the absolute sound

Buyer's Guide to **Audio Electronics 2017**

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A revelation in music reproduction.

Revelation Series | Andromeda Phono Preamp

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From the Editor

Welcome to the new Buyer's Guide to Audio Electronics!

This new 2017 Guide not only features **28 full-length reviews** of **preamplifiers and amplifiers**—and combinations of these—hand-selected by TAS editors, but you'll also find:

On the Horizon – A sneak peek at **11** of the most impressive new electronics to hit the market, from phonostages and linestages to amplifiers of all types.

A Brief Guide to Today's Preamplifiers – Robert Harley sheds light on the different types of preamps—plus classic designs and new technologies—and their functions and purposes.

Book Feature – Take a look inside TAS' *Illustrated History of High-End Audio, Vol. 2: Electronics*; three profiles of legendary designers are included here: William Zane Johnson, James Bongiorno, and Nelson Pass.

Top Picks – We choose our recommendations for each category, from integrated amps, monoblocks, and preamps to reference-level electronics.

No matter what your budget or sonic preferences, this Guide is designed to help you explore the wide range of electronics across all design categories and price-points.

Happy listening!

Julie Mullins, Editor

On the Horizon

Hot New Products Coming Your Way

Neil Gader

Pass Labs XA25 Power Amplifier

The new XA25 Class A power amplifier is now the most affordable power amp in the Pass product offerings. With 25Wpc into 8 ohms and 50Wpc into 4 ohms, the XA25 is not meant as an "entry-level" model, but rather, a less costly way for consumers to experience the Pass Labs line and all its renowned traditions of founder Nelson Pass' comprehensive design, construction, and performance. A smaller Class A stereo amplifier at a lower price, it takes advantage of the lower power requirements of using simpler single-ended circuitry and fewer parts in the signal path. This also allows elimination of degeneration—"that other negative feedback"—in all stages, and having simpler and fewer gain stages improves speed and stability. Lower voltages provide the ability to run gain devices at higher bias currents, more deeply into Class A. As Nelson Pass describes it: "The new XA25 is intended to appeal to those wanting the performance without the frills, in a chassis that will fit on a shelf and can be lifted without the assistance of ruffians." **Price: $4900. passlabs.com**

On the Horizon

Conrad-Johnson Classic Sixty-Two and Classic One-Twenty Amplifiers

Conrad-Johnson has launched two new amplifiers in its popular Classic range of products, the Classic Sixty-Two and the Classic One-Twenty. They represent a fulfillment of C-J's commitment to adapting the advances of its upper-tier designs to more affordable and accessible products. Borrowing heavily from the technology of its flagship ART amplifiers, the Classic Sixty-Two circuit achieves its sonic prowess with just seven vacuum tubes, including one pair of EL34 output tubes per channel to produce 60Wpc. The Classic One-Twenty adds a second pair of EL34s for 120Wpc. High-quality parts are used throughout the circuits. In keeping with a long-standing C-J tradition there are upgraded special edition (SE) versions of both models that feature strategic application of CJD Teflon capacitors and ultra-high-performance metal foil resistors. **Prices: Classic Sixty-Two and Classic One-Twenty are $4250 and $8000 respectively. SE models: $5750 and $10,000. conradjohnson.com**

Constellation Revelation Series

The new Revelation Series bridges a gap in the Constellation product hierarchy. Building on the Inspiration tradition and offering improved performance due to the use of carefully selected parts, the Revelation Series is a logical step up from Inspiration. Its distinctively Constellation casework design draws upon the Reference Series heritage and extends the foundation first used in Inspiration. Products in the Revelation Series include the new Pictor preamplifier (pictured) and the Andromeda phonostage—each of these is available with optional DC Filter—in addition to the Taurus Stereo and Taurus Mono amplifiers. These core products exemplify the Constellation brand. Like their Performance and Reference Series siblings, the Pictor and Andromeda use separate power supplies. The Andromeda has both mm and mc inputs as well as balanced and single-ended outputs for maximum flexibility. While the Revelation Series' distinct heritage is obvious, the intrinsic performance of these components makes the line unique. **Prices: Pictor preamplifier, $18,000; Andromeda phonostage, $18,000; optional DC filter for either, $5000. Taurus Stereo amplifier, $19,500; Taurus Mono amplifier, $39,000. constellationaudio.com**

Zesto Audio Téssera Phonostage

Téssera means "four" in Greek. It's also Zesto Audio's newest product: a phonostage designed to work with up to four different tonearms or turntables. Building on the success of Zesto's original Andros phonostage, the Téssera's new features include true transformer balance outputs driven by dedicated output tubes. Designed with 100% analog tube circuitry, the phonostage has no solid-state devices anywhere in the signal path, and all switching is done with reed relays. The unit is a dual chassis with linear regulated power supply and a 3-meter umbilical. The Téssera has a new circuit design that is paired with upgraded and larger mc step-up transformers. It's been designed with two completely independent dual mono channels that can accommodate one mm and one mc per channel. It's easily adjustable "on the fly" with a 12-position mc load per channel (without clicks or pops), and can save the settings when the user switches between tonearms. A unique feature is its four mc ground switches that help to eliminate noisy ground loops. The Andros Téssera is designed with all-tube circuitry and no solid-state devices anywhere in the signal path. **Price: $12,000. zestoaudio.com**

On the Horizon

Pro-Ject Tube Box DS2 Phonostage

Pro-Ject's new Tube Box DS2 phonostage has two phono inputs and two outputs to provide remarkable flexibility for A/B'ing cartridges, turntables, and systems with more than one turntable and/or electronics path. Utilizing two 12AX7s in a dual mono layout, the precise RIAA EQ is complemented by a continuously variable, front-panel input-impedance adjustment for use with low-output moving coils. Also included are input-capacitance adjustments for high output mc's and mm's. Its separate power supply helps keep the noise floor vanishingly low. **Price: $699. Available in black or silver. Available by special order with walnut, eucalyptus, or rosenut side panels for $799. project-audio.com**

Constellation Centaur II 500 Stereo Amplifier

The Constellation engineering team was charged with the challenge of building a more potent Performance Series amplifier, one that had all the virtues of the highly-acclaimed Centaur II stereo amp, but with more power—500 watts, as its name suggests—and employing the same chassis. The team's accomplishment of this task is evident in the new Centaur II 500 stereo amplifier. As the big brother to the Centaur II stereo amplifier, the Centaur II 500 stereo does everything its smaller counterpart does, and more. With twice the output power of the standard Centaur II, the Centaur II 500 stereo amp delivers noticeably better bass at all listening levels. Dynamics, both macro and micro, have also been significantly improved. And like a big automobile engine, this new 500-watt amplifier possesses plenty of available power in reserve when the music or the mood calls for it. **Price: $55,000. constellationaudio.com**

Zanden 3000mk2 Preamplifier

Zanden's new model 3000mk2 preamplifier preserves the original design's core concepts with the addition of some significant advances. The model 3000mk2 still uses a single 5687 vacuum tube as its amplifying element and employs a unique fixed-bias vacuum-tube amplification circuit. It also uses output transformers, which allows the ground loop to be isolated from the power amplifier and insures powerful drive. Building on the success of its model 3100 preamplifier, some critical upgrades have been implemented to the model 3000mk2. The power-supply section has been completely redesigned, and both the input and output transformers utilize an amorphous cobalt material. Zanden also retained the highest quality ALPS potentiometer while successfully adopting a special custom motor drive system for remote operation. Remote-control functions include volume, switching of sources, absolute/reverse polarity, muting, and power. **Price: $23,000. zanden-usa.com**

On the Horizon

Audio by Van Alstine DVA 4/2 Power Amplifier

The newest addition to the Audio by Van Alstine lineup is the DVA 4/2, a flexible solid-state power amplifier that, as its 4/2 name suggests, is user-selectable as a four- or two-channel amplifier—and changing modes is as easy as pressing a switch. In four-channel mode there are four independent 125-watt channels that are ideal for home-theater systems or multi-channel audio systems. In two-channel stereo mode the DVA 4/2 is a very low distortion 450Wpc high-power amplifier that will effortlessly drive any pair of speakers. The DVA 4/2 is available now, and like all AVA products, the amp comes with a three-year warranty. **Price: $3699. avahifi.com**

Bryston 2.5B³ Stereo Amplifier

The Bryston 2.5B³ is a compact stereo amplifier intended for use in sound systems requiring an accurate and reliable power source. The Bryston Cubed Series is a statement design platform for music enthusiasts, home-theater installations, as well as professional-audio applications. Power is abundant throughout the Cubed lineup. The Bryston 2.5B³ for example features 135Wpc into 8 ohms, (180W into 4 ohms, 360W into 8 ohms bridged mono). Engineering is at the forefront of the Cubed Series designs, which offer a patented, super-linear, low-noise input buffer, plus a more robust RF and audio-frequency-noise-filtering circuit located before the power supplies to prevent unwanted anomalies on the power line from reaching the audio signal. Cubed Series amplifiers also feature an elegantly redesigned, milled-aluminum front panel—in addition to Bryston's legendary 20-year warranty. **Price: $3695. bryston.com**

NAD Masters Series M32 Integrated Amplifier

The M32 is NAD's top-of-the-line, BluOS-ready integrated amplifier offering plenty of flexibility and efficiency with reduced noise and distortion. To accommodate music lovers of all kinds there's a phono input as well as a dedicated headphone amplifier. Its DirectDigital amplification combines all pre-amplification and power amp functions into a single stage. With 180Wpc on tap, the M32 is a true digital amp (not just Class D) that is computer-controlled and amplifies entirely in the digital domain before converting to analog at the speaker terminals; this allows for the shortest signal path possible. There are four MDC (Modular Design Construction) slots—three are for customization and expandability, and all are 24/192-capable. The M32 is also multi-room and hi-res-ready with the optional BluOS module, an advanced operating system for music management and control that includes support for local NAS drives as well as Internet streaming-audio services such as Spotify, Tidal, and many others. All the popular formats are supported including MQA, AAC, Ogg, MP3, and Bluetooth aptX. **Price: $3999. nadelectronics.com**

On the Horizon

Classé Sigma SSP MkII Preamp/Processor

The slim and elegant Classé Sigma SSP surround-sound preamp/processor, noted for its performance, flexibility, and ease of use, has been made even better by the addition of new audio DSP and HDMI hardware. The eight-channel Sigma SSP MkII supports Dolby and DTS 3D audio formats when configured as a 5.1.2-channel system, and passes 4K UHD video at 60Hz with HDCP 2.2. A powerful new dual DSP module featuring a Texas Instruments 456MHz DA830, a dual-core, floating-point audio processor with ARM9, in addition to an audio-specific DA810 32-/64-bit floating point DSP provide the needed processing power to accurately decode the latest 3D audio formats and perform the many post-processing capabilities that set the Classé Sigma SSP MkII apart. **Price: $6000; Upgrade Kit for existing Sigma SSP owners: $1000. classeaudio.com**

Feature

A Brief Guide to Today's Preamplifiers

Robert Harley

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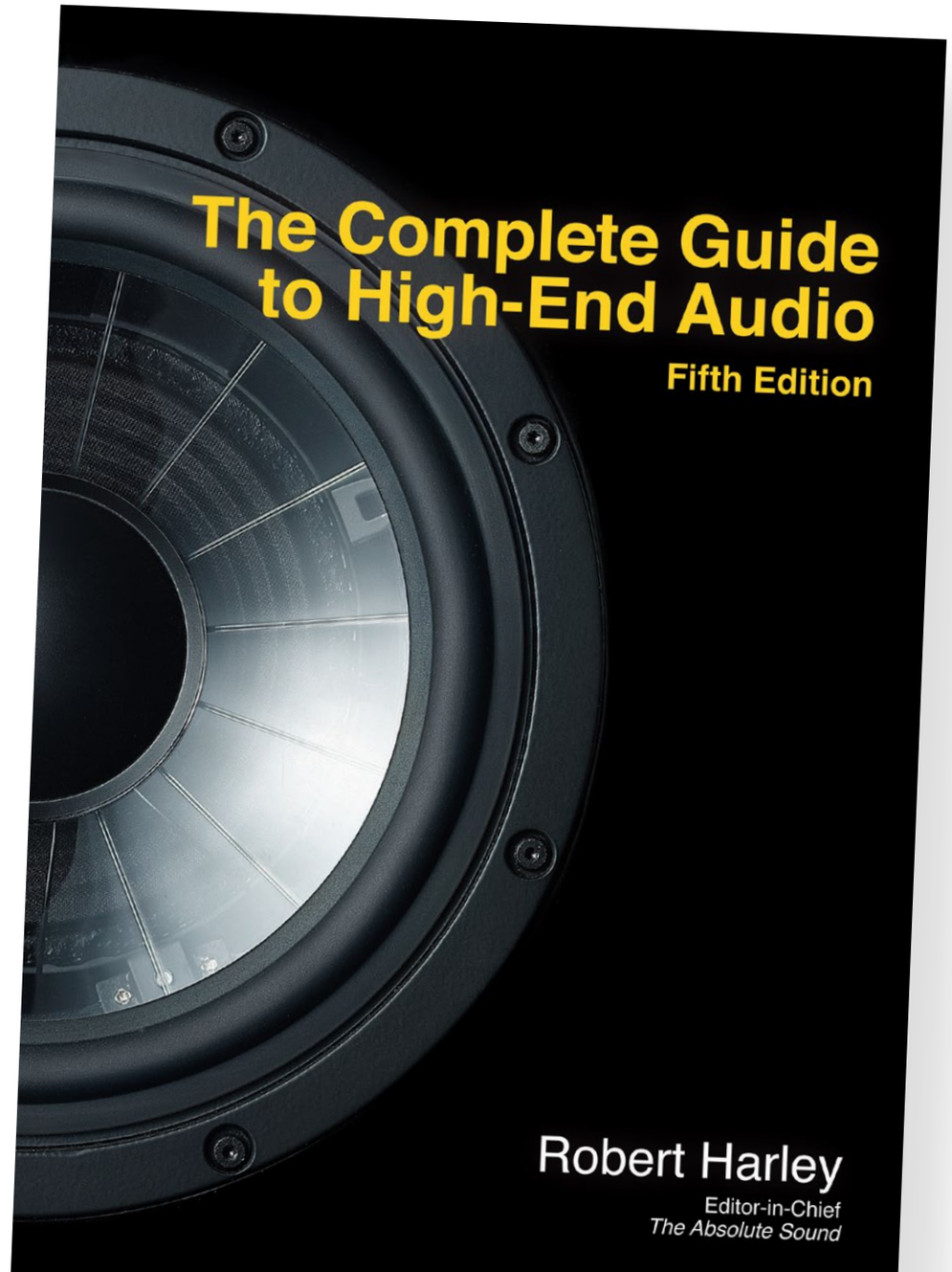
The preamplifier is the Grand Central Station of your hi-fi system. It receives signals from source components—DACs, music servers, turntables, disc players—and allows you to select which of these to send to the power amplifier for listening. In addition to allowing you to switch between sources, the preamplifier performs many other useful functions, such as amplifying the signal from your phono cartridge (in some preamplifiers), adjusting the balance between channels, and allowing you to set the volume level. The preamplifier is the component you will most often use, touch, and adjust. It also has a large influence on the system's overall sound quality. In an integrated amplifier or receiver, the preamplifier is built into (integrated with), the other components in a single housing.

In addition to providing volume control and letting you select which source component you listen to, the preamp is a *buffer* between your source components and power amplifier. That is, the preamplifier acts as an intermediary, taking in signals from source components and conditioning those signals before sending them on to the power amplifier. Source components can easily drive a preamplifier, with the burden of driving a power amp through long cables falling on the preamp's shoulders. By buffering the signal, the preamp makes life easier for your source components and ensures good technical performance.

So far I've been describing the preamplifier and its function in a classic audio system. But new technologies have imbued some preamplifiers with innovative features and capabilities that greatly expand the preamp's role in music playback.

At a minimum, some of today's preamplifiers include an integral digital-to-analog converter (DAC), obviating the need to buy a separate DAC. The inclusion of a DAC within the preamplifier housing is analogous to the inclusion of the ubiquitous phonostage within preamps



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designed before the rise of CD. (Preamps with phonostages are, however, making a comeback, fueled by the LP's spectacular resurgence.)

But integral digital-to-analog conversion is just the start of the preamplifier's metamorphosis into a product category almost entirely new—a component that acts as the hub of an advanced Internet-connected digital-audio system. Let's look at some of these newer preamplifier features.

Streaming music services: Listen to music *streamed* from subscription services such as Tidal, Spotify, Rhapsody, and others.

Internet radio: Tune into just about any radio station in the world.

Network connectivity: Connect the preamplifier to a local *network* and stream music from any device on the network, such as a *network-attached storage* (NAS) drive.

Wireless connectivity: Stream music from a portable device to your home-audio system via the preamplifier's wireless capability. Wireless options may include one or more technologies, including *WiFi*, *Bluetooth*, and *near-field communication* (NFC).

As you can see, new technologies are blurring the lines between traditional product categories. Moreover, these features aren't unique to preamplifiers; they can be found alone or together in a variety of products. Is a component that provides volume control, source selection, and digital-to-analog conversion a preamplifier with a DAC or a DAC with some preamplifier functions? How about a component that offers network connectivity along with volume control and source selection? Is a component that is supplied with a music-management app still a preamplifier?

I consider a component to be a preamplifier if it provides analog inputs, analog source selection, and a volume control, no matter what its other features. A DAC with a volume control and the ability to select between digital sources isn't a preamplifier because it lacks analog inputs and analog source switching. This definition isn't so much an industry standard as my view of each component's role in a music-playback system.

Fig.1 (above) shows the front panel of one of these newer breeds of preamplifiers. Notice the *USB input* and lack of traditional buttons and knobs, along with the large front-panel display. The model is configured and controlled via a single knob under software control. The rear panel Fig. 2 (below)

Feature A Brief Guide to Today's Preamplifiers

looks very different from that of a traditional preamplifier, with many more and varied inputs and connections. Note also that this product's digital inputs are mounted on removable boards (the vertical modules on the left). This modular design allows you to upgrade the hardware as new digital interface standards are introduced.

Keep in mind that preamplifiers that aspire to the absolute state of the art of sound quality are unlikely to include these capabilities. Rather, such products' mission is to do three things—source selection, volume control, act as a buffer between your sources and power amplifier—without compromise. Additional features can degrade sound quality; the parts budget must be spread out over much more circuitry, connections, and chassis space, not to mention the potential for noise from the digital circuits polluting the analog signal path. Given the same size case, a traditional preamplifier can devote more space to the power supply and analog circuits than can a "do-it-all" product. If you have the budget and rack space, buy a traditional preamplifier and then add the newer music-accessing technologies with additional components. This approach also allows you to keep your preamplifier, and to upgrade the digital components as technology inexorably advances.

Having said that, there are compelling arguments for today's multifunction preamps: lower cost, a simpler system, less "system clutter," and greater ease of use. Just be aware that, at the upper end of the price and performance scales, the traditional preamplifier still reigns supreme sonically.

There are many types of preamplifiers, each with different capabilities and functions. Choosing the one best suited to your system requires you to define your needs. Listeners without a turntable, for example, won't need a preamplifier that amplifies the tiny signals from a phono cartridge. Others will need many inputs to multiple source components, and some will need multichannel capability. Let's survey the various preamplifiers and define some common preamplifier terms.

Line-Stage Preamplifier: Accepts only line-level (low-level) signals, which include every source component except a turntable. Line-stages have become much more popular as listeners increasingly rely on digital sources rather than LPs as their main signal source. If you don't have a turntable, you need only a line-stage preamplifier.

Phono Preamplifier (also called a phonostage): Takes the very tiny signal from your phono cartridge and amplifies it to line level. It also performs *RIAA equalization* on the signal from the cartridge. RIAA equalization is a bass boost and treble cut that counteract the bass cut and treble boost applied in disc mastering, thus restoring flat response. Some phono preamplifiers offer other equalization curves besides RIAA.

A phonostage can be an outboard standalone unit in its own chassis, or a circuit section within a full-function preamplifier. If you play records, you must have a phonostage, either as a separate component or as part of a full-function preamplifier.

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Full-Function Preamplifier: Combines a phonostage with a line-stage preamplifier in one case.

Preamplifier/DAC: A preamplifier (with or without a phonostage) that includes an integral digital-to-analog converter.

Tube Preamplifier: Uses vacuum tubes to amplify the audio signal.

Solid-State Preamplifier: Uses transistors to amplify the audio signal.

Hybrid Preamplifier: Uses a combination of tubes and transistors.

Audio/Video Controller: A device analogous to a preamplifier that includes video switching, multiple audio channels (typically eight), and surround-sound decoding such as Dolby Digital and DTS.

Multichannel Preamplifier: A preamplifier with multiple audio channels (typically eight) for playback of multichannel music. Differs from an A/V controller in that the multichannel preamplifier has no surround decoding, video switching, or other functions for film-soundtrack reproduction. Multichannel preamplifiers are rare.

Digital Preamplifier: A preamplifier that accepts digital input signals (such as the USB output from a music server) and processes the audio signal in the digital domain. Digital preamplifiers usually include a digital-to-analog converter so that the digital preamplifier can drive a conventional power amplifier.

Passive Level Control: Sometimes erroneously called a passive preamp, the passive level control can replace a line-stage preamplifier in some situations. It is inserted in the signal path between a source component and the power amplifier.

Instead of amplifying the source, a passive level control merely attenuates (reduces) the signal level driving the power amplifier. It doesn't plug into the wall, and cannot amplify a signal as does an active line-stage preamplifier. Although the passive level control doesn't act as a buffer, it does remove some active electronics from the signal path for greater sonic purity.

No Preamplifier: Some DACs can drive a power amplifier directly with no need for a preamplifier. The DAC must have a variable output level so that you can adjust the volume. Some DACs also offer multiple digital inputs along with source switching, obviating the need for a preamplifier.

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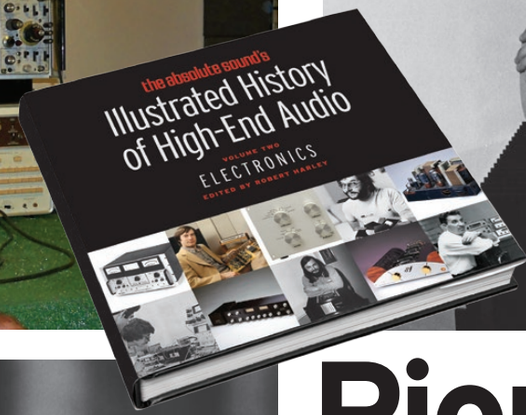

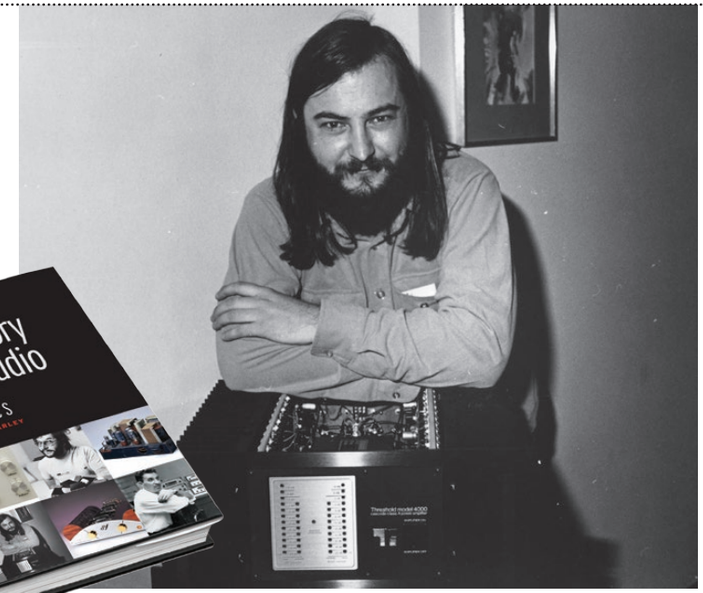

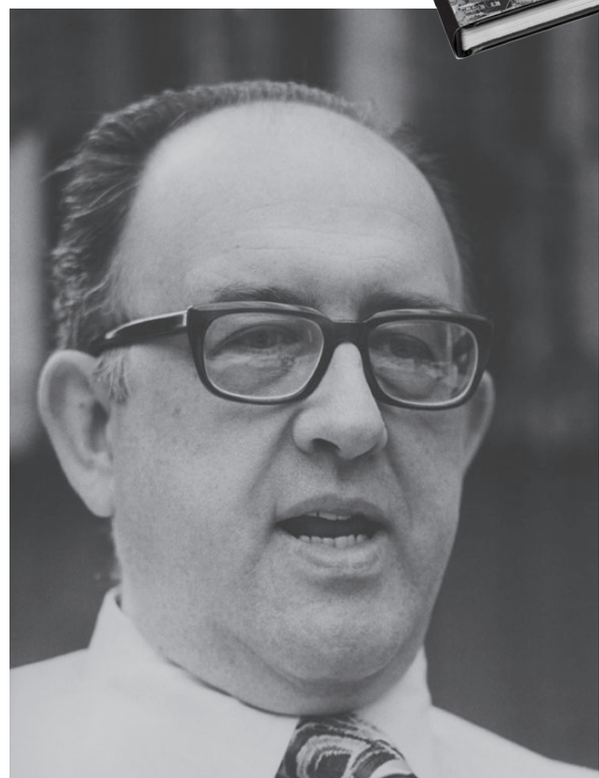

Pioneers of High-End Audio

In keeping with this issue's focus on electronics, we celebrate three of the industry's greatest electronics designers and companies in short excerpts from *The Absolute Sound's Illustrated History of High-End Audio, Volume Two: Electronics.*

TAS' *Illustrated History of High-End Audio* is a series of richly illustrated large-format books that reveal the inside stories of the pioneering individuals who created legendary companies and invented iconic products. The size of an LP cover, and printed on art-quality paper, each hardbound book is packed with candid interviews, historic photos, analysis of the industry's most significant products, and technical milestones.

You can see the full profiles, interviews, and more historic photos of the following pioneers (and 94 others) in Volume Two: Electronics. Go to tasbook2.com for more information.

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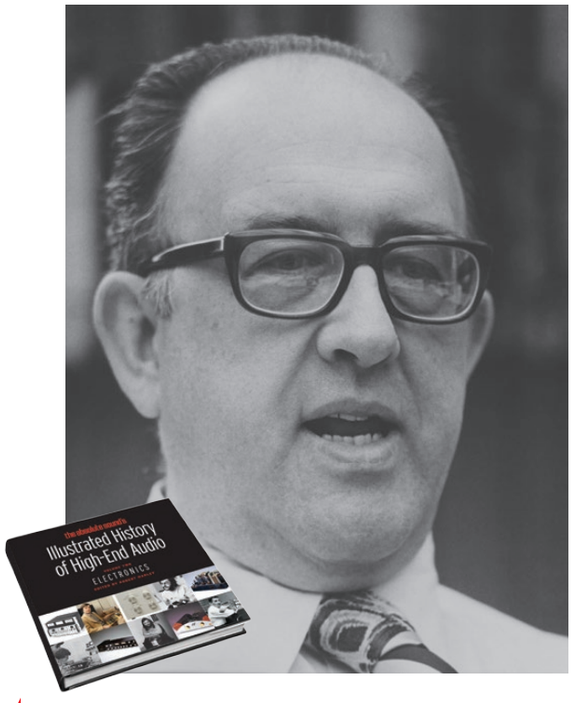

William Zane Johnson and the Audio Research Corporation

Jonathan Valin

Where would the high end be without William Zane Johnson, the founder and, for better than forty years, chief designer of the Audio Research Corporation? Well, I'm not sure. Maybe in a year or two somebody just like Johnson would have come along. (He was one of those visionary figures so seminal to any movement that if he hadn't existed, sooner or later, someone would surely have had to invent him.) But I can tell you for certain where I would have been as an audiophile in a world without WZJ: Nowhere.

Even though he was famously upbraided by an irate engineer when he introduced his Dual 50 tube amplifier at a trade show in 1970—"You've set the audio industry back 20 years!" the fellow shouted when he spotted all those "old-fashioned" glass-bottle 6L6s, 12AX7s, QA2s, and 6FQ7s sprouting from the chassis—the consumer world didn't see it that way.

With the subsequent introduction of his SP-3 preamplifier in 1972—probably the single most important debut of the high-end era—WZJ changed everything: minds, prejudices, the market, the competition, the future. That preamp hit the audio world like a bombshell, provoking not just outrage from AES types wedded to solid-state but an agonizing reappraisal by audiophiles of exactly where that great new thing—the silicon transistor—for all its superior measurements and greater convenience had actually left them.

Oh, there had been plenty of stirrings of discontent in advance of ARC's arrival on the scene. As is noted (repeatedly) elsewhere in this volume, first-gen transistor gear was, for the most part, terrifyingly unreliable and downright amusical. While pouring negative feedback on inherently nonlinear quasi-complementary circuits generated the great THD numbers that AES types (and Stereo Review) loved, it was like applying a Band-Aid to a compound fracture. As Bart Locanthi would famously note when he developed the first truly symmetrical circuit for JBL's SA-600 amplifier, an audio circuit has to be linear to begin with. Otherwise, negative feedback only exacerbates problems, rather than fixing them.

Plenty of audiophiles, weaned on the great Marantz, McIntosh, Citation, and Dynaco tube designs of the Golden Age of Hi-Fi, knew that solid-state wasn't right. Yes, it had measurably lower total harmonic distortion than tubes. But the distortion it did produce was odd-order, rather than the more pleasing even-order harmonic distortion of those disreputable glass bottles. Yes, glass audio didn't have the sheer drivability of solid-state (the current and the low output impedance and the bandwidth); yes, it ran hot; and yes, tubes eventually failed. But those tubes were fast and sweet and musical, and you didn't have to use as much negative feedback (or any) to make them work.

For a whole lot of us, the better "specs" of solid-state—and the reviews in the mainstream audio magazines that paraded those specs as if they were all that mattered—had failed us. The bass of solid-state was good; the neutrality was good; the resolution was good. But the overall sound wasn't. And then along came William Zane Johnson with his SP-3 and D-75 (followed by his D-76 and D76A amplifiers) to show us that tubes didn't have to sound like the fat potatoes of the past—that they could be neutral, high-resolution devices, too. And that on acoustic music they could give us a level of realism and musicality that transistors couldn't then approach, much less match.

Although I met Audio Research Corporation's founding father William Zane Johnson—who passed away in 2011, at the age of 85—at several trade shows and knew him well enough to say "hello," I didn't really have a personal relationship with him. As with a favorite author, I came to know him through his creations—the ARC amps, preamps, and phonostages that were to have a profound effect on my life as a listener, and on the lives of so many other audiophiles of my generation.

I've told the story of how I first heard Audio Research electronics (and Magnepan speakers, which were then distributed by ARC) in the magazine and in our first volume of this history. It was in the winter of 1973–74, and I was a student at the University of Chicago—a budding classical music lover who fell in with a bad crowd of audiophile grad students. I fancied myself an audiophile of sorts, too—had since I first heard Marantz 9s and a 7C driving a home-built horn system at a high-school friend's house—but like the majority of hi-fi hobbyists in the late Sixties and early Seventies I was virtually rudderless when it came to buying decisions. Oh, I was well aware that some things—Quad 57s, IMF Monitors, a hybrid electrostat from the brand-new loudspeaker company Infinity—sounded better than other things, but preferring stuff that sounded good (which is to say beautiful, sensuous, and appealing) was as close as I came to a listening philosophy.

Then came the fateful day when a couple of those grad students dragged me and my wife to a specialty hi-fi "store" (actually a flat in a brownstone apartment building) on the Near North Side run by a colorful character named Basil Gouletas. Basil was rather like the Hugh Hefner of hi-fi sales-

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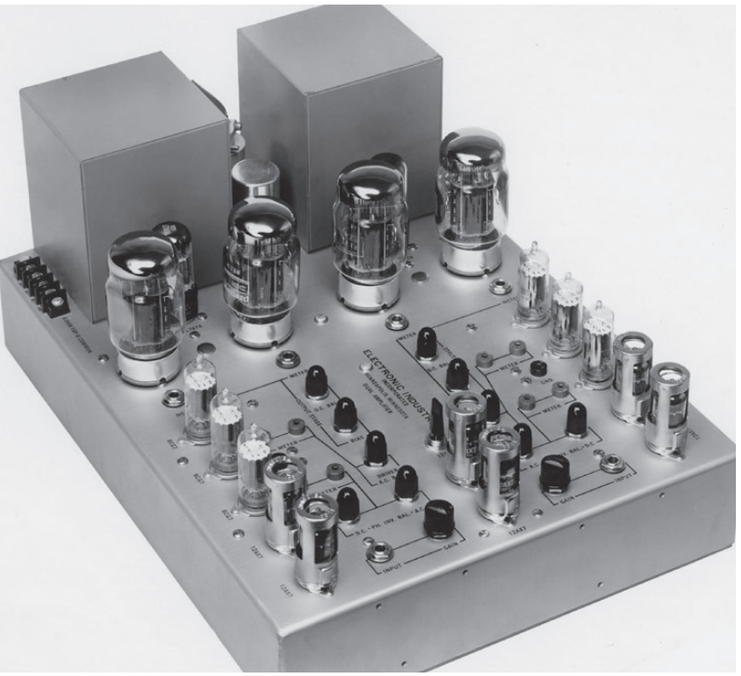


men: I don't remember ever seeing him in anything but pajamas and a bathrobe. At the far end of his flat, Basil had a grand piano almost entirely shielded off by a pair of tall decorative screens; at the listening end he sat ensconced in a La-Z-Boy recliner with a turntable well within arm's reach.

As soon as Kathy and I sat down on a couch nearby him, someone began to play the grand piano behind the decorative screens. "Who's playing your piano?" I asked. Basil smiled and said, "Rubinstein."

Of course, those screens weren't screens—they were Magneplanar I-U loudspeakers. (No one in our crowd had seen or heard Maggies before.) And the electronics that made the I-Us sound so realistic that both Kathy and I were fooled into thinking that someone was actually performing a Chopin Ballade were the Audio Research SP-3 preamp and D75 power amp.

In all my years, that was the most unforgettable hi-fi demo I've ever experienced. And it was a turning point—a genuine epiphany. I didn't know who William Zane Johnson was, didn't know that he'd started a little hi-fi repair shop in Minnesota to modify Dyna gear and to home-brew his own electronics, or that (after a false step with a holding company called Peploe) he'd started his own electronics-manufacturing firm, the Audio Research Corporation, and shocked the hi-fi world by introducing tube gear that sounded unlike any tube gear before it.

What I did realize immediately—and what has stuck with me to this day—was that metal boxes full of electronic parts could not just make recorded music sound "good"; they could (with the right speakers) make it sound real. Suddenly, I had a philosophy that went beyond cosmetics, measurements, and euphony. I had a grail quest: the sound of the real thing. More than any other figure, William Zane Johnson put me—and thousands of other music lovers—on the road to audiophile enlightenment. As with so many of my generation, he and his creations are the high end to me—and always will be.

Book Feature

James Bongiorno Great American Sound, Sumo, Ampzilla 2000

Robert Harley

James Bongiorno's long and storied career spans two entirely distinct eras, from Hadley, Dynaco, Marantz, and SAE in the 1960s, to Constellation in the second decade of the 21st century. Bongiorno designed amplifiers in six different decades, working alongside other industry legends such as Richard Sequerra, Sidney Smith, David Hafler, Morris Kessler, John Curl, and Bascom King.

But Bongiorno will best be remembered for Great American Sound (GAS), the company he founded in 1974 after leaving SAE. The GAS Ampzilla power amplifier was an instant classic, outperforming many much more expensive amplifiers and sending ripples through the industry. This was the dawn of the high-end renaissance, right about the time of Phase Linear and Audio Research, when the demand for relatively high-powered amplifiers was exploding. The 200Wpc Ampzilla was the first to feature a full dual-differential complementary amplifier circuit, a topology that is the basis for nearly every modern solid-state power amplifier. The Ampzilla not only sounded terrific and sold in huge numbers, but Bongiorno exemplified the maverick entrepreneurial designer who created his company from nothing but talent, a dream, and (literally) a kitchen table.

Great American Sound was like a star that burns brightly but briefly; after selling part of the company to fund an expansion, Bongiorno was forced out and the company folded a few years later. Bongiorno quickly founded a new company, Sumo Electric Company, Ltd., to bring his circuits to moderately priced products. In typical Bongiorno fashion, Sumo's launch was announced with a full-page ad in *Audio* magazine that depicted an ape (the GAS company symbol) hanging on a crucifix, accompanied by this inscription, in French: "The end of an era." As with GAS, disputes between business partners led to Sumo's premature demise.

What Bongiorno and his two companies left behind, however, is a rich legacy of innovative designs and a loyal following that continues to this day. There's a cadre of audiophiles who still venerate the Ampzilla and GAS's legendary preamplifier, the Thaedra. In fact, a company called Bettinger Audio Design is dedicated to restoring and refurbishing GAS and Sumo products with modern parts.

In 2008 Bongiorno launched a new company, Spread Spectrum Technologies, and another Ampzilla amplifier, the Ampzilla 2000. The new Ampzilla was widely praised and commercially successful, although the amp was entirely different from the original.

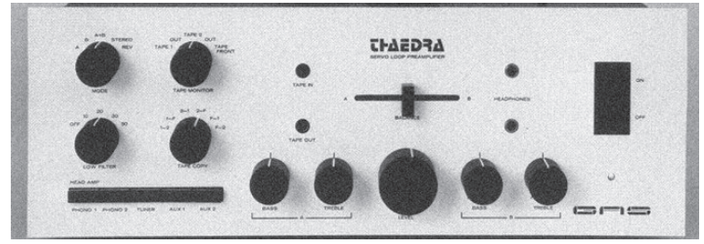
To call Jim Bongiorno a colorful character is not only a monumental understatement, but both figuratively and literally true; the accompanying photo reflects his daily dress. Audacious and flamboyant in the extreme, any encounter with Bongiorno was bound to be a memorable experience. He had a penchant for making sweeping pronouncements such as "I haven't seen a single preamp in the history of the world that I would ever consider using other than my Thaedra." When asked about the merits of specific transistor types, he replied, "It doesn't matter whether a product is made with donkey manure. The only thing that is important is the final performance." In responding to a negative review (of the Son of Ampzilla in TAS Issue 10), Bongiorno questioned the reviewer's qualifications: "Our industry's attempts may be compared to violin-making. Unfortunately, the performance of a Stradivarius can be clouded by the abilities of a questionable virtuoso."

As passionate as Bongiorno was about designing amplifiers, he was even more passionate about playing the piano. He was torn throughout his entire life between amplifier design and working as a professional musician. Bon-

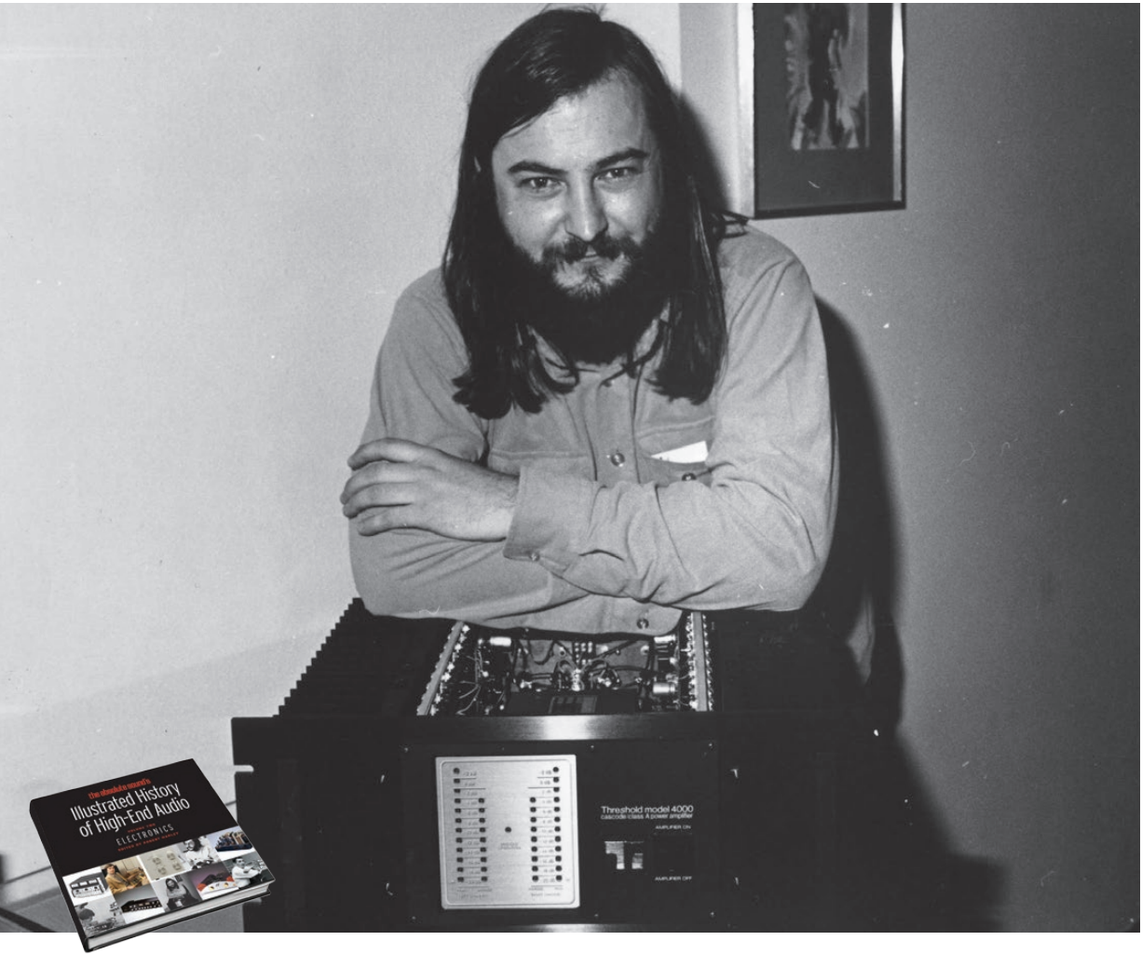
Book Feature

giorno was an accomplished jazz pianist who performed semi-regularly, and made four recordings that were released on CD. A journalist colleague of mine who visited Jim in the 1980s reported finding a house virtually devoid of furniture along with an empty refrigerator, but a living room filled with an audio system, a massive music collection, a stockpile of fine wine, and a 90-year-old, $100,000-plus, 9' Steinway concert grand. The man's priorities were writ large in his decor.

