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Aurender W20 Music Server Not Just a Pretty Interface



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FROM THE Editor

Future Shock

It's abundantly obvious that new technologies are changing the way we access music. What's not so obvious is the seismic shift those changes are engendering throughout the audio industry.

I'm referring, of course, to file-based audio systems. I use that term to describe any platform that delivers music to consumers through files rather than via physical media. This includes streaming, PC- or Mac-based computers, turnkey music servers, and the increasing variety of digital products that don't fit into traditional component categories, such as the Auralic Aries wireless bridge. As diverse as these products may appear, they all have one thing in common: They are computers masquerading as audio components. Underneath the thin veneer of a pseudo-high-end-like user interface, our audio systems are increasingly based on technology from the computer industry rather than from the audio industry.

This shift has profound implications for hi-fi and everyone in it, from consumers, to retailers, to manufacturers. Music lovers who want to access file-based music are, even with many "turnkey" music servers, forced to learn about networking protocols, IP addresses, wireless router setup, operating systems, and software updating. As with any computer, there are the inevitable problems—glitches that most consumers are ill-equipped to diagnose and fix. The days of picking up a new component at your local dealer, plugging it into the wall, connecting a couple of signal cables, pressing a few buttons, and forgetting about that component for perhaps years are long gone. Instead, you must navigate a gauntlet of unfamiliar jargon in an owner's manual—if there *is* an owner's manual—that has been written by someone who assumes that everyone is IT-savvy.

The people designing these products come from the computer and IT industries, and consequently have very different priorities about what makes a "good" product. In their world, the more features and capabilities, the better. Their traditional customers of IT professionals have no problem with technical setup, software upgrades, and roll-up-your-sleeves, hands-on involvement. But for the person who just wants to listen to music, added features and capabilities can be a confusing liability rather than an asset. In my view, the success of any file-based music system is determined by how well it hides from the user its computer underpinnings. Unfortunately, that view isn't shared by many of the server manufacturers. And even if the server manufacturer does try to make setup and operation simple

for the consumer, the state of technology is such that there's really no such thing as "plug and play" (it's more like "plug and pray").

For traditional high-end retailers, file-based audio products offer both promise and peril. The promise is of building a new and large base of loyal customers who rely on the dealer's stock-in-trade—knowledge and expertise. There's a parallel with the retailer's role in the LP era, when his expert advice and turntable set-up skills made him indispensable. What better way to earn customer loyalty than by solving the customer's technical problems so that he can simply enjoy music? The retailer's peril in today's new landscape, however, is that he must first gain expertise in networked computer systems, and then often troubleshoot the customer's entire network—including products such as routers that the dealer didn't sell to the customer.

The shift to computer-based audio has pushed many dealers into abdicating their traditional role as the customer's set-up guru, instead referring their clients to the manufacturer's overworked technical support representatives. That's a mistake, and one that's detrimental to the high-end audio industry. Dealers should use file-based music as a way to establish and solidify relationships with their client base. Turning their customers over to the manufacturer's tech support people is shortsighted—it's a squandered opportunity to develop long-lasting, mutually beneficial relationships with their customers.

Similarly, traditional high-end companies are forced to integrate completely foreign computer technologies into their products, unless they are happy remaining within their own niche—small tube-amplifier makers, for example. Taking the plunge into servers requires an immense long-term commitment in hardware and software development, not to mention marketing, dealer training, and ongoing support.

File-based audio offers opportunities for accessing music unimaginable just two decades ago. I can sit in my listening chair with an iPad Air and not only browse and select any piece of music in my library, but seamlessly switch to Tidal and lossless streaming, expanding my virtual library to more than 25 million pieces of instantly accessible music. That's an immensely powerful vehicle for exploring and enjoying the world of music. The high-end industry now has to figure out how to drive that vehicle instead of being run over by it.

