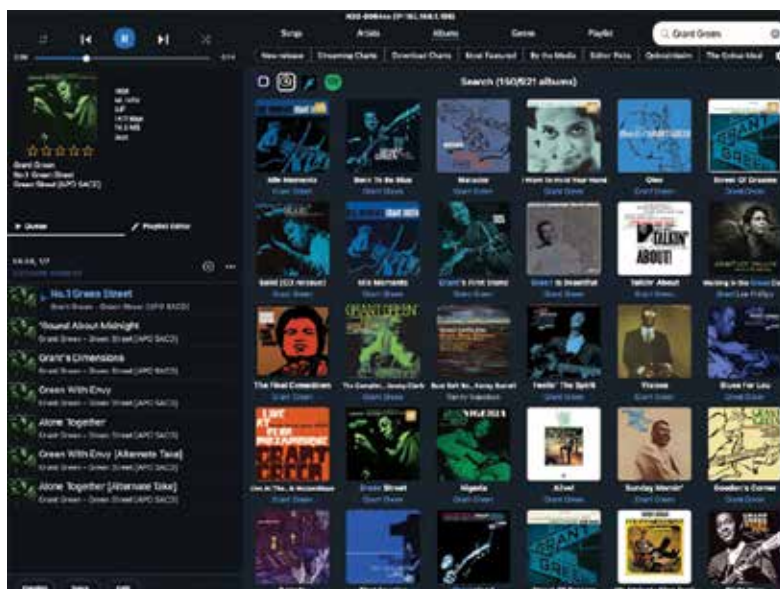
tracks you've selected, but I found just using Replace Queue to be the most "album-oriented" and, for me, the most effective method.

While the Conductor app isn't as intuitive as Roon's interface, it does allow you to add and "mix 'n' match" content from different sources, such as albums and/or streaming playlists, to the tracks in the playback Queue. You can also easily create and save custom playlists, either from files on the drive or from streaming services, within the Aurender app. A particularly nice feature is if you click on the album cover and then touch on the album artwork, an icon with three lines at the lower right pops up that lets you overlay the album track list onto the album artwork. This is a nice feature if, like me, you tend to prefer to listen to an album in its entirety.

Listening Impressions

Right from the get-go, the Aurender N20 impressed me with its audio quality. Blessed with exceptional transparency, resolution, clarity, and focus, the music was presented with superb tonal accuracy, dynamic articulation, and instrumental and vocal body against a jet-black background devoid of digital hash, grit, or grain. The foundational work done by Aurender to mitigate all possible sources of grunge, phase noise, threshold jitter, etc. from servers, networks, and the component itself strips away those nuisance noise factors that can result in disengagement compared to a world-class analog source. Combine this very clean foundation with FPGA-controlled OCXO clocking, and you get an engaging, involving, natural, and organic presentation that pulls you fully into the musical experience and simply won't let go. I spent many a late night enjoying the Aurender, unable to tear myself away from the music.

Have a listen to Gene Harris' beautiful piano playing on the Ray Brown Trio's wonderful *Soular Energy* [Analogue Productions 268], for example. His piano sounds so relaxed, so natural, effusive, and harmonious, that you just can't help getting sucked into "Cry Me a River." The "vapor trail" from the piano has outstanding timbral and temporal articulation as it decays gently into the depth and space of the studio. Brown's bass makes a beautifully textured, weighty, superbly defined counterpoint to Harris' piano. The two artists play off each other, fully resolved in their own spaces. Sublime.

A standout quality of the N20 is its ability to present and portray tonal density—the attribute that gives instruments and vocalists their gravitas. Whether it's the shimmering, almost dulcimer-like quality of Chris Jones' solo guitar on "Set 'Em Up, Joe" [*Closer to the Music, Vol. 1*, Stockfisch Records SFR357.2903.0] or the weight, body, and power of Oscar Peterson's piano

Specs & Pricing

Digital outputs: AES/EBU, coaxial, BNC (75Ω), TosLink, USB

Compatible formats: Native DSD, DSD (DSF, DFF), WAV, FLAC, AIFF, ALAC, M4A, APE

Bit and sample rates: SPDIF: Up to 24-bit, 192kHz; USB: 32bit/384kHz; DSD: Up to DSD256 (DoP), Native DSD: Up to DSD512

Control app: Aurender Conductor iPad and iPhone app, Android phone and tablet

SSD caching drive/DRAM: 1x 500GB, M.2 MVME/DDR3 8GB

DSD-to-PCM: Precision DSD-to-PCM conversion for SPDIF outputs

Digital I/O: 2x Isolated Gigabit Ethernet LAN, 2x USB 3.0 data ports

Internal UPS: Super Capacitor-based uninterrupted power supply for safe shutdown

Master clock input: Word clock or master clock input (BNC) 10MHz, 12.8MHz (44.1kHz and 48kHz multiples from 1 to 512), input impedance 75Ω

Integral storage: None (two trays for 2.5" 15mm/7mm HDDs/SSDs, user installed)

Dimensions: 16.9" x 4.4" x 14.0"

Weight: 29.8 lbs.