Bongiorno's life and career is all the more remarkable when you consider that he was diagnosed with liver cancer at the age of 34 and told that he had just months to live. He fought that disease valiantly for an astonishing 35 years before succumbing to it in January 2013, at the age of 69. He lived and breathed amplifier design, contributing right up to the end as part of the team that created the Constellation Reference Series electronics, which launched in 2010. Jim Bongiorno was one-of-a-kind amplifier (and tuner) designer, and a one-of-a-kind human being.



Book Feature



Nelson Pass
Threshold, Pass Labs, First Watt

Greg Weaver

A case could be made that no other amplifier designer more clearly embodies the philosophy and spirit of simplicity of design than Nelson Pass. From the introduction of his first commercial product in 1975, he has continuously pursued the often flaunted but rarely realized "less is more" goal. Following a decidedly different direction than some other successful manufacturers of that time—companies such as Phase Linear, Harman Kardon, and Crown, who were revisiting the status quo (based on original published Class AB or Class B RCA circuits)—Nelson's work started to blaze in new and uncharted directions.

Those early days of Class B and AB amplifiers were a time when measurement was king. Looking at the distortion of a Class AB amplifier on an oscilloscope, you could clearly observe that distortion actually increased as the output level decreased, where the crossover notch got bigger and bigger in proportion to the size of the diminishing signal. This was due to the failure of the plus and minus halves of the amplifier to mate up cleanly.

Most designers were using more complex circuits and large amounts of feedback to achieve better bench measurements, but the sluggishness of more complex circuits created problems with TIM (transient intermodulation) distortion. In addition, heavy feedback had a tendency to dry up an amplifier's harmonic character, leaving it sounding a little sterile.

By the mid 1970s, Nelson recognized that as distortion numbers were driven down further and further through feedback, the sound was not seeing a corresponding improvement. He saw the inherent linearity of Class A amplifiers, whose traditional low efficiency had limited them to low power output, as an alternative. Since Class A eliminated switching, it removed the offending notch distortion of the waveform and allowed for a monotonic distortion character, diminishing as the level went down—the opposite of Class B and AB designs.

These insights would provide the jumping off point for what has been one of the most celebrated and illustrious careers in the industry. Pass founded Threshold with the strategy of developing a more efficient complementary Class A circuit. Even this early in his career, a pervasive theme had begun to emerge: select quality parts, put them in simple circuit, run heavy bias current, and use minimal (or no) feedback.

Threshold was extraordinarily successful on a number of levels, creating some of the first high-output Class A amplifiers, as well as delivering an incontrovertibly better sound than many other designs. Using bipolar transistors, Nelson pursued this line of development at Threshold throughout the 1980s, engineering one improvement after another—next building amplifiers with cascoded gain stages and then extending the concept to amplifiers having "current bootstrapped" output stages (and collecting a number of patents along the way).

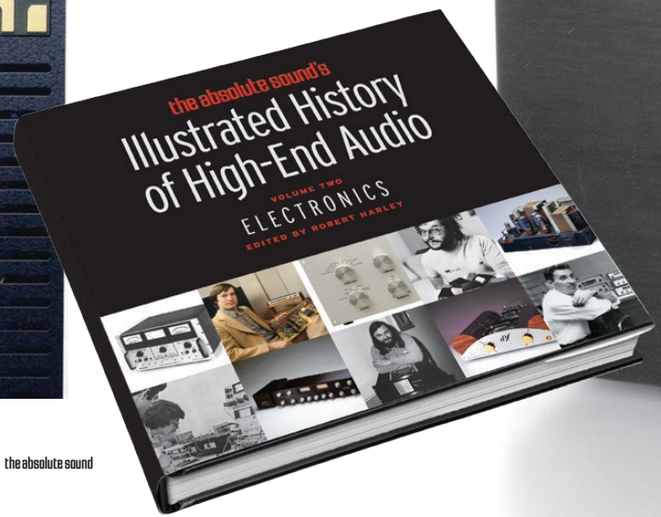
By the early 1990s, Pass felt the urge to leave bipolar devices behind and explore the benefits of FETs, which offered output curves much like those of tubes, and sounded more musically natural. Over the next two and a half decades, his work at Pass Labs led to progressively simpler circuits and increasingly superior sounding amplifiers.

Book Feature

Pass has continuously advanced his craft with series after series of exciting and engaging products, including the breakthrough Aleph design in 1992 (the Aleph 0 was honored as "amplifier of the decade" by one magazine).

Whether making major advancements in circuit topology and performance with products like the revolutionary X (SuperSymmetry) and XA series, or simply refining and honing those already exquisitely performing circuits with revisions like the ".5" and ".8" enhancements, Pass has relentlessly employed minimalism in his pursuit of better sound.

A gifted and driven creator holding seven U.S. patents related to audio circuits, Nelson is likely not finished rewarding music lovers with his insightful and exciting work. Unlike many others in his field, he still believes that listening tests remain invaluable to advancing the discipline and that electrical measurements alone do not fully characterize the sound of an amplifier. His body of work demonstrates that just pursuing diminishing zeroes does not necessarily lead to better sonic performance, and positions him at the forefront in the Pantheon of High-End Audio Designers. tas



INTEGRATED AMPS

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Equipment Report

NuPrime IDA-8

Smart Design at Work

Julie Mullins

When the NuPrime IDA-8 integrated amplifier first arrived at my home, I immediately had a good feeling about it. Initially, that positive impression was based on its packaging. The outer shipping box the amp came in was not any larger than it needed to be, and inside was a smaller box with a plastic carrying handle on top—almost like a little briefcase. More than just a cute or superficial add-on, it represented smart design for those who would be handling the amp—from the distributors to end-users. It also came in handy because I needed to repack the amp before moving house a couple of months ago.

As I'm a relative newbie to the hi-fi scene (though I was raised in an audiophile household) and a fan of great design in all its forms, I appreciate this kind of attention to detail. But the real point here is that those outer elements reflect the care and thoughtfulness that went into the IDA-8's design on the inside.

First, a bit about NuPrime's heritage. Its recent history is slightly complicated, so I'm going to borrow a couple of key points from Steven Stone's review of NuPrime's DAC-10H DAC/pre and ST-10 power amp (Issue 255). In 2014, NuForce's cofounder, Jason Lim, with backing from the OEM factory, bought the assets of NuForce's high-end division, obtained the rights to NuForce technologies, and formed NuPrime Audio, Inc. (Shortly thereafter the NuForce company was sold to Optoma.)

Since NuPrime's founding, Lim has continually sought to improve sonics through the application of innovative technologies—in addition to offering high performance and value with respect to pricing. The IDA-8 exemplifies this approach. Here's how Lim summarizes the IDA-8, "It is as if we combined the 'perfect' ST-10 and DAC-10H, made it sound like a high-end Class A amp, and brought the price down to $995."

Sonically and functionally, there's plenty to love about the IDA-8. Essentially, it's a sleek-looking, small-footprint hybrid Class A/Class D integrated amplifier/DAC—that combines Class A warmth and resolution with Class D speed, power, and efficiency, and delivers both with remarkably low noise, thanks in part to ultra-low-noise JFETs in its input stage. Its DAC supports USB 384kHz/32-bit and DSD256, and is also capable of decoding DoP (DSD over PCM) via coaxial and optical inputs. NuPrime's SRC (sampling rate conversion) IC chip provides FPGA processing with ultra-low jitter and distortion.

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There's also a wireless port (for which an optional dongle is available) in addition to an impressive array of inputs and outs (especially given its rather diminutive dimensions) that allows users a great deal of functional flexibility. The IDA-8 is remarkably user-friendly to boot. The best part? Not only does it work and sound great, but this petite, yet powerful amp is also a stone-cold bargain at $995.

Smart Design, Inside and Out

Let's take a closer look at the IDA-8's internal and external design elements and technologies. On the outside, its relatively minimalist yet modern form factor is clean, sleek, and nearly square in width and depth, and, like its box, appears to have been designed to be only as large as it needs to be. Neither too dinky nor too clunky, its scale seems suitable for almost any size listening room (even one in a small apartment). You won't need much space for this powerful little integrated (so you can go ahead and buy those bigger loudspeakers!). Available finishes include matte black (as with my review sample) or silver anodized aluminum. To provide extra damping to absorb vibration, the amp boasts unique, patent-pending isolation feet shaped a bit like shallow inverted cones.

Elegant in its simplicity, the IDA-8's front panel has only two knobs, each of which is multi-functional, as well as an alphanumeric LED display in blue. The knob on the right serves as a push-button to power on and off and, when pressed for three seconds, to access standby mode (which consumes very low power); when turned, it allows for five input selections (shown in codes): coaxial (C1), optical (O2), USB (U3), extension port for Bluetooth dongle or WiFi module (E4), and stereo analog RCA (A5). The left knob controls the volume functions; turning it adjusts the volume in 99 precise 0.5dB increments, and a brief press mutes and unmutes the sound. The volume control consists of an advanced, thin-film switched-resistor ladder network, with only a single resistor in the signal path at any volume setting. (This switched resistor design is implemented with an FPGA chip.) Each input features individually adjustable volume to allow for precise level-matching across various sources. In addition to the inputs mentioned, the back panel also has subwoofer and stereo speaker outputs, a slow-blow AC fuse, and an IEC power plug, plus a rather tiny toggle switch to turn the unit off and on. On the bottom of the chassis is an AC inlet voltage selector with options for 115V or 230V for use in different countries (it arrives set at 230V to prevent accidental damage). The IDA-8 comes with a power cord and two petite remote controls that could not be simpler to use—another way NuPrime makes the end user's life easier. The smaller of the two remotes is tiny—dimensionally littler than a credit card and weighing not much more.

The innovative technologies inside the IDA-8 provide clues to how it achieves such remarkably detailed, powerful, yet musical sound—not to mention very low noise—in such a compact and affordable package. It has an ultra-linear Class A module (ULCAM) in the input (preamplifier) stage—indeed, the entire amp was designed to sound like pure Class A, according to Lim—that uses discrete components to help fine-tune the signal and reduce noise. In the Class D output stage, the sonic issues that plagued early switch-mode designs have been circumvented via the use of a self-oscillating circuit to generate the PWM (pulse width modulation) signal. While most Class D amps switch at a frequency of 300kHz or lower, the IDA-8 switches at 600kHz. This difference helps eliminate old-school Class D tendencies towards bright and/or rolled-off upper octaves and a darker sonic character elsewhere. In addition to a more uniformly colorless tonal balance, this Class D power stage also seems to provide an enhanced sense of speed and transient response.

Setup and Sound

Setup was straightforward. Indeed, The IDA-8 was virtually plug-and-play (break-in time notwithstanding). It's worth mentioning that the friendly user manual includes a line diagram that illustrates a plethora of possible source options and where they should be connected on the back panel. This is in addition to some technical diagrams showing signal path and amplifier stages. The inclusion of both kinds of illustrations leaves the impression that the IDA-8 is intended for both neophytes and longtime audiophiles. The manual also offers detailed step-by-step instructions for how to set up the IDA-8 for PCM or DSD

SPECS & PRICING

Type: Class A/Class D hybrid integrated amplifier
Power output: 100Wpc into 8 ohms, 100Wpc into 4 ohms
Inputs: USB PCM up to 384kHz/DSD up to DSD256; coaxial SPDIF (PCM up to 192k supporting DoP format DSD64); optical SPDIF (PCM up to 192K supporting DoP format DSD64); Bluetooth or WiFi receiver module (optional); analog, stereo RCA (analog input will be digitized)
Outputs: One pair of stereo speaker (binding posts); one pair of stereo RCA (line-level)
Peak output power: 280W
Frequency response: 10Hz–50kHz
THD+N: < 0.005%
SNR ratio: 95dB
Dimensions: 235mm x 55mm (including feet) x 281mm
Weight: 4.3kg
Price: $995

NUPRIME AUDIO
(219) 364-6549
nuprimeaudio.com

Associated Equipment
Loudspeakers: Raidho D-1, Monitor Audio Gold 300
Subwoofer: JL Audio e110 (pair)
Sources: George Merrill GEM Dandy PolyTable with Jelco tonearm and Air Tight PC-7 cartridge; MacBook Pro with 2.3GHz Intel Core i7 processor running OS X 10.9.5 with Audirvana Plus
Phonostage: Walker Audio Procession
Power conditioner: Ansuz
Cables and interconnects: AudioQuest Fire, Shunyata Research Venom series

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playback on both Windows and Mac platforms.

Although the IDA-8 is designed primarily for digital sources, I found myself in my usual habit of spinning LPs, though naturally I also did some digital listening too. Interestingly enough, it turns out that I was in effect listening to digital even while listening to analog. Here's why: The analog input signal gets digitized by an A-to-D.In general, Mr. Lim says the design of IDA-8 maximizes the performance of digital inputs instead of the analog one. But had I not inquired, I might have been none the wiser—nor would I have enjoyed listening to my LPs any less. And I listened to scores of records throughout the review timeframe; the IDA-8 was my go-to amp across a range of musical genres. I became hooked not only by its ear-pleasing, easygoing sound, but also on its ease of use.

How did it sound? In short, beautiful and inviting. I was first struck by its effortlessness, remarkable resolution, and incredibly dark background. This integrated amp sounds much more expensive than it is. Speaking of darkness, I did notice a touch of it in the timbre overall—no doubt in part a factor of the IDA-8's Class D amplification stage—but it was more apparent on some recordings than others. On the superb Dream with Dean LP reissue from Analogue Productions, Dean Martin's easygoing baritone took on a touch of slight reediness, almost like a bass clarinet, and a slight sibilance, but it remained well resolved and quite lovely sounding. The bass and guitar followed suit beautifully, demonstrating the IDA-8's midrange-to-lower-midrange prowess. An impressive degree of detail and soundstaging clarity allowed me to distinguish the various mike setups across the first three cuts on the recording.

Shifting to some more rocking tunes, tracks on the Mobile Fidelity LP reissue of Dire Straits' Brothers in Arms were reproduced with surprising power and gusto. On "Money for Nothing," bass and kick-drum had plenty of slam, while Knopfler's guitar licks pulsed through my speakers (first Raidho D-1s with a pair of JL Audio e110 subs, then later, Monitor Audio Gold 300s, review forthcoming) with exciting dynamics and long decays. The bells on "So Far Away" sounded, well, a touch far away (as in, slightly receded), but the balance of percussion and guitars was crisp, with more than satisfying speed and attack. Class D's high damping factor is known to benefit the bottom end, but the lower midrange is arguably even more of a strength in the IDA-8.

A listen to Buena Vista Social Club's Lost and Found, a captivating collection of previously unreleased studio and live tracks, presented thrilling speed, snap, and detail—particularly on the wide range of percussion instruments from cowbell to tablas and beyond. The sharp transient attacks, lifelike vocal layers and vibratos, gorgeous horns, and overall high-octane musical energy made me want to jump out of my seat and dance around the room (OK, I did). The IDA-8 conveyed the music's richly woven textures as well as its individual parts. Soundstaging was deeper and wider than I expected for an amp in this price category, with precise instrumental placement. Background noise was also shockingly low; the IDA-8 boasts an impressive 95dB signal-to-noise ratio.

Somewhat to my surprise, I found largely similar sonic characteristics when I shifted to digital sources—a MacBook Pro from mid-2012 with 2.3GHz Intel Core i7 processor running OS X 10.9.5 with Audirvana Plus, wireless streaming via Tidal, and even some run-of-the-mill Red Book tracks ripped from CDs way back when via Bluetooth (using the dongle provided). Perhaps the IDA-8's digital conversion of the analog signal accounts for some of this, but the zeros and ones delivered the great-sounding goods! I still prefer vinyl for most of my critical (and fun) listening, but the IDA-8 brought warmth to its clean and clearly resolved presentation of digital sources too.

In my experience, the downsides to the IDA-8 were few. Upon occasion, the upper treble thinned out a touch, but not much. Can fans might well miss a headphone input option. The only moments I felt something was missing occurred when the sound of the digitally converted analog signal softened ever so slightly due to A-to-D processing; the effect is quite subtle and hard to describe, but once in a while, it seemed some of the raw impact on my LPs was lost. I want to stress that the instances when I noticed this were few and far between and never detracted from my musical enjoyment. Perhaps digital devotees would not register this. The tradeoff here, I would say, is the IDA-8's consistently lovely and uncannily liquid presentation.

In summary, the IDA-8 is a winner, and a force to be reckoned with in its category (and beyond it). Though a touch dark in character (à la Class D), it delivers substance and warmth with speed, resolution, and plenty of gusto—and does so from an astonishingly quiet background. It has a slightly digital-like sound in its detail resolution but doesn't cross the line into the overly analytical. A well-conceived Class A/Class D hybrid that doesn't want for power or clarity, the IDA-8 ought to find itself on the audition short list of a wide range of hi-fi hobbyists, from newbies to more experienced audiophiles. I'm considering purchasing my review sample. Highly recommended. tas

Equipment Report

Hegel H360

Powerhouse

Kirk Midtskog

Hegel Music Systems, of Oslo, Norway, has developed yet another fantastic-sounding integrated amplifier/DAC. Hegel also makes preamps, power amps, and digital products, but it is its continually evolving line of integrated amps that, in a way, represents the heart of the company. Bent Holter, the founder and chief engineer behind all things Hegel, truly believes in bringing as much sonic performance, versatility, and reliability to the music-appreciating public as possible for a reasonable price. He applies his considerable engineering skills—he holds a Master's Degree in Semiconductor Physics from Norway's principal technical institute Trondheim University—to designing high-performing audio products that will work in real-world situations and can be purchased by ordinary citizens, not just well-heeled aficionados.

Background and Description

I have reviewed three other Hegel integrated amps over the past few years, so I can understand that it may seem like I am "Mr. Hegel" at the TAS table. Although other TAS writers (including Robert Harley, Neil Gader, and Jacob Heilbrunn) have also reported on Hegel gear—all positively—I am happy to review yet another Hegel integrated amp because, among other things, Hegel makes good products in general, and the company has really pulled out all the stops with the H360 in particular. It is, to give you my overall assessment upfront, a truly excellent amp. I believe it can readily compete with separates costing more than its $5700 asking price.

With 250Wpc into eight ohms (420Wpc into four) and a damping factor of 4000, the H360 will drive a wide range of speakers with ease. The H360 is equipped with two line-level inputs, one RCA and one XLR, although a home-theater bypass can be configured to function as a third unbalanced (RCA) line-level input. In addition, the H360 has a very good, onboard DAC, capable of supporting 24/192 PCM files and native mode DSD64 and DSD128. The unit also supports Apple's wireless AirPlay, and can function as a DLNA digital-media streamer/renderer so you can connect a UPnP/DLNA-compatible Network Attached Storage device (NAS) through your local router and, voîlà, you have an amplifier that will play a lot of different sources.

To my mind, the most important aspects of the H360's performance come from the analog sections of its preamp and power amp. After all, a fantastic DAC can fall completely short if the analog amplification is less than first-rate. For this reason, I put the H360 through its paces primarily as a standard line-level integrated amp, and only evaluated its very capable DAC once I had established what the analog sections could do. (Fortunately for me, it was through

Equipment Report Hegel H360

my listening to the H360's NAS streaming capability that I began to reevaluate my previously less-than-stellar impressions of digital-file playback. The DAC can do more tricks, but I will cover them further on.)

The H360 represents some of the latest engineering and manufacturing acumen at Hegel. The company's patented SoundEngine technology has been further updated, and some of the rigorous parts-matching protocols, once only applied to Hegel's top power amp (H30), are now also apparently applied to the H360. To recap, one of the main aspects of SoundEngine is a feed-forward technique that reduces noise and also specifically addresses the crossover distortion commonly found in typical Class AB amplifiers when one half of the output section hands off the waveform to the other. SoundEngine adjusts the output transistors' biasing to accommodate ever-changing temperature conditions—depending on signal fluctuations—rather than setting a fixed bias for average conditions. The H360's preamp section has its own transformer to keep power-supply noise in the current-supplying power amp section from interfering with the more delicate signals in the voltage-gain preamp section. The DAC has also been completely updated from the on-board DAC in the H360's predecessor, the well-regarded H300 (reviewed by Neil Gader in Issue 233). I will compare the newer H360 to the older H300 in greater detail later. While the H360 does not run hot, it uses no switching power supplies or any mix of Class D technology. It is a 45-pound Class AB amplifier all the way. The cosmetics remain classic Hegel: simple, pleasant, subtle, functionally proficient...Scandinavian.

SPECS & PRICING

Power output: 250Wpc into 8 ohms, 420Wpc into 4 ohms
Analog inputs: Two RCA (one switchable to HT bypass), one XLR
Digital inputs: One coaxial, three optical, one USB, one Ethernet (RJ45)
Outputs: One fixed line level (RCA), one variable line level (RCA); one digital coax (from digital inputs only); speaker terminals
Frequency response: 5Hz–180kHz
Damping factor: More than 4000 (main power output stage)
Dimensions: 16.93" x 5.9" x 16.93"
Weight: 45.2 lbs.
Price: $5700

HEGEL MUSIC SYSTEMS USA
East Long Meadow, MA
(413) 224-2480
usa@hegel.com

Associated Equipment
Analog source: Basis Debut V turntable & Vector 4 tonearm, Benz-Micro LP-S cartridge
Digital sources: Ayre C-5xeMP universal player, HP Envy 15t /JRiver MC-20, Hegel HD12 DAC
Phonostage: Ayre P-5xe
Linestages: Ayre K-1xe, Hegel P30
Power amplifiers: Gamut M250i, Hegel H30
Speakers: Dynaudio Confidence C1 Signature, GamuT RS3, YG Sonja 1.2
Cables: Shunyata Anaconda ZiTron signal cables, Cardas Clear Reflection, Nordost Heimdall 2 USB, Audioquest Coffee USB and Hawk Eye S/PDIF, Shunyata Anaconda S/PDIF, Shunyata Anaconda and Alpha ZiTron power cords
A/C power: Two 20-amp dedicated lines, Shunyata SR-Z1 receptacles, Shunyata Triton/Typhon power conditioners
Accessories: Stillpoints Ultra SS and Mini footers, Shunyata Research DFE V2 cable elevators
Room treatments: PrimeAcoustic Z-foam panels and DIY panels

Listening

The commanding, clean 250W output and variety of analog and digital inputs would almost be enough to recommend the H360 from the start, but Hegel offers much more than mere competency. The real boon here comes from the H360's revealing, refined, and—best of all—musically compelling character. I could hear more deeply into recordings than I had any reason to expect from a $5700 solid-state integrated amplifier. Details like singers' lip sounds, guitarists' fingers on strings, or drummers' sticks on cymbals came through with clarity, and did so without sounding hyped or forced. The ease with which these sorts of musical cues flowed, coupled with stable solidity of imaging, lent the sound a liquidity and body reminiscent of a well-balanced tube amp. Likewise, the H360's dynamic sure-footed rhythmic drive underpinned the music in a way that propelled it along and made all sorts of music interesting—also somewhat like a good tube amplifier.

The H360's tonal balance is not, however, traditionally tube-like (as in a bit more weighted toward the midbass and midrange with a softening of the extreme upper frequencies and perhaps a slight reduction of definition and control in the low end). On the contrary, another strong suit of the H360 is its apparent neutral tonal balance—achieved without the price of sounding clinical or characterless, as too many products with neutral ambitions do. Hegel has a talent for delivering both tonal accuracy and musicality; all four integrated amps, as well as its top P30 preamp and H30 power amp combo with which I have direct experience, have this satisfying combination of fundamentally correct tonal balance and musical verve. Hegel's VP of Sales and Marketing Anders Ertzeid told me, when I visited Hegel in Oslo in 2012, that Hegel does not "voice" its products as such; rather, it pursues accuracy and noise-reduction through engineering and leaves tonal-shaping out of the design process. Of course, designer Bent Holter and his colleagues also listen carefully to various iterations of a given design, but they seek technology-improvement solutions rather than tonal adjustments. The results reveal a recording's own character as well as the music's inherent thrust—a confluence of positive attributes I more readily find in much more expensive electronics.

The H360's midrange and treble openness really help flesh out the leading edges and

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trailing tails of notes, as well as their overall timbral character. This fine resolution and accurate timbre, taken together, help make images properly positioned and proportioned in the soundscape. Spatial cues add up to a reasonable approximation of 3-D imaging and soundstaging—in as much as this is possible for solid-state electronics under $10,000. For example, instrumental images do not sound recessed; indeed, leading-edge sounds indicate a distinctly closer perspective, without making instruments seem disassociated from the ensemble and the hall. Other Hegel integrateds have this pleasant "greater context" presentation as well, although the H360 portrays images better than any of the others I have listened to extensively in my system (H80, H100, H200, and H300). The H360's apparent listener perspective is basically mid-hall, and the overall soundstage is quite wide, tall, and deep. Soundstaging is one of the areas of audiophilia where separate amplification components—especially monoblock power amps—seem to hold sway. An integrated amp can match or surpass some separates in areas of resolution, tonal and timbral truthfulness, power, and dynamic control, but the expansiveness of the outer reach of the soundscape seems to be aided by the separation of the primary amplification blocks—all other things being similar. I will say, the H360 portrays images and a soundstage better than any other sub-$10,000 solid-state integrated I have heard in a familiar system.

Owing to robust power supplies and—as I believe Hegel would suggest—other aspects of its designs, Hegel amps tend to sound more powerful than their nominal power ratings would suggest. The H360 did not disappoint. It drove all speakers I had on hand with ease: YG Sonja 1.2, GamuT RS3, and Dynaudio C1 II. (I would hazard a guess that the H360 will even match up well with power-hungry Maggies.) Like other powerful amplifiers, the H360 conferred serenity to music listening, perhaps because it doesn't distort or strain on crescendos, as is often the case with less powerful and clean-sounding amplifiers. Bass and dynamics are well served, too. The H360's bass always sounded deep-reaching and articulate, never weak or flabby. Macro-dynamic swings could, in fact, be startlingly powerful and the power region had plenty of slam.

Even though the H360 is powerful, with lots of commanding grip and control, it still sounds beguilingly delicate and detailed. An example of this "play big" and "play refined" ability came through when I listened to the second movement of "Three Meditations from Mass" on Bernstein [Oue, Minnesota, RR]. The opening cello solo was rendered with fine detail and emotional intensity, but when the orchestra joined in and welled up, the weight and force of the ensemble was reproduced realistically and with dimensional verisimilitude. No raggedness crept in, and the soundscape did not congeal.

Comparisons

So how does the H360 compare to its progenitor, the award-winning H300? Both are rated at 250Wpc, but H360 has a damping factor of 4000 where the H300's is 1000. Thus the H360 will, theoretically, offer even greater control over difficult speaker loads. The newer model also boasts 50 percent higher current capacity. The computer-controlled analog volume

Nordost Heimdall 2 USB Cable

Hegel's Anders Ertzeid provided a two-meter run of Nordost Blue Heaven USB 2.0 cable (starting at $249/1m) to use with both the HD12 DAC and H360 integrated amp. Because of a greater distance between my computer and the DAC, I asked about getting a longer run. Accordingly, Nordost's affable and knowledgeable Jon Baker very kindly sent along a three-meter run of Heimdall 2 USB cable (starting at $499/1m). Not only did I then have a longer length of cable to work with, but the sound quality also improved substantially. I experienced, in my own system, what others have been pointing out: USB cable can greatly impact sonic performance. The Blue Heaven USB cable was quite good, but I was impressed by how much more detail, texture, body, and spatial information came through with the Heimdall 2 USB cable in place. It all added up to a more lifelike and enjoyable musical experience.

I had heard a demo of Nordost's complete line of USB cables at Rocky Mountain Audio Fest 2011. A Nordost representative started at the bottom of the line and worked up the product offerings with ever-improving sonic performance (and higher prices) at every cable swap. (At that time, Nordost had carried more than three USB models.) The source material remained the same, as did the volume setting and the rest of the system. Only the USB cables were changed. Every cable upgrade yielded more detail, less grain, better spatial cues, and greater musical involvement. My recent experiences in my own system with this critical link in the digital chain confirmed my impressions at the RMAF demo.

Bits are supposed to just be bits in the computing world. If the digital stream makes it intact from output to the desired input with the proper interface "hand-shaking," the cable is not supposed to matter, right? Well, what constitutes "intact" on the audio side of digital signal processing may be more involved than other common computing tasks. In high-performance audio, the USB cable matters a lot. In a way, it bothers me that the USB cable turns out to matter as much as it does because it then becomes yet another factor we need to pay close attention to—as if we don't obsess over enough already. On the other hand, better sound is better, and if we know how to improve it, then why not pursue it? Such is the nature of our hobby.

The sonic improvements brought about by the Heimdall 2 USB cable were highly instructive. Other writers—TAS' Robert Harley, Steven Stone, Alan Taffel, and Neil Gader, to name a few—have been commenting on the importance of the USB cable, and I concur. Considering how much we already spend on analog signal cables, $699 for a three-meter run of Heimdall 2 USB cable seems to be in line with current industry pricing practices. **KM**

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attenuators remain the same, but Hegel says its new individual voltage regulators reduce high-frequency noise. The new DAC has been extensively re-designed, and much of it is actually based on Hegel's top HD30 DAC. The USB input, according to Hegel, has a new receiver chip, which supports DSD128, has better voltage regulators, and has a superior "first-level" jitter-reducing layout. The new DAC chipset is the AKM 4490 instead of the 4399 in the H300. Both models sound very similar overall, but two performance areas add up to significant improvements in the newer model: First, the H360 sounds smoother and more transparent, especially in the treble; and second, the H360 is just plain more musically enjoyable. The boogie or sadness or tension in the music registered more easily—especially when the amp was mated to the wonderfully revealing and involving GamuT RS3 speakers (review forthcoming).

What about going up in the Hegel line? The top-level P30 preamp and H30 power amp (reviewed by Robert Harley in Issue 223) sounded even more solid and commanding, and the soundscape expanded in all directions. The pre/power amp combo also sounded more revealing, direct, and immediate—quicker, so to speak. The H360 did, however, have a more liquid and musically enticing presentation—at least when it was paired with either the Gamut RS3 or Dynaudio C1 II speakers. To my mind, the H360's ability to perform so well when stacked up against Hegel's own $21k combo is highly commendable. Hegel will probably cringe, here, but I am not at all sure the roughly additional $15k for the P30/H30 would be worth it to a lot of customers, even though the combo is technically more accomplished from an audiophile perspective.

The DAC

I compared the H360's DAC to Hegel's very nice sounding HD12 DAC ($1200) on its respective USB ports, and also listened to the H360's renderer/NAS functionality. On USB, I don't believe I could consistently tell which DAC was engaged if someone else were operating the system. If I had to really seek out (or project, some might assert) sonic differences, I would favor the sound of the H360. It seemed to have a little less grain and sounded a bit more natural overall. Mind you, the HD12 had compared favorably against an Oppo HA-1 DAC (also $1200) in my system; so, one could think of the H360's DAC as equaling or surpassing a $1200 separate DAC. BTW, since I have been listening to more digital audio files in the last few months, I've discovered—like many others have—that the quality of the USB cable can make a substantial difference in sound. (Please see the sidebar about Nordost's excellent Heimdall 2 USB cable.)

The H360 also supports Apple's wireless AirPlay, but the user has to supply the wireless router. Hegel did not include an on-board wireless receiver because it claims that would introduce too much noise. Besides—from my own perspective—as wireless technology advances, consumers can more easily advance with it by upgrading the external wireless router. AirPlay works but is probably more appropriate for casual listening than serious audiophile sessions at this point, sounding, in my opinion, a bit muffled and thin. It will most likely appeal to many consumers, though, because they can easily stream their

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music from familiar Apple devices to their home system with the H360 as the main hub.

As I mentioned earlier, the real surprise on the digital side was the H360's streamer/renderer functionality. Using BubbleUPnP software on an Android tablet, I could control the H360's renderer to play the files on the attached QNAP TS-251 dual drive (configured and pre-loaded by Hegel). Digital files sounded much more lifelike through the H360/NAS than through my HP Envy 15t laptop running JRiver MC-20 and a HD12 DAC—even when this setup was tricked out with a good power cord, power conditioning, and aftermarket footers. The H360/NAS playback was truly musically rewarding. It sounded like a hybrid between my turntable rig and my regular universal-format disc player, and all in good ways: clarity, musical fluidity, focus, and lack of underlying graininess. Soundstaging and imaging also were more fleshed out, and timbres sounded more natural. The renderer/NAS method has the potential to turn this reluctant computer-audio guy into a more receptive digital explorer. Hegel has yet another trick in its digital repertoire, though.

If you already own a good stand-alone DAC (with a coax input), and you want to make use of it to improve performance, Hegel offers a neat DAC-loop feature on both the H300 and H360. You can route any digital input's signal (up to 24/192, no DSD) on the H360 through its coax output to your outboard DAC's coax input, and then route the converted analog signal from the external DAC back to the H360 through its balanced analog XLR inputs. A couple of activation button selections on the remote, and you now have cleaner, re-clocked, jitter-reduced digital-file playback. I used it with both my computer and with the NAS drive as sources, and it worked with both like a charm. Everything sounded cleaner and more continuous through the DAC-loop, with less interstitial haze, greater transparency, and more 3-D depth.

Improvements

Could the H360 be better? Sure, at least one more analog input would be nice. The home-theater bypass input should probably be left as a single-purpose input, rather than allowing it to be configured as another line-level analog input. The display doesn't bother me, but some folks might like an improved screen, in which characters are nicer to look at, rather than the mix of somewhat crude upper- and lower-case characters Hegel currently offers. I realize there are probably good reasons why Hegel has not done this already—increased cost, possibly lower reliability, and maybe added noise. (I can almost hear designer Bent Holter grumbling.)

Conclusion

The Hegel H360 is simply a marvelous piece of audio kit. Its neutral tonal balance, articulate and lovely rendering of details, commanding power reserves, spacious soundstaging, and natural imaging are laudable. At $5700, as solely a linestage integrated amp of its quality and power output, it is a bargain; the included nice-sounding and versatile DAC makes it a real winner. I absolutely loved listening to the H360. I never tired of its low noise, dynamic liveliness, and winning musicality. A very easy recommendation. tas

Equipment Report

Pass Labs INT-250

The Outer Limits

Neil Gader

When Pass Labs introduced its first-ever integrated amplifier, the INT-150 in 2009, the debut was hailed by many, myself included, as a watershed moment for a sector often derided as "down-market." Reviewing the amp in Issue 184, I noted, "The Pass Labs INT-150 lays to rest the arguments and perceptions of the past about integrated amplifiers. It's a musical force of nature and arguably about as good as it gets in the here and now." In my view, it quickly became one of the handful of integrateds that could compete with high-end separates at all but the most extreme levels—and even then, it made for awfully close competition.

With the success of the INT-150 under its belt, Pass Labs has taken the next logical step by releasing not one but two new integrated offerings, the INT-60 and INT-250. Both are Class AB designs with heavy Class A bias based on Pass Labs' latest Point 8 Series of amplifiers. The INT-250—the subject of this review—weighs in at 105 pounds and outputs 250Wpc into 8 ohms and a stump-pulling 500Wpc into 4 ohms. It was optimized for greater flexibility with grunt-worthy speaker loads of 86dB sensitivity or less. The INT-250 features high-voltage rails and output stages, along with the iconic glowing meter found on Pass Labs' Point 8 amplifiers, direct-access buttons for the four inputs on the faceplate, and a blue LED output-level display. The volume control knob, which is about the size of a hockey puck, is solid aluminum and beautifully weighted—it's an old-school joy to use.

Most IA platforms look more like buffed-out preamps, but the INT-250's tall front panel and industrial-scale heatsinks really mirror those of Pass Labs' massive power amplifiers. Only the aforementioned front-panel input buttons indicate that it has also gobbled up an entire line-stage. That said, not a lot of information is observable from the front, so if you're expecting to rename inputs, forget it. The spacious back panel features four line-level inputs, a line-level output, and two pairs of Furutech ratcheting binding posts designed to prevent over-tightening. Included is a hefty, full-featured remote control cast in aluminum. The elegantly tactile volume control is a digitally controlled ladder with 1dB steps, similar to the one in the XP-30.The input is buffered by a simple stage that adds 4dB of gain to feed both amplifier channels and the pre-out connections.

I asked the man himself, Nelson Pass, to provide a basic compare/contrast between the INT-150 and the INT-250. He replied, "The output stage of the INT-150 is identical to the X150.5. The INT-60 and INT-250 use the Point 8 output-stage topology and power supply, having 20 output devices per channel and the same bias current, but neither are identical to their respective Point 8 amplifiers. The output stage of the INT-250 is similar to the X250.8. The 'on-state' power consumption of these units is minimally about 200 watts and 300 watt respectively, reflecting the high Class A region of the output-stage bias.These amplifiers leave Class A at about 15 and 25 watts peak, respectively. All the output devices are power MOSFETs rated at 150 watts and 20 amps continuous (80 amps peak) for short term aggregates of 3kW and 4.2kW per channel." He also explained that the new INT-250 and INT-60 are not "literally identical" to their standalone counterparts, the X-250.8 and XA-60.8. Nevertheless, "the essential details that deliver the sound of the Point 8 power amplifiers have been tweaked in subjective testing, and the result is very close."

In sonic performance, the INT-250 is a thoroughly modern amplifier with effortless dynamics at the micro and macro levels, an ultra-wide bandwidth, superb low-end control and grip, and effortless highs. The orchestral soundstage is as expansive and dimensional as I've experienced in a solid-state amplifier—or a tube one, for that matter. Both the Vandersteen Treo CT (reviewed in Issue 262) and the ATC SCM20-2SL, and later, the new B&W 805 D3 (review forthcoming) simply opened up, became less of a localized source, and in many instances virtually disappeared from the listening space. In fact, the Pass is so open and holographically transparent that it encourages the listener to consider getting up and taking a walk through the orchestra—and dispensing some high-fives to the conductor along the way. As I listened to a cappella singer Laurel Massé's performance on Feather & Bone swirling into the deepest recesses of the Troy Savings Bank Music Hall, I concluded time and again that the INT-250 just broadens the soundspace so effortlessly, even the ceiling of the venue seems to elevate without restriction.

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That's not to say the INT-250 is characterless. Actually it's the amp's lush, Falstaffian midrange that overcame my critic's ear, occasionally freezing my pen midsentence as waves of nostalgia caused me to think back to my earliest experiences with iconic high-end amplifiers such as the ARC D150. (What an amp with the original Magneplanar Tympani 1D!) But its rose-gold signature sound was not due to deviations from accuracy, but rather to the strapping power and fluidity that come from its canny balance of Class A bias and Class AB output. The INT-250 might invite comparisons to tube amps, but only in the sense that, like every Pass amp I've heard, there are strong whiffs of the warmth and harmonic bloom of the actual event. But then there was also the very untube-like "management and control" aspect that produced explosive bass dynamics and supported images on an unyielding foundation in an impeccably delineated stage.

The Pass Labs was a master of serving the extremes in audio reproduction. Timbral contrasts were more vividly distinguished. The baritone sax deployed on Jen Chapin's ReVisions [Chesky] retained the throaty weight and dark resonance that can be constricted and diminished in the company of smaller, less-pedigreed amplifiers. The INT-250 also throws its prodigious weight around in the most unexpected and tender ways. Its transient behavior with percussion instruments was quick-footed and unconstricted, with an almost instinctive ability to capture low-level immediacy, superbly tracking acoustic idiosyncrasies such as an errant footfall, the buzz off a guitar string, a piano's sustain pedal releasing or—even providing a headcount of the voices in a chorus. As I listened to the animated musical exchange between acoustic bass, fiddle, and cello during Appalachian Journey, the Pass Labs amp outlined textural and timbral specifics that exposed more of the entire character of each instrument. Whether reproducing a pianist or cellist, the INT-250 pushes a loudspeaker to the very edges of its performance envelope. I was reminded of the Jack Nicholson line to Helen Hunt in the movie As Good As It Gets: "You make me want to be a better speaker." And this was true of every speaker that the INT-250 drove during my evaluation.

Since I had still had the superb Esoteric K-03X disc player in-house (reviewed in Issue 261), I was primed to return to a favorite recording that I referenced in the INT-150 review. It was the SACD of Anna Netrebko singing Donizetti's "Ardon gli incensi" on the DG SACD Sempre Libera. She's accompanied by a playful glass harmonica that urges her voice upward past a high C, while the delicate layering from the Mahler Chamber Orchestra and chorus defines the limits of the hall behind them. I know I'm quoting myself but, as I said then, for those audiophiles who maintain LP and SACD collections this is where the Pass Labs will show you the money. Its micro-dynamics, fluidity, and spatiality plays to the strengths of these enriched formats and can leave you breathless.

Since the INT-250 was designed for the grunt work of driving low-sensitivity loudspeakers, roughly 86dB and below, my first thought was, "Have I got the loudspeaker for you." My own ATC SCM20-2SL compacts are the passive version of the company's active pro monitor. Rated at 83dB sensitivity—a Marat/Sade-like spec—I figured the ATC's would give the INT-250 a sufficient run for the money. Interestingly the pro version of the ATC is driven in a biamplified configuration allotting 200W to the woofer and 50W to the tweeter—250 watts total, just like the Pass Labs. I know this loudspeaker like the back of my hand. I own it and it has labored steadily as my reference compact for years. It's an acoustic-suspension thoroughbred, tonally neutral and balanced, capable of superb resolution, pitch control, and transparency, with solid midbass response into the 40–50Hz region (and perceptibly lower depending on the room reinforcement). However, it's also a real trouble-maker. It can sound shockingly dull and dynamically flat when driven by lesser, power-challenged amplification. It thrives on a level of juice that doubles down at 4 ohms, and yes, is also a stickler over the quality of that power.

The INT-250 set a new benchmark for the ATCs. Like a sports car suddenly given another gear, the ATC found a new level of speed and resolution. The airspace between orchestral images was more defined. Textural details were more clarified. Often, low-level information—the harmonic decay of a piano and resonances of cello or of drum skins, for examples—extended a little further.