Robert Harley

Aurender W20 Music Server Not Just a Pretty Interface

Robert Harley

Photography by Dennis Burnett





As I describe in this issue's From The Editor, beneath every music server's audio-component-like exterior lurks a computer. Do-it-yourself servers based on a Mac or Windows PC make no attempt to hide this fact from their users. But the *raison d'être* of "turnkey" music servers is to provide listeners with the benefits of file-based music without the hassles of computers. If you want instant access to thousands of albums with a couple of finger taps, but abhor the thought of drilling down through multiple sub-menus of arcane software settings, a turnkey server is for you. Our reviewer Steven Stone once wrote, only half jokingly, that DIY servers are for the ultra-geeky and turnkey servers are for the ultra-rich.

But there's another reason beyond convenience to buy a turnkey music server: sound quality. Building a server from the ground up allows the designer to incorporate techniques that optimize sonic performance—techniques that are unavailable in general-purpose computers. Most turnkey-server manufacturers, however, build their systems around a stock commodity-grade computer-motherboard to which they add custom digital outputs with more precise clocking, improved power supplies, and some measure of electrical isolation between the motherboard and the audio output. Although these are steps in the right direction, creating the state of the art in music servers requires designing and building an entire computer from a blank sheet of paper. This approach obviously requires a much greater investment of time and money, as well as considerable technical expertise.

That's what the Korean firm Aurender has done in creating the flagship W20 reviewed here. Nothing in the W20 is based on stock computer subsystems. Rather, every aspect of the W20's design is aimed solely at delivering state-of-the-art sound quality. As you'll see, the company has gone to extraordinary lengths in the pursuit of better sound.

The W20 is designed to do one thing and do it well: store music, allow you to access that music, and then present the highest possible quality digital-output signal to your DAC. The W20 has no integral DAC and no native CD ripping capability, and offers no metadata editing. The product's ambition is reflected in the substantial \$17,600 price.

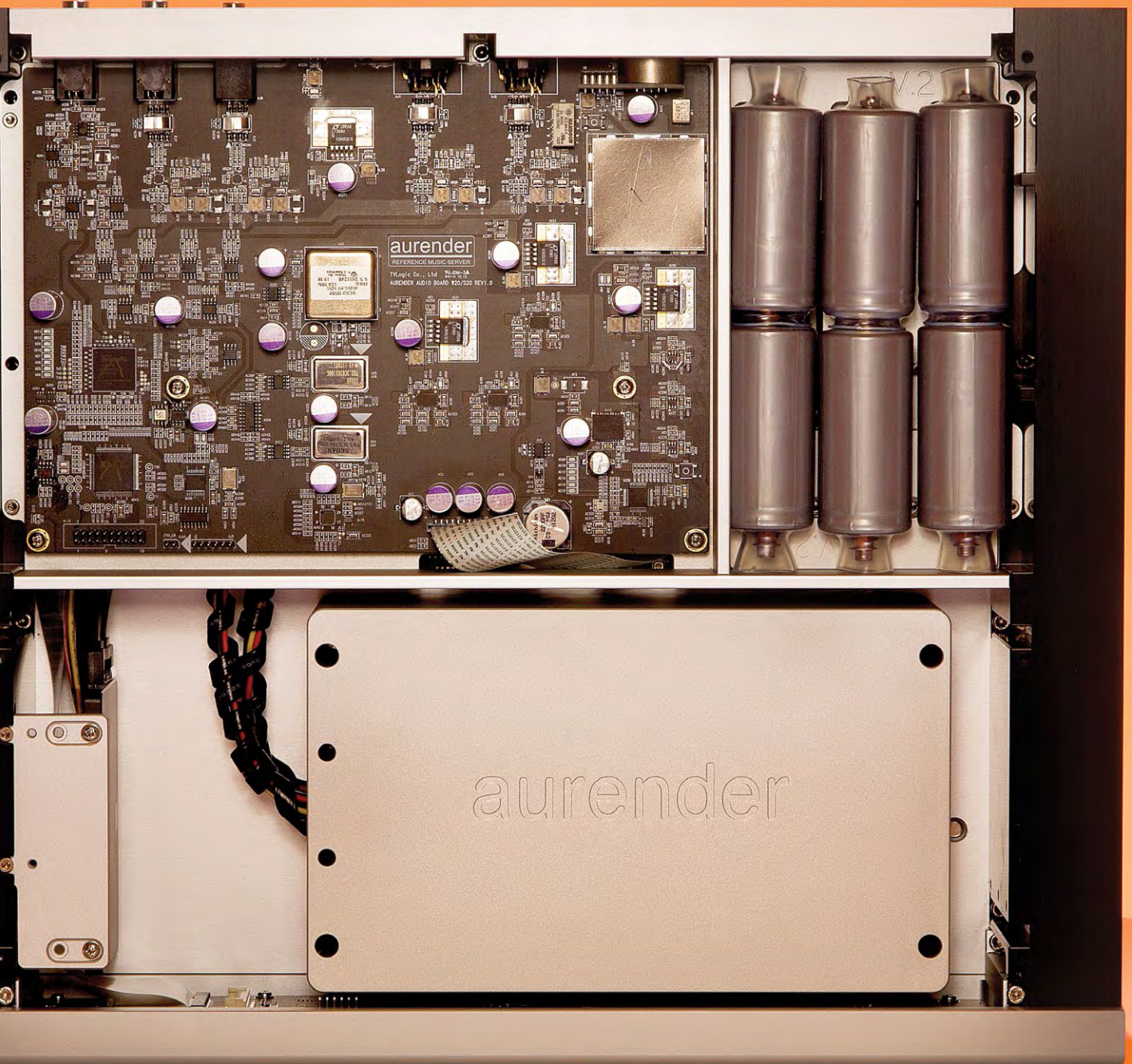
The W20 is housed in a handsome, robust chassis machined from aluminum plate with extruded aluminum heatsinks along the sides. The front panel houses two displays, a power button, and four buttons that provide rudimentary control over playback, as well as certain housekeeping functions. The display can switch between showing the name of the music track in play, the playlist menu, or signal-level meters (with a blue or brown background). In practice, you'll rarely interact with the W20 through these front-panel buttons and displays; instead, you'll use Aurender's Conductor app for the iPad to control the system. (More on this later.)