Price: $12,000

Associated Equipment

Digital sources: Aurender N20 server streamer, Mac Mini Roon Core Server, Sonore OpticalModule fiber-media converter, Uptone Audio EtherREGEN Ethernet switch, Uptone Audio LPS-1.2 linear power supply.

D/A Converter: Lampizator Baltic 3 and Holo Audio May KTE R2R

Analog source: Michell Gyro SE, SME V, Bob's Devices Cinemag step-up transformer

Phonostage: E.A.R. 324

Preamplifier: First Sound Presence Deluxe 4.0 SE MkIII-SI active preamp with Paramount Special Edition Upgrade

Power amplifier: Conrad-Johnson ART150S

Integrated Amplifier: Constellation Inspiration

Loudspeakers: Harbeth 40th Anniversary 30.2, Dynaudio Contour S3.4 with Esotar 2 tweeters, REL R-305 subwoofer

Cables: Shunyata Research Sigma XC and NR V2 (Everest & amplifiers), Alpha NR V2 (preamp and phonostage), Shunyata Omega QR-s (DAC), V14D Digital power cables (for 100% digital components), Shunyata Omega and Sigma interconnects, Omega Ethernet cable, Shunyata Alpha USB cable, and Shunyata V2 VTX-Ag speaker cables, Shunyata DF-SS cable elevators.

A/C power: Shunyata Research Everest 8000 and SR-Z1 wall outlet.

and the tonal color and richness of Ben Webster's sax on *Ben Webster Meets Oscar Peterson* [Verve 5214482], the N20's presentation is driven forward with powerful and refined sophistication in rhythm and timing. Staying seated in my listening chair was challenging because this wonderful recording just *swings* with the N20.

I also spent some time listening to the N20 in Critical Listening Mode, where the main display and other ancillary functions are powered down to provide the best possible audio quality. In this mode, the N20's sonic attributes do not change in character or degree. What is improved, however, is soundstage resolution and refinement, imaging definition and placement, and the resolution of spatial and ambient cues. This was most noticeable on recordings made in real spaces, e.g., churches or symphony halls, rather than in the "spaces" created by a recording engineer in a studio session.

Using Critical Listening Mode for J. S. Bach's Violin Concerto No.1 in A Minor [Bach: *Violin Concertos*, Philips 420 700-2], played by the incomparable Arthur Grumiaux and Les Soloistes Romands, was a veritable delight. Grumiaux's impeccable tone, attack, and pacing, his exquisite phrasing and control of dynamic range (did you know that a violin has more dynamic range than a piano?) infused this wonderful recording with energy, joy, and exuberance. With Critical Listening Mode on, I heard spatial, imaging, and soundstage cues that I had never heard before. It is a *tour de force* performance, and it sounded gorgeous on the N20.

Kenny Dorham's legendary 1956 hard-bop album, *'Round Midnight at the Café Bohemia* [Blue Note BLP 1524] was presented through the N20 with the wonderful intimacy and nuance that only come from live recordings made late at night in a jazz club, when the band is fully warmed up and really swinging. The stick and brush-work of Arthur Edgehill on cymbals was rendered with a fine, delicate, brassy sheen; Dorham's trumpet was warm, sweet, and inviting, never biting. The Aurender N20's fine rendering of space, atmosphere, and instrumental subtleties put me in the club with the audience. What a wonderful recording.

Summing up, I loved the musical experiences conjured up the by the Aurender N20. It presented the music with very high accuracy and precision, complete with the requisite muscle and horsepower to provide superb rendition of dynamic contrasts and shadings, but could temper and punctuate those dynamics with the delicate articulation of instruments and voices. The overall presentation was exceptionally uncolored and tonally accurate, yet rich with natural timbral warmth, three-dimensional weight and body, and fine gradations of instrumental or vocal textures. All this goodness was presented with clean, quiet, and very black backgrounds, refined, stable, and precise imaging, expansive sound-staging, and most importantly, nuanced, refined, and relaxed naturalness.

Bringing it home, the Aurender N20 is one of a handful of the best-designed, best-integrated, best-engineered, and, most importantly, *best-sounding* audio components I have ever had the pleasure to use and experience. As such, it constitutes an innovative new benchmark in digital music server/streamers. Highest possible recommendation—the Aurender N20 is a veritable home run. **tas**