A true reference integrated such as the 180Wpc MBL C51 made it a contest throughout most of the audio spectrum, but the difference in the Pass Labs' raw power was telling in midrange dynamics and mid/upper-bass grip. In my experience only the Vitus Audio SIA-25 (Issue 218), a pure 25Wpc Class A integrated, has exhibited a more transparent top-end but its relatively low power removes it from the equation with lower-sensitivity loudspeakers.

Finally I should add that the INT-250's soothing and seductive sonics proved an ideal companion for analog LP playback. It just makes you want to spin vinyl, to take a moment to slow life down a bit and appreciate the gatefold art or follow along with the lyrics, or check out who's playing drums, or singing backup on a particular track—elements that are all missing when I plug in a USB stick. With something like Mobile Fidelity's newly remastered, two-disc, 45rpm mono pressing of Jefferson Airplane's Surrealistic Pillow, it's hard to imagine ever sitting down to listen to Grace Slick's fluttering vibrato on "White Rabbit" and "Somebody to Love" on any other format again.

The INT-250 is a force to reckon with. With musicality that is second to none, it operates at the outer limits of what is currently possible in today's integrated amplifier marketplace. It does have rivals breathing down its neck, and it's heavy lifting both physically and financially, but overall I simply don't know of a better integrated amplifier in the world today. tas

SPECS & PRICING

Power output: 250Wpc into 8 ohms, 500Wpc into 4 ohms
Inputs: Four RCA, two XLR
Outputs: Two RCA and XLR
Dimensions: 19" x 21.5" x 9.06"
Weight: 105 lbs.
Price: $12,000

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Equipment Report

Rogers EHF-100 Mk2

Sweet Tube Sounds without the Maintenance Hassle

Vade Forrester

It's easy to see why integrated amplifiers have made a comeback. Except for very high-end or very high-power amplifiers, there's not much reason to split the amp and preamp functions. Many integrated amplifiers now are *really* integrated; they include DACs, and many include phono sections as well, both moving-magnet and moving-coil. So all you need to do is plug in your source equipment.

Designed and manufactured in Warwick, New York, the Rogers EHF-100 Mk2 is a two-channel tube integrated amplifier rated at 65 Class A watts per channel. The EHF-100 Mk2 is a classic integrated: There's no DAC or phono section. The $8000 hand-wired EHF-100 Mk2 has premium parts throughout. For example, Teflon-insulated wire is used, as are Furutech output jacks, and electronic parts are said to be the same as those used by NASA in the shuttle and space station equipment. I was tickled to see that the EHF-100 Mk2 uses self-biasing circuitry for its four KT88 output tubes. About its self-biasing circuit, Rogers' website says that the "customer does not need to adjust tube bias. As the tubes age, they adjust for bias changes automatically. The customer can change tubes at any time or replace a single tube rather than the full set of four and the amp will automatically re-bias for the change." That's a very useful feature. Biasing tubes is, on a good day, a pain in the posterior.

EF86 pentode tubes are used in the input circuit, described as ultra-low noise and high gain (40dB). Phase splitter tubes are common 12AX7s. The KT88s are Gold Lion-branded, the 12AX7s, Sovteks, and the EF86s, JJs. All these tubes are in current production and not crazy expensive. A rare but welcome feature of the EHF-100 Mk2 is that it comes already burned in for 100 hours. Even rarer but more welcome is its lifetime warranty. Rarer still is the fact that the warranty is transferrable if you sell the amplifier. Tubes are guaranteed for 90 days—pretty much industry standard. Evidently Rogers believes it has a rather special product. Its amplifiers are manufactured using a "statistical process controlled" procedure that is said to offer higher reliability than products made for the airline or hospital industries. No wonder Rogers can offer a lifetime warranty.

The EHF-100 Mk2's only deviation from a classic integrated amplifier design is its remote control—for volume only. Isn't that all you really need? Maybe so, although I find a mute button pretty handy when the phone rings. Unlike many tube amplifiers, there's only one set of speaker terminals, optimized for 4-ohm speakers. I was concerned that my 16-ohm speakers might not be optimal for use with the EHF-100 Mk2, but Rogers assured me they would work fine, and they did. The input impedance for all inputs was 100k ohms, which should not be a problem with any conceivable source. As you would expect from a tube amplifier, the 50-pound chassis is large at 17" by 10" by 14", and of course, you'll need plenty of room around the chassis for ventilation. Even the four feet are special—constructed of Delrin, conical in shape, but with flattened points so they won't scratch your equipment rack. The feet are designed to damp vibrations at a center frequency of 1kHz.

Styling for the EHF-100 Mk2 is rather retro, or, if you don't care for it, plain; the entire chassis is powder-coated in a black finish. I found it appealing, but if you're looking for audio jewelry *à la* Rowland or D'Agostino, the EHF-100 Mk2 may not be your cup of tea. Located on the front panel (hooray!) are separate switches labeled "power" and "operate." The power switch turns on the tubes for warm-up, and 30 seconds later, you flick on the operate switch, which

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applies high voltage so the tubes will conduct. Front-panel controls are minimal—a volume control and a source selector. There's no balance control, no mono switch, no phase-inversion switch, no (gasp) tone controls. These would add cost to the amplifier, might degrade the sound, and I suspect most people wouldn't use them anyhow. There are four inputs, all on RCA jacks; one is on the front panel, a thoughtful feature which allows you to plug in a smartphone or tablet without having to access the rear panel. But you must use a cable—no Bluetooth circuit here. (Bluetooth would have required not only a receiver, but also a DAC.) There is no line-level output, so you can't easily add a subwoofer—except one that connects to the speaker terminals. A single small meter, centered on the front panel, measures the combined power output of both channels. On the top of the chassis nearest the front panel are the low-level tubes, then the output tubes, then, at the rear of the top of the chassis, a perforated cover over the power and output transformers. All of the transformers appear to be quite sizable for the amplifier's rated output. The weight of the amplifier was definitely concentrated towards the rear.

On the rear panel, from left to right, you find the left and right speaker terminals, which are carbon-fiber Furutech units, then the three sets of gold-plated RCA input jacks, a fuse holder, and an IEC jack for the power cable. The speaker terminals are spaced far enough apart to allow the use of cables with large spade lugs, in addition to banana plugs or bare wire. Unlike many manufacturers, Rogers offers a special optional power cable for its amplifiers, called the Rogers High Fidelity Quiet Cable, which was included with the review unit. I'm always pleased to see manufacturers recognizing the contribution of power cables to the overall sound. The Quiet Cable sells for $1900 for a 10' length. Like the EHF-100 Mk2 amplifier, the Quiet Cable is also broken in when it arrives, so you'll be able to enjoy it right away. Also included was Rogers High Fidelity Upgraded Remote Control, a $300 option. Another option, not included with the review unit, is a tube cover, made of transparent Lexan. While essential in environments like homes with small children, tube covers are usually ugly (my view), so making one out of a transparent material seems particularly clever.

Setup and Use

I was a bit worried when the Fedex driver dropped the amplifier on his way to my front porch, but Rogers' sturdy packing prevented any damage. To assure plenty of ventilation, I placed the EHF-100 Mk2 on the top shelf of my shorter equipment rack, displacing the laptop-computer server, which normally resides there. I connected the Clarity Cables Organic speaker cables I usually use. For the input, I first used an unidentified 3.5mm-to-RCA cable that was included with a portable USB DAC I had reviewed. I employed that cable because I was using Meridian's Explorer² DAC to play the few MQA-encoded files I have collected. Later, I used Clarity Cables Organic unbalanced cables from my PS Audio DirectStream DAC. I also plugged my FM tuner into another rear input using Crystal Cable's Piccolo interconnect cables. Since Rogers sent me one of its Quiet Cable power cords, I used that for the power input straight into the wall. The Quiet Cable was rather stiff, but didn't have any problem flexing to go into the wall or the rear of the amplifier. It has impressive carbon-fiber Furutech AC and IEC plugs, which helps explain its cost.

I normally use a separate powered subwoofer, but since the EHF-100 Mk2 had no line-level output, and my subwoofer has no speaker-level inputs, I had to forego the sub. I disconnect the subwoofer anyway when evaluating an amplifier's bass performance.

I loved the printed user manual, which was clearly written in a large font—much appreciated by us aging audiophiles. Two spare fuses were included. The manual included a section on the theory of operation for the amplifier, which describes the circuit used, and a section for care and maintenance. In addition to the manual, there was a very thorough list of measurements for the specific amplifier being reviewed. Very cool.

The hefty Rogers optional remote control operated very smoothly. The action of the remote volume control was gradual, so I had fairly fine control over the playback level. I like that. Some remotes have two volume settings: too loud and too soft.

Tubes were shipped in the manufacturers' boxes. The manual cautions you to avoid mixing up the similarly-sized EF86s and 12AX7s. Fortunately, the tube sockets were plainly labeled on the top of the chassis. The manual advises you to use the supplied cloth to wipe the oil from your fingers off the tubes before turning the amplifier on—a good idea. [*Or better yet, wear cotton gloves when handling tubes.*—RH]

After inserting the tubes and attaching the cables, I turned on the power switch, let the tubes warm up for 30 seconds, then turned on the operate switch. Both switches lighted up when turned on, and the music started as soon as the operate switch was thrown. The manual states that the operate switch can be used as a pause or standby switch for a short period. There was a slight hum after the power switch was turned on, which went away when the operate switch was turned on.

Class A amplifiers run rather hot, and tube amplifiers run fairly hot, so a Class A tube amplifier can run very hot. The EHF-100 Mk2 certainly does, although I have used several amplifiers that ran even hotter.

Both the amplifier and power cord were already broken in, but I played them for several days after installing them, getting used to the sound while I cycled through a variety of music—some old, some new, some high-resolution downloads, lots of Red Book rips. This is the fun part of being a reviewer.

The front meter was calibrated in watts, but driving my sensitive horn speakers, the needle sometimes seemed to be stuck or broken (it wasn't). Even when I cranked the volume up uncomfortably high, it showed a maximum output of 3–4 watts.

Sound

When the EHF-100 Mk2 arrived, I had been playing Amy Duncan's album *Undercurrents* (44.1kHz/24-bit FLAC, MQA-encoded), downloaded from 7digital.com. To decode the MQA recording, I used Meridian's little $299 Explorer² DAC/headphone amplifier (reviewed by Robert Harley in Issue 263) plugged into the sweet-sounding Aurender N100H network mu-

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sic player, which I was auditioning. For convenience, I merely unplugged the output cable of the DAC from my preamplifier and plugged it into the EHF-100 Mk2. Although I had only downloaded the album the previous day, I was surprised at the sheer beauty of its sound. Even though the master file was only 44.1/24 FLAC, Duncan's voice had a delicacy, a purity, that I don't remember hearing before in other recordings. The recording had a pristine, low-distortion quality that reminded me a little of DXD recordings, but without the analytical sound quality that sometimes goes with them. Since I had only heard the record a couple of times, I really couldn't say whether the EHF-100 Mk2's playback was anything special, but the overall sonic experience was very memorable. (I'm eager to audition more MQA files.)

The Explorer^2 DAC won't play DXD or DSD files, which form a valued part of my music collection, so I switched back to my PS Audio DirectStream DAC to continue the review. I also switched to my SOtM sMS-1000SQ Music Server with its sMS-1000 Power Supply.

My overall impression: The EHF-100 Mk2 sounded very lively, very spontaneous—probably a result of fast microdynamic capabilities and good forward momentum. It also sounded very neutral; no part of the frequency spectrum was emphasized. Sometimes the term "neutral" can be used to mean "threadbare," but not for the EHF-100 Mk2. It was harmonically rich and full.

The album *Frottole*, by the Ring Around Quartet and Consort [352/24 AIFF, 2xHD Naxos/HDtracks], features "short, improvisatory polyphonic songs with instrumental accompaniment that flourished in the Renaissance courts of Italy for some forty years between c. 1480 and 1520." The disc was recorded with the Digital eXtreme Definition (DXD) system, a very high sampling rate (352.8kHz) PCM recording. With the EHF-100 Mk2, I heard the squeaky-clean recorded sound typical of DXD recordings, and also a very palpable soundstage with lots of air around the performers. Microdynamics were fast and realistic.

Turning to a favorite album, *La Folia 1490-1701* by Jordi Savall and his band (ripped to an AIFF file from CD Alia Vox AFA 9805), the EHF-100 Mk2 played the track "Folia Rodrigo Martinez" with terrific forward momentum, and lots of instrumental detail, so that the hyperactive percussion parts clattered forth in their full glory. With other equipment they have sometimes receded into a background haze, but not here. Since the EHF-100 Mk2 had no line output, precluding the use of my subwoofer, I didn't hear the deep bass present on this track, but even so, the bass, which provides a solid floor, seemed a tad light. A bit of detail and slam was missing. That made the overall presentation just a bit midrange-centric.

On Shelby Lynne's album *Just a Little Lovin'* [DSD64/DSF, Acoustic Sounds], the title track exhibited a similar lack of deep bass without the accustomed subwoofer, but Lynne's vocals were reproduced with excellent detail and nuance. Percussion detail was quite pronounced, but there was not a smidgen of etch or peakiness.

To see how the EHF-100 Mk2 handled a full orchestra, I queued up Gershwin's *Rhapsody in Blue* from the album *Piano Concerto in F, Rhapsody in Blue, Cuban Overture*, with Jon Nakamatsu on piano and Jeff Tyzik conducting the Roches-

SPECS & PRICING

Tube complement: 2x EF86, 2x 12AX7, 4x KT88
Power: 65 watts RMS per channel/0.1dB from 20Hz to 20kHz with less than 0.1% THD
Gain: 40dB
Inputs: Four unbalanced
Output: 4 ohms
Dimensions: 17" x 10" x 14"
Weight: 50 lbs.
Price: $8000 (Rogers High Fidelity Quiet Cable, $1900 for a 10' length; Rogers High Fidelity Upgraded Remote Control, $300)

ROGERS HIGH FIDELITY
52 Kain Road
Warwick NY 10990
(845) 987-7744
rogershighfidelity.com
roger@rogershighfidelity.com

Associated Equipment
Speakers: Affirm Audio Lumination speakers, JL Audio Fathom f110 subwoofer
Headphones: Audeze LCD-X, NAD VISO HP50, AKG K701, AKG K712
Amplifiers: Berning ZH-230 stereo amplifier, Linear Tube Audio microZOTL 2.0 headphone amp, JDS Labs O2 headphone amplifier, LH Labs Geek Out V2 headphone amp/DAC, Meridian Explorer^2 headphone amp/DAC
Preamplifier: Audio Research SP20 preamp
Analog sources: Linn LP-12 turntable on a custom isolation base, Graham 2.2 'arm, van den Hul Platinum Frog mc cartridge, Audio Technica AT120EB mm cartridge; Sony XDR-F1HD tuner (Radio X modified)
Digital sources: Sony SCD-XA5400ES SACD player; Hewlett Packard Envy laptop computer running 64-bit Windows 7 Home Premium and Roon server software; SOtM sMS-1000SQ server and sPS-1000 power supply; PS Audio DirectStream DAC; QNAP TS-251 Network Attached Storage drive
Interconnects: Crystal Cable Piccolo unbalanced interconnects, Clarity Cables Organic interconnects, Audience Au24 e balanced interconnects, Purist Audio Design Venustas unbalanced interconnects, Wireworld Cable Gold Eclipse 7 balanced interconnects, CablePro Freedom unbalanced interconnects
Speaker cables: Clarity Cables Organic loudspeaker cables
Power cords: Purist Audio Design Venustas, Blue Marble Audio Blue Lightning, Clarity Cables Vortex, Audience powerChord e, Au24 SE LP powerChord
Digital cables: Wireworld Platinum Starlight 7 USB cable, AudioQuest Coffee and Diamond USB cables, Paul Pang TZ YUN Red II USB Cable, Audience Au24 SE USB cable, Au24 SE SPDIF cable
Power conditioner: Audience aR6-T

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ter Philharmonic Orchestra [88.2/24 FLAC, Harmonia Mundi/HDtracks]. Orchestral harmonics were rich and complete; upper bass was powerful and realistic. Nakamatsu, a frequent soloist with my local symphony orchestra, seemed to play with an extra dollop of swagger, and the orchestra strutted its accompaniment with unusual verve. Piano sound was bright and detailed, but not at all peaky. Soundstaging was a close approximation of what I hear at a live concert. Dynamic range was wide-open; no compression here. The sound was almost sensuous.

Let's conclude the audition with a choral work, the "Salvator Mundi" movement from Herbert Howells' *Requiem* performed by Craig Hella Johnson's choral group Conspirare. One of my first high-resolution downloads, this Harmonia Mundi FLAC recording was recorded at 88.2/24. This *a cappella* performance was utterly serene, with the well-rehearsed chorus sounding almost like a single voice. When a soprano soared upward in a solo part, the EHF-100 Mk2 projected her effortlessly. No part of the frequency spectrum was emphasized. It's surprising how much power a chorus can project, and the EHF-100 Mk2 never sounded strained as the volume rose in later pieces. Sublime.

Comparison

My reference system consists of an Audio Research SP20 preamp, and a 30Wpc Berning ZH-230 amplifier, connected by High Fidelity CT-1 interconnect cables. Total cost: $19,160. To be fair, the SP20 includes a fine phono preamp; still, the cost is over twice that of the EHF-100 Mk2. And that doesn't include the price of an extra shelf needed for the amp/preamp configuration. I normally use a JL Audio f110 subwoofer, but to make things comparable to the subwooferless EHF-100 Mk2, I left the sub turned off for the comparison.

Through my reference system, *Frottole* had a bit more precise soundstage. Vocal textures were more solid as well; I could understand the text better. Well, not really. I don't speak Italian, but the pronunciation was a smidgen more distinct. Microdynamics, a strong point of the Berning amplifier, were just as well reproduced as through the EHF-100 Mk2.

Even *sans* subwoofer, the track "Folia Rodrigo Martinez" had noticeably deeper and more impactful bass from my reference system. Maybe that stemmed from the fact that the Berning amplifier uses an output transformerless circuit. This very information-dense recording packs a lot of detail into the soundstage, with dynamics varying continuously as the performers traverse the piece.

"Just a Little Lovin'" also had more bass punch and depth. Lynne's vocals were equally expressive and resolved, and instrumental detail was also noteworthy. The bass provided a better underpinning for this music.

Rhapsody in Blue was reproduced by my reference system with excellent detail, but seemed to be lacking an element of excitement that made it come across as more mechanical. I hate it when a reviewer says something like that; there's certainly not an excitement track on the recording, and the dynamics which I normally credit with providing more excitement were reproduced just as well. I suspect the EHF-100 Mk2 may have had better timing—but that's only a theory.

Through my reference system, the choral group in "Salvator Mundi" sounded slightly more focused and projected more power. Solo parts were a smidgen more distinct.

If I say that overall I preferred the sound of my reference system, let me reiterate that it costs over twice as much and is rated at less than half the power of the EHF-100 Mk2. I've spent years putting the system together to get a sound that's just to my taste. While my Berning amplifier drives my very sensitive horn speakers quite well, it might not be capable of driving lower sensitivity speakers nearly as well.

Bottom Line

The Rogers EHF-100 Mk2 integrated amplifier was a harmonically rich, dynamically powerful amplifier that was satisfying to listen to over long periods. With a smoothly extended high end, a detailed, realistic midrange, and tight bass, it should have enough power to drive a wide variety of speakers. Its automated bias setting eliminates one of the chief objections to tube amplifiers, assuring the amplifier will deliver peak performance for the life of the tubes with no effort from the owner.

The EHF-100 Mk2's unmatched lifetime warranty tells us that Rogers doesn't expect the amplifier will ever cause the original owner or second owner any problems, so except for normal tube wear, you shouldn't have any trouble with the amplifier, something I can't say about any other amp I've used. And the tubes are current production models, so replacements should be easily obtainable at moderate cost—and easy to access when you do need to replace them. (A recommended source for replacement tubes is listed in the user manual, and the 12AX7s and KT88s are often available at local guitar stores.) The optional power cord and remote control were solidly constructed and contributed to the amplifier's performance.

If you've been tempted by tube amplifiers but aren't sure you want the hassles that come with many of them, the Rogers EHF-100 Mk2 is about as easy to maintain as a tube amplifier can be, and offers the typical sonic advantages a tube amp provides with the best warranty in the industry. Highly recommended. tas

Equipment Report

Exposure 3010S2D

Outer Purity, Inner Beauty

Neil Gader

A life lesson that we all learn: Looks can be deceiving. It's also an axiom that applies to the high end—it's what's inside that counts. An amp like the Exposure 3010S2D is a case in point. Visually its nondescript design conveys classic component minimalism and purpose. British reserve, if you will. Only a purist volume control, input selector knob, and power switch occupy the forthright aluminum front panel, which eschews the dozens of flashy pushbuttons and infotainment-style LED displays common to many designs. Operationally it cuts to the chase by getting right down to the critical business at hand—high-performance amplification in the form of a clean, direct circuit design, a robust power supply with plenty of headroom, and rigid construction to thwart EMI as well as acoustic and airborne resonances.

These qualities weren't born overnight. Exposure was founded in 1974 by John Farlowe, whose early passion for recorded music led to building guitar and PA amps and later working in recording studios rubbing elbows with the likes of David Bowie and Pink Floyd. Since the company's inception, expert engineering combined with a philosophy geared to "real hi-fi at real-world prices" has been its stock-in-trade. All current Exposure products are designed by Brighton-based chief designer Tony Brady (see his Back Page interview, Issue 265), and final assembly still takes place in the United Kingdom.

The 3010S2D represents the fourth generation of Exposure's top-tier integrated. It outputs 110Wpc of solid-state power. Like its predecessor it comes equipped with six line-level inputs, but now also includes an AV input for integration with a multi-channel system. A preamp output permits the addition of a separate power amp for system bi-amping. There are dual sets of speaker terminals (banana only). A remote control is included as well.

Internally, Exposure uses high-quality capacitors in the signal path, and has carefully mapped its circuit topology to keep signal and power-supply paths short. Cascode circuitry is used for improved power-supply immunity. The 3010S2D preamp stage now sports a new circuit board with all discrete components (rather than op-amps), while the power amp boasts a fast bipolar transistor output stage (four bipolar devices per rail) and the new power supply adds extra stages of regulation. The volume control is a fine Alps potentiometer.

Owners can also select from a pair of options: an mm or mc phonostage, or a plug-in DAC board. My review unit came equipped with the latter. The board is capable of up to 192/24-bit PCM and DSD64, and comes with two inputs: USB and BNC, with auto-switching between them. For my Apple TV I ran a SPDIF into the BNC via a superbly crafted Cardas Audio adapter. Using my MacBook via Pure Music/iTunes, I linked to the 3010S2D with the excellent Audience USB interconnect. Setup was a snap and performance was even snappier with very good transparency, smooth quick transients, and solid dynamics. A world-class DAC on the order of a Berkeley or a dCS? Well, maybe that's a stretch, but considering the price segment that this package competes in, adding the $595 DAC option is a virtual no-brainer.

Generally my sonic impressions begin to gel when listening to solo instruments—vocals, piano, cello, guitar—and then I move on to smaller ensembles and ultimately the "big guns." This protocol permits me to isolate certain criteria first: the ambient silence in and around the instrument, image integrity, decay patterns, harmonic sustain, and so forth, without the soundfield being clouded by the complexities of added instrumentation. However, like many of you, my *other* impulse is to grab all the symphonic heavy-hitters in my record collection and throw the whole sonic kitchen sink at the product. It was difficult to hold back with the Exposure—right out of the box, its clarity, tonal authority, and timbral authenticity immediately captured my attention.

The sonic lynchpin of the 3010S2D's performance was the stability and musical foundation it reproduced. From the opening salvos of Copland's "Fanfare for the Common Man" to the angelic vocal of Alison Krauss' "You're Just a Country Boy," the amp established a stable soundspace in which each image was positioned with sure-footed specificity. There was a superb combination of poise, densely textured midband detail, and dynam-ically

Equipment Report Exposure 3010S2D

authoritative overall energy. Plus the Exposure's very low noise floor led to an appreciation of the ambient riches that reside between musical passages. Images, such as Russ Kunkel's signature tom-tom fill during Carole King's "Home Again" from *Tapestry*, stood out as they suggested genuine weight and dimensionality rather than appearing as flat cardboard cutouts.

As for a distinctive sonic signature, neutrality prevailed for the most part, though at times the 3010S2D's character conveyed warmer, darker shadings, reminiscent of a walnut wood grain. Female and male vocals had realistic body in a distinct sense of place—with both feet on the ground, so to speak. On his *Mule Variations* Tom Waits' voice had the requisite chest resonances and throatiness I've come to expect; Leonard Cohen's vocals from *Old Ideas*, closely miked and darkened with age, seemed to emerge from a subterranean underworld. During violinist Anne-Sophie Mutter's performance of the Tchaikovsky Violin Concerto, her violin's top end was nicely extended, but not overly detailed or etched.

Could the sound have used a bit more top-end air? I think so, but importantly, there was a sweetness to the 3010S2D that was especially pleasing on full-bodied, resonant, acoustic instruments such as cello and bass viol. Bass response was equally musical and balanced with hints of tube-like warmth but all the while maintaining the tautness, pitch stability, and control that are the essence of a modern solid-state performer.

In my review of the B&W 805 D3 compact (in this issue) I point out the chameleon-like character of its brilliant diamond tweeter, a transducer so finely polished in its resolution that it doesn't let any texture, distortion, or harmonic slip by. It also doesn't suffer poor amplification lightly and will reveal grit and grain or any hint of treble artifacts. It was love at first sight for the B&W and the Exposure, and as I listened to Respighi's *Brazilian Impressions* [BiS] the 3010S2 handled the delicate percussion cues with sensitivity and finely honed resolution.

In sonic colorations, the Exposure kept its nose clean. It didn't hype treble frequencies, etch transients, or evince any pernicious tonal peaks or bumps. Its minor sins were subtractive at best.

While the Exposure is suitable to power most compacts and smaller floorstanders I always recommend auditioning an amp while listening at typical volume levels to the loudspeakers you'll pair with it. (Considering your room size is also important.) For example, my own ATC SCM20 compacts and their very naughty 83dB sensitivity elicited a bit of compression, and caused this 110Wpc amp's bass grip to loosen slightly; an acoustic bass or a kick-drum lost a bit of the sheer, ball-fisted dynamic energy that a larger amp imparts with that power-hungry speaker.

In sonic colorations, the Exposure kept its nose clean. It didn't hype treble frequencies, etch transients, or evince any pernicious tonal peaks or bumps. Its minor sins were subtractive at best. It could drive a speaker like the Vandersteen Treo CT beautifully across most of the frequency spectrum, and only when really pushed *hard* did the Exposure's sound tend to relax and soften in the lower midbass; the potency of deep percussion dynamics was slightly reduced, and sustains were less discernable. Substituting the likes of a Pass Labs or an MBL Corona C51 restored a soundstage dimensionality and harmonic authority which the Exposure had backed off slightly. On the other hand, substituting either of these well-regarded amps could also send a carefully crafted audio budget swirling down the drain.

Don't let the simple façade of the Exposure 3010S2D integrated amp fool you. It may not have outer glitz and glamour but it's a real standout when it comes to inner beauty. The Exposure 3010S2D is an honest and classy piece of work that honors the finest traditions of the high end. tas

SPECS & PRICING

Power output: 110Wpc at 1kHz into 8 ohms
Frequency response: 20Hz–20kHz ± 0.5dB
Dimensions: 17" x 4" x 11.8"
Weight: 25 lbs.
Price: $2795 (Options: mm or mc phonostage, $495; DAC, $595)

EXPOSURE ELECTRONICS USA, INC.
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exposurehifiusa.com

Equipment Report

Yamaha A-S3000

A Welcome Return Home

By Paul Seydor Photography by Dennis Burnett

Back in the day, Yamaha components were always regarded as a cut or three above the usual imports from Japan such as Pioneer, Sansui, Kenwood, even Sony. They boasted solid build, superb engineering, very good (or better) sound, and often both technical and aesthetic innovation. Readers of my generation may remember the TC-800G cassette deck, with its cool front panel that sloped back about 45 degrees; the B-6 amplifier shaped like a pyramid; the NS-1000M speakers, reportedly the first to use beryllium tweeters; and the NS-10M studio minimonitor, a favorite of professionals in search of a high-accuracy small speaker (and which attracted a cult among audiophiles as loyal as that of the LS3/5a).

In addition to seeming more serious about performance and sound, Yamaha also had an aura of being, well, classier than the competition. The layout of the controls was a model of ergonomic logic, while both knobs and buttons inspired confidence and were a tactile pleasure to operate—the word "silken" comes to mind.

Although there was nothing ostentatious about Yamaha's high-fidelity products, they nevertheless projected a distinct image that separated them from the pack, which was all the more surprising since Yamaha was then and is still a large, diversified international company that manufactures everything from hi-fi components to professional audio gear to musical instruments (pianos most famously, but recently the company won Japan's prestigious Good Design Award for an electronic violin), motorcycles, industrial robots, and even golf products (!). But these last several years its profile on the home-audio scene has been low to missing, which may account for the rather obvious agenda behind the way its new flagship integrated amplifier, the A-S3000, is being promoted. "We've missed you, too" announces the sole blurb above a backlighted photograph of the amplifier in the ads, the implication being both that Yamaha has been absent in high-end audio for a while and that audiophiles have missed it. Well, speaking for myself, I can't say I've given Yamaha much thought one way or another for a very long time, but a company

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spokesperson did inform me that the A-S3000 was definitely "designed to show a renewed commitment to high-end audio."

As I've already indicated, the aesthetics are redolent of classic styling from the old days, and this extends to function as well. The A-S3000 is part of a new breed of control electronics that run against the—to my mind, misguided—minimalism that has run rampant in high-end audio for at least the last thirty years. When Robert Harley asked me to review the A-S3000, he said, "You'll love it, Paul, it's got tone controls." (One mark, among many, of a good editor is that he knows his writers, and RH certainly has my number here.) In addition to tone controls, the A-S3000 also has balance control, A/B speaker switching, headphone amplifier (with a novel trim feature that allows for a greater physical range of the volume pot), and a built-in phonostage for both mm and mc pickups. Functionally and ergonomically, this new integrated may be retro, but a great deal of very forward thinking has gone into the circuitry, the layout, and the physical construction. In terms of design, engineering, quality of parts, execution, and sophisticated thinking, the A-S3000 can withstand easy comparison to competing integrateds and separates costing multiples of its $6999 suggested retail price.

The technical side and features complement of the A-S3000 are summarized in the sidebar, so let me get directly to the sound, where, I fear, I'm going to get into trouble once again in certain quarters when I report that the sound is exactly what you'd expect from any contemporary solid-state amplifier with pretensions to high-end status: transparent, low in noise and distortion, tonally neutral. But before you trip the trapdoor, give me a moment to say that I pressed the A-S3000 into service during the last three weeks of my evaluation of Harbeth's Monitor 40.2 loudspeaker (see TAS 269), for which I was using a Pass Labs 10/X150.8 preamp/amp combination, graciously on loan from the manufacturer. I just swapped in the Yamaha—it was already well broken-in—and went on with the business of concluding my evaluation of the speakers, paying little or no attention to the amplifier as such. It's not that I didn't notice there were some differences—the Harbeths are extremely accurate—but these were of so low a magnitude as to cause no distraction from the immediate task at hand. Admittedly, I wasn't concentrating on the amplification, but that is precisely my point: The Yamaha did nothing to draw attention to itself. With any competent or better contemporary solid-state electronics in what I would call the broad middle of the market, which is to say above the budget range and below the stratospherically priced gear, I find this to be far more the rule than the exception.

Once I turned my attention to the A-S3000 itself, here's what I can report: Its sonics are essentially neutral in the specific sense that it's difficult to isolate tonal characteristics to which I can reliably attach adjectives. Yamaha's designers make a big point about how solid-state MOSFET technology, of which this new amp is an example, tends to suggest the warmth of tubes. Well, I've rarely encountered a well-executed MOSFET circuit that I've found anything to complain about. But while the A-S3000 exhibits absolutely no untoward solid-state effects, I can't say that for me it evokes the sound of tubes either. For one thing, unlike most tube amplification, no one is likely to find that the A-S3000 saturates tonal colors—"saturation" being a term of great approbation among tube fans—nor is it glowing or liquid or refulgent. Neither is it grayish, lean, thin, bright, mechanical, or electrical sounding. Rather, it's notably clean, controlled, and composed. Is there a trace of the coolness that some people claim to have found in Yamahas back in the old days? Not that I can discern, but if your tastes lead you to judge any component that doesn't sound *positively* warm as therefore cool, you might hear things differently.

There may be an exceedingly mild hint of reserve and restraint, but I surely wouldn't want to push that too hard. One review I read, of British origin, considered the amplifier smooth but unexciting, and another found it didn't do rhythm engagingly enough, or whatever words to that effect are current among British reviewers—the all-purpose "pacey" still seems to be the favorite. I have a hard time getting my mind around judgments like that because reviewers who make them seem to me to be asking the component to contribute something *to* the source rather than reveal what is *in* it. This particular reviewer was specifically referring to the amp's performance with rock music, wherein may consist the rub. Do audiophiles who love rock 'n' roll, heavy metal, rap, hip-hop, etc., prefer inaccurate reproduction? If that sounds too judgmental, let me substitute "interventionist." I raise the question because there's obviously no equivalent in reality to the sound one hears on rock recordings, and maybe the current widespread enthusiasm for tipped-up top ends, presence projections, lean upper-bass, and punchier midbass are perceived as compensating for the sensory tactile and visual deprivations of the home experience compared to the concert experience.

As I hardly ever go to rock concerts, I'm in no position to say, but I can report that I greatly enjoyed my usual rock favorites with the A-S3000. Smooth the Yamaha certainly is, but I found no lessening of excitement vis-à-vis other excellent or better amplification I'm familiar with. All the big numbers from *Graceland* are powerfully rendered, which hardly surprised me because the amp handled the hammerblows

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from the Zander/Telarc Mahler sixth symphony with suitable, even spectacular weight, impact, and slam. Was there a bit *more* crunch, say, from Pass' X150.8, physically much beefier than the Yamaha but with only 50 more watts per side and partial Class A circuitry? Maybe a little, but I'd really have to stretch the point to suggest that the A-S3000 was left at the post or that it left me disappointed and hankering for something else. In fact, bass response is notably clean, clear, articulate, extraordinarily well-defined and solid. Of course, the Monitor 40.2 presents an easy, responsible load to any amplifier. I can't judge the amp's performance on speakers that present haywire impedances, but everything about the design, including its protection circuits, suggests it's essentially indestructible under any remotely normal domestic applications. (One reviewer used it drive Wilson Alexias, which are not exactly of benign impedance, and reported that it didn't break a sweat.)

And my goodness, the thing certainly does have resolution, if that's your end-all and be-all. In connection with evaluating the Harbeths, I hauled out a recording I hadn't listened to in years, *The Sheffield Drum Record* direct-to-disc LP. Even after all these decades, this is still a reference-caliber achievement, one of the late great Doug Sax's technical *tours de force* when it comes to sonic realism in the timbral and (very nearly) the dynamic senses. Two different drummers perform on two different drum sets with different miking, and so they should sound—immediately and obviously so over any system with pretensions to high fidelity. I played both sides a few times and wrote down my impressions, then checked the liner notes where the differences are described, and was pleased, though hardly surprised to find that what I wrote tallied almost exactly with the notes' descriptions. And you could really hear the room, could almost sense its size.

Tiny details sometimes lost with other components—like Martha Argerich's fingernails clicking on the keys in *Gaspard de la nuit* or Glenn Gould's humming on many of his recordings—are always clearly in evidence, though by no means exaggerated. And if you care to concentrate on things like pages turning, chairs squeaking, musicians breathing, the A-S3000 will certainly allow you to do so. As for soundstaging, well, inasmuch as its frequency response is dead neutral, the Yamaha imposes no characteristics like "forward," "distant," "wide," "narrow," etc., on the presentation, at least none that seem to recur from recording to recording. In other words, what's in the recording is pretty much what you get.

Several of the integrated amplifiers and preamps I've been asked to review these past few years have come with built-in phonostages, and this new Yamaha is no exception. If the $7k asking price sounds a bit steep for an integrated amplifier that offers only 100 watts per channel into 8 ohms (albeit exceptionally high-quality watts), the phonostage may help offset the sticker shock. By any standards, this is an outstanding phonostage: extremely low in perceived noise and distortion, very high in transparency and dynamic range, tonally neutral (like the linestage), and notably natural sounding. "Natural sound" is one of Yamaha's blurb phrases; in the case of this phonostage, I think it's neither mere advertising puffery nor by any means accidental. This is because Yamaha has done something unusual in choosing a very low value for the load a moving-coil pickup will see (the moving-magnet input is the standard 47k ohm). According to the published specifications the mc section has a fixed 50-ohm load with no provision for selecting alternatives. So relatively low a fixed impedance is rare in my experience of phono preamps; it is usually set at 100 ohms or higher for mc. I personally applaud Yamaha's decision here because moving-coil pickups almost always sound better—as in flatter in frequency response and thus more neutral—when loaded down. And in this case it provided an almost exact match to my reference Ortofon Windfeld with its internal impedance of 4 ohms, yielding recognizably outstanding results. How it would perform with other mc's with higher internal impedances I cannot say. More than likely what you'd hear is a presentation that is less crisp way up top, perhaps even a little rolled-off, and maybe a slight loss of hair-trigger attack on transients. But none of this occurred with the Ortofon.

Before I conclude, let me address the tone controls, which have ideal characteristics. The treble turnover frequency is 3.5kHz, the bass 350Hz, both with a range of ±9dB. If these turnovers strike you as too low or too high respectively, bear in mind that the slope is *very* gradual and maximal boost or cut is available only at the frequency extremes. I can't imagine a situation in which you'd ever boost or cut to the max. When a recording strikes you as too bright—you'll notice it right away on violins—a judicious turn to, say, the 11- or 10-o'clock position is all that's necessary to restore a welcome impression of greater tonal truthfulness. Move it further to the left and the response starts sloping in the presence region above 1kHz (I never find it necessary to boost the treble), which is very helpful when recordings are extremely closely miked. As for the bass control, again, the effects are gradual. With the Harbeths I rarely had to employ it at all at normal listening levels except for recordings that are notoriously shy in the bass, e.g., many of the Szell's Cleveland recordings, to which a judicious boost helps restore a much-needed warmth, heft, and apparent extension

SPECS & PRICING

Power output: 100Wpc into 8 ohms, 150Wpc into 4 ohms (20Hz–20kHz) minimum continuous, 0.07% THD; 130Wpc into 8 ohms, 210Wpc into 4 ohms (1kHz, 10% THD)
Frequency response: 5Hz–100kHz (+0/–3dB)
Phono inputs: mm and mc
Line-level inputs: 2 balanced, 5 RCA, main amp in RCA
Outputs: 1 record-out RCA, 1 preamp out RCA
Dimensions: 17 1/8" x 7 1/8" x 18 1/4"
Weight: 54.2 lbs.
Price: $6999

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usa.yamaha.com

Equipment Report Yamaha A-S3000

(I say "apparent" extension because a tone control or equalizer can never truly *extend* the frequency response of a speaker system, merely raise or lower its level, which can produce the psychoacoustic effect of extension). Inasmuch as both controls have similar characteristics you can use them in conjunction as a highly effective tilt control pivoted at a thousand cycles. It's a pity there's no loudness circuit, as I'd love to have one designed as usably as these tone controls. However, the bass control can provide loudness compensation at low volume levels—arguably more effectively because it gives you more control over the amount (most loudness circuits are fixed in their boost).

There are some electronic components that immediately announce themselves with a distinctive sound, while others just do their job with a minimum of fuss and bother, preferring to remain in the background as it were. This new Yamaha is obviously one of the latter, which I intend as very high praise indeed. Its operation was flawless throughout the review period and it was fully up to the most demanding source material I threw at it, never betraying any evidence of stress, strain, or effortfulness. If someone asked me to recommend a high-quality preamp and amplifier in a single box free from quirks and idiosyncrasies both sonic and functional, one that is reliable, trouble-free, and does just precisely what it's designed to do—which is transfer the source with as little alteration as possible to the speakers—the A-S3000 would be very high on any short list.

If this is a harbinger of things to come, there can be no question that Yamaha has come back home—in triumph. tas

Inside, Outside, and Behind the Box

I haven't discussed the thinking and engineering behind the A-S3000 because it would amount to little more than quoting or paraphrasing Yamaha's own literature. The talking points are these: First, quite a lot of expense, effort, and ingenuity has been lavished upon the amp's physical construction to address issues of damping and isolation from externally induced vibration, including a "highly rigid double structure construction" using lots of copper and featuring an internally isolated inner frame, including placing and positioning of internal parts, components, and power supply (toroidal) "to minimize the length of the signal paths and achieve low impedance." The amplifier employs MOSFETs in the output stages and floats the entire circuit from ground, which Yamaha claims "removes any negative impact of minute voltage fluctuations or ground noise."

The A-S3000 is balanced throughout, and in several places uses screw connections instead of solder for lower impedance and reduced signal loss. The four feet are individually adjustable for level and have removable magnetic inserts that access built-in spikes for even greater rigidity. It's impossible to say for certain how much any of this and/or other design features are responsible for the final sound quality, but perceived noise and distortion are exceptionally low, and clarity, transparency, and stability exceptionally high. The phonostage accepts both mc and mm pickups. Line-level inputs are two balanced and two single-ended, plus CD and tuner. Two sets of speaker terminals are available and there is a built-in headphone amplifier accessible via the front panel. The amp and preamp sections can be operated independently.

The remote handset duplicates all the basic front-panel functions such as volume, mute, source selection, and on/off, but channel balance and tone controls are available only via the front panel. There is no tone-control bypass switch, but when centered the controls are completely out of the system as evidenced by the split-second mute; then they are moved into or out of the high-noon position.

There are a few novel touches that I haven't seen on other units. For one, next to each pair of XLR jacks is an attenuation switch for gross-level mismatches between balanced and single-ended sources, in addition to a polarity switch. For another, the headphone jack has a trim knob that allows the volume control to operate over a greater physical range from loud to soft. The only thing I really missed is a stereo/mono switch. I suspect the meters are mostly for show, but they do allow for choice between VU and peak, and they are really, really pretty to look at (they can also be switched completely off).