Aurender W20 Music Server

The rear panel showcases the W20's manifold capabilities. The two AES/EBU outputs can be configured either as two separate single-wire outputs or one dual-wire AES/EBU. This latter format is provided for those few DACs that require dual-wire inputs for accepting sampling frequencies above 96kHz. A clock input appears on a BNC jack, allowing the W20 to lock to DACs with a clock output, or to an external clock that sends a master clock to the W20 and a DAC. In addition to the two AES/EBU jacks, the W20 provides digital outputs via coaxial-on-RCA, coaxial-on-BNC, TosLink optical, and a dedicated audio USB connector. Two additional USB jacks are provided, but these are strictly data ports for connecting external drives. Finally, an Ethernet port connects the W20 to your network. I know of no other server with an array of features this extensive.

The W20 connects wirelessly to the iPad, but adding the server to your network and enabling Tidal streaming is best realized with an Ethernet connection. You can rip CDs directly to the W20's drives (by specifying those drives as the target in a ripping program such as XLD AutoRip) or download hi-res files directly to the W20. A better method is to rip CDs and download hi-res files to a network attached storage drive (NAS) that's on the same network as your PC or Mac and the W20. You then drag and drop music files from the NAS to the W20's disk drives. It's a bit of a hassle to go through this procedure if you just want to listen to a single, recently purchased CD. Transferring music to the W20 is best done in batches. (Just as I was finishing this review, Aurender announced a software update, available by the time you read this, that allows you to transfer music from the NAS to the W20 directly without a PC or Mac via the Conductor app for the iPad, but the update wasn't ready in time for me to try it.)