Everything about the unit worked exactly as claimed with no glitches or hitches; there was never a switching transient, and the classic aesthetics are truly beautiful to behold, especially in the silver alternative (the black is too severe for my tastes). To top it all off, in addition to the two-year parts and labor warranty, Yamaha will replace the unit should there be any sort of failure during the first year of ownership. Talk about buying with confidence!

Equipment Report

Rotel A14 Integrated Amplifier/DAC and CD14 CD Player

The Tradition Continues

Vade Forrester

As Rotel has been manufacturing hi-fi gear for over 55 years, it's surprising I'd never heard any of its components. The 14 Series gear reviewed here falls towards the entry level of the Rotel line. In today's market, however, that doesn't mean it's stripped of extras. The A14 amplifier in particular is chock full of features—it has a moving-magnet phonostage, a very capable DAC that can play DSD and PCM music files, an aptX Bluetooth connection, a front-panel USB connection so you can play the music stored on your smartphone, and a headphone amplifier to listen to through your favorite cans. Rated at 80 Class AB watts per channel, the A14 sells for $1299. The $599 CD14 CD player follows the example of many recent CD players—it doesn't try to be anything other than a CD player. Actually, I probably shouldn't have said "many" CD players, since there aren't "many" CD players on the market. I have no data to support this, but I'd venture a guess that there are far more turntables than CD players in current production. But if you need a DAC to use with a music player, there's one in the A14.

Since these two Rotel components are part of the same family and look alike, I'll review them together. When connected together via Rotel's proprietary Rotel Link, they can be controlled by an app on your iPhone. Each unit comes with its own remote control, as well. As parts of the 14 Series, they share the same styling—simple black or silver faceplates slightly beveled at the top and bottom with a small display window in the center.

Hard to believe, but we get a few letters and e-mails griping about the prices of high-end components, and it's true—some are quite pricey. But you don't have to pay a fortune to get acceptable sound; budget gear is better than ever. These units, especially the A14 amplifier, exemplify how good budget can be. And if the A14 is above your financial comfort zone, there's also a the very similar A12 amplifier for $899 with a less advanced DAC and "only" 60Wpc—not much to give up for $400 savings.

It's actually easier to list the features the A14 lacks than the ones it has. It has no moving-coil phono input (the phonostage's gain is suitable for moving-magnet cartridges only), but I doubt that most people who buy an amplifier like the A14 will invest in expensive moving-coil cartridges, and even if they do, a step-up transformer or headamp can add support for moving coils. The A14's power output should suffice to drive quite a few speakers, but if you need more power, there are preamp outputs on the rear of the amp that could be used with an amplifier like Rotel's massive 350Wpc RB-1590. There are plenty of analog inputs and enough digital inputs for almost any digital source you're likely to use. So you're giving up very few options at the A14's price. Of course, this assumes everything works fine, a subject that this review will explore.

I've heard several industry pundits proclaim that the CD is a dead or dying format, but that's baloney; many new recordings are still released on CD, and there are tons of used CDs available—just check eBay, or your local used bookstore. Lots of audiophiles and music lovers already have large CD collections, so saying the CD is dead makes as much sense as saying the LP is dead.

The CD14 uses a highly regarded Wolfson DAC chip, which is capable of sampling rates up to 192kHz. Of course, as the sampling rate of CDs is 44.1kHz, the DAC's capability is overkill. The CD14 will also play MP3 files, but you'd need to burn those onto CDs first (there's no USB input that would allow you to play them off a USB flash drive). Analog output is on unbalanced RCA jacks—there's no balanced XLR out. Front panel layout is pretty standard: a power on/off button on the left side, a slide-out CD drawer underneath a digital display window in the center, and standard operational buttons on the right. The remote control duplicates the button functions, and more. On the rear panel, the RCA output jacks are on the left side; the 12-volt trigger jacks and the Rotel Link jacks are in the center, along with a digital SPDIF output on an RCA jack. On the right side of the rear panel is the connector for the power cord, which uses no ground connector. (Though IEC-terminated power cords will fit the socket, the ground wire won't be connected.) The SPDIF output lets you connect the CD14 to the A14's SPDIF input or to any DAC with a SPDIF input, and bypass the CD14's internal DAC. Would that sound better?

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We'll find out.

The A14 amplifier's internal DAC uses an AKM DAC chip to play PCM files up to 384/32 and DSD256 files. However, there's no MQA capability, and with Tidal now streaming MQA files, that's become more important.

But wait, there's more. By pressing the Menu button, you can access bass and treble controls, a balance control, and a dimmer control for the display window. Analog inputs for the mm phono section, CD, tuner, and aux are so labeled on the back of the amplifier, and also on the selector buttons on the front panel. Then there are the digital inputs: two sets of SPDIF inputs (both coaxial), two more on optical (TosLink), a USB Type B, and a Bluetooth. There's also a front-panel USB Type A connector where you can plug in your iOS Apple smartphone or tablet. You can select each analog and digital input by pressing buttons on the front panel and on the remote—much nicer than having to scroll through the entire list of inputs as you have to do on some preamplifiers. Direct access to inputs is also available on the remote control. There are two sets of speaker output terminals, which you could use to biwire a speaker or drive speakers in two zones.

Setting Up and Using the CD14 and A14

The first things you'll notice when you unpack the shipping boxes are huge "Getting Started" instruction sheets, almost as large as the boxes themselves. It's pretty hard to ignore or lose such instructions, which have good illustrated directions for installing the equipment. Inside the box is something you don't often see: a complete assortment of cables needed to operate the units—power cords, RCA cables, SPDIF cable, USB cable, Rotel Link cable, and 12-volt trigger cables. These are not audiophile-grade wires but are still plenty good enough to get started. There's also a CD with each unit, which has the Windows driver for the A14, and the full manuals for both devices in PDF format. The CD14 comes with a remote, as does the A14.

Since it's doubtful lots of users would immediately run out and buy new power cords and RCA interconnects for units priced like the A14 and CD14, I used the supplied cables.

A photo on the Rotel website shows a CD14 stacked on top of an A14. That looks good, and the big, soft feet used on both units should protect whatever they sit on, but I'm not keen on stacking anything on top of an amplifier, which needs ventilation space—the A14 manual says four inches on all sides. Stacking the units would put the CD14's CD drive right above the A14's heat sink, which radiates heat. To make matters worse, there's a section of the CD14 that hangs down below the rest of the enclosure. Located in the center, beneath the drawer, it provides space for the laser assembly that reads CDs. As you definitely don't want to heat that section up, don't put the CD14 atop the A14—or any other amplifier.

After you install the batteries in the remote and cable up the CD14, you're ready to listen. When you pop in a CD, you'll see its status in the front window displayed with black letters on a white background. However, the display is rather small, so you may need a magnifying glass to read the smallest text. The large black plastic CD14 remote is well designed and easy to use, with a numeric keypad that enables you to jump directly to any track on a CD rather than having to scroll through them one at a time. Some of the lettering on the remote appears in grey, which is a bit hard to read on the black background. Most functions on the CD14 remote are repeated on the A14 remote, so you can use the A14 remote to control both machines. (If your coffee table suffers from remote control overload, that's a valuable feature.) The CD drawer can be operated either from the remote or the front panel. The only quibble I had with the CD14's operation was with taking CDs from the drawer; it was hard to remove them since the usual indentations were not cut out on the sides of the tray. I had to either reach underneath the drawer and poke the disc upward from below, or stick my little finger into the center hole from above to lift the disc that way—both methods were annoying.

The Rotel Link cable that connects the A14 to the CD14 is the one with the stereo mini-plug and white connectors. That's spelled out in the A14 manual but not the CD14 manual. If you use the Rotel Link, don't use the 12V trigger connection (the cable with the mono mini-plug and black connectors).

The A14 should be broken in from "two to four weeks of listening enjoyment" per Rotel's Tech Support. I wasn't sure what "weeks of listening enjoyment" meant, so I gave it three weeks of 24/7 break-in. Incidentally, Rotel Tech Support's Tim Wyatt was very prompt and helpful in responding to my questions, which should be the norm but isn't always.

I connected my KEF LS50 speakers using Wireworld Helicon OCC speaker cables. The KEFs are small stand-mounted speakers with a low 85dB sensitivity and limited bass response. Above the bass region, their response is fairly flat, certainly not peaky by any stretch of the imagination. I normally augment them with a subwoofer, but of course using subwoofers or other forms of powered woofers when testing an amplifier is *verboten*, since you're listening to the subwoofer amplifier in the bass, not the amplifier you're reviewing. This is not a quibble so much as an observation. The volume level for the A14 had to be set at what appeared to be a very high numeric level (between 60 and 70, with 96 being the maximum) to achieve my normal listening volume, and I'm no head-banger. There was still plenty of headroom left, so it's just a matter of convention what level is shown on the front panel. At least the numeric volume level is displayed in a large font, easy to see from my listening chair.

I wanted to get the best sound from the digital inputs of the A14, so in addition to the CD14, I connected my SOtM network music player as an external source. That way, I could explore the A14's ability to play high-resolution PCM and DSD files. Hint: When you're using a source that has a USB output, select the PC-USB input on the A14, not the USB input. The USB input refers to the USB connector on the front panel, where you can plug in your smartphone.

To check out the A14's phono input, I connected my turntable to the A14—not directly, though. Since I have a moving-coil cartridge, I used a Rothwell Headspace headamp to boost the cartridge output to a level that the A14's moving-magnet phonostage could handle. (If you're not familiar with a headamp, think of it as an amplifier that performs the same duties as

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a step-up transformer, boosting the signal level of an mc cartridge to that of a mm cartridge, but not applying RIAA playback equalization.)

Some of the files I use for component evaluation are high-resolution, so to evaluate the CD14, I converted a few of them to 44.1kHz sampling rate/16-bit WAV files and then burned them to a CD-R. I prefer black CD-R blank CDs, which may reduce scatter of the laser beam. Some CD players won't read these, but the CD14 read them without a hiccup. I also used these converted files to test the Bluetooth connection. Both the CD14 remote and the A14 remote have numeric pads that let you access a track directly; without this feature you must advance through tracks manually to reach the one you want to hear—a real pain when your CD has lots of tracks.

To check out the headphone input, I plugged my HiFiMan HE400s into the front panel jack. These planar-magnetic headphones are moderately low in sensitivity, and usually need a fairly hefty amp. I needed an adaptor to fit the ¼" plug into the 3.5-mm jack in the front panel of the A14. When I plugged in the 'phones, the speaker output did not cut off, so I had to turn off the speakers via the front panel. The A14's internal headphone amp had plenty of power to drive the HiFiMans, and sounded very good doing so. If you're a serious headphone listener, you'll want a separate headphone amplifier, but the A14 is good for occasional headphone use.

Balance and tone controls were once commonplace, but lately have almost disappeared from the hi-fi scene. Now they're making a comeback in integrated amplifiers. On the A14, these controls are accessible either through the menu or from the remote control. The remote control is really the only useful way to access the tone controls. First you have to press the bypass button to engage the tone controls (normally they are bypassed). The bass and treble controls both work as you would expect, with fairly gradual action in their respective regions. The balance control is also accessible through the remote control, and is always engaged. This system works and minimizes the number of controls on the front panel, but for serious use it isn't as handy as actual knobs on the front panel. However, if you don't need or want to use these controls, you'd probably rather they didn't clutter up the faceplate.

Sound

For a variety of reasons I do most of my listening these days to digital music streamed from a central NAS drive over my home network and rendered by a network music player, either a laptop computer running a program like Roon or JRiver Media Center or a dedicated music player like the SOtM sMS-1000SQ, converted to an analog signal by a DAC. Control of my music playback is through the appropriate app installed on my iPad. Although I have a lot of ripped CDs, I also listen to many downloaded high-resolution files. To establish a familiar benchmark for comparison, I started listening to digital music, using the SOtM network music player connected to the A14's internal DAC via its PC-USB input. (I'm using a limited number of musical selections in this review since we need to evaluate the A14's many inputs.)

"Folia Rodrigo Martinez" from the album *La Folia 1490-1701* was ripped from the CD Alia Vox AFA 9805 as an AIFF file. Played by Jordi Savall and a small band of Renaissance music specialists, it's a lively, energetic piece. Most Renaissance music doesn't have much bass, but this piece has a drum that extends into the mid-20Hz range. Of course, the tiny KEF speakers can't begin to play that low, but driven by the A14 they actually surprised me with how much upper-bass impact they had. They also captured percussionist Pedro Estevan's very light brushes of his sticks on the drum—something that often

SPECS & PRICING

CD14 CD Player
Formats supported: CDs, MP3s
Output: Unbalanced, fixed-level on RCA jacks
Dimensions: 17" x 3.8" x 12.3"
Weight: 13 lbs.
Price: $599

A14 Integrated Amplifier and DAC
Power output: 80Wpc into 8 ohms
Analog inputs: Moving-magnet phono, line level (4)
Analog outputs: Preamp out, speakers out
Digital inputs: USB, SPDIF on coaxial (2) and optical (2), aptX Bluetooth, RJ45 network
Digital formats supported: PCM 384kHz/32-bit, DSD256
Headphone output power: 90mW @ 16 ohms
Dimensions: 17" x 3 5/8" x 13 1/2"
Weight: 18 lbs.
Price: $1299

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Associated Equipment
Speakers: KEF LS50
Preamplifier: Rothwell Headspace MC head amp
Analog source: Linn LP-12 turntable on a custom isolation base, Graham 2.2 tonearm, Van den Hul Platinum Frog cartridge
Digital source: SOtM sMS-1000SQ network music player with sPS-1000 power supply; QNAP TS-251 network drive for music file storage
Interconnects: Crystal Cable Piccolo unbalanced interconnects, CablePro Freedom unbalanced interconnects, Crimson RM Music Link interconnect cables
Speaker cables: Wireworld Helicon OCC
Power cords: Purist Audio Design Venustas power cords, Clarity Cables Vortex power cords, Audience powerChord e, Au24 SE LP powerChord power cords
Digital cables: Wireworld Platinum Starlight 7 USB cable, Audience Au24 SE SPDIF cable
Power conditioner: Audience aR6-T

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disappears beneath the noise floor. Throughout the piece, the many percussion effects were plainly audible, more so than with many more expensive components. What was not done as well was the reproduction of Savall's *viola da gamba*—a cello-like instrument from the Renaissance and Baroque eras. The *viola da gamba* plays the main tune, but unfortunately it was slightly muffled, without the harmonic richness that's a part of this recording.

The Tallis Scholars' "Miserere" from their album *Allegri's Miserere & Palestrina's Missa Papae Marcelli* is a 96/24 FLAC file. "Misere" is an *a capella* work, with a small choral group in the front, a solo tenor narrator, and a small solo group at some distance behind the main group. The A14 projected the piece with a huge soundstage; when the solo group behind the main group entered, the rear of the soundstage was illuminated more brightly than I've heard it before. The solo tenor was portrayed without any brittleness, a trait I sometimes hear from lesser components. His vocal shadings were quite expressive, including the barely detectable vibrato he uses at times. The echo of the solo group was realistically integrated into the overall soundstage about as well as I've heard it. The A14 widely spread the soundstage between the speakers, with the solo tenor firmly positioned in the center.

Shelby Lynne's album *Just a Little Lovin'* is a DSD64/DSF recording sourced from Acoustic Sounds. The title song was reproduced with excellent detail across the frequency spectrum. The A14 captured delicate inflections of Lynne's voice, so that I could easily understand her phrasing as she strove to project meaning and emotion. Although the KEF speakers don't go too deeply into the bass, the A14 made the LS50s sound like much larger speakers, projecting lots of punch and impact that almost made me forget there's a lot of deeper bass in this song. The A14 was particularly good at reproducing percussion; at one point, the percussionist taps a cymbal very lightly, and the A14 reproduced the barely audible cymbal ever so convincingly. It was all there—the initial transient as the cymbal was struck, the sustain, and the decay as it gradually faded into inaudibility. This track, recorded at a low level, needed a volume setting of 81 to achieve normal playback level, leaving plenty of headroom. OK, so that's our benchmark for these pieces, let's see how they sound through other inputs.

A configuration I imagine will be popular with many readers would be the combination of the CD14 driving the A14. So I popped the test CD-R into the CD14 and started listening, first with the CD14's internal DAC. This is what you'd hear if you buy the CD14 to use with an amplifier that lacks an internal DAC.

"Just a Little Lovin'" lacked all the bass impact and slam I've heard from the high-resolution file. Lynne's vocals were mostly smooth and breathy, but, a couple of times, had a very slightly edgy sound.

On "Miserere" I heard more of this edginess when the main choral group sang. I had expected to hear it, if at all, when the solo tenor entered, but his part was clean as a whistle. The solo group was imaged at a greater distance behind the main group and the reverberant echo that occurs when they sing was more smeared. The soundstage was not as well defined as it was with the high-resolution file.

On "Folia Rodrigo Martinez" I again heard a slight edginess, and the bass had less impact than the original file.

Next, I switched to the DAC in the A14, connected to the SPDIF coaxial output from the CD14. In this configuration, I used the CD14 as a transport, connected via the digital output to the A14. I played the same CD.

On "Folia Rodrigo Martinez" the first thing I noticed was an increase in bass impact over the CD14 with its internal DAC. Then I noticed there was less edginess. Finally, I noticed that the piece sounded more open and spacious than the CD14 with its internal DAC.

Switching to "Miserere" the story was similar: less edginess for the main choral group, noticeably less smear in the reverberant echo when the distant solo group sang, and an overall more open soundstage, though not as well defined as on the high-resolution file.

On "Just a Little Lovin'" the bass descended deeper, though not as deeply as heard with the high-resolution file playback. There was a smidgen of the edginess left, but less than with the CD14 by itself. Percussion instruments were still realistically reproduced. I think these results tell us the DAC in the A14 sounds better than the one in the CD14.

Finally, I listened to files played from my laptop computer through the Bluetooth connection. I used the JRiver playback software, and instead of installing a driver for the DAC I installed a Bluetooth driver. The A14 then paired with that setup easily. Since Bluetooth wouldn't support high-resolution files, I converted the files to CD-quality WAV files using the dBpoweramp music-converter program.

On "Folia Rodrigo Martinez" I was surprised at the high quality of the sound. Previous experiences with Bluetooth playback using other components have left me unimpressed. But I heard very respectable sound quality from the Bluetooth connection, so much so that I wondered if part of my previous unfavorable impressions had stemmed from using an iPhone to play music. Could the use of the high-end JRiver software have made that much of an improvement? I heard powerful, impactful bass, as deep as any other source. Instrumental harmonics were accurately portrayed, and dynamics were accurately tracked. A very good experience.

Then I switched to "Miserere." As much as I'd like to report an equally good listening experience, I can't. Vocals sounded very slightly rough—first the main choral group, then the solo tenor. The solo group behind the main group sounded unfocused, and the reverberant echo was a bit smeared.

Wanting to hear another vocalist, I played "Just a Little Lovin'" and again heard a bit of roughness. As before, bass reproduction was quite respectable, and the instrumentals were fairly realistic, but once again Lynne's voice had an unfortunate edge or roughness. So I think Bluetooth has a way to go yet before it's equal to wired connections, though I was still amazed at how far it's come in the couple of years since I first tried it.

I also wanted to try the A14's mm phono section, but unfortunately, a couple of the evaluation tracks had no equivalent LPs; however, Shelby Lynne's *Just a Little Lovin'* did, so, of course, I used it. It exhibited the smooth, contin-

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uous sound typical of an LP, but also had a few pops and clicks, also typical of LPs. Although the bass did not extend as deeply as with the DSD version, it somehow sounded more realistic; although it's exciting, the digital recording probably overdoes the bass. The LP's bass seemed better integrated into the midrange. Microdynamics seemed to pop with a bit more energy. Lynne's vocals benefited from the analog smoothness.

Next I played a recording by the Emerson Quartet augmented by Mstislav Rostropivich of Schubert's String Quintet in C (Deutsche Grammophon Stereo 00289 479 4384) to get a feel for how the A14 handled a small instrumental group. The string sound was very smooth and continuous, harmonics were rich and accurate, and microdynamics were just right.

I'm not so sure I really determined how the phono input sounded so much as how LPs sound compared to digital. That said, I thought the phono section sounded deliciously expressive.

Comparison

I don't have anything available remotely similar to the A14, so going on memory I tried to compare it to the Yamaha A-S801 integrated amp I reviewed in Issue 263. The Yamaha was physically larger than the A14 and generated 100Wpc. Like the A14, it had an mm phono section and an advanced DAC. I used it with Yamaha's YBA-11 Bluetooth wireless adaptor, which gave it Bluetooth capability similar to the A14. Like the A14, the Yamaha had a built-in headphone amp, and similar features such as tone controls and a balance control; additionally, it had a loudness control, useful for maintaining frequency extension when listening at low volume levels. It also had direct connections for a CD player, bypassing all those features. But unlike the A14, which has all its features accessible through the menu, the Yamaha had separate knobs for each of those functions—which I found easier to access than a menu. And it only cost $899, $400 less than the A14—almost 30% less, for 100Wpc. I used only file-based playback to evaluate the Yamaha.

On "Folia Rodrigo Martinez" the Yamaha exhibited similar bass performance, but didn't quite capture the very light taps on the drum as well as the A14. The percussion instruments blurred into the background more than on the A14, but the *viola da gamba* was clearer on the Yamaha.

On "Miserere" the Yamaha was similarly free of brittleness, but the A14 was noticeably better at depicting the soundstage of this piece. On the A14, the small solo group behind the main group was reproduced with less smear in the reverberant echo. The Rotel's soundstaging was way above the norm.

"Just a Little Lovin'" saw the Yamaha produce an equal amount of detail and bass impact, but the A14 was a bit better at reproducing the delicate cymbal. The extra power of the Yamaha could be useful if you used it with less sensitive speakers, but both drove the KEF speakers easily. My memory of the Yamaha's sound is that it was more matter-of-fact than the A14's, which was delightfully tuneful.

Bottom Line

Rotel's CD14 CD player and A14 integrated amplifier show us that Rotel still deserves its reputation for affordable high-quality audio equipment. In these days when lots of manufacturers are talking about building their "last CD player," the CD14 is a fine performer at a modest price. Sounding good as a stand-alone unit, it showed even more promise as a CD transport. Because many integrated amplifiers now include high-quality DAC circuitry, using the CD player as a transport is a good way to step up the player's sound quality—just plug its digital output into the SPDIF input of the integrated. Rotel even supplies the SPDIF cable.

I was hugely pleased with the A14 integrated amplifier. One of the crop of modern integrated amplifiers with a very capable internal DAC and Bluetooth connectivity, it's ready to support virtually any source you might choose, even an mm phono cartridge, which sounded utterly delightful. With power a-plenty to drive most of the speakers you'd likely partner to, it's a superb choice for a modest audio system, whether for a beginner, an office, or a bedroom, or even for a main audio system. While I appreciated its long list of features, what really impressed me the first time I heard it was its sweet, musical sound which encouraged long listening sessions. Highly recommended. tas

Our Top Picks Integrated Amplifiers

NAD D 3020

$499

Truly a design for our times, the D 3020 is improbably small and portable and *loaded*. The 30Wpc D 3020 offers 24-bit/96kHz resolution USB computer audio and aptX Bluetooth music streaming. For all its humble size and appearance it's pure NAD. Firmly midrange-centered, it never over-reaches in the sense of growing shrill in one direction or tubby in another. Yes, its lighter overall balance is due to some bottom-octave attenuation, but the D 3020 retains an essential *presence*, a midrange integrity, that sculpts the body of a performance and makes it *live* in the listening space. Although there's a little bit of a shaded ceiling over the top end, the D 3020 need make no apologies. The other argument is, hello, $499—making it by most standards a small miracle of packaging and portability, and with a few exceptions a delight to use and listen to. (239)

Yamaha A-S801

$899

The Yamaha A-S801 may be inexpensive but its feature set is amazingly rich. There's a plethora of inputs: five line analog, plus a mm phono in, in addition to digital options. The parade of features continues with bass, treble, and loudness controls. And it's not like the features of this a 100Wpc integrated amplifier with an built-in DAC were just thrown in to impress; the A-S801 surprised reviewer Vade Forrester by how good it sounded driving the inefficient KEF LS50 speakers in his large-ish room. Optional Bluetooth connectivity expands the A-S801's functionality and appeal. The Yamaha A-S801 amplifier sounded sweet and smooth, particularly with vocals. A flaming bargain. (263)

Nuprime IDA-8

$995

Sonically and functionally, JM found plenty to love about the IDA-8. Essentially, it's a sleek-looking, small-footprint hybrid Class A/Class D integrated amplifier/DAC—that combines Class A warmth and resolution with Class D speed, power, and efficiency, and delivers both with remarkably low noise, thanks in part to ultra-low-noise JFETs in its input stage. Its DAC supports USB 384kHz/32-bit and DSD256, and is also capable of decoding DoP (DSD over PCM) via coaxial and optical inputs. NuPrime's SRC (sampling rate conversion) IC chip provides FPGA processing with ultra-low jitter and distortion. Though a touch dark in character (à la Class D), the well-conceived IDA-8 delivers substance with plenty of gusto—and does so from an astonishingly quiet background. It has a slightly digital-like sound in its detail resolution but doesn't cross the line into the overly analytical. Since NuPrime's founding, Jason Lim has continually sought to improve sonics through the application of innovative technologies—in addition to offering high performance and value with respect to pricing. The IDA-8 exemplifies this approach. Here's how Lim summarizes the IDA-8, "It is as if we combined the 'perfect' ST-10 and DAC-10H, made it sound like a high-end Class A amp, and brought the price down to $995." A great-sounding stone-cold bargain. (263)

Our Top Picks Integrated Amplifiers

Cambridge CXA80

$1099

Cambridge really stepped up its game with its suavely restyled and affordable CX Series. A rung above its lower-cost sibling, the CXA60, the dual-mono, Class AB, 80Wpc CXA80 is battle-ready for the digital world. Thanks to the CXA80's Wolfson 24-bit/192kHz WM8740 DAC chip, computer audio is as close at hand as the USB input, or use the front-panel jack for MP3 players. Although it mysteriously lacks a display, you'll get over it given the CXA80's smooth, relaxed sonics, and abundant headroom for demanding loudspeakers. Includes a full-function remote and headphone jack. (257)

Rotel A14

$1299

Rotel's A14 integrated amplifier show us that Rotel still deserves its reputation for producing affordable high-quality audio equipment. Reviewer Vade Forrester was hugely impressed with the A14. One of the crop of modern integrated amplifiers with a very capable internal DAC and Bluetooth connectivity, it's ready to support virtually any source you might choose, even a moving-magnet phono cartridge (which sounded utterly delightful through the Rotel). With power a-plenty to drive most of the speakers you'd likely partner to, it's a superb choice for a modest audio system, whether for a beginner, an office, or a bedroom, or even for a main audio system. While VF appreciated its long list of features, what really impressed him the first time he heard it was its sweet, musical sound which encouraged long listening sessions. Highly recommended. (273)

Hegel H360

$5700

The Norwegian firm's integrated amplifiers have always been overachievers, but the new H360 is, by a wide margin, Hegel's most impressive effort yet. With 250Wpc into 8 ohms (420Wpc into 4 ohms) and 50% greater current capacity than the H300 it replaces, the H360 is a powerhouse. But that power comes with Hegel's signature virtues of a gorgeous rendering of timbre, a completely relaxed and natural presentation devoid of electronic artifacts, and a spatial dimensionality that competes with expensive separates. To top it off, the integral DAC is outstanding—fully up to the quality of the amplifier. Throw in network connectivity and an innovative feature that allows you to upgrade the DAC section, and the H360 is clearly the integrated to beat at this price. (260)

Pass Labs INT-250

$12,000

A force to reckon with, the muscular INT-250—equipped with 250Wpc and 500Wpc into 4 ohms—embodies effortless dynamics, an ultra-wide bandwidth, superb low-end control and grip, along with effortless, unpretentious highs. Optimized for greater flexibility to pair with grunt- worthy speaker loads of 86dB efficiency or less, its soothing and seductive sonics make it an ideal companion for analog LP playback; the amp just makes you want to spin vinyl endlessly. Remarkable, too, is the INT-250's Falstaffian, lush midrange that pushes a loudspeaker to the very edges of its performance envelope. With musicality that is second-to-none it operates at the outer limits of what's currently possible in today's integrated amplifier marketplace. (263)

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Equipment Report

Audio Alchemy DDP-1, DPA-1, and DPA-1M

Value City

Robert Harley

Audio Alchemy blazed a trail in the 1990s with a range of ultra-low-priced products housed in utilitarian cases with no cosmetic frills. The products were almost toy-like in appearance and name—the $199 DAC-in-the-Box, for example—but contained solid engineering inside. If you could overlook the Spartan casework, Audio Alchemy products delivered exceptional performance for the money. I reviewed quite a number of these components in the mid-1990s and found them to be excellent. Audio Alchemy folded in the late 1990s, probably because it didn't build enough profit into the products' retail prices.

But that was then and this is now. The company is back, headed by industry veteran Peter Madnick, the design talent behind the original Audio Alchemy (and many products from other companies). Audio Alchemy has retained the same value orientation as before, but this first wave of products from the new company is a far cry from the black stamped-metal chassis and faceplates of the original. Instead, the new company's first offerings boast upscale casework, an extensive and modern feature set, and more ambitious engineering.

The products reviewed here are the $1995 DDP-1 linestage preamplifier/DAC/headphone amplifier, along with the $1995 DPA-1 stereo power amplifier and $1995-each DPA-1M monoblock amplifiers. All are housed in compact chassis of the same size and shape, their rounded edges and satin-silver finish exuding a decidedly upscale vibe.

The DDP-1's front panel is dominated by two large knobs, one for volume and another for input selection as well as navigating the menus. The oval display shows the input selected, the volume setting, whether the unit is locked to a digital source, the digital filter selected, and whether "resolution enhancement" is engaged (more on these features later). Four small buttons provide additional controls, including mute, selecting between headphone output and preamplifier output, and back/enter buttons that are used in conjunction with the menu/input selector knob. An 1/8" headphone jack, a feature that for many years all but disappeared from preamps but is now mandatory, adorns the front panel. The power button just below the display rounds out the controls. A well-laid-out remote handles nearly all the DDP-1's functions.

The outboard power supply, a little larger than a "wall wart," can be upgraded to a more sophisticated supply, the $595 PS-5 Power Station. The PS-5 is housed in a chassis that matches aesthetically with the DDP-1, "nesting" into that unit's curved side panel. It offers independent supplies for the DDP-1's analog and digital circuits, more elaborate voltage regulation, and more filter capacitance. Audio Alchemy claims that the PS-5 offers lower noise and wider dynamics than the stock supply.

The DDP-1's sensible array of controls and buttons, its feel, and the display itself are all superb—this is one well-thought-out user interface. The display's source-selection is unique; as you scroll through the list of inputs, the one selected becomes larger in type size. The remote is also outstanding; your index finger naturally falls on the volume up/down buttons. Even the volume-control ballistics are perfectly dialed-in; I could quickly make large volume changes, yet had fine control once I was in the ballpark. Moreover, the chassis' industrial design and metalwork are far above what's

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expected at this price. The compact package, with the rounded edges and satin-silver finish, is extremely attractive, and a welcome departure from the less inspired chassis work of competing products. My only complaint is that the front-panel markings are white against a silver panel, with almost no contrast. Between the low contrast and the small type, the text is difficult to read. There are, however, so few controls that it doesn't take long before you're operating the DDP-1 without need for the legends. Audio Alchemy reports that they are increasing the contrast of the lettering, which, incidentally, is laser-etched in the front panel. No channel-balance control is provided.

The DDP-1 offers two unbalanced inputs on RCA jacks, one balanced input on XLR jacks, and an extensive array of digital inputs. These include AES/EBU, two TosLink optical, two coaxial, USB, and even I2S. The USB input accepts PCM up to 216kHz/32-bit along with DSD64. The other digital inputs accept PCM only (also up to 216kHz/32-bit). Mac users can connect to the USB input and start playing music. Windows users must download a driver. You can select from four digital filters, including an apodizing filter. (To recap, an apodizing filter shifts the filter ringing in time so that the ringing occurs after the transient, rather than before and after the transient. This is an important distinction, because in nature we never hear part of a transient signal's energy *before* the transient itself. This filter "pre-ringing" is particularly deleterious to music, and contributes to the glassy hardness of textures and flat soundstaging of most digital. In my experience, there's a slight penalty in bass tautness and definition with apodizing filters, but it's a worthwhile tradeoff.)

Through the front-panel display and controls, you can select any one of the filters as the default for a particular input. Similarly, resolution enhancement can be turned on and off for the individual inputs. The front-panel "Enh" legend turns green when resolution enhancement is on, red when off (see sidebar for more detail on resolution enhancement).

An important consideration when buying a DAC today is whether the its software can be updated to decode Master Quality Authenticated (MQA). I've written extensively about this new technology (Issues 253 and 261) that greatly improves digital sound quality. Because the DDP-1 is a purely software-driven product that runs on two XMOS general-purpose DSP chips and a field-programmable gate array, it may be possible that the DDP-1 can up updated to offer MQA decoding. Although Audio Alchemy hasn't committed to this possibility, it's worth noting that the demonstration board MQA has provided to manufacturers runs on the same XMOS chip used in the Audio Alchemy DAC, and that the Alchemy's software can be updated via the read-panel micro-USB port.

Overall, the DDP-1 is a highly capable and versatile centerpiece of a system that's a pleasure to use on a daily basis.

Looking next at the DPA-1, this stereo power amplifier delivers 125Wpc into 8 ohms and 200Wpc into 4 ohms. The front panel offers more features than are traditionally found on power amplifiers, including selectable gain (a +6dB button), clipping indicators, a mute button, and soft-start warm-up. Both balanced and unbalanced inputs are provided, and the binding posts are of high quality. A 12V trigger input allows connection to the DDP-1 (or other product with 12V trigger output) so that powering on the DDP-1 automatically powers on the amplifier as well. The DPA-1M is simply a monaural version of the same amplifier, delivering 325W into 8 ohms and 400W into 4 ohms. At the most recent CES, Alchemy announced the DPA-2 stereo amplifier with 250Wpc ($2995). The company also showed the matching PPA-1 phonostage and the Roon-ready DMP-1 Media Player, both of which are $1795.

The amplifier features a Class A input stage

SPECS & PRICING

DDP-1 Linestage Preamplifier/DAC and Headphone Amplifier
Analog inputs: One balanced, two unbalanced
Analog outputs: Balanced on XLR jacks, unbalanced on RCA jacks, 1/8" headphone jack (plus 12V trigger)
Digital inputs: Coaxial (x2), TosLink (x2), USB, I2S (additional micro-USB for software updates only)
Digital format supported: Up to 192kHz/24-bit on all inputs, plus DSD64 on USB input
Digital filtering: Custom, with four user-selectable filters
Outputs: Balanced and unbalanced
Headphone amplifier power: 1W into 32 ohms
Input impedance: 50k ohms
Output impedance: 75 ohms
Channel separation: 100dB (digital input), 130dB (analog input)
Dimensions: 10.5" x 3" x 11.6"
Weight: 8 lbs.
Price: $1995

PS-5 Power Station (for DDP-1)
Dimensions: 5.5" x 3.5" x 11.6"
Weight: 9 lbs.
Price: $595

DPA-1 Stereo Amplifier
Output power: 125Wpc into 8 ohms, 200Wpc into 4 ohms
THD: 0.05%, 1W into 8 ohms
Input impedance: 100k ohms
Output impedance: 0.06 ohms
Gain: 20dB or 26dB (switchable)
Channel separation: 80dB
Dimensions: 10.5" x 3" x 11.6"
Weight: 16 lbs.
Price: $1995

DPA-1M Monaural Power Amplifier
Output power: 325W into 8 ohms, 400W into 4 ohms
THD: 0.05%, 1W into 8 ohms
Input impedance: 100k ohms
Output impedance: 0.06 ohms
Gain: 20dB or 26dB (switchable)
Dimensions: 10.5" x 3" x 11.6"
Weight: 16 lbs. each
Price: $1995 each

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built from discrete FETs, the same topology found in expensive amplifiers. Most amplifiers at this price rely on op-amps rather than discrete circuits. The output stage is Class D, which explains the DPA-1's compact size and light weight—the amplifier weighs just 16 pounds. Specifically, the output stage is a Hypex UcD module, designed by Bruno Putzeys. The DPA-1M monoblock simply bridges two of these modules for greater output power.

From first impressions, these new products from Audio Alchemy appear to be quite a step up from those of the company's first incarnation.

Listening

I was eager to review the new generation of Audio Alchemy products for several reasons: I was a fan of the company's earlier offerings; I have great respect for the design talents of Peter Madnick; and most importantly, I heard the DDP-1 and DPA-1M sound amazingly great in very-high-end systems at several shows. One of those show systems (Munich) featured TAD CR-1 loudspeakers (perhaps the best stand-mount speaker extant) and another (Rocky Mountain) showcased the Alchemy products with the outstanding Wilson Sabrina speakers. The Alchemy gear more than acquitted itself in this illustrious company.

Speaking of illustrious company...I dropped the DDP-1 (with the PS-5 supply) and a pair of the DPA-1M monoblocks into my reference system. After three days of warm-up, I began by listening to LPs, driving the DDP-1's balanced analog input, with the DPA-1M monoblocks powering Magico Q7 Mk.IIs. I was immediately impressed by the Alchemy's sonic virtues and ability to communicate the music. The sound was remarkably transparent, clean, dynamic, and resolved by any measure, and even more so considering the components' reasonable price.

The Alchemy products threw a large and well-defined soundstage, with outstanding depth, dimensionality, and separation of individual instrumental lines. On "Mars" from *The Planets* (Mehta, LA Philharmonic, Decca), the insistent snare drum that drives the rhythm was well back in the stage, with a real sense of air and space around it. The call-and-response lines of the tenor tuba and trumpet were well differentiated from each other and from the rest of the orchestra. The sense of size and scale was outstanding. Other hallmarks of the products were clarity and transparency—the sense of nothing between you and the music. The soundstage lacked the veiling that diminishes the sense of realism of instruments at the back of the stage.

With smaller-scale music, the Alchemy electronics showed that they were transparent enough to reflect a recording's spatial character. Intimate music, like Joni Mitchell's *Blue* (LP reissue), was rendered with the appropriate sense of presence and immediacy.

Perhaps the most salient characteristics of the DDP-1 and DPA-1M, however, were powerful rhythmic drive, wide dynamic expression, and rock-solid visceral grip in the bottom end. The timpani in "Mars" was taut, powerful, deep, and dynamic. Bass guitar had a solid feel that was simultaneously full and tight, combining timbral warmth and body with outstanding pitch definition and articulation. Kick-drum cut through the mix with a solid impact. Switching to the less powerful DPA-1 stereo amplifier, I heard no reduction in dynamic range, bass control, or bottom-end extension, at least driving the 94dB-sensitive Magico loudspeakers. (Less sensitive speakers may benefit from the monoblocks' greater output power.) Both the stereo and the mono versions of this amplifier sounded like indefatigable powerhouses, with plenty of dynamic headroom. I never heard the amplifier soften the bass, harden textures, or congeal the soundstage, no matter what the playback level or how demanding the music.

This powerful rhythmic expression wasn't just the result of terrific bass grip and definition. The DDP-1 and DPA-1 excelled at portraying transient information, such as drums and percussion. The Alchemy electronics were fast and dynamic, qualities that brought to the fore subtle rhythmic nuances by great drummers, allowing their kits to take on a lifelike quality. The contribution from the great Roy Haynes on the track "Windows" from the album *Like Minds* (Gary Burton, Chick Corea, Pat Metheny, Dave Holland, and Haynes) was highlighted by the Alchemy electronics. On the track "Helena" from Gary Burton's *Guided Tour,* drummer Antonio Sanchez (who, incidentally, composed and performed the soundtrack for the film *Birdman*, for which he won the Academy Award in 2015) lets loose with a *tour de force* solo that was well served by the Alchemy's outstanding speed and immediacy. Similarly, the timbales on the outstanding Mobile Fidelity reissue of Santana's *Abraxis* fairly jumped from the soundstage as though they were recorded yesterday.

When listening to LPs, I thought the overall sound was a bit laid-back in the midrange to the lower treble, with vocals slightly recessed in the mix. The DDP-1 and DPA-1Ms were at the other end of the sonic spectrum of electronics that are bright and forward in this region. This was a good sign, because I've selected for these qualities in my LP front end (Basis Inspiration turntable with Basis Superarm 9 and Air-Tight PC-1 Supreme cartridge), which leans toward a less incisive rendering than many vinyl playback systems. I'm no fan of moving-coil cartridges that are tipped up in the treble or that hype detail. In other words, the DDP-1's linestage section and the DPA-1M sounded like my LP front-end sounds; the Alchemy electronics managed to pass along the LP playback system's character with very little editorializing. This level of transparency to sources in a product of this price is remarkable, particularly when considering the quality of the LP front-end and the resolution of the Magico Q7 Mk.II speakers. These reference-grade components would have laid bare any added brightness, hardness, opacity, or reduction in dynamic expression.

When I switched to a digital source (the Aurender W20 via USB) and was listening to the DDP-1 as a DAC and preamplifier, all the virtues mentioned were present, but now the music had greater verve and illumination. The sound was a bit more immediate and upfront, reflecting the DAC's character compared with that of my turntable. It didn't take a lot of careful listening to realize that the DDP-1's DAC is spectacular—highly resolved, open, transparent, and extremely dynamic. The DAC is very lively and incisive, with a full measure of detail. As with the DPA-1 amplifier, the DDP-1's DAC excels at reproducing transient information, from the micro to the macro. The

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DAC's sound can be fine-tuned through filter selection; I opted for Filter 4, which has a more "gentle" sound than the other three.

The DAC's sound could be improved by engaging the resolution enhancement feature described earlier (and in the sidebar). Turning on resolution enhancement seemed to make the overall perspective a little less immediate and upfront, as though the entire stage moved back slightly. Put another way, engaging resolution enhancement was like moving from Row G to Row M. Resolution enhancement better resolved the space around individual instruments, and soundstage width and depth expanded. Reverberation tails were longer and better defined. On the 44.1kHz/16-bit recording *Aras* by the band Curandero, the first track begins with some sharp percussion work. Engaging resolution enhancement not only expanded the space around the percussion, but I could hear more detail and texture in the drumhead's decay, and more resonance of the air within the bodies of the drums. On the track "Switchback" from Jesse Cook's *Free Fall*, the multiple rhythm acoustic guitars behind the lead guitar were more clearly distinguishable as individual instruments, and they had a more immersive sound. That is, the soundstage was more continuous horizontally, with less impression of sound coming from two loudspeakers. The background guitars were also farther back in the mix, increasing soundstage depth. The intricate horn and woodwind lines in the contemporary big-band music of Gordon Goodwin were more clearly resolved. Resolution enhancement also benefited the Alchemy's rendering of timbre, which was a little smoother, particularly in the upper midrange. Overall, resolution enhancement contributed significantly to my view that the DDP-1's DAC section is not only terrific in an absolute sense, but nothing short of amazing in a $1999 full-featured preamplifier.

Finally, I'll comment on the PS-5 power supply and the differences between the stereo and mono amplifiers. Compared with the stock power supply, the PS-5 vaults the DDP-1 into a different league. The sound with the PS-5 is more refined, spacious, and detailed. Instrumental textures are more liquid and natural. The upgraded supply also gives the sound much greater dimensionality, with a heightened sense of layering and depth, along with more air between instrumental images. I auditioned the DDP-1 only briefly with the stock supply because the sound was so much better with the PS-5. My description of the DDP-1's sound is with the PS-5. It's a worthwhile upgrade.

The DPA-1 stereo amp gives up nothing in sound quality to the monoblocks, except output power. The DPA-1's 200W into 4 ohms was plenty of power for the 94dB-sensitive Magico Q7 Mk.II. In fact, I never saw the clipping LEDs illuminate, even at high listening levels. Of course, if you're driving loudspeakers of lower sensitivity the additional power provided by the monoblocks will come in handy, but don't jump to the conclusion that you need the monoblocks. The cost difference between the complete package (a DDP-1 with its power supply) with the stereo and mono amps is $4600 vs. $6600—quite a jump. The best way to tell if the DPA-1's output power is enough for your

DDP-1 Tech Tour

The DDP-1 incorporates a number of advanced technologies and circuit topologies that reveal its ambitions as a high-end product. First, the entire analog signal path is based on discrete Class A circuits rather than op-amps. On the digital side, the DDP-1 features dual AKM DAC chips in a proprietary configuration that reportedly increases dynamic range. The filtering and digital processing is performed on a pair of XMOS general-purpose DSP chips, followed by a field-programmable gate array. These DSPs perform the digital filtering and resolution enhancement.

The digital input stage is built around a dual phase-locked loop (PLL) architecture, a technique pioneered by Alchemy more than 20 years ago. The first PLL locks to the incoming data; the second PLL locks to the first PLL and generates the clock. This technique isolates jitter in the incoming data stream and creates a low-jitter clock that serves as the timing reference for the digital-to-analog converters.

One of the original Audio Alchemy's most ambitious and successful products in the mid-1990s was the DTI-Pro (and later, the DTI-Pro 32) that offered a "resolution enhancement" technology. The DTI-Pro was a purely digital device that was inserted between a CD transport and a DAC, allowing the user to selectively increase the DTI-Pro's output word length to 18 bits, 20 bits, or 24 bits to match your DAC's capability. When the DTI-Pro was introduced, digital-to-analog converters varied in how many bits they could handle. DACs with the Yamaha input receiver truncated incoming data to 16 bits, which introduces significant distortion. Those with the NPC digital filter truncated to 18 bits. DACs with the Pacific Microsonics PMD100 filter could handle up to 24 bits, but in some implementations, the DAC's architecture provided a data path of only 16 or 18 bits. The DTI-Pro thus allowed you to select the appropriate output word length for your particular DAC.

But in today's world, 24-bit (or wider) data paths and DACs are standard. The DDP-1's data path is 32 bits wide, and the AKM DAC can accept 32-bit input words (this doesn't mean that it has 32-bit resolution). The DDP-1's resolution enhancement algorithm knows this and redithers the data to 32 bits for input to the DACs no matter what the word length of the incoming data.

The resolution enhancement is most effective on data coming in on the USB input, and less so on the other digital inputs. Audio Alchemy is working on a software update that will apply resolution enhancement equally across all digital inputs.

Incidentally, the resolution enhancement in the DDP-1 was designed by Keith Allsop, who created the original resolution-enhancement algorithm for the DTI-Pro more than 20 years ago. He and Peter Madnick have worked together continuously since that time. Finally, it's worth noting that the DDP-1's DSP horsepower is greater than ten times that of the DTI-Pro.

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loudspeakers, room size, and listening levels is to borrow one from your dealer and try it. There's simply no substitute for auditioning an amplifier in your own system.

Conclusion

These new products are a far cry from the Alchemy of yore, with much more advanced engineering, upscale casework, and a superb user interface. The DDP-1 and DPA-1 bring terrific sound and stunning value to the category. As a linestage, the DDP-1 is amazingly clean and transparent. Unlike most electronics of this price, the DDP-1 doesn't add a patina of electronic hardness over instrumental timbres. Nor does it add opacity to the soundstage or compress dynamics. The DDP-1's DAC section is simply sensational; this level of sound quality would be outstanding in a $4000 stand-alone DAC. Clarity, openness, detail, and exceptional dynamics define the DAC's performance.

The DPA-1 stereo amplifier and DPA-1M mono amplifiers are no less impressive. Their wide dynamics, terrific grip in the bass, and upbeat sonics made them a joy to listen to. Moreover, the amplifiers possess the same level of clarity and resolution as the DDP-1. Significantly, the amplifiers don't exhibit the shortcomings I've heard in previous Class D designs. Even in the context of reference-quality sources and loudspeakers, it was easy to forget that I was listening to electronics that aren't stratospherically priced.

The return of Audio Alchemy is welcome news for those seeking the highest possible price-to-performance ratio in electronics today. tas

Equipment Report

NAD Masters Series M12 and M22

Sensible but Serious

Neil Gader

NAD electronics has been marching down audio's red carpet for years, picking up awards and accolades from high-end journalists and customers alike. Its classic BEE line—all buttons and knobs, and blue collar to the core—is still being turned out in sturdy but sensible, olive-gray stamped enclosures. Outward frills are kept to a minimum, and that's always been NAD's point. It's the sonic thrills rather than the visual bells and whistles that customers have come to expect, and that keep them coming back.

The Masters Series represents the more uptown side of NAD. Stylish and sophisticated, this is a company flexing its technical muscles while preserving the underlying value it is famous for.

In case your experience with NAD electronics ended with the original, circa-1978 3020—the modest integrated amp that addicted many a young audiophile to this hobby—you'll be in for a big surprise. The latest generation Masters Series (the originals were introduced in 2005), as embodied in the M12/22, is unreservedly gorgeous. The aluminum casework is elegantly crafted. Its shiny black, accented front panel and vented top plate are sumptuous to the eye and the touch. Both units are powered-up via a recessed top-mounted switch. The M12's large, readable touchscreen display easily handles functions normally left to a small army of buttons and toggles. The only vestige of a bygone era is the nicely weighted rotary volume knob. For that, let us all give thanks.

The M12 is a preamplifier/DAC—a high-end segment that has been growing in leaps and bounds. Like the M2 Direct Digital Amplifier, and more recently the C 390DD, the M12 employs its own "Direct Digital" 35-bit processing technology, thereby circumventing all analog stages in the signal path. Music remains in the digital domain through the preamp. By NAD's reckoning this eliminates the phase shift, noise, and distortion of many analog designs.

Before I describe back-panel connectivity, a word or two is needed about a unique feature of the M12 architecture. NAD calls it "Modular Design Construction" or MDC, and it looms large in the Masters Series. MDC uses replaceable cards that fit into slots on the M12's back panel, essentially making the unit future-proof as upgraded features become available. The M12 back panel has slots for three additional modules. Currently one such MDC option is the DD HDM-1 HDMI module with three inputs and one output (3D video pass-through). My M12 review sample, however, was outfitted with the optional DD BluOS network-audio module, which permits streaming of various music services like Tidal and TuneIn radio, plus high-resolution PCM files (no DSD yet) from a NAS device or local USB HDD/SSD. The NAD Controller App (from the iTunes App Store) manages a music library and can be controlled with an iOS or Android device. The card includes integrated WiFi/Ethernet and aptX Bluetooth connections for hi-res streaming from a smartphone or tablet. For Millennials this module is likely a must.

Even without the DD BluOS module, standard M12 connectivity is excellent. The back panel is densely populated with inputs, including AES/EBU, asynchronous 24-bit/192kHz USB Type B, coaxial digital, and optical digital, along with balanced and single-ended line-level. There

Equipment Report NAD Masters Series M12 and M22

are also front and rear USB-A inputs capable of 24-bit/48kHz resolution. Additionally there's a pure Class A buffer using the newest generation of "Super OP Amps" to provide low-impedance balanced and single-ended connections to power amplifiers or active loudspeakers. Also resident is an mc/mm phonostage module with settings for both moving-magnet (mm) and moving-coil (mc) cartridges. Gain is set automatically. Vinyl lovers should keep in mind that with Direct Digital processing a 24/192 ADC will convert the analog signal to digital, automatically setting the gain for the best resolution and lowest noise. The included remote control handles all functions quite capably.

Master Stroke

NAD describes the M22 as a hybrid digital amplifier. Output is rated at 250Wpc into 8 ohms, and >650W into 2 ohms. In NAD's words, the M22 "uses the latest nCore amp technology licensed from Hypex." Further refinement of the UcD concept (Bruno Putzeys was its inventor) has yielded distortion that in NAD's words is now "below measurement, [providing] an ultra-high damping factor and unconditional stability with any speaker." Additionally, the M22 is DC coupled throughout, from input to output. There is no capacitor in the signal path. The power supply is a custom switch-mode design, while secondary supplies are individually regulated and decoupled at each op-amp to maximize dynamic range and lower noise. The M22 employs NAD's latest generation of digital Power Drive, which automatically senses the speaker's impedance and adjusts and controls the amp's power envelope to more efficiently drive that particular load.

Getting Up and Running

The touchscreen menus are well-organized. The main screen lists the input and volume settings in large script, while smaller shaded boxes indicate current preferences. Settings include: Mode for polarity, reverse, and mono and stereo options; EQ for treble, bass, and balance; and a disable option. Setup is divided into four subsections: Source for renaming inputs; Digital Output for selectable sample rate; Control Setup for IR and auto-standby options; and Speaker for adding and optimizing a subwoofer in a 2.1-channel configuration (including a second-order high-pass and low-pass crossover with selectable frequency).

Activating the DD BluOS module was as simple as connecting an Ethernet wire to the LAN connection. The NAD Controller App instantly recognized my WiFi network from my iPad Air 2. Logging in to TuneIn was easy, but finding my Synology NAS was another matter.

Fortunately NAD is sympathetic to the plight of the computer-phobic, and aware of the fact that hooking up an existing NAS with a DAC/renderer can be a bit of a nail-biter. It offers a couple of helpful options if you get stuck (as I did). First there's online help at support.bluesound.com, where I searched for instructions and found (Eureka!) the document titled "Synology NAS and Network Discovery Configurations." Alternatively you can email (as I did) to support@bluesound.com. I got a swift response, and within about five minutes, was up and running. In my particular situation the fix was easy—I needed to enable "Guest Access" from the Synology in order for it to broadcast its shared folders to BluOS. Not a big deal, but NAD's help probably saved me hours of fruitless fiddling.

Sonically the M12/M22 system will remind NAD followers that there is a bloodline here. These components remain true to NAD values in the way they prize midrange neutrality and integrity, yet also throw hints of warmth and richness into the mix. However, the M12/22 begins to depart from NAD tradition in subtle but important areas. Particularly rewarding is its broader, more crisply defined sound at the frequency extremes, where earlier NAD amps often softened up just a little bit. As I listened to *Nojima Plays Lizst* [Reference Recordings], the greater extension and air that the Masters separates brought to this recording were striking. Harmonics seemed to radiate and rise into the soundspace without a ceiling hanging over them. There was a stronger bell-like quality to hard stabs of the keyboard, and greater fluidity to the lighter touch of Nojima's arpeggios. Importantly, the top-end and the midrange sounded seamlessly co-joined. There was no sense of treble information "kicking in" suddenly. This benefitted resolution in countless ways. Low-level details were conveyed with superior clarity, which enhanced my ability to locate instruments within the mix. The M12/M22 also provided a level of immediacy that further enlivened recordings. Familiar singers such as Holly Cole and Norah Jones were reproduced with an intimacy that made me feel like a fly on the wall of the recording studio. Perhaps because of the Masters Series' improved micro-dynamics, transient speed, distortion, or all three in combination, I found a jaunty playfulness in the 24-bit/96kHz version of Malcolm Arnold's *Sussex Overture* that I haven't always heard in the past. This well-known bon-bon, overflowing with orchestral humor, color, and contrast, needs a similarly acrobatic system to let it blossom.

While the NAD duo maintains a solid grip on the midrange, imaging and soundstaging have also firmed up. I've been listening a lot to tracks from the LP VHS from the alternative band X-Ambassadors (including the hit "Ren-

SPECS & PRICING

M12 Preamp/DAC
Inputs: SPDIF (x2), TosLink (x2), AES/EBU; analog RCA, analog XLR; phono and BluOS
Optional outputs: Two digital, SPDIF/TosLink; analog RCA and XLR
Outputs: Two digital, SPDIF/TosLink; analog RCA and XLR
Dimensions: 17.1" x 5.25" x 15.1"
Weight: 32 lbs.
Price: $3499

M22 STEREO POWER AMP
Power output: 250Wpc into 8 ohms
Inputs: RCA and XLR
Dimensions: 17.1" x 4.1" x 14.9"
Weight: 33 lbs.
Price: $2999

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Equipment Report NAD Masters Series M12 and M22

egades"—an alt chart-topper). The quartet is led by lead singer, co-writer, and multi-instrumentalist Sam Harris. His brother Casey adds keyboards. Fronted by Harris' full-throated baritone, which can leap between a rich, chesty timbre and an angelic falsetto, the band serves up jousting polyrhythmic tracks with chant-like backgrounds. Soundspace plays a large role in many of these arrangements. Like the negative space in a photograph, the songs live within their ambient minimalism, with low-level contrasts and pauses followed by strong, explosive, colorful hooks and choruses.

The Masters Series' bass response was startling. It's bold and extended with an iron-fisted grip that not only sounded deep during Copland's *Fanfare for the Common Man* [Reference Recordings], but which also provided superior pitch definition and tunefulness. In a large measure, this system represents the maturity of Class D bass. Many will remember that even in its earlier iterations, Class D bass response, though its key strength, produced textures and timbre that were often homogenized and overly controlled. The NAD system allowed me to hear more of the dynamic contrasts and harmonic complexities that define the timbre of a bass drum or a tympani or a tom-tom. A prime example of M12/22 capability was the seemingly infinite amount of expression and color that five-string double-bassist Renaud Garcia-Fons [Solo: The Marcevol Concert] manages to snap, pluck, or bow from his instrument—from rattling percussiveness to soothing, lullaby-like fluidity.

So how does the NAD duo stack up in the company of a couple of integrated amps from the "old guard," such as the Pass Labs INT-250) or my current reference, the MBL C51? An amp like the Pass will reproduce ambient and reverberant space just a bit more vividly. It edges the M12/22 in the specificity of individual images, too—chorus members achieved an added level of focus, for example, during Rutter's "Praise Ye the Lord." The MBL, on the other hand, is all about the sweetness of upper-octave piano and violin, and the air riding above the harmonics. During Peter Gabriel's "Don't Give Up," it has superior resolution of the delicate percussion accents, the ride cymbal, the Kate Bush vocal (of course), and the bouncing bass patterns and synth pads. The NAD often matched the Pass and MBL in bass performance, particularly in grip and pitch definition. The Pass had the darker, weightier signature; the MBL was a bit warmer overall. But all three integrated amps graced the music with convincing timbre and bloom. In sum, the NAD held its head high in this exalted company. Very high.

Once upon a time, NAD gear was thought to be great entry-level componentry but ultimately a stepping stone to something more fabulous and more refined from some other maker. Not so fast, and not this time. The NAD Masters Series M12/M22 combo proudly holds its own in pretty much any company. And it scores points at all levels—refinement of sound, classy execution, and cool, cutting-edge modularity that gives it attractive and sensible "have-it-your-way" appeal for the old guard and the network-savvy alike. Sensible, serious, masterful. tas

Equipment Report

Constellation Inspiration Series 1.0 Linestage, 1.0 Stereo, and Mono 1.0

Progeny

Robert Harley

I get more reader letters complaining about the prices of some of the products we review than on any other topic. Six-figure amplifiers are bound to offend many sensibilities. But I'm about to demonstrate how the development of those cost-no-object components can benefit music lovers of more modest means.

Exhibit A is the new and relatively affordable Inspiration Series electronics from Constellation. You may recall that back in 2008 this newly formed company launched a no-holds-barred assault on the state of the art in solid-state amplification by assembling a team of the world's greatest electronics designers—a "constellation" of audio stars, if you will, that included Peter Madnick, Bascom King, the late James Bongiorno, John Curl, and Demian Martin. They were given a mandate to do the best work of their illustrious careers without regard for time or cost. No idea, design, or implementation, however expensive or exotic, was off the table.

The result of that effort was the $65,000 Altair preamplifier and $140,000-per-pair Hercules monoblock power amplifiers. The design and execution of these electronics were beyond heroic. To give you but a single example, the Altair's volume control attenuated the signal by inserting in the signal path a single resistor—without any mechanical connections or relays. This feat was achieved with an elaborate circuit that involved 48 pairs of light-dependent resistors, corresponding LEDs, and a DAC, all under software control. (I could have cited any number of additional cutting-edge circuits developed for the Reference Series—this was clearly a landmark effort.)

So how did the Reference Series sound? In my review in Issue 215, I concluded, "Constellation has established a benchmark against which all other linestages and power amplifiers can be compared."

Constellation followed that success with the Performance Series that included the $24,000 Virgo preamplifier and Centaur power amplifier ($24,000 stereo, $54,000 monoblocks). The Virgo and Centaur employed the same circuitry as the Altair and Hercules, but in less elaborate implementations. The Performance Series delivered a surprising degree of the Reference Series' magic at a still high, but less-than-stratospheric price. The Virgo II and Centaur monoblocks sound so good that I've used them in my system for most of the past year driving the Magico Q7s.

Looking back now, I can see that the development of the Altair and Hercules wasn't purely intended to sell $65,000 preamps and $140,000 power amps. Rather, Constellation wanted to create platforms for discovering optimum circuit topologies and to establish a performance benchmark. Once created, the reference-level

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Constellation Inspiration Series 1.0 Linestage, 1.0 Stereo, and Mono 1.0

products would inform more affordable implementations that would be accessible to a wider audience. In my view, the ultimate goal of the Altair and Hercules design project was the Inspiration Series reviewed here.

It sounds simple in theory, but creating a successful trickle-down model is easier said than done. It requires that the initial development effort produce components that are truly world-class—which is far from a given. Then the reference-level products must sell in sufficient numbers to sustain the company. Finally, the firm's founders must possess long-term vision, not to mention adequate capitalization. But when it works, trickle-down engineering can bring to mid-priced products the essential DNA of cost-no-object components.

The three products in the Inspiration Series are the Preamp 1.0 linestage ($9000), Stereo 1.0 stereo power amplifier (200Wpc, $10,000), and Mono 1.0 monoblock power amplifiers (400W, $20,000 per pair). Although not budget-priced by any stretch, Constellation products at these prices represent quite a breakthrough. This is particularly true when you consider that the Inspiration Series uses exactly the same audio circuits designed for the Altair and Hercules. The $9000 Preamp 1.0's schematic (and even the audio circuit-board layout) is identical to that of the $65,000 Altair (and to the Virgo). The Stereo 1.0 and Mono 1.0 amplifiers employ the identical topology as the Hercules, along with many of the same components, including the transistors in the input, driver, and output stages. The cost savings are realized with simpler implementations of the same fundamental platforms. The circuit design isn't what's expensive in an audio component (after the R&D has been amortized), so why not use the best topology at every price level? I don't think I've encountered an example of trickle-down engineering in which the progeny hews as closely to the parent as it does here (see sidebar for details).

Even the Inspiration's styling, build, and visual aesthetic come close to those of the Performance and Reference Series. I had the $24,000 Virgo II and $9000 Preamp 1.0 in my rack at the same time, and sometimes had to do a double-take to know which was which. A closer look, however, reveals some clever techniques for saving money on the casework without diluting the aesthetic. The Preamp 1.0's front panel, for example, is flat rather than sculpted, and the aluminum case is smooth instead of rippled. The same is true for the visual difference between the Centaur power amplifier and the Stereo 1.0. Yes, the Performance Series has a more upscale look, but if you didn't see the Inspiration side-by-side with it, you could easily believe that the Inspiration preamp and amplifier carried Performance Series price tags.

I'm in the fortunate position of having had Reference, Performance, and now Inspiration electronics in my home for extended auditions. Although the Reference Series was returned a long time ago, I still have the Virgo II preamp and Centaur monoblocks on-hand for direct comparison with Inspiration. It's been fascinating to hear how Constellation has taken that original groundbreaking design and translated it into products that cost a fraction of the originals. Consider that the Inspiration Stereo 1.0 is just 7% of the Hercules' price. But how much of what made the Reference Series so special ended up in Inspiration?

Quite a bit, it turns out. For starters, the fundamental "Constellation sound" survives intact down the line. By "Constellation sound" I don't mean a set of easily identifiable colorations. Rather, I'm referring to the brand's most salient and salubrious sonic qualities. First among these is the extraordinary transparency—the impression of hearing back through the playback and recording chains to the original musical event. The Constellation electronics have so little opacity that it's as though I could sense the air in the room in which the music was performed. The second defining character of Constellation electronics has been a treble presentation that's unique among amplifiers, in my experience—exceedingly highly resolved yet exceedingly delicate and refined.

This combination of transparency and resolution without etch that defines the brand was readily apparent in all three Inspiration products. I have so much experience with Constellation that there was no mistaking the Inspiration's crystalline transparency and openessfor

SPECS & PRICING

Preamp 1.0
Inputs: Four balanced, four unbalanced (USB input for control)
Outputs: Two balanced, two unbalanced, 12V trigger
Input impedance: 20k ohms balanced, 10k ohms unbalanced
Output impedance: <50 ohms
Weight: 25 lbs.
Dimensions: 17" x 5.25" x 15"
Price: $9000

Stereo 1.0
Power output: 200Wpc into 8 ohms, 400Wpc into 4 ohms (1kHz, 0.1% THD)
Inputs: Balanced, Constellation Direct (balanced), unbalanced
Input impedance: 20k ohms (balanced, Constellation Direct), 10k ohms (unbalanced)
Output impedance: 0.1 ohm
Gain: 14dB unbalanced, 26dB balanced
Weight: 55 lbs.
Dimensions: 8.5" x 17" x 19"
Price: $10,000

Mono 1.0
Power output: 400Wpc into 8 ohms, 800Wpc into 4 ohms (1kHz, 0.2% THD)
Inputs: Balanced, Constellation Direct (balanced), unbalanced
Input impedance: 20k ohms (balanced, Constellation Direct), 10k ohms (unbalanced)
Output impedance: 0.1 ohm
Gain: 14dB unbalanced, 26dB balanced
Weight: 55 lbs each
Dimensions: 8.5" x 17" x 19"
Price: $20,000 per pair

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Equipment Report

Constellation Inspiration Series 1.0 Linestage, 1.0 Stereo, and Mono 1.0

anything else. This see-through quality didn't just allow me to hear instruments in the back of the hall or deep into a multitrack mix; it also conveyed an impression of immediacy, of the air in which the instruments exist being "charged" with the life and vitality of the hall or studio. Many otherwise excellent electronics overlay the presentation with a kind of electronic haze that dilutes this impression of "aliveness," but the Preamp 1.0 and both Inspiration power amplifiers produced a sound that made me feel as though I were in the presence of the original music-makers. This quality goes a long way toward promoting deep immersion in the music.

The Inspiration's resolution was far beyond what I expected at this price. The treble, in particular, had that unmistakable delicacy and inner detail that most electronics smear. Think brushes on snares, hi-hat, tambourine, and other percussion instruments with very fine micro-dynamic structures. Many electronics are resolving, but not in the same way as Constellation's products are. What makes this brand special is the subtlety and refinement with which treble detail is presented. This isn't detail for the sake of detail, but rather an understated sophistication that provides all the cues that make instruments sound lifelike. Consequently, the top end is silky smooth and perfectly integrated into the musical fabric without any metallic edge. The Virgo and Centaur are, not unexpectedly, smoother in the top end than the Inspiration electronics, but that doesn't take anything away from the Inspiration's achievement.

There's another Constellation quality that the Inspiration preamp and amp embody, and that's a lack of tonal and spatial homogenization. Even compared with mega-buck amplifiers, the Inspiration is superb at defining individual instruments within an ensemble. The Inspiration's ability to differentiate tonal color, even among the individual brass and woodwind instruments in a big band playing unison phrases, is up there with the best amplifiers I've heard. Speaking of tone color, the Inspiration comes very close to maintaining the richness and saturation I've heard in the Performance and Reference Series. The Preamp 1.0, however, doesn't have quite the textural density and timbral warmth of the Virgo II. Timbres are more richly portrayed through the Virgo II—more "meat on the bone." The Preamp 1.0 is a little leaner by contrast with less apparent density in the lower mids. Nonetheless, we're talking about reference-level tonal quality in the Virgo II, a level to which the Preamp 1.0 comes very close. In fact, the Inspiration's tonal beauty may be unprecedented at this price.

Incidentally, I found the "preamp bypass test" a useful tool in hearing exactly how each preamplifier affected the signal passing through it. I first drove the Stereo 1.0 with the output from the Berkeley Alpha DAC Reference with no preamp in the signal path. I then inserted into the signal path the Virgo II set at unity gain (the input level was the same as the output level). I repeated this comparison, this time with the Preamp 1.0 in the signal path. The bypass test allows you to compare the preamplifier under evaluation with no preamplifier.

Soundstaging is outstanding for a preamplifier and amplifier of any price. Inspiration has a huge, open, and airy presentation that easily makes the loudspeakers disappear. Soundstage dimensionality is also sensational, and among the best of the amplifiers I've heard. Just like its antecedents, the Inspiration excels at portraying the bloom around instrumental outlines. The Virgo II and Centaur monoblocks are a touch wider and deeper, but this essential characteristic remains intact.

There's one area in which the Inspiration power amplifiers depart from the sound of the original Reference Series and of the Centaur amplifiers—the bass performance. In my previous reviews of Reference and Performance I've noted that both tend toward a more polite, rather than visceral, bottom end. In my Reference Series review I wrote that the bass "favored articulation and pitch definition rather than weight and warmth." In my Centaur review I noted: "The Centaur's bottom end is full and satisfying, but not the last word in weight and heft." You bought Constellation for qualities other than bottom-end slam.

I'm happy to report that with the Inspiration Series, bass performance is no longer a caveat. In fact, the Stereo 1.0's bass is outstanding, combining weight and authority with dynamic agility and a wonderful tunefulness. For example, Ray Brown's incomparable playing on the high-res download of Soular Energy has plenty of weight, along with the ability to convey the instrument's dynamics and tone color. The Mono 1.0s are even better, offering greater dynamic impact and effortlessness. Compared with the Centaur monoblocks, the Inspiration's fuller bottom gave the entire presentation a bolder, more forceful character. The Centaur (and Hercules) fosters an impression of elegance, grace, and refinement, not one of raw, primal power. The Stereo 1.0 and Mono 1.0 largely retain the midrange and treble refinement of the Centaur while giving the presentation a more muscular quality. It isn't just power music that benefits; even on a record like Duke Ellington's Duke's Big Four the Inspiration's fuller bass better conveys the swing and drive of this terrific band. Incidentally, the circuit changes that improved the bass were developed for the new Hercules II, and have been incorporated first into the Inspiration amplifiers.

Several years ago a visiting loudspeaker designer had just finished setting up a pair of reference-quality speakers in my room, and asked to hear the various amplifiers I had on-hand. After the auditioning, he pointed to a non-Constellation amp and said, "I want the bass extension and power of that amplifier," and then pointing to the Constellation continued "with the midrange and treble of that amplifier." If he were to visit again, he would wish for no such chimera; the Inspiration leaves nothing to be desired in bass weight and tonal balance. This is particularly true with the Mono 1.0 monoblocks, which have greater bass authority, wider dynamic contrasts, and sound more composed during complex passages than the Stereo 1.0, as you'd expect from twice-the-power monoblocks. Nonetheless, the Stereo 1.0's bottom end is fully satisfying.

If you're getting the idea that these electronics are spectacular values, you're right. It seems almost churlish to point out the Inspiration's shortcomings relative to the world-class Performance Series, but since I've heard them all I would be remiss not to share my experience. I must reiterate, however, that if you didn't hear

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the two Series side by side, you wouldn't miss anything in the Inspiration. You'd still get the essential quality of Constellation electronics, which as I mentioned earlier is an extraordinary transparency, high resolution, gorgeous tone color, and tremendous soundstage dimensionality. The differences in sound between Performance and Inspiration are more quantitative rather than qualitative. Moreover, the Performance Series, despite its not insignificant price, is still a terrific value, delivering close to the benchmark established by the Altair and Hercules in the Reference Series. I should mention that I've heard the Inspiration Series at three shows driving a variety of loudspeakers, and thought (along with many other showgoers) that the sound was superb on each occasion.

After I'd finished auditioning the Preamp 1.0 and Mono 1.0 I returned to the $55k Soulution 725 preamplifier and $165k-per-pair 701 monoblock amplifiers. One would think that this juxtaposition would only highlight the limitations of the one-eighth-the-price Inspiration pair. Instead, the comparison threw into sharp relief just how extraordinary the Inspiration electronics are. Not surprisingly, the Soulution was decidedly better (see Jonathan Valin's review this issue and my comments). But the Inspiration had some exceptional qualities that drove home what a great achievement and value these electronics represent.

Conclusion

The Inspiration Series brings more than a taste of world-class performance to electronics within reach of music lovers for whom six-figure amplifiers are out of the question. Although not budget-priced, the Inspiration Series delivers much more than a taste of the musical virtues of the Altair and Hercules. The sonic differences between the Reference, Performance, and Inspiration Series are a matter of degree, not of fundamental character.

The Preamp 1.0, mated to the Stereo 1.0 or a pair of Mono 1.0s, bring a level of transparency, resolution, refinement, and soundstaging to this price segment once reserved for much more expensive electronics. Coupled with these traditional Constellation qualities is a newfound bass performance that adds a welcome authority, bottom-end dynamics, and tonal richness that were not the strong suits of the Reference and Performance Series.

It's unlikely that the Inspiration's combination of performance and value could have been realized from a clean sheet of paper. By taking the long view and investing in developing cost-no-object electronics, Constellation is able to offer the identical circuit topologies, and many of the design tricks, of those cutting-edge products in the relatively affordable Inspirations.

For those of you who find $65k preamps and $140k amps morally objectionable, take heart knowing that the existence of those products made it possible for music lovers of more modest means to own very close to the best for a fraction of the price. That's something we can all celebrate. tas

Equipment Report

T+A PA 3000 HV and MP 3000

Swiss Sound for Less

Alan Taffel

I've been testing these two flagship T+A components for longer than any other review equipment in memory—over a year now, on and off. One reason is that they are so fascinating; in some ways they're downright unbelievable. Another is that they are so comprehensive (especially the MP 3000 HV music player) that there are seemingly infinite modes to evaluate. Throughout this odyssey, T+A has been gracious, helpful, and patient. (I offer my profound thanks to them for indulging me for so long.)

During this extended evaluation period, my perspective on these two components has gone through several phases. It seems fitting to recount them to you, in the order they occurred, so that you can share my journey with these unusual and in many ways remarkable products.

Phase 1: Abject Lust

I've had the opportunity to test quite a lot of very expensive gear lately, but none of those has inspired more lust than the T+A HV series. To uncrate these components is to be smacked upside the head by their obvious top-drawer quality. They are weightier than you'd expect. Hoist one of these things and you know you're getting something for your money. Then there are the aesthetics. These are ruggedly handsome pieces that instantly telegraph "we mean business." Yet there are also stylishly extravagant touches, like the glass inset on top that lets you peek at the classy componentry within.

There are lust-worthy operational touches, too. Large informative screens with touch controls dominate the front panels. The PA 3000 HV integrated amp's screen includes very cool, cassette-deck-like power output meters. The screens are flanked by enormous, positive-action knobs that imbue the user with a sense of complete command.

The FD 100 remote, which is included with the MP 3000 but treats all HV units as an integrated whole, is the most tricked-out device of its kind that I know of. A two-way system, it not only governs every imaginable function, but also displays status information such as the source selected, volume level, and album cover art. Although T+A also offers a nice tablet app, I never felt the need to use it. Meanwhile, HV units communicate with each other via an "H-Link" connection, making operations even simpler and more seamless.

Finally, lust springs from the no-compromise

sonically-oriented features. Like two AC inputs—one for digital and one for analog—on the player. Want to tweak the digital sound to your liking? The music player's DAC lets you select from four available filters. You can make your choice on the fly from the listening position using that incredibly resourceful remote. For its part, the integrated amp sports an oversized AC input socket, massive heatsinks, and dual sets of binding posts made of rhodium-plated solid brass.

And these are just the visible signs of serious sonic design. The spec sheets and technical details read like audio porn. For instance, as is the case with such benchmark brands as Soulution, CH Precision, and Spectral, the HV-series is ultra-wide bandwidth. T+A employs additional top-tier touches like highly-regulated power supplies and dual-mono, symmetrical, discrete, fully balanced, zero-global-feedback circuitry. But these products are far from copy-cats; T+A

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has gone in some bold new directions. Most notably, the "HV" in its model names indicates that these pieces run at an unusually high voltage. Whereas most solid-state amp electronics operate at about 100 volts internally, T+A gooses its HV units to a whopping 360 volts—roughly the range of tube gear. As in valve equipment, these voltages ensure that the amplification devices are working well within their operating parameters. Indeed, the HV models utilize only about 20 percent of their amplification transistors' available range. This, in turn, greatly reduces non-linearities. The goal, says T+A, is to mate the naturalness of valves with the speed of solid-state.

With all these aesthetic, operational, and technological goodies, it's impossible to meet these HV components and not fall at least superficially in love with them. I certainly did. Ah, but would the promise be fulfilled? The need to hear what these HV Series components sounded like was becoming urgent.

Phase 2: Corporate Culture Envy

In the course of getting ready to do just that—what with setting everything, meeting company reps, and poring over manuals—I learned a few intriguing things about T+A. One is that those letters don't stand for what you thought they did. (And, by the way, shame on you!) Rather, they stand for Theory + Application. That's not hype. As its name implies, T+A has always prioritized pure theoretical research over technological ideology, marketing trends, or price points. As a result, the company's history is impressively replete with innovations that T+A either spawned or was among the first to adopt, including software-based digital filters; multiple speaker advances, like active amplification, transmission-line configuration, and digital room matching; and discrete, switching power supplies.

T+A's culture also includes a genuine commitment to social consciousness. The Herford, Germany, campus consists entirely of green buildings, and the production line avoids substances that are potentially damaging to the environment or worker health. That means no CFCs or even chlorine-based cleaning agents. Most plastics and PVCs are also shunned. Wherever possible, parts and casings are made of recyclable metals, an approach that serves the dual purposes of screening components from external electrical interference while protecting the atmosphere from electro-magnetic radiation.

As much as I admire these corporate touchstones, the element of T+A's culture that I most wish other companies would emulate is its dedication to fair pricing. Almost all high-end manufacturers give lip service to this principle, but T+A walks the walk. For example, as you may be aware, over the past two years the exchange rate between the euro and the dollar has undergone a seismic shift in favor of the greenback. This makes European goods sold in the U.S. cheaper—at least in theory. Yet, can you name any European audio company that has reduced its prices accordingly? I didn't think so. In contrast, when the rates shifted, T+A lowered U.S. prices across its entire lineup. That's just the kind of company T+A is, and I for one applaud it.

Phase 3: Value Incredulity

As I (finally!) embarked on the listening stage of my time with the HV components, the word "Value" with a capital "V" constantly swirled around my brain. Let me tell you why. As readers will know by now, I am a dedicated fan of what I call the Swiss Sound. At first this school was represented by Goldmund and Spectral; now there is Soulution and CH Precision as well. What makes them arguably the best electronics on earth is that their high-speed circuitry and power supplies deliver fast, virtually unlimited dynamics, well-defined transients, vanishingly low distortion, tremendous timbral detail, and near-perfect linearity in both frequency and time domains. The resulting sound is exciting, engaging, and true.

But these virtues come at a price. Circuitry bandwidth must be much wider than usual, power supplies have to be carefully regulated, and the builder is obliged to include extensive protection mechanisms. None of that is cheap. So the first miracle of the T+A HV-series is that it employs all of these design principles yet delivers them at a fraction of the price of the Swiss alternatives. The second miracle is that—significant price difference notwithstanding—the sonic result is a dead ringer for this school's more expensive gear.

SPECS & PRICING

PA 3000 HV Integrated Amplifier

Power output: 300Wpc into 8 ohms
Inputs: 4 XLR, 2 RCA, H-Link (HV data bus), LAN (system control), trigger input
Outputs: 2 pairs speaker binding posts, XLR balanced line-level, RCA line-level, 3/8" headphone jack
Input impedance: 20k ohms single-ended, 5k ohms balanced
Gain: 38.6dB
THD: .001% (pre-amp stage), .03% (power amp stage)
Frequency response: .5Hz–450kHz (pre-amp stage), .5-150kHz (power amp stage)
Dimensions: 18" x 6.7" x 18"
Weight: 84 lbs.
Price: $17,000; optional phono module $1500

MP 3000 HV Music Player

Inputs: FM antenna, remote antenna, 5 SPDIF (2 BNC, 1 coax, 2 TosLink), 1 AES-EBU, LAN, USB, USB Master-Mode (stick or HDD)
Outputs: USB, SPDIF, H-Link (HV data bus)
File formats: CD, UPnP 1.1 streaming, UPnP-AV streaming, DLNA streaming, WiFi streaming, FM, Internet radio, MP3, WMA, AAC, OGG, FLAC, WAV, AIFF, ALAC
Dimensions: 18" x 6.7" x 18"
Weight: 57.3 lbs.
Price: $13,500

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Equipment Report T+A PA 3000 HV and MP 3000 HV

How close is the sound? Let me start with the PA 3000 HV. At $17,000, this 300-watt integrated amp costs about 15 percent of my reference CH Precision C1/2xA1 combo. Yet when I switch between them the most striking thing I hear is their utter similarity. Of course, I tried to find differences. On the Original Master Recording LP of Donald Fagen's The Nightfly, I queued up "The Goodbye Look" and carefully compared bass (identical), vocals (identical), the twang of the solo guitar (identical), and the snap of the xylophone (identical). Most importantly, both presentations preserved the percolating rhythm that make this—and many of the album's other songs—such an enduring pleasure. To be sure, the reference CH equipment creates a wider soundstage, and its tonality is a little more fleshed-out. But I seriously doubt I'd be aware of either of these without a back-to-back comparison.

The biggest difference between the T+A and the CH Precision is at the very top end, where the reference is more refined, though not any more extended. Bear in mind that even this difference, though audible as a touch of roughness, still falls into the subtle category. As evidence, consider that while trying my darndest to ferret out differences like this one, I frequently put down my pen and succumbed to the music. I listened to entire sides of even the most familiar albums. That's an indication of how little these scant distinctions matter, and how miraculously close the PA 3000's sound and capacity to captivate come to the higher-buck Swiss Sound stalwarts.

As icing on the cake, T+A offers an optional phono module for this amp. I'm sure such an option, were it available from a Swiss brand, would run many thousands of dollars. But T+A's module costs just $1500. Eminently fair, as always. Naturally, I compared it to my Swiss reference, a Goldmund PH-01. Once again, the similarities vastly outweighed any differences. Speed! Dynamics! Nuance! As before, there were some disparities; however, in this case, they were not all in favor of the reference. For instance, the T+A phonostage is actually more linear and less euphonic than the Goldmund, with purer tonality. On the other hand, the HV's bass is less meaty. A tradeoff—and a tossup. Without question, if you don't already have a high-quality phonostage and are investing in a PA 3000, the optional phono module is a no-brainer.

The MP 3000 is a component that's not to be missed.

While the integrated's value proposition is based on sonic miracles, the MP 3000 HV is attractive partially for the same and partially for different reasons. In the latter category, know that this is one of the most all-encompassing units of its kind you're likely to find. Let me count the ways in which this thing delivers music. First, naturally, there is the superb built-in CD player (more about that later). But that's merely the iceberg's tip. The MP 3000 is also a full-fledged DAC that handles USB and SPDIF—the latter via coax, BNC, AES/EBU, and TosLink interfaces. You can also plug a USB hard drive or thumb drive directly into the unit. Then, too, the MP 3000 will happily stream music from a NAS, and it will do so through either a wired or a wireless connection. As if all this weren't enough, the MP will play Internet radio and even pick up good old FM. You may be thinking that managing all these source options—and the content within each—must be a nightmare. The truth is that the remote (or the tablet app) makes it easy.

Of course, sonics matter too. In its CD mode, the MP 3000 is every bit as impressive as the PA 3000. This is one remarkably good CD player. Not only is it clean, open, richly detailed, and dynamic, but it gets completely out of the way of the music and imposes virtually no coloration or digital artifacts. While the CH Precision C1/D1 DAC/transport combo (about $80k) has certain advantages—greater scale, timbral density, and dynamic jump—when considered independently, in the context of a PA 3000-based system, the MP 3000 actually sounds better. This is not unheard of; the synergies reaped by staying within a given manufacturer's line can be surprisingly powerful. In any event, the HV combination plays music more organically than when mixing and matching, with greater rhythmic drive and coherence.