Adding a NAS should be considered mandatory because it provides a backup of your music library. Note that although the W20 has dual disk drives (6TB x 2), the second drive isn't a redundant backup; if a drive fails you'll need to reconstruct as much of your library as was on that drive. The Synology DS214 NAS I use (\$557 with two 3TB drives) comes with software that performs automatic backup of any





into this cache memory, after which the disk drive is spun down to sleep, eliminating noise and vibration. This also minimizes wear and tear on the hard drives. The audio data are then clocked out of the cache with a high-precision, oven-controlled crystal oscillator. An oven-controlled crystal oscillator is encased in a small heated chamber that maintains a precise and optimal temperature for the crystal. These expensive devices are much more precise than the ubiquitous crystal oscillators found in virtually all digital products. Both the clocking circuit and the cache memory feature proprietary techniques for reducing noise and jitter on the output signal feeding your DAC.

Unlike many computer-audio products, the W20 comes with an excellent and well-illustrated “Quick Start Guide.” A full owner’s manual is offered on the Aurender website. Should you encounter problems with any current Aurender model server, you can request Remote Internet Support right from the app. An Aurender

technician can then access your network and probably diagnose and resolve any problems with the W20 or its setup.

THE CONDUCTOR APP

A server lives or dies by its control app. The app can be a constant source of frustration or a joy to live with on a daily basis. I’m happy to report that the Aurender Conductor app is by far the best I’ve used. It’s fast, visually appealing, stable, intuitive, capable, and uncluttered, and its features have been clearly refined through actual use. The app runs much faster on a 64-bit iPad (I tried it on an older iPad 2 as well as a new iPad Air 2.) The 64-bit iPads are required for rendering album art in high resolution. If you spend ten minutes with someone who knows the app (your dealer, for example) and then begin using it yourself, you’ll feel like an expert half an hour later.

other drive on the network, including the W20’s drives. A single NAS, however, shouldn’t be your only backup. For true security, you should have a second NAS stored in a remote location that is periodically backed up. This may seem like an extreme measure, but not when you consider how much time, effort, and money your stored files represent, particularly if you’ve edited the metadata.

TECHNICAL TOUR

Removing the thick, heavy aluminum top plate reveals a chassis compartmentalized into several aluminum sub-chassis. The fanless switching-mode that powers the computer motherboard is encased in an isolated block just behind the display. The dual 6TB disk drives are mounted on compliant platforms to reduce noise and vibration. I never heard the sound of drives spinning during my entire time with the W20. The audio-output board is separated from the other circuitry by an aluminum plate. The critical audio-output circuits are powered by two of the three separate banks of lithium-ion-phosphate rechargeable batteries that consume a big chunk of the interior real estate. By powering the audio-output electronics with batteries, the digital audio signal is made completely immune to power-supply noise or fluctuation. The two banks are redundant: One set is being charged as the other is being used. The batteries also protect the computer from sudden loss of power; when the W20 detects that the AC power has been disconnected, it safely powers down the system, protecting the stored data.

Another design feature aimed at delivering a pristine digital output to your DAC is a 240GB cache memory, which serves as a buffer between the disk drives and the audio output. When you select music and create a playlist, the W20 reads the audio data from the spinning disk drive

Aurender W20 Music Server



Aurender W20 Music Server





Aurender W20 Music Server

The majority of the app screen shows your library by album, artist, or song, with a smaller playlist section on the left. Tapping a track from the main display moves the track to the playlist. Entire albums can be moved to the playlist with one tap. A nice feature allows you to slide back the main display to show the playlist in greater detail. Another thoughtful design element is the way tapping a button brings up the additional controls you need in the context associated with that button. For example, I just mentioned that you can add an entire album with one tap. When you tap the album name, a menu appears that offers you the option of adding the entire album, and where in the playlist to do so. This structure keeps the interface clean and simple, presenting you with additional choices only when you need them. Moreover, the interface's colors, shapes, and organization are easy on the eyes. You can filter your library view by sample rate (showing you only hi-res titles, for example), DSD files, recently added titles, and those albums you've marked as favorites.