As an additional reference point, I compared the MP 3000's CD playback with that of my trusty Bryston BCD-1. Although this great CD player is no longer in production, when it was available and selling at $3500, it punched well above its weight class. My goal in this comparison was to see if the T+A, even without all those other inputs, justified the extra money. So, did the Bryston come close to the MP 3000? No, it did not. Not even a little. The MP 3000 is far more open, larger in scale, deeper in dimensionality, more extended, and even more musically compelling than the Bryston.

Another of the MP 3000's inputs that squarely hits the sonic mark is SPDIF. This input runs a bit mellower than the CD, but in every other way the two sources are very close. Of course, the SPDIF input has an advantage in that it can handle hi-res source material, and this sometimes gave it the edge over CD. All in all, listening to either of these two sources had me once more agog at what I was hearing.

Stage 4: Reality Check

As it turns out, the MP 3000 is not perfect. Specifically, its other sources don't measure up to the benchmark set by its own CD and SPDIF prowess. Switch from either of these to NAS streaming, for instance, and the soundstage and instruments flatten. The sound isn't objectionable, mind you, but nor does it engage. If you must stream into this DAC, be sure to use a wired connection. That route will still be less dynamic, open, and extended than the CD, but not to the same extent as going wireless, which throws a thick soggy blanket over the proceedings. For all I know, this is no fault of the MP 3000's and is instead endemic to wireless connections. More research is required, but I can say for sure that this particular instance of WiFi streaming isn't suitable for anything other than background music.

There is better news on the USB front. This interface, at its best, sounds way better than streaming. "At its best" means downloading T+A's custom USB2 driver rather than using the ones that self-install when you first connect the unit to your computer. T+A's research revealed sonic problems with kernel streaming drivers as well as ASIO drivers, so it developed its own

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approach. The MP benefits from the use of a good USB cable. You'll want to select the "Bezier"—as opposed to the "Bezier plus IIR" or any other—filter. Thus armed, the MP 3000's USB sounds quite good. The only problem is that the CD and SPDIF sound very good.

The main knocks on USB compared to the MP 3000's best inputs are that vocals are more recessed, dynamics are more restrained, and the presentation isn't as three-dimensional. None of these do major damage, so USB turns out to be quite enjoyable. As an illustration, consider Charles Mingus' Ah Um. Listen first to the album via USB, and you'll be tapping your feet and marveling at how realistic the brass sounds. The first track "Better Git It In Your Soul" can lose all sense of cohesion in the wrong hands. But the MP 3000's USB DAC is fully up to the task. Yet when you switch to the CD, the sound suddenly bursts with more life, the stage opens up, and those tonally convincing instruments now take on three-dimensionality. The same contrast holds true when comparing CD with USB-tethered hard drives.

These discoveries tempered—but didn't eradicate—my original excitement about the MP 3000. Naturally, I yearned for USB and streaming that sounded every bit as good as CD and SPDIF. I also found myself wishing that the MP 3000's transport handled SACDs and that its DAC supported DSD files. It's worth noting, though, that T+A makes a more expensive music player, the PDP 3000 HV Reference DAC/Transport ($20,000). That model includes everything the MP 3000 HV does (except client streaming functions and an FM tuner), adds in the missing SACD and DSD capabilities, and utilizes a more sophisticated DAC.

Stage 5: Full Circle

After a Reality Check stage that, as noted, somewhat curbed my enthusiasm, I decided to set all that aside and listen afresh to the T+A combo playing either CDs or hi-res files via SPDIF. The sound, once more, just blew me away. I invited fellow TAS writer Karl Schuster to drop by and have a listen. He summed things up perfectly when he described the sound as "spooky good." That spook factor stems from how eerily close these units come to the sound of far costlier Swiss gear. And that, I realized anew, is really the bottom line here.

For $13,500, the MP 3000 delivers tremendous versatility and, on its best sources, sound that rivals digital playback from components that cost six times as much. Not all of its sources are up to that standard, so consider your own listening habits and decide if the MP 3000 is for you. Similarly, the $17,000 ($18,500 with phonostage) PA 3000 not only competes directly with integrated amps that run all the way up to $50k, it holds its own against $120k worth of Switzerland's best separates. This is a component that's not to be missed.

But these HV models not only stand up to their Teutonic brethren, they sound just like them. What T+A has done is to make it possible for audiophiles of more modest (though still significant) resources to get in on the extraordinary build-quality, sonic merit and character, and sheer musical enjoyment of the Swiss School. And that is surely a promise fulfilled. TAS

Equipment Report

McIntosh MC275 VI and C22

Classic Cool Plus

Paul Seydor

The cool factor is way cool: Turn it on and the seven small tubes across the front light up, one after another, in a soft orange glow. Once they're all lighted, a moment's pause, then they turn green and you're in business. I am referring to the latest iteration of what is widely and justly regarded as the one of the greatest tube amplifiers ever made and the greatest from McIntosh: the MC275, now in its sixth version. Not necessarily Mac's "best," whatever that may mean, but its greatest in the sense of an innovative product—Tim di Paravicini, a man not exactly generous when it comes to distributing compliments, called Mac's "unity gain" circuit one of the few circuits he wished he had come up with himself—that came to be regarded as a classic even before its initial ten-year lifespan ended with the company's turn toward solid-state. But diehard audiophiles continued to cling to the warmth, musicality, and sheer beauty of the best tube sound and the technology stubbornly refused to go away. (I think it not an overstatement here to say that attention of The Absolute Sound, Harry Pearson in particular, was for a time almost single-handedly responsible for keeping tube technology before the audiophile public.)

Let us not be sentimental, however: There's no tube amp in the world that for laboratory accuracy will not be eclipsed by any competently or better-designed solid-state amp. But those last few degrees of accuracy as such are not necessarily the be-all and end-all of music reproduction. A personal example: A close friend, an amateur musician and audiophile whose ears are as discriminating as those of any reviewer I know, dropped by not long after I had received this latest MC275 for review, accompanied by another Mac retro-classic, the C22 preamplifier. Now this man—who uses solid-state gear, I should point out—knows the sound of my system virtually as well as he does his own. After scarcely a minute's worth of listening to my Quad 2805 ESL speakers, the source a CD of Dvořák's "American" string quartet, he said, "This sound is just lovely, absolutely lovely, completely involving and beautiful. Everybody should hear it just to experience how beautiful music reproduction in the home can be." He's right. If it wasn't the

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"best"—that pesky word again—sound I've ever had in my home, I've rarely had any I'd pronounce better.

And let's not fret the accuracy issue too much. McIntosh tube gear has a long and well-deserved reputation for being the most neutral-sounding of all tube electronics: no apologies necessary for plummy bass, bogus warmth, pushed-back presence, drooping highs, euphonic distortions, or excessive noise. Of course, it helps that both this latest MC275 and the companion C22 preamp, the last of Mac's classic tube preamps, are most emphatically not exercises in mere nostalgia. The company's engineers know that just because something is old or "original" doesn't automatically guarantee it's better, particularly when it comes to electronics, where it would be folly to ignore the considerable advances in the half century since these products were first introduced. Despite outward similarities, these are not your father or grandfather's Macs (see sidebar). Tubes constitute the heart of the circuitry, but no vintage 275 or 22 sounded like or as good as these new ones. Let's begin with tubes' principal *bête-noire*—noise. None. No, of course, not literally—with no signal playing I can crank up the volume to maximum and hear some thermal rush if I stand close enough to the speakers. But, hey, who listens that way? Certainly not I. Yet even at very loud volume levels, from my listening location I hear nothing in the way of noise to suggest tubes in the circuit. Every pause yields quiet backgrounds or ambience if it happens to be decently captured on the recording. (And keep in mind there are many solid-state units that will not pass the volume flat-out, ears-up-against-the-tweeter test.)

Transients? Completely natural and realistic, just as these things sound outside of recordings, with force and impact but never with the kind of exaggerated "speed" that screams "high fidelity"! There is resolution galore but not of the sort that calls attention to itself, a wealth of detail to savor as you wish yet that is not in least coercive or excessive. At no time did I find myself wishing for more or worrying I wasn't hearing what was there. Definition and clarity top to bottom are superb. Indeed, the circuit improvements in the 275 mark it out as clearly a better amplifier than the version IV I reviewed over ten years ago, splendid as that one was. Well-recorded rock music sounds fabulous. Admittedly, I don't listen to a lot of it, but the things I do I like a lot, such as the Rolling Stones or Buddy Holly. Or take Paul Simon's *Graceland*, which the pair send up with sensational power and drive, where such qualities are called for, or delicacy and subtlety, where they are called for. Every strand in the texture of "The Boy in the Bubble" emerges with a clarity so revealing that I doubt many solid-state amplifiers could materially better it, while the a capella singers in "Under African Skies" are projected with lifelike warmth and vitality.

These components were originally designed at a time when serious audio designers and audiophiles used classical, acoustic jazz, and mainstream pop and folk as references; that is, music for which there is a live, acoustical equivalent. These new Macs really thrive on such music. Take the Dvořák quartet I referred to at the outset: Get the playback level right with accommodating speakers and you really could almost be tricked into believing the players are arrayed before you, such is the solidity of the imaging, the tactility of the reproduction. Suffice it to say that whether it's small music or big, this pair does soundstaging and imaging superlatively. The opening of Stokowski's *Romanian Rhapsody* (on vinyl) has breathtaking power, definition, and real reach deep into the bass, with a quality to the lower octaves that I wish to emphasize: It is not that "tight" kind of bass which so many audiophiles (and reviewers) seem to delight in but which has no real counterpart in reality. Rather, bass instruments are subtly rounded and highly dimensional, with great bloom if the recording allows for it, yet never spongy, as tube bass can often be, even in several modern designs.

Voices. Gorgeous. In combination with Harbeth's new Monitor 40.2, the best three-way speaker system I've ever heard (review forthcoming), these Macs made for some of the richest, most vibrant and beautiful vocal reproduction I've ever heard in home playback systems, whether it's the Anonymous Four or Peter, Paul, and Mary, Sinatra or Fitzgerald, choral groups like Conspirare or Theatre of Voices. Anything and everything throughout

SPECS & PRICING

C22 Tube Preamplifier
Frequency response: 20Hz to 20,000Hz +0, -0.5db @ 0.08% THD
Maximum output voltage: 16Vrms balanced, 8Vrms unbalanced.
Input impedance: 20k ohms, balanced and unbalanced.
Inputs: 6 unbalanced, 2 balanced, 1 mm phono, 1mc phono
Outputs: 3 pairs main unbalanced, one pair balanced
S/N: 98dB
Headphone: ¼" jack
Tubes: 6 each, 12AX7
Dimensions: 17.5" x 6" x 18"
Weight: 27 lbs.
Price: $6000

MC275 Tube Amplifier Version VI
Power: 75Wpc into 4, 8, or 16 ohms; 20Hz–20kHz
Output impedance: 0.4 ohms
Frequency response: 20Hz–20kHz +0/-0.5dB; 10Hz–100kHz +0/-3.0dB
THD: 0.5%
S/N: 105dB (below rated output)
Dynamic headroom: 1.2dB
Damping factor: >22
Dimensions: 21.5" x 8.5" x 12"
Weight: 67 lbs.
Price: $5500

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Equipment Report McIntosh MC275 VI and C22

the midrange has the warmth, roundedness, and body for which the best vacuum-tube reproduction has always been prized.

When I reviewed version IV of this amplifier I noted that it was not quite as transparent as the best solid-state gear. If that is still true, the margin has so narrowed as to be of virtually no consequence. I have recently been the object of some sarcasm from another reviewer for insufficiently valuing small, not to say really tiny sonic differences among components. So as not to offend further in this regard, let me say that, as with other marginal differences, this reduction in transparency is there to be heard if you really want to concentrate upon it to *the exclusion of everything else*. That said, I personally judge it insignificant. I also noticed a slight darkness to the presentation with version IV, but not with this new one. All that attention Mac paid to extending the bandwidth with the new transformers has resulted in considerably more top-end extension, clarity, and definition. Yet there is no harshness, glare, or brightness that I can attribute to the amp or the preamp. By the way, there is no mystery about why the MC275 sounds so neutral, especially as compared to most other tube amplifiers known to me: Its output impedance is a mere 0.4 ohms. This is comparable to many solid-state units and in marked contrast to a lot of tube amplifiers, on which I've seen output impedances north of 2 ohms (no such amplifier is capable of sonic neutrality).

Power. It's common knowledge that, owing to their greater output voltage swing, tube amps generally sound louder than their nominal ratings might indicate. This proves to be the case with the MC275. For one thing, the amp puts out an easy 90 watts a channel, as opposed to its rated 75. For another, the circuit is exceptionally stable, so it doesn't frazzle when pushed too hard. All that said, the Harbeth Monitor 40.2s are capable of playing very loud, and there were rare times when the 275 sounded fractionally undernourished on really big material (the Quads won't play as loud as the Harbeths, so this was never an issue with that combination). The spectacularly recorded hammerblows on the Zander Mahler Sixth on Telarc—the best recording quality sonics of this piece I know—land with tremendous force and impact.

I had no sooner unboxed the C22, placed it on my shelf, and turned it on than I was glad I asked to review it.

I compared the 275 to the solid-state Pass Labs X150.8, which generates double the power. Though the Pass was slightly better in impact, the Mac was by no means left at the post. I must point out that I was playing the speakers much louder than I would normally do, and louder than the relative level would be if I were listening to a large orchestra live, even in the first few rows (I've heard this symphony from row two in Disney Hall, the Los Angeles Philharmonic conducted by Dudamel, whose hammerblows are cataclysmic.). It is well to keep in mind, too, that the Pass is considerably more expensive than the 275's $5500 and double the rated power. But the 275's 75 watts per channel can be strapped for double the power when it is used in bridged mode as a mono amp. I didn't have a second 275, but I suspect the already-small gap in dynamic freedom would have been narrowed even further by a pair of 275s.

I had no sooner unboxed the C22, placed it on my shelf, and turned it on than I was glad I asked to review it. At last a preamplifier that looks like the real deal. None of this bare-bones minimalist nonsense with vast acres of unused real estate on a fascia occupied with only a volume pot and a parsimonious row of pushbuttons for source selection. Many diehard McIntosh fans regard the C22 as the company's best preamplifier before (or despite) the great solid-state designs of the late nineties. It would certainly be difficult to imagine one with a more useable range of options, features, and functions. There are volume, balance, bass and treble tone controls, and even a loudness circuit. There are seven high-level inputs plus a pair of tape inputs with full monitoring. There are two sets of phono inputs, one for moving-coil, the other moving-magnet, while the front panel offers a choice of loading for mc's and capacitance for mm's. There is a mode knob for stereo, mono, stereo reverse, left to both channels, right to both channels, and mono to both channels. My only criticism is that many of these functions are not duplicated on the large, weighty all-metal handset, in particular the balance and tone controls. Not to worry, however—volume, source selection, and mute are all remotely accessible. Typical of Mac, there's a trigger circuit that allows the C22 to turn the MC275 on and off (it also works with similarly equipped other amplifiers). It is a real convenience to be able to power up and down both units in one operation, with all mutes in force until the tubes stabilize. (Such convenience may seem a small thing but you'd

Equipment Report McIntosh MC275 VI and C22

be surprised how used to it you get.) This is a company that seems to think of everything.

When I first heard the price of the C22, I blanched a bit: a cool—or it is hot?—six grand. Hardly outrageous for a preamplifier these days, but a fifty-year-old design, even one as beautifully engineered and appointed as this one? Hmm. Then I listened to the phonostage and thought, "How the hell did they do all this for six grand?" This phonostage—I availed myself only of the mc option—is easily competitive with stand-alone units north, *far* north, of two to three grand and more. It's as quiet as any tube phonostage I've ever heard and a lot more so than most of them, tonally neutral, *really* dynamic, with loading capabilities adequate to or better than any mc out there. Offhand, it's hard for me to think of another preamplifier more suited to the well-rounded audiophile dedicated equally to his or her digital and vinyl sources, unless it's one of Mac's other preamps, including some solid-state ones, flexibility and versatility always a priority from a company that knows how to design control units that cater to real music lovers.

Hookup is so simple and straightforward with flawless ergonomics that I didn't even have to consult the manual to get it set up and running (though, typical of McIntosh, the manual is beyond criticism for clarity and thoroughness and puts to shame the amateurish printouts that many high-end manufacturers provide). But it's not just control; it's the feeling of power and confidence that gives you such a thrill. No push-buttons here—flip the rocker switch on, the soft blue lights illuminate, the tubes come up and, man, you feel like you're at the controls of a 747. And then the music starts. Despite reports to the contrary from various sources on the Internet, my ears tell me the C22 is cut from the same sonic cloth as the MC275. That is, no bogus or excessive warmth or color. On the contrary, fundamental neutrality is at work here, with as much control, grip, and transient speed as any music I listen to might require. Yes, to be sure, a fine solid-state preamp, like one of the Pass Labs (which I happen to have in house at the moment), will still outshine it at the bottom when it comes to ultimate definition, clarity, punch, and slam, ditto at the top end when it comes to airiness, crystalline clarity, and extension. But saying this is by no means to suggest that the C22 is in any way deficient in these qualities or in the current (in some quarters) be-all end-all of audio reproduction: "resolution."

Inasmuch as the MC275 in its several iterations has been widely covered, I'd like to close with a few more words about the C22 in this, its first reincarnation. Sonically, as I hope I've made clear, there is next to nothing to complain about, instead volumes to praise. But what is exceptional, perhaps unique, about the C22 is that it preserves the fabled McIntosh sound, styling, features, and functionality in a design that is otherwise modern in feel and use. My nine-year-old, while switching the input knob so she could play a CD for a musical she's in, said, "Daddy, these are really fun to use." They have a feel like none I've ever experienced, paradoxically soft yet secure, and of switching transients, swishes, turn on/off thumps, there are none, while the transformers are dead quiet even with your ear right on top of them. The only sound you hear is the source you're playing. The back panel features both balanced and unbalanced inputs and outputs, with more than enough for the C22 to serve as the control center of a very sophisticated two-channel sound system. Routine system checks, such as channel balance, are a snap with the mode knob, which allows mono recordings to be enjoyed *in mono*, where they typically sound better.

The tone controls and the loudness circuit can of course be switched out for flat response, but why would you want to? They can make so many recordings sound so much more pleasurable in ways that are musically not only valid, but necessary if you want to enjoy natural-sounding reproduction. Take Herbert von Karajan's celebrated recording of *La Mer* for DG from the sixties: The sound is quite beautiful but the strings are too brightly lit, something easily addressed with a modest cut from the treble control. My family and I watch movies with sound routed through the music system. Often movie soundtracks are too bright, especially older ones, those that have been digitally remastered, and even a lot of new ones. What a relief it is to have a treble control that allows these films to sound so much more listenable. Then there's loudness-compensation, that all-purpose whipping boy of those who are against any sort of tonal control for the consumer. But the pioneering work Fletcher and Munson did in demonstrating how bass frequencies are disproportionately reduced in volume at low-listening levels is valid and its effects are real.

The loudness circuit in the C22 is as close to perfect as you can get, and I used it frequently for late-night listening, where it made the sound more natural, more satisfying, and more pleasurable because it was more realistic in the areas of tonal accuracy and balance. As I write this, it is very early in the morning, I'm the only one awake in the house, and Evgeny Sudbin's sonically and interpretively marvelous new recording of Scarlatti sonatas is playing at a very low volume. I started with the settings at flat but after several moments I found the piano sound just a little thin, as it had not at normal levels—though the recording is quite outstanding. So I kicked in the loudness circuit and *voila!*—despite the low volume the piano was naturally balanced again, with weight, warmth, and richness in the lower registers. Indeed, with some recordings played at *very* low levels, I used loudness compensation together with the bass control—don't mock it until you've tried it.

At the end of the daypleasure is the operative word when it comes to these wonderful new retro-made-new-again Macs. Pleasure in use, in function, in appearance, and paramountly pleasure in the listening. Most components I review come and go with few regrets. But I'm going to miss these big-time. In the highest senses of the words, they have real class and character. And something more: a connection to audio history in an unusually direct, intimate, and accessible way. Those pioneers of audio design had their priorities right when it comes to the reproduction of music in the home. If you have a local dealer who allows you to audition these in your house, be warned: They are highly addictive. And if you're courageous enough to ignore the purists and take advantage of the full panoply of their features, especially tonal correction, well, I'll warn you again: They're addictive. tas

Equipment Report

PrimaLuna DiaLogue Premium Preamp and HP Stereo/Mono Amplifiers

Tube Audio Made Simple

Greg Weaver

When Kevin Deal, of Upscale Audio in California, and Herman van den Dungen, of Durob Audio in the Netherlands, both audio importers and distributors, started collaborating in the late 1990s, they found that they shared a common concern. They both felt the existing tube component market was plagued by too many examples of high-priced, poorly built entrants of questionable reliability, and that when presented with such uninspired choices, more and more music lovers would forgo the joys of listening to and owning tube gear.

With classic designs like the Marantz 8B or Dynaco ST-70 in mind, they felt that music lovers should have better access to gear that drove tubes with reduced distortions and extended tube life and reliability. Ideally, these designs would use point-to-point wiring, and offer strategic features (such as PrimaLuna's AC Offset Killer and Adaptive AutoBias) to further extend the lifespan and performance of the tubes in the system. The biggest gains would be dependability, ease of use, and the enhanced sonic properties such a design would afford. Overall, they wanted to create tube products that offered an enhanced user experience. So over the course of about three years, starting in 2000, they joined forces to start PrimaLuna, with these goals in mind.

You may read more about their efforts in Jim Hannon's engaging and entertaining section of *The Absolute Sound's Illustrated History of High-End Audio, Volume 2: Electronics*. The short version is that after some three years of preparation, planning, and development, in 2003 PrimaLuna became a reality with the introduction of the ProLogue series of components to the European market. Its initial success led to wider distribution, and to the creation of the DiaLogue series of components in 2006. It is the current flagship products in that DiaLogue line that are the subject of this review.

Creation

One of the many methods brought to bear to realize the PrimaLuna vision included manufacture in China. While others have tried this with limited success, PrimaLuna has effectively leveraged the reduced costs of overseas production by paying fanatical attention to quality control, with constant parts-sourcing monitoring and rigorous adherence to the manufacturing rules Kevin and Herman put in place and stringently enforce. This excessive oversight, continuously and methodically applied, seems to have had its desired effects.

Next, rather than hire a full-time design team, they decided it would be much more cost-effective to contract designers from other successful houses. As such, their designs are primarily the work of Marcel Croese, who was Chief Engineer at Goldmund in Switzerland. However, Herman also has added two more engineers to the design team.

Both the Premium preamp ($3199) and HP amplifiers ($3899 stereo, $3899/each monoblocks) share an identical dark metallic grey chassis, 15" wide, by 8.3" tall, by 14.2" deep. Using the same-sized chassis is a smart production move, reducing waste and duplicated efforts. The HP amps weigh in at just over 66 pounds each, while the Premium preamp tips the scales at a substantial 53 pounds. The results are particularly sturdy components, surprisingly more massive than you would expect at a mere glance.

The lower 3½" of each chassis is allotted to the circuitry, with a 3/8"-thick front panel (available in silver or black) accommodating controls. There is a rocker power switch on the front of the left side panel; all the jacks and the AC connection are on the rear. The upper rear section, roughly 4¾" tall, 5½" deep, and

Equipment Report PrimaLuna DiaLogue Preamp and Amplifier

the full 15" wide, houses the transformers under a slot-vented enclosure. Finally, the upper front section is open, housing the respective tube complement, protected by a unique black curved guard employing two arched rectangular pillars that flow from the front top of the transformer housing to the top of the front of the chassis just behind the faceplate, with round cross bars running left to right between them, and glass end covers. The whole look is more than just vaguely reminiscent of a "roll-top" desk.

The DiaLogue Premium preamplifier is a dual-mono, tube-rectified linestage, using a pair of 5AR4 rectifiers, and three 12AU7s per channel (one driver, two inputs in a conspicuous attempt at lowering distortion and increasing dynamic range and bandwidth), all arranged in a slight arc under the tube guard. Finally, in a row immediately behind the 12AU7 array are the two rectification 5AR4s flanked by a set of Nichicon 330 microFarad capacitors. Very attractive, functional, and easy to access.

The choice of the 12AU7 seemed obvious, with more in current production today than virtually any other tube made, as well as significant stockpiles of vintage NOS varieties. The owner's manual touts that you may substitute ECC82s, ECC802Ss, E82CCs, 5814s, 6189s, or even CV4003s.

The volume control is a Japanese-built, high-quality, Alps Blue Velvet potentiometer, with input selection accomplished using premium sealed Fujitsu relays, rear-mounted and very proximate to the input jacks. When an input is selected, only that particular relay closes. As all the other relays are left open, this quite effectively isolates noise and signals from other sources. An additional benefit of this choice is drastically shorter signal paths, further minimizing pick up of radiated or generated noise.

The preamp's front panel offers the volume control to the far left side, a centered status indicator LED (red for standby, green for ready) with a mute indicator just above it, and a rotary source selector switch to the right. The back houses, from left to right, a set of tape (monitor) outputs, five sets of inputs (CD, Tuner, Aux1, Aux2, and Aux3), and two sets of amplifier outputs, all single-ended. There are no provisions for XLR connections. To the right side is a grounding post and the EIC AC socket.

The remote is a 19-button, 7⅞" long, 2⅜" wide, 13/16" high black rectangle, with rounded sides. Besides volume control, mute, and direct input selection, it includes function control for the PrimaLuna CD player, and a button for on-the-fly switching of the amplifiers between ultralinear and triode modes. Unique in my experience, two black rubber O-rings circle the remote, one each near the very top and bottom, seated into channels recessed into the chassis itself, assuring that the remote will not be scratched by, nor easily slide off, any surface that it is placed upon. Nice touch.

Both the DiaLogue Premium preamp and the HP power amps use a heavy-gauge slotted bottom panel to allow ready airflow into the fully ventilated, panel-mounted tube sockets. The choice of tube sockets and panel mounts as well as the point-to-point solder work are very good, quite reminiscent of that found in costlier designs. Circuits are populated with French-made audiophile-grade DuRoche and SCR tin-

SPECS & PRICING

PrimaLuna DiaLogue Premium Preamplifier
Tube complement: Six 12AU7, two 5AR4
Analog inputs: Five pairs RCA, one pair HT bypass
Outputs: Two pair RCA preamp outs, one pair RCA fixed tape out
Dimensions: 15" x 8.3" x 14.2"
Weight: 52.9 lbs.
Price: $3199

PrimaLuna DiaLogue Premium HP Stereo/Mono Amplifiers
Output power: Stereo, 70Wpc (ultralinear)/40Wpc (triode); mono, 148 watts (ultralinear)/85 watts (triode)
Tube complement: Six 12AU7, eight EL34
Inputs: One pair RCA
Output impedance: 100k ohms
Dimensions: 15" x 8.3" x 14.2"
Weight: 66.3 lbs.
Price: $3899 ea., $7798/pr.

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Associated Equipment
Analog source: Kronos Sparta turntable and Helena tonearm, Air Tight PC-1 cartridge
Digital sources: Dell Optiplex running JRiver MC-22 and Fidelizer Pro v7, Hegel HD30 DAC, McCormack UDP-1 Ultimate universal disc player
Phonostages: DSA Phono II, ModWright PH-150 Reference
Preamplifiers: DSA Pre 1, Pass Labs XP-20, ModWright LS-100
Power amplifiers: Pass Labs XA160.8 monos
Speakers: Von Schweikert Audio VR-55 Aktive
Cables: Stealth Śakra and Audience Au24 SX signal cables, Stealth Dream V14 speaker cables, Audience Au24-SX biwires, Audience Au24 USB, Audience Au24 powerChords.
A/C Power: One 15-amp and one 20-amp dedicated line, Audience aR12-TSSOX power Conditioners
Isolation system: Grand Prix Audio Monaco equipment stand and amp stands, Magico QPods
Room treatments: Shakti Hallographs, Room Tunes Corner Tunes

Equipment Report PrimaLuna DiaLogue Preamp and Amplifier

foil capacitors, and Japanese TAKMAN resistors. Swiss-made, silver-plated, continuous-crystal, oxygen-free copper wire, with Teflon dielectric, is used in all critical signal paths. The power and output transformers are massive custom toroidals, rated for 200% of their duty cycle, and are potted to protect the windings from moisture and deterioration.

The front of the Premium HP power amplifiers shares the livery of the preamp, and sports only the power/standby lamp dead center, flanked by two additional indicator lamps, red to the right to indicate ultralinear mode, green to the left for triode mode. While the amps also have their power switches at the front of the left side panel, they also include a tube-type selection switch (down for EL34s, up for KT varieties) at the front of the right side panel. The back panel includes, left to right, single-ended inputs (again, no XLR connections), a stereo/mono toggle switch, followed by the right (also used for mono) then left speaker outputs, with 16-ohm, 8-ohm, 4-ohm, and ground binding posts, then the IEC socket. Each amp comes with its own narrow (7⅞" long, 1¼" wide, 13/16" high), rounded side, single button remote, also equipped with twin rubber O-rings, allowing for mode switching.

The Premium HP amplifiers use a set of eight EL34s, arranged in two rows of four, directly in front of the transformer compartment. Two sets of four red LEDs, part of the BTI system (read on), are oriented in a square in the space created at the center of the four EL34s on the right, the other set for the quad to the left. These LEDs are numbered to match the tubes, and indicate when a tube is failing, or has failed. The system will mute itself until you replace the bad tube, then restart. In front of the EL34 complement is a row of 12AU7s, also in a slightly curved alignment as with the Premium preamp. Honestly, to my tastes, these are some extremely good-looking designs.

The EL34 is a classic pentode with five elements (cathode, anode, and three grids). First introduced in 1953, it is generally lauded for its midrange tonal properties. Its use in such classic amplifiers as Saul Marantz's Models 5 and 9 monos and Sid Smith's Marantz 8B stereo, and David Hafler's Dynaco ST-70. The Conrad-Johnson MV55 and MV60 are most likely what inspired its use here. One of the first things you notice, even before powering on, is that all the tubes are PrimaLuna-branded. In conversation with Kevin I learned that these tubes are sourced from Shuguang, giving PrimaLuna the option of careful selection, and allowing them yet another layer of quality control.

As to features, the PrimaLuna Premium HP amps in particular are second to none in my experience at, or anywhere near, their price points. As already stated, their output circuits can be switched *on-the-fly* between 40 watts (triode) or 70 watts (ultralinear) in stereo mode, or between 85 watts (triode) or 148 watts (ultralinear) in mono configuration, as reviewed here. Ultralinear output is about 3dB louder than triode mode—something that should be kept in mind when doing live mode-switching.

Maybe most interesting of all is that, though the HP power amp, as equipped from the factory, runs EL34s, in that same switch position you *can* run 6CA7s, EL34s or EL34LSs. And, if you are all right with a slight drop in output, you can even run 6L6GCs, 7581As, or KT66s. With the switch in the KT position, you may use 6550s, KT88s, KT90s, KT120s, or KT150s, should you care to! Though I had no store of other power tubes on hand to explore those options, the HP amplifiers are obviously a tube-rollers delight.

A big part of the PrimaLuna amplifier technology (and sales pitch) is something they call Adaptive AutoBias. Essentially, PrimaLuna claims it is an entirely passive process allowing tubes to run less stressfully, with greatly reduced distortion, yielding longer life and affording some large degree of safety and convenience. This circuit constantly monitors tube operation to sense when a tube is failing or has failed, at which point, it both mutes the circuit, protecting the amplifier from damage, and lights an LED indicator, notifying you of just which tube is affected. This eliminates the guesswork of swapping tubes one at a time to locate the culprit.

Though the Premium HP amplifier manual claims the Adaptive AutoBias circuit is, "an exclusive PrimaLuna feature you won't find anywhere at any price," PrimaLuna's sister company Mystere, (also run by Herman) uses the same circuit. Further, Kevin Hayes' Valve Amplification Company's (VAC) employs his unique patented iQ Continuous Automatic Bias System throughout his entire amplifier line.

PrimaLuna employs a number of other technologies, including Soft-Start, used in conjunction with the Adaptive AutoBias circuit to slowly bring the amplifier up to full power. Another, called AC Offset Killer, utilized in both the preamp and amplifiers, is said to remove problems that may occur in your AC mains before power gets into the circuits and to keep the main AC power transformer as quiet as possible. There is also the aforementioned BTI (Bad Tube Indicator), which lights a red LED on the chassis to indicate which tube is experiencing any degree of failure. Finally, there are PTP (Power Transformer Protection) and OTP (Output Transformer Protection). In the event that the power transformer's internal temperature becomes too high, PTP uses a thermal switch to cut off the main AC input. With OTP, the transformers are protected from improper loads during hook-up or under play, or while changing speakers with the power turned on.

I must mention that packaging is every bit as exquisite as the components' fit and finish. Triple-boxed, in custom-formed foam, with individual sleeves covering the power tubes and a set of white cotton gloves included for handling, these things couldn't be packaged any better or more safely.

Communication

As one of my strongest axioms is "change only one item (component, cable, isolation device, etc.) at a time," when my review samples arrived, I installed the amps in place of my Pass Labs XA160.8 monos, switched them into mono mode, and connected them to my VSA VR-55 Aktives, with the rest of my reference system intact. However, so as not to squander break-in time, I also installed the Premium preamp into my theater system and ran it consistently there.

Immediately apparent on insertion of the HP amplifiers, using the 8-ohm taps, was the signature EL34 midrange performance. Bass was a bit cold and constricted, both in extension and im-

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pact, and treble was a bit soft and muted, not at all atypical for brand-new amplifiers, but it was pretty clear that this ride was going to be fun. Just to be sure I wasn't missing some unexpected magic, I tried brief connections to both the 4-ohm and 16-ohm taps after run-in. But the slight midrange emphasis with the 4-ohm tap further exacerbated the slight bass leanness. As I really heard no advantage or detriment with the 16-ohm tap, I settled on the 8-ohm tap for the bulk of the review. (Note that when operating as a monoblock, the taps are marked as 2, 4, and 8 ohms.)

Making the choice between ultralinear or triode mode will be as much (if not more of) a matter of your loudspeaker choice as it is of personal taste or the music in play. While you may be tempted to use ultralinear for louder listening and triode for lower volumes, over the years I've found that more often than not, at quieter volume settings, ultralinear provides the extra dynamics and inner resolution that are necessary to breathe life into a softer presentation.

My Von Schweikert Audio VR-55 Actives have a comparatively low 88dB sensitivity, but present a fairly stable 8-ohm load, making them relatively easy to drive. With them, the added warmth, more pronounced midband, more laid-back presentation, and somewhat less focused and slightly larger-than-life imaging in triode mode simply couldn't match the more controlled and accurate microdynamics and higher resolution of inner detail that I experienced in ultralinear mode. Though triode mode offered a lusher, more organic balance overall, for me, in my system, it wasn't even close. Once that became clear over repeated comparisons, I kept the amps in ultralinear mode for the rest of the review. Your experience will likely vary, so take advantage of the freedom of choice and experiment.

Once fully run in, (I gave them a full two weeks in this case), high-frequency performance opened up considerably, now offering greater and more refined extension and providing a more convincing sense of air and shimmer on cymbals, upper-octave strings, and winds. This attribute was readily noticeable on classical pieces like the Bach Violin Concertos and Double Concertos [Philips] or *The Three-Cornered Hat* [London].

Midrange was rendered, as you'd expect, with almost reach-out-and-touch texture, rich and vibrant tone color, realistic bloom, and a faithful sense of dimensionality and space. In this regard, these PrimaLunas are the embodiment of the characteristics that make valve amplification so intoxicating.

It was the deepest octave-and-a-half, roughly from about 65Hz down, that enjoyed the greatest sonic advance. The slight limitation that the HPs had exhibited when new all but vanished, and their response, all the way down into the 20Hz range, was much better defined. They now had a much firmer, more effectual grip on the deepest bass, giving them an amazing sense of graceful power.

This was clearly exemplified early in "Three Wishes," from Roger Waters' *Amused to Death* [Analogue Productions]. As the track picks up momentum, the QSound voice of a Genie fills the room—surrounding and engulfing you. And it goes deep! Still fresh from the boxes, that voice was generated only toward the front of

the room, with very little of the powerful underpinning that makes it so creepy. Post run-in, the envelopment was much more complete, easily extending to behind my listening chair. And the weight of the voice was back, convincingly enough to make me shudder, as this track normally does. The recording evokes a visceral reaction, one that the Premium HP amplifiers were quite comfortable generating.

With something like the organ work from the second movement of Saint-Saëns Symphony No. 3 [Reference Recordings], the PrimaLunas had more than enough authority to convincingly create the power that loads the room with the lowest, sustained organ notes. Though still not as authoritative as the best solid-state bass, they were, nonetheless, very well extended and articulate, showing remarkable transient capability and excellent pitch definition, especially for a tube amp in this price range.

Though overall transparency was not astonishingly see-through (the amps do come up shy of the best resolution and transparency attainable), the HPs' ability to render fine detail was more than merely convincing. Key-fingering on instruments like sax or clarinet was revealed cleanly and accurately. While you might be tempted to assume that such sounds would always be clearly and honestly rendered, such micro-detail is not always this finely presented.

What I found to be the HPs' most remarkable strength was their ability to render dynamic attack and maintain scaling, from very quiet through much more boisterous volume

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settings. Respighi's *Feste Romane/The Pines of Rome*, with Lorin Maazel conducting the Cleveland Orchestra [Mobile Fidelity UHQR], was goosebump-raising—so powerfully, cleanly, and accurately did the HPs reproduce orchestral dynamic swings. This extraordinary dynamic capability is yet another stirring asset of these amplifiers.

Spatial recreation was downright magical, especially when I was listening to something with an enormous and/or clearly delineated acoustic, like Falla's *The Three-Cornered Hat* or *Harp Attack* [Alligator LCD 4790]. The soundscape on *The Three-Cornered Hat* is enormous, with expansive and detailed sonic queues, cavernously deep and wider than your room when your system is up to the challenge. *Harp Attack* features the voices of Carey Bell, Billy Branch, James Cotton, and Junior Wells, each playing a different keyed harp (harmonica). In the opening cut, "Down Home Blues," the four men are lined up left to right across the stage. As they take turns soloing, both their location within the soundstage and the resultant sounds of their voices and harps were vibrant and lifelike, with remarkably nuanced pitch, and so well recreated in space that, with eyes closed, you might credibly believe the four were standing in your room!

Prior to inserting the PrimaLunas, I had been using either the Pass Labs XP-20 ($8600) or my reference Dynamic Sounds Associates Pre I ($16,500) preamplifiers. Time to add the DiaLogue preamp to the mix. As they had been run in at the same time, though in a different system, resolution was excellent, and in fact, much better than I had expected.

Soundstaging was finely and accurately layered, and images were rock-solid in location and stably placed, if somewhat larger than life. Centrally located images seemed less affected by this, but instruments to left and right of center, and especially those deeper in the soundstage, tended to be generated with a slight increase in size. I first noticed this with "Peggy's Kitchen Wall" from Bruce Cockburn's *Stealing Fire* [True North]. Bruce's somewhat forward and central voice was still rather faithfully imaged, while the somewhat elevated-to-each-side and deeper-into-the-soundstage voices of the backing vocalists were slightly more inflated, and rendered with a bit less fine individualization. While this attribute persisted throughout the rest of my audition, it was minor and may not even have distracted me had I not been aware of the more focused and clearer individuality rendered by my reference preamplifiers.

While microdynamics, transparency, and resolution took minor hits with the installation of the Premium preamplifier (keep in mind, my reference preamplifier is more than five times costlier), the overall superb mastery of musical scaling, the dynamic prowess and the unflinching faithfulness of tone previously noted with the HP amps were apparent with the Premium preamp too. With it in the mix, the system maintained its enchanting sense of effortlessness, yet relinquished very little in control and slam—not an easy trick even for such an overachieving yet affordable preamp to pull off. There is no questioning the synergistic results of pairing of the preamp and HP amps, they clearly work extraordinarily well with each other.

One peculiarity surfaced while using the mute function with the remote. When engaging mute, the lamp on the preamp lights red to indicate its muted status. Because I had the preamp set to the right side of my equipment rack, just above and slightly behind the right HP amplifier on its isolation stand, sometimes pressing the mute button would change the lamp to red on the preamp and both amps; other times, the left amp light stayed green. But depending on how I was aiming the remote, sometimes the preamp and right amp would have their lamps green, and the left would remain red. I could restore the errant left amplifier lamp to green by aiming the remote slightly past the left amp, holding it just so, and pushing the mute button.

This was merely a distraction; it had no effect on the sonic performance of the gear. But given that the amps don't actually have a mute mode, I wondered why the amplifiers' status lamps would change color when pressing that button on the remote.

Summation

While these PrimaLuna DiaLogue components may have been inspired by the milestones of yesteryear, gone here is any hint of that syrupy, dark, blatantly euphonious sound common in those earlier components. Even today, with lesser designs, the over-editorializing of color and texture that has put me off many of today's more affordably priced tube gear—even some held in high regard—never reared its ugly head throughout my months of audition. PrimaLuna has set an incredibly high bar for performance, with equally incredible pricing.

It would seem apparent that the degree of "overbuild" these products enjoy, the sheer number of devices employed, all being run well below their thresholds, the parts-quality, and the surfeit of safeguards put in place contribute to superb sonic performance. To my ears, the PrimaLuna DiaLogue gear (the HP amplifiers in particular) represent some of the best bargains in valve electronics available today.

While these devices may not reach the pinnacle of "the absolute sound," I want to make it perfectly clear that they are nonetheless *exceptional* performers, metaphorically punching well above their class, never failing to serve the music they are asked to portray. They display a degree of tonal purity, dynamic expression and scaling, and resolution that I had no reason to expect at this price point. The result is that they have an unswerving ability to draw you into whatever they are serving up.

Combining their exquisite sonic performance with their seemingly bullet-proof design, supplemented by the host of features like their Adaptive AutoBias and AC Offset Killer, these PrimaLunas deliver remarkably authentic music and will likely give their owners years and years of dependable, musically engaging enjoyment.

For someone looking to indulge in the tube experience, with most of the drawbacks superbly minimized, I cannot recommend the PrimaLuna DiaLogue gear highly enough. They offer creative and thoughtful design, exceptional build-quality, first-rate parts and assembly, tremendous attention to detail, an elegant look and feel, and their sonic performance is clearly well above their reasonable asking price. Don't bother with how they pull it off, just sit back and enjoy! tas

Equipment Report

Bryston BP26 and 7B³

A Workhorse Refined

Kirk Midtskog

Bryston LTD is known for making well-engineered, high-value audio gear. Its famous 20-year warranty and successful 35-year track record in both the pro- and home-audio worlds have helped solidify the company's reputation for producing reliable, high-performing products at fair prices. The BP26 preamp and 7B³ mono amplifiers exemplify this approach.

The quality of the casework is good. Everything fits well, and there are no rough edges. The controls are intuitive. There are no configuration set-up menu selections to make and no operating firmware updates to download. You connect your sources and speakers to the combo, and you're ready to go—all sort of reassuringly "traditional." The Brystons functioned without any problems throughout the five months I used them regularly. This is all fine and good, but would be disappointing if the components did not also sound good. I can happily report the BP26/7B³ combo was a pleasure to listen to. To be honest, I expected the sonic performance to be more along the lines of competent than inspiring, which has sort been my impression of Bryston gear in the past, despite my long-standing admiration for the company's history of delivering solid engineering, reliability, and value—not to mention its reputation for treating its employees well.

The BP26 preamp and its MPS2 external power supply list for $5160. (Bryston also offers an alternative, compact PS-3 power supply for $1000, but I believe most users get the standard MPS2 power supply [$1865].) The MPS2 can also power three other Bryston devices, such as a separate crossover, phonostage, or digital music player. The remote control unit costs an extra $375, and I recommend it. The robust metal handset controls a variety of Bryston equipment and has nifty user-set sensors, which illuminate the buttons in low light when a button is pressed or when the remote is merely moved. I grew to like the convenience of seeing the buttons in low ambient light simply by picking up the remote. Bryston offers other on-board options: a DAC ($1595), a moving-magnet phono section ($750), and a moving-coil phono section ($1500). You have to opt for either the DAC or one of the phono options but not both. Bryston's PR rep Micah Sheveloff told me most customers choose one of the phono sections and use an external DAC because digital technology changes more rapidly than phono technology. To sum up, as reviewed as a linestage only, the BP26, MPS2 power supply, and BR2 remote retail for $5535.

The BP26 is fully featured. It has a tape loop, a mono/stereo toggle, a mute toggle, a channel balance control, a motorized volume pot, an input selector, and a feature one does not find very often anymore—a phase inversion toggle (also activated on the remote control). Some recordings sound better with the absolute polarity inverted (like Alison Krauss' *Forget About It* [Rounder]), so I liked this feature. Only tone controls are missing, but I presume Bryston reasoned they would cause more harm than good or would push the cost higher than the design brief. The BP26 has both balanced/XLR and unbalanced/RCA inputs and outputs and a ¼" headphone jack. The matching external MPS2 power supply is connected to the main unit via a detachable umbilical cord with six-pin connectors. I separated the MPS2 from the main unit on another shelf, but the instruction manual mentions that users may stack the main chassis on top of the power supply chassis unless excessive system noise is present through the optional phono section. The BP26's volume knob has its position indicator slot on its outer edge, so I could not easily tell what the volume setting was from my listening position.

Equipment Report Bryston BP26 and 7B³

A more visible, direct-view indicator would be helpful.

The 7B³ mono amplifiers retail for $11,390 per pair and deliver 600 watts into 8 ohms (900 into 4). Each amp has balanced/XLR and unbalanced/RCA inputs, an input gain selector (23dB or 29dB), and one pair of multi-way speaker binding posts. Thankfully, the binding posts' spade slots face upwards for easy speaker cable connection from above and for routing speaker cables away from the floor. The 7B³ was released earlier this year, so it has some of Bryston's latest technology, whereas the BP26 has been in production since 2009. The previous series of power amps, labeled SST², made advances in reducing distortions typically found in the output sections of Class AB amplifiers through technology Bryston calls "Quad Complementary" output. The new Cubed Series retains that technology and also addresses lowering noise in the input stage. The updates were co-designed by a Bryston team led by Christopher Russell with some further advances to the work of the late physicist and computer scientist, Dr. Ioan Alexandru Salomie. (Salomie apparently held patents in fields such as circuit-design software, 3D computer-animation, medi-cal applications, as well as in audio design through his work with Bryston.) The Cubed series amps reportedly have better common-mode noise rejection and improved EMI/RFI noise rejection.

The 7B³ is more refined sounding and more musically rewarding than previous Bryston amps I have heard. Even though I didn't have a pair of the previous generation 7BSST² on hand to directly compare to the new 7B³, I am willing to give some credit to what I perceive to be a "new Bryston sound" to the updates in the Cubed Series.

Evaluation

I listened to the Brystons with some of my reference gear, including the very revealing YG Sonja 1.2 speakers and a set of nicely transparent Shunyata Anaconda cables. I did several A/B/A comparisons with two other pre/power combos (discussed later). I also mixed and matched each combo's preamp with the other combos' power amps to cross-reference my sonic impressions and to get a better idea of the BP26's and 7B³'s respective individual characteristics. Because I used a higher-resolution evaluation platform than a typical listener might, given the Bryston combo's price, the observations and distinctions I make may not be as readily apparent in other systems to the degree I describe below. I ran the Brystons for at least 300 hours before I did any serious listening.

To summarize my overall impressions upfront, the Bryston BP26/7B³ combo sounds musical and engaging with fabulous rhythmic drive and momentum. It is tonally neutral with an open quality that does not veer toward edgy or forced. It imparts a sure-footed foundation with good bass extension and control. The soundstage is wide, tall, and reasonably deep.

The sort of musicality I hear in the Brystons is more along the lines of a winning, agile tunefulness than a beguiling, silky lusciousness. I kept listening to cut after cut not necessarily because every nuance was brought forth, but because the Brystons seemed to convey a feeling of unfettered directness and immediacy. I remained engaged with the music during long listening sessions, my feet tapping to the beat and my head leaning with the phrases, because the Brystons' readily transmitted the central "musical core"—if you will.

Nothing seemed out of balance tonally or rhythmically. All too often, some other gear at this price level tends to focus your attention on a particular aspect of the music, such as leading edges, punchy dynamics, or a pervasive silkiness, any of which can register as affectations after a while. The Bryston combo just gets the "musical gestalt" right and doesn't otherwise draw much attention to itself. Could it be more revealing of fine detail? Perhaps, but considering its total price of $16,925, I would be hard pressed to find a similarly priced, solid-state, feature-rich, 600-watt rig that delivered similarly enjoyable and honest musicality.

Calling solid-state electronics at this price level "neutral" is sometimes understood to mean, "leans towards the clinical." I don't mean that at all. The Brystons' tonal spectrum is basically correct but there is nothing sterile or pedantic about it. From top to bottom, the combo sounds tonally and dynamically coherent. The Brystons have a rich and weighty

SPECS & PRICING

BP26 Preamplifier
Type: Solid-state linestage
Analog inputs: Two balanced (XLR), five unbalanced (RCA), 12V trigger port, auxiliary relay jack
Digital inputs: Two SPDIF (with optional DAC section, not reviewed)
Formats supported: 16kHz–108kHz sample rates and 16-, 18-, 20-, or 24-bit word lengths (with optional DAC section, not reviewed)
Phonostage: Moving magnet, input impedance 50k ohms, 5mV sensitivity; moving-coil, input impedance 180 ohms (with optional phono section, not reviewed)
Outputs: One balanced (XLR), two unbalanced (RCA)
Dimensions: 17" x 2.25" x 11"
Weight: 27.9 lbs. (main unit and MPS2 power supply)
Price: $5535 (including MPS2 external power supply and BR2 remote)

7B³ Power Monoblock Amplifier
Type: Solid-state, Class AB
Output power: 600W into 8 ohms (900W into 4 ohms)
Inputs: One pair balanced (XLR), one pair unbalanced (RCA), one 12-V trigger port
Output impedance: Not listed
Dimensions: 17" x 6.3" x 16.2"
Weight: 42 lbs.
Price: $11,390 per pair

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Equipment Report Bryston BP26 and 7B³

quality while simultaneously sounding open and airy, somewhat like live orchestral music in this regard. The bass is deep reaching and tuneful, and conveys a reassuring feeling of stability and ease. Dynamic power reserves are very good, too. I never had the sense that the 7B³ was running out of juice on even the most demanding musical passages, and I presume it will easily drive a wide variety of loudspeakers.

Soundstage width is a particular strong suit. I think some of this good width performance stems from separating each channel into its own power amp chassis as well as having sufficient power on tap to really control the speakers, and easily move a lot of air when called upon. When paired with other power amplifiers, the BP26 preamp demonstrated that it also presents a fairly wide soundstage, so it, too, contributes to the combo's performance in this area. Soundstage height is also notably good. Soundstage depth is good, but not exceptional. If you must have a very deep soundstage, you are probably already aware that depth portrayal is not a typical strong suit of solid-state gear at this price level. Mind you, the Bryston combo does render depth fairly well, but tube gear and some other solid-state electronics—usually more expensive ones, like those from GamuT and Hegel—will portray depth more readily. The Brystons revealed plenty of hall and distance cues, but those cues were a bit foreshortened. Still, for solid-state at this price level, the Brystons acquitted themselves nicely.

I listened briefly to the headphone output on the BP26. Since I don't own any other headphone-capable preamps or dedicated headphone amplifiers against which I could directly compare it, all I can report is that the BP26's headphone output sounded quite good, better than I expected—based on the 'phone listening I have done in the past with the Oppo HA-1 and at industry trade shows. I have a hunch that Bryston engineered more performance into the BP26's headphone section rather than merely including it as an additional marketing feature.

Comparisons

Switching between the Brystons and the Hegel P30 ($7500) preamp and H30 stereo power amp ($15,000, Issue 223) as respective combos pretty much mirrored what each component brought to bear individually. The Brystons sounded more rhythmically nimble and imparted a shade more upper-frequency openness. The Hegels sounded more continuous and a bit more revealing, and they rendered depth better, too—both of individual images and of the larger soundscape. The pairing of the Bryston BP26 preamp with the Hegel H30 power amp actually sounded quite good. The quick, pristine quality of the BP26 complemented the more tube-like liquidity and sonic sophistication of the H30. The Bryston 7B³ amp also sounded good with the Hegel P30 preamp driving it, but the Bryston BP26 preamp seemed to be just a bit "quicker" no matter which power amp it was paired with. The Hegel P30 sounded as if it had less of a solid-state sonic signature than the BP26, but the P30 also sounded just a hair rhythmically restrained compared to the very direct and immediate-sounding BP26. The 7B³ power amp did lend just slightly more bass foundation and, perhaps, expanded the soundstage width a hair over the Hegel H30 amp. But, again, the H30 rendered depth better, sounded more continuous, and revealed subtle details a little better.

Comparing the Bryston and Hegel gear to my reference Ayre K-1xe preamp and GamuT 250i mono amplifiers proved instructive as well. In short, my roughly $35,000 reference combo outplayed the Brystons in every way—particularly in overall resolution and almost tube-like image density and soundstage depth, but then they should as they cost a little over twice the price. In my system, the Hegel combo performed at a level between the Brystons and my reference Ayre/GamuT electronics, but it is quite possible that some listeners might prefer one of the Brystons to either of the Hegel units depending on system matching and their tastes. To summarize, the following qualities followed the Brystons no matter in what pairings they were placed: notable musical immediacy, good rhythmic drive, solid foundation through good dynamic and bass performance, open but non-fatiguing top end, honest tonal balance, and finally, depth portrayal and "liquidity" that can be bettered by other gear. A good showing, indeed.

Conclusion

The Brystons proved to be a real treat. The new 7B³ power amplifier and the already well-received BP26 preamp are a wonderfully musical combination. Together, they offer feature-rich, real-world practicality in the form of the BP26's versatility and the 7B³'s high-output power delivery and ability to drive a wide range of speakers. Bryston's 20-year, transferable warranty applies to both units, so you can buy with confidence knowing that you are purchasing well-engineered equipment that also sounds good. If you favor high-powered solid-state amplification and would rather not spend more on audio gear, the Bryston BP26/7B³ combination should be on your short list. I don't know of a more powerful, versatile, and musically rewarding solid-state pre/power pair at its asking price. tas

Our Top Picks Preamplifier & Power Amplifier Review Combos

Audio Alchemy DDP-1 and DPA-1M

$1995 and $3990/pr.

The Audio Alchemy that produced a series of no-frills, bargain-priced electronics in the 1990s is back, but this time with a more upscale vibe. Now under Alchemy's former designer, Peter Madnick, the new Alchemy's first products are the DDP-1 preamp/DAC/headphone amp, and a pair of power amplifiers, the 325W monoblock DPA-1M and 125W DPA-1 stereo models. The DDP-1 offers some sophisticated technology for extracting the best sound from digital sources, including a "resolution enhancement" algorithm. The amplifiers are based on a switching output stage. The chassis work and the DDP-1's user interface are outstanding. The Alchemy combination has terrific dynamics, bottom-end grip, and control in the bass. The overall presentation, particularly when listening to the DDP-1's DAC, is immediate, incisive, and lively. A lot of performance for the price. (262)

NAD Masters Series M12 and M22

$2999 and $3499

The latest generation in NAD's Masters Series is unreservedly eye- catching, dressed in its elegantly crafted aluminum casework. The M12 preamp/DAC offers high connectivity via MDC Modular Design construction that allows enthusiasts to add the excellent optional network audio module called DD BluOS. Partnered with the M22 amplifier, a 250Wpc hybrid Class D design, sonics remain true to NAD values in the way it prizes midrange neutrality and integrity, yet also throws hints of richness into the mix that stir the warmer side of the musical spectrum. The M12 amp is a paradigm of power and touch, and its bass response is startling in its boldness and iron-fisted grip. A serious and masterful effort with sensible "have-it-your-way" appeal for the old guard and the network-savvy alike. (258)

PrimaLuna DiaLogue Premium and HP

Premium preamplifier, $3195; HP monoblock amplifier, $7798/pr.

The Dialogue Premium Preamplifier is a dual-mono, tube-rectified linestage, using a pair of 5AR4 rectifiers, and three 12AU7s per channel. It combines innovative design with high-quality parts and construction. The midrange was rendered with almost reach-out-and-touch texture, rich and vibrant tone color, realistic bloom, and a faithful sense of dimensionality and space. In this regard, this PrimaLuna is the embodiment of the characteristics that make valve amplification so intoxicating. The DiaLogue Premium line offers creative and thoughtful design, exceptional build-quality, first-rate parts and assembly, tremendous attention to detail, an elegant look and feel—and its sonic performance is clearly well above its reasonable asking prices.

For someone looking to indulge in the tube experience, with most of the drawbacks superbly well minimized, GW cannot recommend the 70Wpc (40Wpc in triode) PrimaLuna DiaLogue Premium HP highly enough. It offers creative and thoughtful design, exceptional build-quality, first-rate parts and assembly, tremendous attention to detail, and elegant look and feel, and its sonic performance is clearly well above its reasonable asking price. (269)

Our Top Picks Preamplifier & Power Amplifier Review Combos

Bryston BP26 and 7B³

BP26 preamplifier, $5160; 7B3 monoblock, $11,390/pr.

The BP26 is a fully featured preamp with a tape loop, a mono/stereo toggle, a mute toggle, a channel balance control, a motorized volume pot, an input selector, and a feature one does not find very muc xh anymore—a phase-inversion toggle. Remote control is a $375 option. The BP26 has both balanced/XLR and unbalanced/RCA inputs and outputs and a ¼" headphone jack. The BP26 sounds musical and engaging with fabulous rhythmic drive and momentum. It is tonally neutral with an open quality that does not veer toward edgy or forced. It imparts a sure-footed foundation with good bass extension and control. The Bryston's musicality is more along the lines of a winning, agile tunefulness, than a musicality derived from a beguiling, silky lusciousness.

Bryston's 600W 7B³ monoblock power amplifier is a wonderfully musical product. It offers feature-rich, real-world practicality and the ability to drive a wide range of speakers thanks to its very high power/current delivery. If you favor blockbuster solid-state amplification and would rather not spend more on audio gear, the Bryston 7B³ should be on your short list. (269)

Constellation Inspiration Preamp 1.0, Stereo 1.0, and Mono 1.0

$9000, $11,000, and $22,000/pr.

As with Constellation's other Inspiration Series components, the Preamp 1.0 offers Constellation-grade sound quality in what is essentially breakthrough pricing for this maker of cost-no-object components. The Preamp 1.0 sports the same circuitry, chassis build-techniques, remote control, and display as the $24k Virgo 2. The sound is similar as well, with the trademark Constellation combination of resolution with ease, tremendous clarity and transparency to sources, and wonderful rendering of timbre.

The 200Wpc Inspiration Stereo 1.0 brings the same circuit design and some parts from Constellation's $140k Hercules monoblocks to a more accessible price point. Constellation has done an amazing job of maintaining many of the qualities that made the Hercules such a standout, including a highly resolved treble that never crosses over into the analytical. Transparency and timbres are also first-rate. The icing on the cake is that the Stereo 1.0 incorporates new circuit refinements that improve bass performance beyond that of its predecessors.

The Mono 1.0 amp in the Inspiration series brings plenty of power to the table (400W into 8 ohms, 800W into 4) along with the circuit design of the much more expensive Reference and Performance Series amp. Compared with the half-the-price stereo version, the Mono 1.0 offers even wider dynamics, a more solid bottom-end, and an effortlessness on musical peaks (which are already excellent with the Stereo 1.0). This monoblock shares Constellation's signature sound of tremendous transparency, a finely detailed treble, gorgeous midrange textures, and a sense of refinement and sophistication. (249)

PREAMPS & POWER AMPS

Click any product name to read that review

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Equipment Report

Rogue Audio RP-5 Preamplifier

An Old Soul

Neil Gader

Equipped with remote control, phonostage, four unbalanced RCA inputs, microprocessor control, and even a trendy front-panel headphone output, the Rogue Audio RP-5 is a handsome, full-featured preamplifier that's thoroughly modern in every sense of the word. You won't find any grass growing beneath its anti-resonant footers. But it's also brimming with classic vacuum-tube virtues that brought back personal memories of an earlier era in the high end. Specifically, from the 1970s, when owning a high-power solid-state amp was the strongest incentive to purchase a tube preamp. Anyone who came of age during that period knows what I'm talking about. Solid-state output devices and topology were still in their relative infancy, and while these beasts were powerful, stable, and even sonically praiseworthy in some areas, they had already developed a bad-boy reputation for a dry top-end, as well as an off-putting graininess of texture in the treble region. On the other hand, tube electronics, the established old guard, while relatively low-powered in comparison (and often encumbered with colorations of their own), still possessed a fluidity and warmth that solid-state couldn't approach. Audiophiles seeking to take advantage of solid-state power without giving up the sonic qualities of tubes often resorted to a hybrid solution—a tube preamp placed in front of a transistor amp could ameliorate the more offensive behavior, smooth over the grain, and add the bloom and warmth that solid-state so sorely lacked. Clearly as the years passed the attributes of tubes and solid-state began to converge until the sonic differences today are of a lower magnitude. But for many of us a tube/solid-state electronics chain remains a very compelling solution.

No doubt about it, the RP-5 is one good-looking hunk of electronics. A central oval display is centered on its brushed-aluminum front panel with a large aluminum volume knob on the right side, microprocessor-controlled input buttons along the bottom, and a balance knob on the left. The bright VFD display provides volume, balance, and source info in large, readable characters. The volume control is a stepped-attenuator with 60 steps in 1dB increments. There are no op-amps in its signal path. Adjusting balance over 66 steps is as easy as giving the knob a spin, but Rogue has also added a return button beneath the balance knob that when pushed will automatically rebalance the two channels. Very clever, and an example of what good software engineering can accomplish.

The headphone amplifier is fed from the outputs of the tube gain stage. The RP-5's headphone amplifier is a tube/solid-state hybrid that offers sufficient power for more-difficult-to-drive higher-impedance headphones. Other features include home-theater inputs, a processor loop, and a mono button. The ten-button remote allows access to volume, balance, selector, mute, mono, and on/off from your listening position. The RP-5 also features a "slow-start" turn-on sequence and automatic muting when

Equipment Report Rogue Audio RP-5 Preamplifier

powering on or off. Every RP-5 is fully tested, burned-in, and auditioned prior to shipment.

Internally the tube complement is four 12AU7/ECC82. Rogue employs a mu-follower—a high-gain, low-output-impedance inverting stage known for low noise and very low distortion. Classic old-school tube stuff. But on the modern end it's also the first preamplifier to be based on Rogue's RP-X platform—a formula of hardware and software that will be the basis for the brand's future preamps. The software has been developed in-house and will allow the company to bring more functionality to its designs. "Top" Rogue and President Mark O'Brien stated that "the goal was to create vacuum tube preamps that not only sound extraordinarily good but included the modern feature-set that our customers are looking for. The tube circuitry is now computer-optimized for extreme accuracy, ultra-quiet operation, and long-term reliability. The RP-5 also has features such as a vacuum-fluorescent display and the ten-button remote, which would not be possible without the new hardware and software package."

Turning to sonic performance, the RP-5 did not immediately strike me as a tube preamp in any Old World sense. To begin with it was very quiet—solid-state quiet. No valve whoosh, chug, or hiss. Even as it idled and I applied increasing amounts of gain, the sonic result was the same silent, inky-black background. Tonally, the RP-5 was predominantly neutral with just a very subtle hint of a rose-blush complexion to warm the mids. The treble was nicely extended, quick, detailed, and replete with harmonic information. Bass performance was authoritative, very nicely controlled and musical, yet also adding small amounts of bloom to bass violin, timpani, and cello. Transient behavior was quick off the mark but naturally so—firmly struck notes from a piano, a flatpick, a rimshot, a trumpet presented a complete picture of the initial transient, the sustain of the note, and its trailing decay.

The RP-5 especially brings its magic to bear in the areas of color saturation and tonal liquidity. A prime example would be how vividly the RP-5 reproduced the contrasts in the intricate vocal harmonies and acoustic arrangements of neo-bluegrass band Nickel Creek [This Side]. The RP-5 had the ability to balance the competing images in much the way we experience them in life—individual and apart in space, yet at the same time locked together in performance. In the instance of Nickel Creek, mandolin, acoustic flattop, and vocals resided unwaveringly in their own pockets of ambient air—utterly stable, with no smearing. And they did so effortlessly, without sounding clinical or over-articulated. The RP-5 simply presented a natural acoustic clarity that rang truthful. The preamp had an inner resolving power that established a sense of dimension and space so specific to each image that I was almost able to isolate each player visually, as if I were attending a live concert.

Since Rogue outfitted the RP-5 with a phonostage as standard equipment, I wasn't going to let the opportunity pass me by to put my Sota Cosmos/SME V rig through its paces. Optimizing the phonostage for the Sumiko Palo Santos Celebration was an easy task. It required removing ten cover screws, and lifting away the aluminum top plate. Once inside there was easy access to a pair of red slide switches for capacitance, plus DIP switches for eight settings of resistive loading and four gain settings between 40 and 60dB. Total work time was about five minutes, and I was being very careful. I can understand those who consider the effort an imposition, but consider the fact that, one, it's not something you do every day, and two, in contrast with the convenience of front-panel phono adjustments, placing the phono switching so close to the phono circuitry reduces the distance that the signal has to travel and thus potentially reduces noise. As an aside, opening the cover made it easy to appreciate how neatly laid out the RP-5 interior was, including the expensive Mundorf caps, and the relative isolation of the sensitive phonostage nestled in a corner well away from the rest of the circuitry.

Turning to the phonostage performance, overall imaging was stable and transients retained their spontaneity. There was solid underlying continuousness across the soundstage, as well. However, I heard a lighter energy and cooler cast in familiar recordings. The sound wasn't quite as richly varnished compared with other sources I'd input through the RP-5. One instance would be the new Impex LP remastering of Jennifer Warnes' Famous Blue Raincoat. During "Song For Bernadette," Warnes' vocals seemed a little less rich and colorful, and the airy buoyancy of her head-tone was a dash drier. I have to confess the phonostage was a little bit disappointing given the overwhelmingly positive nature of the experience up until that point. However, to be fair, I was running the phono at maximum gain for the benefit of the Palo Santos Celebration moving coil (0.5mV), and though it was reasonably quiet for this class

the RP-5 phono section couldn't match the seriously quiet Parasound JC3+, proving once again that I'm spoiled, and that it's hard to beat a premium outboard phonostage for isolation. For a built-in phono with this level of optimization, it still represents good value.

Rogue Audio is an instance of an American high-end company whose name may not instantly ring bells of recognition, at least compared with the zoom factor of more costly headliners like ARC, VAC, CJ, or Pass Labs. Nonetheless, a reasonably priced, high-performance preamp like the RP-5 is a prime example of what the high end is all about—music reproduced accurately and beautifully. With a nod to the past and footers firmly planted in the now, the RP-5 is a component that should tempt a lot of people to go Rogue. tas

SPECS & PRICING

Inputs: Four RCA, one phono
Outputs: Two variable RCA, one fixed
Dimensions: 18.5" x 4.5" x 14.5"
Weight: 30 lbs.
Price: $3495

ROGUE AUDIO, INC.
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Equipment Report

D'Agostino Classic Stereo Amplifier

Classic Indeed

Jacob Hellbrunn

For such a big amplifier—and the Classic Stereo weighs in at 108 pounds—there isn't much to it in the way of fancy doodads. Quite the contrary. A pair of XLR inputs on back, plus speaker connections. Push one green backlit button on the faceplate and you're off and running. This is truly a plug 'n' play amplifier. But my word, how it does play!

Dan D'Agostino's latest creation is a throwback in looks (can you say industrial design?) but not in performance. No, it's not as bruising as the famous Krell amplifiers of yore that D'Agostino used to build before he exited to start his new company. I have seen grown men's knees turn to jelly as they whimper about their memories of a particular Krell amp they once owned. Those days are long over, particularly in an era when more than a few manufacturers are concerned with producing diminutive amps that fit into home décor rather than questing for the absolute.

To his credit, D'Agostino has ventured back to his origins. Go heavy or go home, so the weightlifters like to say. Mr. D. has done the former. The fully balanced Classic Stereo, which D'Agostino constructs at his factory in Arizona, has real cojones. It is a brawny and manly amplifier, one that D'Agostino is proud enough of to emboss his name on the faceplate. The amplifier is part of his new Master Power Series.

The Master Power Series offerings are all one amplifier in different configurations. The Classic Stereo amp reviewed here is the basic stereo amp, the Master Power 2+ has a crossover and can be bridged to become a 1000W mono amp, the Master Power 3+ has crossover on two of its three channels for daisy-chaining, home-theater use, etc. All amps have RS232 control.

The Classic Stereo is, to use an old-fangled term, a gas to use. It had me pulling out the big stuff, whether orchestral or soul music, to remind myself of what the Wilson Audio XLF loudspeakers can deliver in the nether regions, especially when mated to an amplifier that delivers a hefty amount of current like the Classic Stereo. Power may corrupt, as they saying goes, but I didn't hear much corruption here. What I heard was the abundant plusses that a powerful amplifier can offer—unflappability, smoothness, and dynamics. The days of abrasive solid-state, folks, are over.

And if you're into power, check out the ratings on this amp. Naturally, it has a very high damping factor and, unlike some amplifiers that don't double up power from 8 ohms to 4 ohms to 2 ohms, this one does. It goes from 300 watts to 600 watts to 1200 watts. Short of an Apogee Scintilla, I doubt there are many speakers extant that this amp can't drive with aplomb.

As D'Agostino himself emphasizes, the aim of the Classic Stereo is to deliver a lot of performance for a reasonable (by, I hasten to add, high-end standards) price. This amplifier contains as many of the parts and as much of the sound of his top-drawer Momentum Series as possible. One area he hasn't skimped on, for example, is build-quality. The amplifier features what is known as through-hole construction. This means that the leads on the capacitors, resistors and other parts extend through the circuit board rather than being surface-mounted—for better sound and reliability.

From the very first CD that I played—I ran the amp in balanced mode both directly from the dCS Vivaldi four-piece stack and from my Ypsilon PST-100 Mk II preamp—it was clear that this amplifier doesn't waste time getting down to cases.

Take the CD *This Time For Real* [VizzTone], which features the southern soul singers Otis Clay and Billy Price. On track after track, I was both impressed (and seduced) by the command of the Classic Stereo. From bass to treble, it was as though the sonic tapestry were cut from a single cloth, partly because of the alacrity of the amplifier, partly because of its grip in the bass region. TAS Editor Robert Harley has written previously about the sensation of bass being a half-step behind the rest of the musical presentation. It creates a slightly vertiginous sensation, as though you want to physically push the music forward. There was none of that

Equipment Report D'Agostino Classic Stereo Amplifier

time lag here. On the Warner Classics reissue of the trumpeter Maurice André's recordings, for instance, the precision of the bass accompaniment on Benedetto Marcello's "Adagio" meant that there was no overhang—André's trumpet simply soared over the bass line, which clearly demarcated the pulse of the music.

Worthy of note, too, was the verisimilitude with which the Classic Stereo conveyed the nuances of Clay's and Price's singing—crooning sighs, bellowing, and so on seemed to be palpably realistic. Much of this can be ascribed to the interstitial silence created by the amp's ability to start and stop on time. What separates the pros from the amateurs in amplifiers, the men from the boys, is their sense of timing, regardless of musical genre. This is one area that D'Agostino has nailed.

Another thing that D'Agostino's amp does very well indeed is to set up a cavernous soundstage. On the album *Philadelphia Beat* [Sunnyside Records], it presents the trio of Albert "Tootie" Heath on drums, Ethan Iverson on piano, and Ben Street on bass with a remarkable presence and sense of space. The tautness of Street's bass is beautifully delineated, a real thud on the deepest notes, not to mention a warm, deep, and rich sound to the piano, particularly in the bass area, where it resounds thunderingly. This amp pushes a loudspeaker to move gobs of air.

So much, in fact, that some listeners may initially be taken aback by how much energy the Classic Stereo delivers in the 60–200Hz region, where most of the sense of bass performance really resides. On Leonard Cohen's *Old Ideas* [Sony], it offered the richest and gruffest rendition of his voice that I've ever heard. Some may find this a little over the top, but I think D'Agostino's amp is fleshing out what's already present in the recording without supplying much of an additive flavor. All of this is a way of saying that this isn't a sterile and bleached-sounding amplifier. Rather, it lands on the warm and full side but without sacrificing detail or transparency. It's not necessary to play it loud, for the Classic Stereo will reproduce fine detail at lower volumes, once again as a function of its power.

So what separates it from the truly megabuck amplifiers? It lacks the last degree of tactility, finesse, and depth that a more refined amplifier would convey. On a Harmonia Mundi recording of Bach's violin concertos by the Freiburg Baroque Orchestra, the amp's control was readily apparent but so was a slight glaze over the original instruments that the ensemble deploys for its performances. If this amp has a weak spot, it's the treble where it can harden slightly on very complex and dynamic passages. Obviously, some compromises had to be made to get to this price point. I seriously doubt, however, that an amplifier built a decade ago for ten times the price would sound as good as D'Agostino's Classic.

In that regard, perhaps the most striking aspect is how easily the Classic Stereo delivers the sense of an ensemble playing in unison. There is always what the U.S. Army likes to call unit cohesion when listening to the Classic Stereo. Put otherwise, there is no smearing, no bloat, or any of the other sonic nasties that can mar the suspension of disbelief that audiophiles crave when attempting to replicate live music; rather, the amplifier conveyed a lissome sense of ease and flow to the music. In sum, the Classic Stereo offers amazing imaging and clout. If you're looking for an amp that can handle difficult loads with ease and provide excellent performance without costing you a packet, this is it. tas

SPECS & PRICING

Inputs: Two balanced XLR (XLR to RCA adapters supplied)
Power rating: 300Wpc into 8 ohms, 600Wpc into 4 ohms, 1200Wpc into 2 ohms
Frequency response: 1Hz–200kHz, -1dB
Signal-to-noise ratio: 100dB
Input impedance: 100k ohms
Output impedance: 0.12 ohm
Dimensions: 11.5" x 19" x 20"
Weight: 108 lbs.
Price: $12,000

D'Agostino Master Audio Systems
7171 E. Cave Creek Road Unit K
Carefree, AZ 85337
(480) 575-3069
dandagostino.com

Associated Equipment
Continuum Caliburn with Swedish Analog Technology and Cobra tonearms, Lyra Atlas and Miyajima Zero mono cartridges, dCS Vivaldi digital playback system, Ypsilon (silver) PST 100 Mk. 2 preamp, VPS 100 phonostage and SET 100 Ultimate Mk 2 monoblocks, Wilson XLF and Hammer of Thor subwoofers, Nordost Odin 2 and Transparent Opus Gen 5 cabling, Stillpoints Ultra 6 isolation feet

Equipment Report

Optoma NuForce STA200 Power Amplifier

Depth and Dimensionality Aplenty

Steven Stone

A good power amplifier design is a good power amplifier design whether it was created in 1950, 1960, 1970, or anytime thereafter. Given how long audio has been around, you can expect any list of all-time great amplifiers to have 100 entries and there would be still some worthy examples that would not make the roster. Depending on whom you ask, and who answers, the Goldmund job 225 power amplifier ($1499) could very well be one of the amps that would make it onto that list. Recently Optoma NuForce (along with Goldmund's knowledge), introduced a new amplifier that is based on the Goldmund job 225 amplifier, called the STA200 ($1299).

How did collaboration between Goldmund and Optoma NuForce come about? According to Optoma NuForce, years ago Goldmund used to offer its customers Optoma projectors. When merger discussions between Optoma and NuForce began, the leaders of the emerging company-to-be considered how to move forward and how to expand or refresh the NuForce portfolio. At the same time Goldmund was curious to see whether younger audiophiles and audio enthusiasts would be interested in affordable high-performance equipment, and whether its own brand awareness could be expanded through NuForce. For Optoma NuForce, introducing a Class AB amplifier was a way to test the market and see whether this was a direction the company should pursue. So the STA200 power amplifier is an experiment for both firms.

Technical Tour

While the STA200 has many similarities to the Goldmund job 225 power amplifier, it is not identical. The primary difference is the power output specification. The job 225 puts out 125 watts into 8 ohms while the STA200 has only 80 watts of output into 8 ohms. This difference in power output was instituted so that the STA200 would not be a direct competitor for the job 225 (it could even be argued that for the $200 difference the job 225's additional power offers a better value). Another difference between the job 225 and the STA200 is the latter has a slightly lower gain (34.4dB) that's closer to a more standard figure, as opposed to the job's 36dB gain.

According to a review by Brent Butterworth of the job 225, that amp's Class AB design "was taken from an amplification circuit originally used in a Tektronix oscilloscope in the late 1960s." Michel Reverchon, Goldmund's CEO, said that the circuit has since been refined by nine generations of Goldmund engineers, and variations on the circuit were used on all of that company's amplifiers.

The STA200 has the same wide bandwidth as the job 225, spanning the range from 10Hz to 100kHz. The STA200 also extends its high-frequency response up to 900kHz (at 3dB down). The reasoning behind such a wide bandwidth design is to eliminate phase shifts caused by the high-frequency roll-off effects.

Setup

The STA200 has all the controls you normally find on a basic power amplifier, which are not many. The only input option is a pair of single-ended RCA connections. For output the STA200 has one pair of five-way binding posts. The only other features on the back panel are the IEC AC line connection, a heatsink that takes up three-quarters of the back panel, a 115/230V AC switch, and a power output connector that can deliver power to the Optoma NuForce WDC200 streamer. The STA200's front panel is an unadorned expanse populated by a single power on/off button located on the right side next to a small red power indicator LED.

Dimensionally the STA200 ranks as a ¾-sized cabinet. It's 14 inches wide, only 8 inches deep, and 3¼ inches high. Even when it's left on 24/7 the chassis only gets warm to the touch—the heatsink on the back does a good job handling all the serious heat dissipation duties.

I used the STA200 extensively during a two-month period while I was listening to and reviewing the Mytek Brooklyn DAC/preamp. The STA200 was installed in both my nearfield desktop monitoring system where it was connected to the Audience 1+1, Dali Opticon 1, ATC SCM7 II, Role Audio Sampan FTL, and Role Kayak; and in my room-based system where it drove the Spatial M3 Turbo SE loudspeakers. I did not connect the STA200 to any especially difficult-to-drive loudspeakers since I do not currently have anything with a sensitivity of less than 87dB on hand. I did find with the high-sensitivity Spatial

Equipment Report Optoma NuForce STA200 Power Amplifier

M3 loudspeakers that the STA200 did not generate any more hiss from the tweeters than the more standard 27dB gain specification of the Bel Canto REF M600 power amplifier.

Given STA200's extremely wide bandwidth specification I was curious if there would be any noise issues. As mentioned, during the review period I had the amplifier in two systems, and neither displayed any noise issues that could be attributed to amplifier instability or to RFI/EMI issues affecting the amp's performance.

Another potential sonic issue was the STA200's higher than usual gain specification. With some preamplifiers, the STA200's higher gain could mean that the preamplifier could be operating in a less than optimal gain range. With the Brooklyn DAC/pre I rarely got above -45 on the Brooklyn volume scale of -100 to -0). The last potential downside of an amplifier with higher gain is it can amplify the basic noise levels in an audio signal chain from inaudibility to unfortunate audibility. When the sound was muted, I had no issues with added noise from my loudspeakers in either of the systems where I used the STA200.

Sound

For the last couple of years I've been listening primarily to systems using switching (Class D) power amplifiers, so it was illuminating to go back to a linear solid-state design. I hesitate to make any gross generalizations, but listening through the STA200 provided a more organic and less coolly objective view of the music than most switching amplifiers I've used recently. Near the end of the review period, my venerable Pass Labs X150.3 power amplifier (circa 1996) was returned fully restored and updated by Pass Labs. Harmonically the STA200 had far more in common with the Pass X150.3 than any of the switching power amplifiers I use regularly. Perhaps there's something to the idea that amplifiers that employ similar technologies share a certain intrinsic characteristic sound.

The STA200 displayed exemplary dimensionality. Lateral image placement was as precise as I've heard from any amplifier. Depth delineation was equal to the Pass Labs X150.3, and on some selections I felt the STA200 did a better job of defining the edges of each instrument or vocalist than the Pass could. The Bel Canto REF M600 did an even slightly better job of defining image edges and produced an even larger soundstage, but it did not better the STA200 in overall dimensionality. The REF M600 was slightly inferior in depth recreation compared to the STA200. In comparison, the REF M600's soundstage was wider, but less deep than the STA200's.

The STA200 had a darker than absolutely neutral harmonic balance that is quite similar to the Pass X150.3. Depending on the other components in your system you might find, as I did, that I preferred this less spotlighted upper midrange on modern pop, but on some classical and vintage jazz I preferred the Bel Canto REF M600's slightly brighter harmonic rendering. I must stress this wasn't a radical difference, but it was enough be readily identifiable.

SPECS & PRICING

Type: Solid-state, Class AB
Output power: 80Wpc into 8 ohms
Input: RCA analog (single-ended)
Input impedance: 51k ohms
Output impedance: 30m ohm

Dimensions: 14" x 3.4" x 8.8"
Weight: 13 lbs.
Price: $1299

OPTOMA USA
3178 Laurelview Ct.
Fremont, CA 94538
(510) 897-8600
optomausa.com/soundproducts

Associated Equipment
Source devices: A 2013 MacPro Desktop with a 3.7GHz Quad-Core Intel Xeon E5 processor with 16GB of memory and OS 10.11.5, running iTunes 12.4 and Amarra Symphony 3.3, Pure Music 3.0.1, Audirvana+ 2.5, Roon 1.2, and Tidal 1.3.
Analog sources: VPI TNT III w/Graham 1.1 tonearm and ClearAudio Victory II cart; VPI HW-19 with Souther SLA-3 tonearm and Denon 103/van den Hul cartridge
Phono preamps: Vendetta Research SCP-2B and Vinnie Rossi LIO
DACs: Mytek Brooklyn, PS Audio DirectStream Jr. DAC, Cary Audio DMC-600SE Music Hub, Grace m9xx
Amplifiers: Bel Canto REF M600, April Music S-1 monoblocks, NuPrime ST-10, Pass Labs X150.3
Speakers: Spatial M-3 Turbo SE with two JL Audio Fathom f112 subwoofers; Audience 1+1, Role Audio Sampan FTL, Dali Opticon 1, ATC SCM7 II, with one Velodyne DD 10+ subwoofer
Cables and accessories: WireWorld Silver Starlight USB cable, WireWorld Eclipse 7 balanced interconnect, AudioQuest Carbon USB cable; AudioQuest Colorado single-ended RCA interconnect, Kimber KCAG single-ended and balanced interconnect, Audience Speaker Au24e speaker cables, PS Audio Quintet, Dectet, Octet, and Premier power conditioners

Equipment Report Optoma NuForce STA200 Power Amp

One particular performance area where the STA200's sonics were closer to those of the Bel Canto REF M600 than the Pass X150.3's was dynamic speed and agility. Here the Pass seemed a bit less fleet. It lacked some precision in its transient attack and decay that both the REF M600 and the STA200 had little trouble traversing. Perhaps this sonic difference could be attributed to the REF M600's and STA200's S/N figures, which both bettered those of the Pass.

In bass control and definition the STA200 displayed a nimbleness that matched the best amplifiers I've heard. The bass rendition was definitely tighter and better defined in the STA200 than in the Pass X150.3, where the lower octaves were fluffier and slower by comparison. Once more I found the STA200's basic low-frequency personality closer to that of the Bel Canto REF M600.

Currently I have the Spatial M3 Turbo SE loudspeakers set up so they receive a full-range signal with no crossover-set bass roll-off. This system also has a pair of JL Audio Fathom f112 subwoofers configured for a 45Hz, 24dB-per-octave crossover slope. Both the STA200 and the Bel Canto REF M600 generated fast, tight bass that melded well with the Fathom f112.

On my own recordings played back through my nearfield system I found the STA200 was among the more truthful amplifiers I've used. I did some A/B testing where I compared it with the NuForce ST-10 amplifier. I found the NuForce produced a bit larger soundstage, but it was a dead heat between the two amps in image specificity, low-level detail, dynamic contrast, and bass extension.