With two finger-taps the view switches from your music library to the Tidal streaming service. (A Tidal subscription is required: \$19.95 per month for unlimited lossless streaming.) You can create playlists with tracks mixed from your library and Tidal. Its integration is so seamless that it's easy to forget where your library ends and Tidal starts. The Aurender Conductor app's Tidal interface is better than Tidal's own app. The best software is powerful yet simple to use, and that is a good way to describe the Aurender Conductor.

As I mentioned, the W20 offers no way to edit metadata directly. You can, however, edit metadata with a program such as JRiver Media Center. Speaking of metadata errors, I discovered a couple of funny and interesting ones. I ripped a CD by the Western swing band Asleep at the Wheel and the band's name showed up in my library as "A Sheep at the Wheel." The double



CD of John Mayall's 70th birthday concert appeared as two separate albums, one by John Mayall and one by John Mayall & the Bluesbreakers.

SETUP

Setting up the W20 in my system wasn't without glitches. After using the system for a couple of weeks I powered it down to rearrange my equipment rack, and when I powered it back up the W20 wouldn't connect to my iPad Air 2. Oddly, it *would* connect to an older iPad 2. Aurender had not encountered this issue before, but I figured out the solution. (The W20 and iPad Air 2 weren't on the same network; resetting the router fixed the problem.)

On another occasion, after the W20 was turned back on, it wouldn't boot up. Previously unbeknownst to me (or to Aurender), the W20 won't boot up when certain DACs are connected to it. (I was using the DAC in the Hegel H160 at the time.) Aurender had not seen this problem with any other DACs.

I should add, however, how wonderful it was to connect different DACs to the W20 and have them instantly recognized, with their names shown in the W20's display. Anyone with a PC- or Mac-based server who has struggled to get his software to recognize the DAC will appreciate the W20's ease and reliability in this regard.

LISTENING

Does the W20's \$17,600 price tag buy you merely the convenience of a turnkey server and a nice interface, or does it sound considerably better than, say, a fully tricked-out MacBook Pro? (There's no question that the user experience is vastly better with the Aurender than with the Mac-based server. In fact, the comparison's not even close.)

To answer that question I first assessed the W20's sound quality by auditioning its various digital outputs to find the best interface. I found that the best-sounding configuration was with the W20's USB output driving a Berkeley Alpha USB (a USB-to-AES/EBU or SPDIF converter), which in turn fed the Berkeley Alpha DAC Reference via a 1m run of AudioQuest Wild Digital AES/EBU cable.



Aurender W20 Music Server



The W20 was put under the extremely powerful microscope of the state-of-the-art in digital conversion, the Berkeley Alpha DAC Reference connected to some of the most transparent and resolving electronics extant—the Constellation Audio Altair 2 and Hercules 2, or the Soudation 725 and 701 combos. These, in turn, drove the Magico Q7 Mk2 and MartinLogan Neolith loudspeakers, all connected with MIT's best cables. The listening room's AC power, supplied via four dedicated 20-amp AC circuits, was conditioned by an all-out Shunyata system with the new Shunyata Sigma AC cords. This system's resolution immediately revealed exactly what was happening at the digital source. (I'm reviewing the new Constellation electronics and the Neoliths in the next issue. Shortly thereafter, I'll write a feature article on building this entire system and what I learned along the way.)

Listening to the W20 on a daily basis, after living with a MacBook Pro as a server for the past year, I was immediately aware that Aurender's extraordinary efforts in clocking, buffering, and lowering noise paid off in the musical experience. The W20's "sound" was characterized by a natural and organic quality that came closer to the "feel" of analog than any digital source I've experienced. The presentation had a dimensionality, life, bloom, and illumination that one doesn't associate with digital. I was repeatedly amazed by just how much space and depth were encoded on 44.1kHz/16-bit sources, just waiting to be revealed by playback hardware of this quality. I thought that we had long ago bumped up against the limits of standard-resolution digital sources, but the W20 feeding the Berkeley Alpha Reference DAC showed that the flatness, hard timbres, lack of air and depth, and absence of fine detail were not purely attributable to the standard-resolution digital format. Of course, there are

many inferior-sounding CDs, but the W20 still managed to get the most music out of them. The W20 not only revealed new depth and dimensionality on well-recorded CDs I had ripped (in AIFF), but also rendered instruments as separate objects in the mix. The W20 "de-homogenized" the soundstage, allowing me to hear each instrumental line with startling clarity and focus. Reverberation decay was longer and deeper, adding to the impression of space and dimensionality. The recording *Live in America* by flamenco guitarist Paco de Lucia was a particularly vivid example: Paco's guitar was focused in the center of the stage, surrounded by the hall's dense reverberation, with the thrilling *zapateo* (percussive footwork) and handclaps at the far left and right boundaries "lighting up" the acoustic space with each sharp transient. I've listened to this track many times, but never before felt I was hearing the recorded acoustic this clearly. The experience was mesmerizing.

In addition to greatly increased dimensionality, another salient characteristic of the W20 was its very quiet background. It was as though the W20 cleaned up a bit of low-level hash that was diminishing the impression of hearing instruments in space. Presented against a dead-silent backdrop, instruments took on more palpability, realism, and life. This low-level hash had also set a noise floor below which no information was being resolved. The Aurender's deeper silence allowed very fine details of timbre, micro-dynamics, and ambience to emerge. The W20 was so adept at resolving the lowest levels of information that I consistently heard new musical nuances on albums I'd been listening to for decades. Treble through the W20 was cleaner and purer, with less grit, hardness, and unnatural sheen. The top end had greater delicacy, air, and detail—qualities that were rewarding on Jack DeJohnette's wonderful cymbal work on the live Keith Jarrett recording *My Foolish Heart*. Cymbals seemed to float in air rather than being painted on a flat canvas; their airiness and decay approached that of analog with some recordings.





Aurender W20 Music Server

SPECS & PRICING

Storage capacity: 12TB (6TB x 2)

Formats supported: DSD (DSF, DFF), WAV, FLAC, AIFF, ALAC, M4A, APE, and others

Outputs: AES/EBU (x 2, single-wire or dual-wire mode), USB 2.0 (dedicated audio output), USB data ports (x 2), TosLink optical, Ethernet, coaxial (RCA), coaxial (BNC)

Inputs: Clock on BNC

Network: Ethernet

Dimensions: 16.93" x 4.17" x 14.57"

Weight: 41.9 lbs

Price: \$17,600

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There was a sense of precision and order that made the music tight, defined, detailed, and dynamic. Bass was tauter and more tuneful, with greater pitch articulation and dynamic impact. This precision was particularly impressive on 44.1kHz/16-bit sources. Although the best hi-res material sounded spectacular, what impressed me even more was how the W20 reproduced standard-res material day after day. It was as though the Aurender had remastered my entire CD library, giving me new and improved versions of old favorites. In some respects, realizing great sound from standard-resolution sources is a greater technical challenge than performing the same trick with hi-res ones; on Red Book CD, the digital source and DAC have much less information to work with, leaving no room for error.

The W20 was significantly better sounding than the MacBook, even though both sources' USB outputs were being buffered, isolated, and reclocked by the same Berkeley Alpha USB. (I suspect that the difference in sound quality between the MacBook and the W20 would be even greater if the latter were driving DACs directly, without the Berkeley Alpha USB interface.) It did not take hours of back-and-forth comparisons to hear the W20's superiority. I started by listening to "Back Row Politics" from *Act Your Age* by Gordon Goodwin's Big Phat Band, first on the W20 and then through the MacBook Pro. The tune starts with few bars of piano intro. Switching to the MacBook Pro was almost like hearing a different piece of music. Through the MacBook the left- and right-hand piano lines were blurred into a single musical statement. Through the W20, the two lines were clearly distinct, and much more musically involving, the interesting meter generated by the left and right hands setting the stage for the rest of the tune. When the band came in, I heard a much tighter and deeper bottom end, a more open and spacious soundstage, and far more detail. Small percussive details smeared by the MacBook were rendered with

pristine clarity by the W20. I had been listening to the MacBook Pro for about a year, and was surprised by just how much better my system sounded with the W20 as the source.

CONCLUSION

The Aurender W20 is in my experience the current state of the art in music servers. It excels in every parameter; its array of features is unmatched, the 12TB of available storage will accommodate virtually any library; its interface is wonderful and intuitive; and most importantly, it delivers sound quality unmatched by any other digital source I've heard. The W20 brought out the best in my system, delivering the greatest dimensionality, timbral purity, resolution, and freedom from hash I've heard from digital sources. Of course, a great digital-to-analog converter is required for realizing the sound quality I've described, but I can say that the combination of the W20 and the Berkeley Alpha DAC Reference sets a benchmark in performance.

Although many listeners will be drawn to the Aurender W20 by its capabilities and outstanding iPad control app, it's really the sound quality that makes the W20 special. The Aurender W20 is not just a pretty interface. **tas**

Aurender W20 Music Server



A More Affordable Alternative

I'm happy to report that much of the Aurender experience is available in Aurender's far less expensive N100H server, priced at \$2695 with 2TB of integral storage. You don't get features such as dual-wire AES and the clock input, but most users don't need those capabilities anyway. Although the audio output circuitry is powered by a conventional power supply rather than by batteries, the circuit is based on the design developed for the W20. The N100H's much smaller chassis provides less isolation between subsections than that of the W20, but the N100H's chassis-work is still first-rate. It's like a miniature version of the W20. The N100H's cache memory is 120GB rather than the W20's 240GB. Nonetheless, you still get the same outstanding Conductor app, Tidal integration, and Remote Support.

I was able to compare the W20 with the N100H by creating playlists of the same music on both servers, and then switching between them by selecting the server I wanted to hear from the Conductor app (and moving the USB cable). I also compared the two Aurenders to the MacBook Pro described in the review.

The N100H was much closer in sound to the W20 than it was to the MacBook Pro, which came in a distant third. The N100H had much of the W20's expansive soundstage, dimensionality, purity of timbre, separation of individual instrumental lines, bass definition and dynamics, and resolution of low-level detail. In absolute

I suspect that the N100H would be a major sonic upgrade to just about any digital front end.

terms, the N100H was not quite as clean in the treble as the W20, slightly less resolving of low-level information, and not as dimensional. I should stress that the differences between the W20 and the N100H were ones of degree, not of fundamental character. The N100H was significantly superior to the MacBook Pro in every sonic criterion, and inferior in none. I suspect that the N100H would be a major sonic upgrade to just about any digital front end. And the user experience is absolutely identical. The N100H strikes me as a compelling solution for many listeners—and a terrific value. **tbs**

Aurender W20

Heartfelt thanks from the entire team at Aurender for Robert Harley's thoughtful and comprehensive review of our flagship music server, the W20. There's really nothing more for us to say, as Mr. Harley so accurately portrayed his experience with the W20.

It's always a pleasure to be recognized for your efforts by RH and *The Absolute Sound*, but what is most extraordinary is the fact that the W20 was introduced nearly three years ago! In the fast-paced world of digital audio where "breakthroughs" occur frequently, it is gratifying to know that we achieved our goal of creating a "living product."

And Aurender feels it mandatory that the W20 remains technologically competitive for many years to come. This is entirely possible since at its core the W20 is a software- and firmware-driven device. (Aurender has an internal programming capability that is perhaps larger than most "audiophile" companies; being "internal" allows rapid and extensive interfacing between programmers and engineers.)

We're also thrilled Robert came to experience the core competency of the unit's "analog-like reproduction of digital files." Achieving this was no small feat for Aurender, requiring countless hours of sound-quality evaluation during the W20's development.

We also thank Robert for pointing out that Aurender offers less expensive solutions for file management and playback. Our N100H serves as a gateway to the world of digital-file reproduction at a price point similar to what one once spent for a good-quality CD player.

Harry Lee
Director
Aurender