Conclusion

Basic solid-state power amplifiers are not, due to their essential nature as boxes with parts inside, sexy objects that inspire a lot of audiophile lust. Perhaps that is why so many manufacturers feel the need to tart up their basic power amplifiers with thick front panels, cool meters, or artistically sculpted, rad-colored enclosures. The STA200 will never be accused of looking sexy or especially stylish—unless you are into stark minimalism. But if sound quality and solid-state reliability are your primary purchasing criteria, the STA200 should be on your radar. You may not be blown away by the STA200's looks, but its sound turns it into one sexy beast. tas

Equipment Report

Audio Research Reference 250 SE Amplifier

World-Class

Don Saltzman

A new Reference tube amplifier from venerable manufacturer Audio Research is always a big deal. Incorporating significant upgrades from its Reference 250 predecessor, the Reference 250 SE mono amplifier features Tung-Sol's latest high-current output tube, the KT150 as well as new active and passive parts. Reference 250 owners can have their unit upgraded to SE status at the factory, which includes new tubes.

Sonically, the Reference 250 SE is the epitome of the "High Definition" tagline of its maker. First, the lack of background noise is startling, especially for a large tube amplifier. It's so quiet that it sometimes comes as a shock to hear an unexpected instrument seemingly "pop out" of nowhere. For example, I have played the Haydn Cello Concerto with Jacqueline du Pré (EMI) so many times that the record can almost find its own way to the turntable. In the adagio the orchestra slowly sets up the subtle entrance of the cello near the center of the stage. I knew when to expect du Pré's entrance, yet the background was so black that it was still a pleasantly fresh surprise the first time I heard it through the 250 SEs. That's one way to rediscover your records. On other material where instruments or vocalists were playing on only the right or left channel for a short period of time, the other channel was so quiet that more than once I had to check to make sure it was still working.

Likewise, I frequently listen to the 45rpm reissue of *The Red Hot Ray Brown Trio* [Groove Note]. Great music, great sound. It was recorded live at the Blue Note in New York City. Still, the instruments were so present in the room and the background so silent, I was fooled into thinking it was a studio recording until, shortly into "That's All," the audience started clapping in a wide panorama behind the musicians.

After listening to other (even more powerful) tube and solid-state amplifiers for the past six months or so, it required a period of adjustment before I could really appreciate the virtues of the Ref 250 SEs. Not quite as bold or brash as some of the bigger tube amplifiers I have heard at home or elsewhere, it took a while to realize that I was hearing perhaps even more in the recordings than before, but with an uncanny smoothness from top to bottom and lack of edge. The music is all there but with no sense that any particular frequency range is either highlighted or recessed. The sense of air and space is almost (but not quite) as great with the 250 SEs as with tube and solid-state amplifiers in the 600–700 watts per channel range (into the 4-ohm impedance of the Maggie 20.7s), but the 250 SEs had no trouble at all driving these very low-sensitivity speakers to ear-shattering levels without any sense of strain.

More importantly, the 250 SEs were uncommonly friendly to those recordings I would often pass over because I sometimes found them harsh or bright to the point of fatigue. Whenever we get new equipment, I think most of us turn to certain "problem" recordings in our collections to see if the new equipment has worked a miracle with that disc. Is my favorite performance of the Shostakovich Fifth Symphony now, *finally*, listenable? Do the loud passages no longer make my ears bleed? Stepping a little further out on the limb, I think it is often because of difficult records like these that we are looking for the magical piece of electronics that now will allow us listen to the recording with the ease and enjoyment we have been seeking.

I haven't yet found the electronic miracle that makes all recordings perfect. Moreover, we have all experienced new equipment that improves some area of sonic performance but takes a step or two backwards in other areas. But the improvements in listening enjoyment wrought

Equipment Report Audio Research Reference 250 SE Amplifier

by the Ref 250 SEs are significant, while it is much harder to pinpoint any offsetting deficiencies. Those massed strings on some recordings that used to take on an annoying metallic hardness now sound only like massed violins through the 250 SEs. As a bonus, it is easier to differentiate the individual strings and the air around the string section(s) expands from spacious to billowy. I can now play many of these previously difficult recordings with enjoyment instead of relegating them to their lonely vigil on my shelf. Crescendos that used to instinctively make me lower the volume now sail through the room in all their glory. Sonic peaks do not seem to be compressed; instead, they maintain the integrity of all the instruments, simply played at a louder level—just like at the symphony hall, or any indoor rock concert I can recall. What was previously perceived as glare, either in the recording or perhaps caused by the tubes themselves, is now taken as increased energy without the fatiguing artifacts.

I play orchestral music fairly loud, to a level I believe roughly corresponds to sitting in the middle to front of the orchestra section at a live performance. Some of my friends think it may be louder than life, but I usually win those arguments if we are at my house and they have had a lot of wine. I play rock 'n' roll even louder, because that is the way I hear it live and because it is *fun*. If my system won't give me goosebumps on certain music, from the delicate second movement of Ravel's Piano Concerto in G to the Rolling Stones' "Can't You Hear Me Knocking" to Mama Cass belting out "Dream a Little Dream of Me," I've failed. We all have accumulated this expensive electronic and mechanical *stuff* to let us enjoy listening to music at home, in a way that brings us maximum enjoyment. In this most fundamental endeavor, the Ref 250 SEs prove to be a valuable part of the arsenal. They will let you get the most out of that string quartet played quietly at night. At the same time, they have the ability to play an orchestra or band at full tilt with a degree of listenability (sweetness perhaps?) and lack of listening fatigue that, in my experience, is rare for a relatively high-power all-tube amplifier. And if the 250 SEs sound like more than their rated 250 watts on my power-hungry Maggie 20.7s, I can virtually guarantee that they will sound like 500 watts on almost any other speaker system out there (more about this below).

One of the most interesting aspects of the Ref 250 SE is its tonal palette. Some reviewers have commented that earlier Audio Research amplifiers suffered from a certain lightening of tonal color, i.e., a threadbare or whitish quality. After months of listening to the 250 SEs, I can report that the tonal color of these amplifiers is anything but threadbare. All instruments are presented with a richness of color that you would hear live. Indeed, this is one of the reasons many of us are addicted to the sound of tube amplification. The interesting part is that while tonal color is fully saturated, it never progresses to the over-ripe or excessive bloom that some tube amplifiers can't seem to avoid. For example, one of my most cherished recordings is Daniel Shafran playing the Shostakovich Cello Sonata (RCA). Although a clean copy may not be that easy to find, IMHO this is one of the greatest early RCAs and a must-have disc for anyone who loves this music. Through the 250 SEs, Shafran's cello sounds delicate, full, and vibrantly present with 3-D texture; but it avoids sounding overblown as if two cellos were playing. Nor does it sound more like a viola, a direction possibly taken by some solid-state amplifiers.

The rich tonal colors of the 250 SEs were apparent on every good recording I played. Ray Brown's bass, in *The Red Hot Ray Brown Trio*, was full and vibrant without being plummy. Gene Harris' terrific piano sparkled and thundered, with appropriate weight and impact in the lower registers. Massed violins, piano, and woodwinds in Julius Katchen's performance of the Brahms Piano Concerto No. 1 [Decca] were simply gorgeous, the 250 SEs finding new color in this great old recording. Further, all of the instruments were suffused with their own air and space to a level I did not previously know existed on these recordings.

I have already alluded to how well the 250 SEs controlled the Maggie 20.7s. Like a black hole with a grille cloth, these relatively inefficient speakers can inhale an aspiring power amplifier with nary a trace left behind. But, with the right amplifiers, these speakers sing like few others. With the 250 SEs they sing with a full

SPECS & PRICING

Type: Mono tube amplifier
Power output: 250 watts continuous from 20Hz to 20kHz
Power bandwidth: (-3dB points) 5Hz to 70kHz
Frequency response: (-3dB points at 1 watt) 0.5Hz to 110kHz
Input sensitivity: 2.4V RMS Balanced for rated output. (25.5 dB gain into 8 ohms)
Input impedance: 200k ohms balanced
Output taps: 16 ohms, 8 ohms, 4 ohms
Dimensions: 19" x 8.75" x 19.5"
Weight: 73 lbs.
Price: $17,000 each

AUDIO RESEARCH CORPORATION
3900 Annapolis Lane North
Plymouth, MN 55447
audioresearch.com

Associated Equipment
Magneplanar 20.7 loudspeakers; Kuzma Stabi M turntable with Kuzma 4Point arm, Lyra Etna and Koetsu Rosewood Platinum Signature cartridges; CD playback system, EMM Labs; Aesthetix Eclipse Io phonostage with two power supplies; Aesthetix Eclipse Callisto
linestage with two power supplies; Audio Research Ref 10 Line Stage; Audio Research Reference 250 SE Amplifiers; Audio Research REF 10 Phono; VTL 750 amplifiers; Purist Audio Design, Transparent, and AudioQuest cabling; Sain Line Systems power cables; Stillpoints Ultra 6 isolation feet

Equipment Report Audio Research Reference 250 SE Amp

chorus. Each watt has been to the gym and the nominal 250-watts rating feels conservative, a pleasant surprise for someone who previously was convinced that only much more powerful amplifiers (tube or solid-state) could do justice to the 20.7s.

In light of the above comments, it should come as no surprise that the dynamic range of the Ref 250 SEs is outstanding. Even at quiet listening levels, crescendos or hard-hit timpani or bass drums can still be startling in impact. At the suggestion of Audio Research, I used two accessories that improved the performance of the amplifiers, with no downsides I could discern.

These amplifiers use 20-amp power cables, making it impossible to use my usual assortment of 15-amp cords. The 250 SEs sounded fine with their stock cables but took steps toward greater transparency and increased instrumental texture when I swapped in power cords made by Sain Line Systems of Minneapolis, MN. These hand-made and cryogenically treated cables, at $1895 for six-foot standard length, are not inexpensive but nevertheless proved to be a very worthwhile upgrade over the stock power cords.

Another improvement in sound was gained by using Stillpoints Ultra 6 feet beneath the amps (and, ultimately, the preamps as well). The most notable gains were a slight but perceptible increase in soundstage width and depth, tighter bass, and even more precise placement of instruments and vocalists in space. At this already-stellar level of performance, any improvement is welcome.

One other aspect of the sound of the 250 SEs deserves special mention. Unlike some of the earlier ARC amplifiers I have heard at shows in past years, these babies have slam. Drum whacks will hit you in the chest and low bass is very extended. The 250 SEs display tighter grip of the 20.7 bass panels than any other tube amplifier in my experience. Electronic bass, such as in "Rose Rouge" from St. Germain's *Tourist* album [Parlophone], plumbed new depths of the 20.7s' capabilities. In fact, if your eyes were closed you would think the Maggies were being driven by solid-state amps in the bass. But they depart somewhat from traditional solid-state bass by offering a bloom and air that's almost always the sole province of tubes.

The unique virtues of the Reference 250 SE amplifiers held up through various changes of linestages and phonostages. Near the end of my review process I had the luxury of pairing the 250 SEs with Audio Research's Ref 10 Phono and Ref 10 linestages. It immediately became obvious that all three pieces of equipment were designed with the same sensibilities, leading to a synergy that added substantial enjoyment to the listening experience. The Ref 250 SE's strengths were magnified (backgrounds were blacker, frequency response even smoother, and details clearer) and the entire amplification chain did more of a disappearing act, drawing my focus more to the music and less to the equipment.

When the brawn of the 250 SE is combined with its saturated tonal colors, huge dynamic swings, great transparency and delicacy, lifelike textures and solid-state-like low-bass extension and control, it is clear that this new amplifier is a world-class leader in the higher-power tube amplifier category. tas

Equipment Report

Bel Canto REF600M Power Amplifier

A Class D Reference

Steven Stone

It may be hard to imagine, but when Bel Canto first opened its doors in 1994 the company made only tube-based electronics. The Bel Canto Orfeo SE2 power amplifier was a two-stage amplifier that used a triode input stage and one 845 triode output stage with local degenerative feedback and no global feedback. But in 1998, John Stronczer, Bel Canto's chief designer, began to investigate switching amplifiers. "We began exploring linear switching Class D amplification in early 1998 with the goal of developing a more efficient, highly accurate, yet musical amplifier," explains Stronczer. "We transitioned from our SET tube amplifiers to a technology that promised to offer superior performance over the long term. Our initial choice was from a company called Tripath."

In 2000, Bel Canto introduced its first switching amplifier, as part of the Evo line that included both stereo and multichannel models. Within these designs Bel Canto implemented proprietary modifications to the original Tripath module and provided its own 50/60Hz power-supply architecture for main and auxiliary power supplies. The Evo line was in production for six years before the Tripath module was replaced by B&O's ICEPower digital technology.

ICEPower offered lower-noise performance with even greater dynamic transparency due to its integrated switch-mode power-supply architecture. Stronczer designed and implemented external power filters and low-noise rectifiers as well as proprietary input stages in a compact, rigid chassis to improve the basic performance of the core ICEPower device. This technology was used in Bel Canto's REF300M, REF1000M, and REF500M power amplifiers, which were in production for almost ten years.

Recently Bruno Putzeys developed new Class D NCore technology for Hypex. NCore uses an advanced, fully discrete, self-oscillating Class D architecture combined with a 5th-order control loop to achieve extremely low levels of noise and distortion throughout the audio bandwidth. A version of this NCore technology was chosen for application in Bel Canto's current flagship Black power amplifiers, which were introduced in 2015—essentially a custom version of the NC1200 amplifier with the gain stage removed, replaced by a Bel Canto discrete gain stage.

The Bel Canto REF600M is the first amplifier in the REF series to use the NCore technology. According to John Stronczer, "There was a 10dB drop in noise going from Tripath to ICEPower. I've measured at least a 10dB drop in distortion, especially at high frequencies, going from ICEPower to NCore. Each 10dB represents a significant improvement in the technology. Noise also dropped by 3–6dB, (equal to 1.4x to 2x), reducing sonic artifacts and increasing musical detail and resolution."

With its latest design Bel Canto claims to have achieved "the right balance between neutral transparency and musicality." Stronczer says that the REF600M "demonstrates the full sonic promise that began to emerge over 15 years ago with the implementation of our first Class D amplifier."

Description

The REF600M power amplifier, which can produce up to 300 watts into eight ohms, and 600 watts into 4 ohms, weighs only 15.4 pounds. Its half-size chassis is very similar to Bel Canto's earlier eSeries amplifiers, but with a rounder and less squared-off faceplate. The back of the REF600M includes both single-ended and balanced connections along with a push-button selector, a pair of WBT "NextGen" five-way speaker connectors, a standard AC connection, and a 5-to-12 volt trigger connector. The REF600M comes from the factory set for 27dB of gain, but this can be changed to 33dB via an internal dip-switch.

Equipment Report Bel Canto REF600M Power Amplifier

The REF600M is based on Hypex's NC500 OEM module and SMPS 1200 power supply. Bel Canto uses proprietary low-noise amplifiers with precision film resistors and capacitors to filter out high-frequency noise and prevent its aliasing within the audio band. The REF600M is also DC-coupled to avoid any dynamic degradation brought by coupling capacitors. According to Stronczer, "There is a lot of architectural similarity with the original Orfeo design and the REF600M. Both employ simple high-performance stages with local feedback and no global amplifier feedback. Also both have a first stage that provides most of the amplifier gain with a high input impedance and low output impedance to drive the output power stage."

Setup

The vast majority of my listening time with the REF600M was spent with them tethered to a pair of Spatial M3 Turbo SE loudspeakers ($2650). These open-baffle horn designs have a sensitivity of 94dB so they require very low-noise amplification. With the REF600M powered up I could hear only the faintest hiss if I put my ears within a few inches of the Spatial's coaxial driver. I ran the M3/REF600M combination full-range with no crossovers limiting their bass extension. I combined the Spatial M3s with a pair of JL Audio Fathom f112 subwoofers set for a 45Hz crossover with a 24dB roll-off.

I also used the REF600Ms with a pair of AV123 X-Statik open-baffle loudspeakers modified by Skiing Ninja with an external crossover and No-Rez interior damping material. Again I ran the X-Statiks full-range and coupled one Velodyne DD 10+ subwoofer set to 50Hz crossover with a 12dB-per-octave roll-off.

Sound

The problem with saying that a solid-state or a switching amplifier is "tube-like" is that readers will inevitably think that you are referring to its warmer harmonic balance or softer top octaves. But the REF600M is not tube-like in that way. No, its tube-like characteristics are in its soundstaging and dimensional capabilities. To put it bluntly I've never experienced a switching amplifier that is as spatially accurate or three-dimensional as the REF600M.

Michael Morgan, who is a world-class on-location recording engineer, came to visit me during the review period. He brought with him some of his fine recordings. He immediately noticed the REF600M's imaging capabilities. Through the REF600Ms all of his recordings were mapped out in the soundstage so clearly that you could easily and instantly locate every instrument or vocalist. Also the layering and depth retention was as three-dimensional as I've heard from any recording on any system. My own recordings also sounded more three-dimensional than with any switching (and most linear solid-state) power amplifiers I've had in my system. Only the Pass Labs X150.3 had the same level of dimensional accuracy.

One of the principal sonic failings laid at the feet of most switching amplifiers is their harmonic threadbareness. In timbral neutrality I'd place the REF600M on the darker, richer side of the razor's edge, primarily due to its more nuanced lower midrange. Compared to the Bel Canto 300M amplifiers that I often use for the rear channels in my 5.1 system the REF600M had a less mechanical and more relaxed harmonic presentation. Not only was I immediately struck by the REF600M's richer tonal palette, but also by its superior dimensionality and by spatial characteristics that were noticeably superior to the 300M.

The REF600M's relaxed harmonic character was also a result of its less forward upper midrange. Compared to one of my reference power amplifiers, the April Music Eximus S1, the REF600M was less hi-fi-like and more natural. The midrange's leading edges didn't jump out, but instead remained within the confines of the music. Usually when an amplifier is more "relaxed" image specificity suffers as a result, but the REF600M still outpointed the Eximus S1 when it came to dimensional accuracy and depth retention. Simply stated, music sounded more like the real thing through the REF600M

SPECS & PRICING

Type: Switching
Output power: 600W into 4 ohms, 300W into 8 ohms
Inputs: Single-ended RCA or balanced XLR
Input impedance: 100k ohms/200k ohms
Output impedance: <8 milliohms at 100Hz
Dimensions: 216mm x 88mm x 305mm
Weight: 15.4 lbs.
Price: $2495 each

BEL CANTO
Bel Canto Design. Ltd.
221 North 1st Street,
Suite 300
Minneapolis, MN 55401
(612) 317-4550
belcantodesign.com

Associated Equipment
Source devices: A 2010 Mac Mini with 8GB of memory and OS 10.11.1, running iTunes 12.3.3 and Amarra Symphony 3.3, Pure Music 3.0.1, Audirvana+ 2.5, Roon 1.2, and Tidal 1.3; QNAP TS-251, Cary Audio DMC-600SE
Analog sources: VPI TNT III w/Graham 1.1 tonearm and ClearAudio Victory II cart, VPI HW-19 with Souther SLA-3 tonearm and Denon 103/van den Hul cartridge
Phono preamps: Vendetta Research SCP-2B and Rossi LIO
DACs: PS Audio Direct Stream Jr., Cary Audio DMC-600SE Music Hub
Amplifiers: Pass Labs X150.3, April Music S1 monoblocks, NuPrime ST-10
Speakers: AV123 X-Statik modified by Skiing Ninja, Spatial M3 Turbo SE, two JL Audio Fathom f112 subwoofers, one Velodyne DD 10+ subwoofer
Cables and accessories: WireWorld Silver Starlight USB cable, WireWorld Eclipse 7 balanced interconnect, AudioQuest Carbon USB cable; AudioQuest Colorado single-ended RCA interconnect, Kimber KCAG single-ended and balanced interconnect, Audience Speaker AU24e speaker cable, PS Audio Quintet, Dectet, Octet, and Premier power conditioners

Equipment Report Bel Canto REF600M Power Amplifier

than it had via any switching amplifier I've heard before.

Does the REF600M do everything better than its competition? Not quite. Its mid- and low-bass response was not as vibrant and impactful as several of my reference power amplifiers. While not soft or overly fluffy in a tubey way, the REF600M did not produce the same amount of dynamic punch or bass slam as either the April Music Eximus S1 (used in bridged mode as dual mono amplifiers) or my freshly refurbished Pass Labs X150.3. (The reason for this refurbishment was due to increased noise from aging capacitors and resistors after almost 15 years of continuous use.) After its return from the factory the Pass was almost as quiet in terms of noise (without a signal) as the REF600M, with only a slightly higher hiss level and zero hum.

Conclusion

In the past I've reviewed lots of power amplifiers. Once I even had a dream that I was twenty feet tall with a Krell 160 monoblock under each arm striding across the urban landscape yelling, "I am Amp Man!" (imagine Godzilla, only prettier). Luckily I had that dream only once. But with the advent of compact and lightweight switching amplifiers such as the REF600M no audiophile need experience the "pleasures" of lugging around a 60-plus-pound amplifier because it was the only device that could deliver the power and finesse needed to drive a top-echelon system.

How good is the REF600M? To my ears it's good enough to qualify as the best all-around power amplifier I've heard to date, regardless of technology or circuit topology. Its combination of extremely low noise (that makes it suitable to drive even highly sensitive loudspeakers), precision three-dimensional imaging, relaxed and natural harmonic balance, and power capability makes for a potent package. Couple all its sonic achievements with its relatively modest price, and you have a power amplifier that could well be a benchmark reference for many audiophiles for years to come. tas

Equipment Report

Wyred 4 Sound SX-1000R Power Amplifier

Class D Powerhouse!

Steven Stone

During the time that I've been a reviewer for *The Absolute Sound* I've played host to many power amps. Some were large, heavy, and sucked juice from my AC outlets like a dehydrated Great Dane, while others were so small that they could even fit into one of those "tiny houses" featured on HGTV. But whether big or small, powerful or flea-watt, all power amplifiers perform the same function: supplying somewhere between 20 and 30dB of gain, turning a volt or two into multiple watts of power. But even after all these years there is still no way to know, before listening, how well a particular power amplifier will mate with a given set of loudspeakers. Often the subtle differences between a synergistic match and one that leaves something to be desired comes down to things that we can't measure reliably in a home listening room by any methodology except listening.

Obviously after many years of listening to and using power amplifiers I have developed my own set of preferences. I am not a big fan of big, heavy, energy-sucking, high-power, and usually expensive-to-own power amplifiers. And while low-power single-ended tube amplifiers can sound superb when connected to the "right" loudspeaker, they certainly aren't a universal power-amp solution. In recent years, I have gravitated towards high-efficiency power amplifiers that use switching technology. The first units that sounded good used a Tri-path module; later, B&O ICEpower modules came along. Recently, some manufacturers, including Bel Canto, have been using Hypex modules as the heart of their Class D designs. Wyred 4 Sound's new power amplifier, the SX-1000R, uses the B&O ICE power module. Does this current incarnation of Class D topology finally deliver all the sonic special sauce found in traditional solid-state AB or even Class A designs? Let's find out.

Tech Tour

The SX-1000R monoblock power amplifier can produce up to 625W into 8 ohms with 1% THD and noise, and 1225W into 4 ohms at the same distortion level. It delivers 27dB of gain with 118dB of dynamic range. The SX-1000R has an output impedance of only 0.005 ohms and a damping factor of 2000 at 100Hz into 8 ohms.

Equipment Report Wyred 4 Sound SX-1000R Power Amplifier

Although quite powerful, the SX-1000R draws only 15 watts at idle and has an efficiency of 78% when delivering 500 watts into 8 ohms. Compare this to a Class A amplifier, which averages only 25% efficiency, and you begin to see how much more energy-efficient the SX-1000R is compared to older power amplifier topologies.

Although the SX-1000R has at its heart the B&O ICE module, much of the rest of its design is proprietary, such as the field effect transistor (FET) input buffer that supplies both single-ended and balanced input options. This circuit includes a dual-differential common mode converter, originally developed for the Wyred 4 Sound DAC-2, that produces a true balanced signal. The SX-1000R's front-end design also isolates the power amplifier from impedance mismatches: Its high 91k-ohm input impedance matches both solid-state and tube preamplifiers without loading down their output stages. Wyred 4 Sound's third-generation circuit topology also significantly reduces the detrimental effects of noisy sources due to its balanced circuitry, audio-grade capacitors, and quad-paralleled front-end layout.

The SX-1000R replaces the now-discontinued SX-1000 that garnered TAS' Editors' Choice award for six years in a row. Since the new amplifier uses many of the same parts, including the chassis, Wyred 4 Sound offers a trade-in program giving owners of the earlier-gen amp the option of upgrading to the new design for $2000 (for amps up to three years old). If your SX-1000 is more than three years old the trade-in will cost an extra $200, or $2200 plus your two amps. Unlike many firms that offer only a one- or two-year warranty, Wyred 4 Sound offers a five-year warranty on the SX-1000R.

Cosmetics, Ergonomics, and Setup

The SX-1000R power amplifiers will never qualify as audio jewelry, but I think their understated looks are in line with Wyred 4 Sound's focus on performance rather than bling. The SX-1000R is available with either a black or slate-gray chassis. The front panel features a thin blue line of illumination of adjustable intensity flanked by a pair of wedge-shaped, satin-black corner panels. The SX-1000R's on/off switch is located on the back along with one pair of five-way binding posts, single-ended RCA and balanced XLR inputs, a 12-volt trigger, and an IEC AC input. Both sides of its chassis sport a row of diagonal ventilation slots. One minor quibble with the SX-1000R's layout: There's no on/off switch on the front panel, so when or if you want to turn the amp off, you will need to access its rear panel.

Installing the SX-1000R monoblocks in my two primary listening systems was easy. The amps are relatively small at 8.5 inches wide, 4.125 inches high, and 13.5 inches deep—and certainly light at only 13 pounds each. In both setups I used the balanced XLR input connections. The banana terminations on the Audience Au24 SE speaker cables fit snugly into the SX-1000R's WBT five-way binding posts. When connected and powered on there is no physical noise from the SX-1000R. Even when I placed my ear directly on its cabinet I could hear nothing—no hum whatsoever. This quiet extended to the loudspeaker output when the input was muted—with the 94dB-sensitive Spatial Audio M3 Turbo S speakers I needed to be within four inches of the tweeter to hear any hiss.

Sound

My primary listening room is very quiet, with a steady-state background-noise level of 35dB. So, the noise, or lack of noise, of the power amplifier is very important to me. The SX-1000R proved to be almost as quiet in base noise level as the Bel Canto REF600M monoblock amplifiers I reviewed recently, and quieter than the Pass Labs X150.8 stereo power amplifier. Having an amplifier that doesn't add to the noise floor is very important, not only for low-level information retrieval, but also so the speakers disappear completely from aural view. Obviously, audiophiles with less sensitive (say 90dB or less) loudspeakers will find the SX-1000R to be even quieter than I did.

One of the most dominant sonic characteristics of the SX-1000R is its sense of unlimited power. With both the Spatial Audio M3 Turbo S and Audience 1+1 loudspeakers there was never any sense of strain or added hardness during even the most punishing triple-fortissimo passages. Also, the SX-1000R's control of the drivers, due in part to its high damping factor, meant the chances of the Audience 1+1's transducers getting damaged during momentary high SPLs was reduced to the point where I didn't worry about it after the first couple of days of use.

And what does the SX-1000R sound like? It sounds like whatever music you choose to play through it. This is not an amp for someone who is trying to warm up, sweeten, or euphonize his system. No, the SX-1000R is very much a "straight, no chaser" sort of device where the harmonic balance doesn't get "improved" and that badly-recorded cymbal will still sound like eggs frying (as it should). But on well-recorded albums, such as Todd Rundgren's *Runt*, which is over 30 years old, it was easy to hear that the newly remastered MQA version on Tidal had a level of clarity and articulation that I had never heard from previous releases. I was even more aware that the piano was recorded on a tape machine that had some speed stability issues, but the increased lucidity of the presentation made even that sonic wart more acceptable.

Imaging through the SX-1000R was laterally precise to the point that on some cuts I could not only pinpoint each primary instrument accurately, but the secondary and tertiary players also occupied distinct locations across the soundfield. On the 192/24 MQA version of the Cars' "Just What I Needed," I could not only hear Elliot Easton's muted rhythm guitar on the

SPECS & PRICING

Type: Switching (Class D) monoblock power amplifier
Output power: 625W into 8 ohms, 1225W into 4 ohms
Inputs: Balanced XLR and unbalanced RCA
Output impedance: 0.005 ohms
Dimensions: 8.5" x 4.125" x 13.5"
Weight: 13 lbs.
Price: $1799 each

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Equipment Report Wyred 4 Sound SX-1000R Power Amplifier

left, but also the secondary rhythm guitar that was nestled just to the right and behind Ric Ocasek's lead vocals, in front of the drum kit in the center of the soundstage. Unlike most versions I've heard in which that center rhythm guitar track gets buried by the drums halfway through the cut, on this MQA version that guitar remained distinct throughout.

Soundstage width was determined more by each musical selection than by the system itself. On some cuts, such as Chance the Rapper's "Same Drugs" via Tidal, the synth drum pans extended from one wall in my listening room all the way to the other. On Thin Lizzy's "The Cowboy Song" from their *Live and Dangerous* album, the crowd's sounds on the Tidal MQA version were even wider than the band's. Switching to a mono source, Charlie Christian's *Genius of the Electric Guitar* on CD, the entire band on "Flying Home" seemed no wider than a strand of spaghetti held by one end.

Treble extension was both smooth and incisive. There was no loss of air on the flute and piccolo on my own live concert recordings. Also, when I compared MP3 versions of several recordings I know well with full-res or hi-res versions, the MP3s lacked that last bit of air and treble extension when compared to the uncompressed versions played through the SX-1000R.

Bass extension, speed, and pitch definition through the SX-1000R proved to be among the best I've heard from any power amplifier. Take DJ Snake's "Too Damn Low" from Tidal—the SX-1000R preserved the "puff of air" that accompanied the low-frequency attack. Also, the pitch of the synth drums was easy to identify and remained easy to hear throughout their decay from low to too damned low. I have my Spatial M3 Turbo S loudspeakers set up so their bass rolls off naturally without any crossover-imposed augmentation or restriction. Even when the pair of JL Audio Fathom f112 subwoofers were turned off, plenty of well-defined and well-controlled upper and midbass remained.

Inner detail and low-level information retention through the SX-1000R were exemplary. Listening to the remastered MQA version on Tidal of Joni Mitchell's "Blue" all the subtle micro-dynamics of the slightly fluttery piano as well as the variations of her vocal vibrato were obvious. On the well-recorded "live" album *Cayamo Sessions at Sea* by Buddy Miller and Friends, on the "Angel from Montgomery" cut featuring Brandi Carlile and Lone Bellow, it was easy to hear every instrument, including the cello drone and the background fills.

When I compared the SX-1000R with the power amplifier I reviewed most recently, the Bel Canto REF600M ($2495 each), I noticed that the former had more precise lateral imaging, but the latter had a better sense of depth. Also, the SX-1000R's images had better defined edges while the Bel Cantos' had greater dimensionality but less distinct edges. There was some subtle difference in image height between the two amps with the SX-1000R having a consistently higher image (but not by much). In presentation the SX-1000R was a bit more forward, with the listening perspective moved two or three rows closer.

Another power amplifier on premises for comparison was the Pass X150.8 ($6400). The Pass projected a more three-dimensional image than the Wyred 4 Sound. Also, the overall presentation through the Pass seemed more relaxed, but with an equal amount of low-level information and detail. Like the REF600M, the X150.8 had a less forward presentation than the SX-1000R, but it also had a greater sense of intimacy, envelopment, and bloom. The X150.8 also created a slightly larger image overall, with greater height, width, and depth. Overall, the Pass X150.8 is one heck of a fine power amplifier.

I also have a Pass X150.3 power amplifier that I've used regularly over the past 25 years. Compared with the SX-1000R the X150.3 was noticeably noisier at the speakers with a louder hiss level and a small amount of low-level buzz. The X150.3 had a warmer and less controlled midbass that lacked the definition and detail of the SX-1000R. The X150.3 was also less forward in its image presentation, more like the Bel Canto REF600M and Pass X150.8. Finally, the X150.3 was more three-dimensional than the SX-1000R, but the SX-1000R had more precise lateral imaging. As I switched back and forth between the two amps I kept thinking that the ideal power amplifier would possess a combination of the best characteristics of each—which would result in it sounding much like a Pass X150.8.

Summary

At the beginning of the review I posed the question of whether the latest switching amplifier technologies equaled the sonic performance of more traditional linear Class AB amplifiers. While I found that the SX-1000R performed at a very high level, it did not quite equal the current-production Pass X150.8. But it also costs $2800 less and will use substantially less energy during its lifetime. So, while the SX-1000R does not yet surpass a cost-no-object traditional-circuit topology, it is, without a doubt, a fine and near-state-of-the-art performer.

If you require a power amplifier that can generate oodles of effortless output, runs cool, produces a very precise lateral soundstage, has substantial bass extension and control, has a neutral harmonic balance, and is exceedingly quiet, the Wyred 4 Sound SX-1000R should be on your short list. It does its job with understated aplomb so you can focus on the music. Also, I have little doubt that, like its predecessor the SX-1000, the Wyred 4 Sound SX-1000R is practically a shoe-in for a seventh TAS Editors' Choice award. It is simply that good. tas

Equipment Report

Van Alstine DVA 850 Hybrid Monoblock Amplifier

The Best of Both Worlds

Jacob Heilbrunn

A few weeks ago I heard Jean-Guihen Queyras play the Bach cello suites in an intimate setting at the Phillips museum in Washington, D.C. Queyras, who has recorded the suites for Harmonia Mundi, delivered an impassioned performance. As the mind is apt to do, I found my thoughts wandering at a few points, musing to myself about what his playing would sound like on a recording. My experience has always been that while a high-end stereo can capture enough elements of a live performance to deliver a convincing replica, it can't really do more than that. The key question for me is always which elements it delivers. Stygian bass? Detail at the expense of sumptuousness? Or is the overall musicality enough to banish such considerations, allowing you instead to indulge in the sheer musicality, even sensuality, of a performance?

When it comes to the 850-watt Van Alstine DVA 850 hybrid monoblock amplifier, which retails for $3699 each, this last musicality point is very much in evidence. The amp offers a remarkably jaunty and silky sound—with lots of headroom—that always errs on the side of musical bliss. There must be something in the water in Minnesota, what with all the great products coming out from Van Alstine, Magnepan, and Audio Research.

Bliss isn't exactly what I was expecting when I first removed the DVA 850s from their shipping boxes and got them into my system. Yes, I have a soft spot for hybrids. It's hard to forgo a solid-state output stage because of the grip and control it tends to have over loudspeaker drivers. At the same time, a dollop of tubes on the input stage can smooth things out.

Still, given that it can produce up to a prodigious 1.7 kilowatts, I was fixated with the idea of a muscular amp that would smack around the Wilson XLF loudspeaker's 13" and 15" drivers. Indeed, the DVA 850's stern owner's manual makes it plain that this is no amplifier to be trifled with. The manual is rife with warnings about the perils of melting your drivers if the amp is abused or improperly installed. It sensibly warns that the amplifiers are "not designed to reproduce the ear-damaging levels of live rock concerts. Your ears, your windows, and your associated equipment will be ruined if you attempt this long-term."

Your windows? Well, I guess a bit of hyperbole is pardonable. But you get the general drift, and given that most audiophiles play their stereos far too loudly, Van Alstine's admonition serves as a kind of public health warning. Quite frankly, the manual inspires confidence simply because it's so well written, which is something of a rarity in the industry. The amplifier also comes with some useful features such as a ground lift in the rear. I didn't need it, but to avoid ground-loop hum, you might. The manual also notes that it is critical that your power cord be properly wired to electrical code standards, as a mis-wired one has the potential to put "dangerous 120V AC on the chassis of the amplifier." In other words, don't do this, or there will be one fewer TAS reader. I also bring this up because initially I had plugged the amps into my balanced power outlets, which are fed by an Equitech transformer. As a result I blew several fuses, and had to make a trip to the hardware store to get new ones. You don't know true terror until you've plugged in new fuses, praying after you press on the power button that nothing serious is wrong. Eventually, it dawned on me that the

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amp really is that sensitive to the nature of incoming power—I ended up plugging the amps into normal house wall outlets and thereafter they performed without incident.

Once the DVA 850s started playing, I was quite smitten by their lissome quality. Much of this I ascribe to their 12AT7 input tubes. The slightly grainy sound that I had expected from what is—let's face it—a quite modestly priced (by high-end standards) amplifier was nowhere in evidence. Instead, the tubes seemed to impart a holistic sound to woodwinds, an elegance and refinement that I did not expect. These qualities first became apparent to me on a Channel Classics CD of Telemann concertos—a disc that I recently swiped from my old man's copious CD collection in Pittsburgh, PA—played by the wonderful Florilegium ensemble. On the Concerto in E major, the woodwinds came through with marvelous palpability, a sense of 3-D sound that was a sonic treat. Far from displaying any sterility, the DV 850 reproduced the interplay between this British ensemble's period instruments with a true sense of glow and grace. Of course, these attributes were already present in the performance, but the DVA 850 allowed them to emerge with unforced lucidity in playback. Was there a slight softening taking place on voice and flute in a Telemann cantata? Probably. But I'll take it over rebarbative sound any day. Mezzo-soprano Clare Wilkinson's intonation and pronunciation of the original German sounded spot-on to me, and I reveled in the fact that the treble sounded as relaxed as it did. Put bluntly, I gained a new appreciation for some of this CD's musical virtues by listening to it through the DVA 850.

Earlier I pointed to the tubes' presence as helping to endow the DVA 850 with a healthy sense of musicality. But an amp's sheer power can also help produce an ease of presentation—witness for example the mighty Boulder 2150 mono amplifiers that I had *in situ* a few months ago.

Another benefit raw power can produce is a guilty pleasure that a goodly number of us enjoy: dynamics. A couple of years ago David Wilson told me that he would do nothing that would sacrifice dynamics. I can understand the sentiment. A few days ago I was in Miami and heard the New World Symphony. The brass fortissimos in the Sibelius violin concerto were delivered with a visceral force that was enough to make you jump out of your seat. If you want to produce some kind of simulacrum of the real thing, you're going to need to try and recreate some of that jump factor. Having more than a kilowatt of power in reserve—as the DVA 850 does—helps you accomplish that.

So I popped on the venerable Verve recording of a live performance by Jimmy Smith called *Root Down*, which I have on both CD and LP. The amps delivered a real thump on the drums on the first cut "Sagg Shootin' His Arrow." You get not only a sense of the kick-drum being whapped, but also of the air billowing out from it. It almost feels as though the impact is emanating from below the floor, that's how low the amp goes. At the same time, on "Let's Stay Together," the amps did a superb job of delineating the bass line—it doesn't lose its grip on the deepest notes, and the rhythm comes through clearly in the nether regions rather than being an oleaginous clump of sound. For all this early funk recording's dynamism, the DVA 850 also allows you to luxuriate in the sound. I'm not talking about a diminution in transient speed, but a fuller and more rounded presentation that, more often than not, audiophiles associate with tubes. When Jimmy Smith speaks on the recording, his voice has more authority and huskiness than a purely solid-state amp would likely convey.

The DVA 850's appealing qualities were even more apparent on LP. Take András Schiff's London recording of Mozart's piano sonatas. On the Sonata in A major, I was immediately aware of the ample hall space that the amps served up, not to mention the precision of Schiff's touch. The amps also provided a nice sense of decay on the notes—something only hinted at on the Jimmy Smith CD that became more readily evident on this LP. On the scale of amps that provide an easy sense of emotional connection to the music—allowing you to get past the sensation of listening to electronic equipment—I'd have to rate these amps very high indeed.

None of this will likely come as much of a surprise to industry veterans. Frank Van Alstine, the designer of this amplifier, is known as an experienced hand who delivers the goods. When I mentioned to an old friend in California that I was receiving the amps, he raised his eyebrows significantly, or at least as significantly as I could discern over the telephone.

I don't know that there is a secret ingredient here so much as a shrewd mind at work that balanced the variables and produced a high-powered amp that manages to remain extremely musical. In fact, these amps make me think right off the bat of a friend in Denver who has been searching for longer than he probably cares to admit for an amp capable of driving his current-hungry Sonus faber loudspeakers. All along he's craved more musicality than he can really afford. (You know who you are: Consider this a shout-out.) This is one amplifier that anyone intent on putting together a truly musical system without spending a fortune should definitely consider.

No, the DVA 850 will not trounce much pricier amps from the likes of Boulder, Ypsilon, or Soulution. It lacks the ultimate gravitas, sheen, transparency, and musical sophistication of those megabuck amplifiers. Put on a really demanding symphonic work and you can start picking nits about the sound of the strings and so on. But that's not the sweepstakes that this amplifier is competing in. For my money, the DVA 850 is a prodigious product that anyone looking for real-world amplification with a beneficent sound should consider. tas

SPECS & PRICING

Type: Hybrid monoblock
Output power: 850W
Tube complement: 12AT7 (input stage)
Inputs: Switchable RCA, XLR
Dimensions: 17" x 7" x 13"
Weight: 36 lbs. (each)
Price: $3699 (each)

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Equipment Report

Zesto Eros 300 Monoblock Amplifier

Zesty

By Don Saltzman. Photography by Dennis Burnett

The new Eros monoblock amplifier is the most ambitious offering yet from Zesto Audio, a relatively new company on the audio scene. All its products are designed by music-fanatic-engineer George Counnas and built by hand in-house in Zesto's Thousand Oaks, California, location. I did some basic research on the word "Zesto" and was surprised to discover it isn't a valid Scrabble word. Who knew? But a little deeper digging did reveal a Greek derivation of "Zestos," meaning "boiling hot." Since George is of Greek derivation himself, I figured this must have been what he was going for. With "zest" coming in as "an enjoyably exciting quality," and "Eros" being the Greek mythological god of love and desire, I became concerned I might need fireproof gloves just to install the amps.

I shouldn't have worried. The installation chores were handled entirely by George and his lovely wife Carolyn, who deserves a raise as she not only schleps all equipment with her husband and helps set up shows, but is also responsible for the stunning visual design of the Eros and all Zesto products—part retro, part industrial, and (literally) new wave.

Although Zesto is a relatively new company as I said, George is no newcomer to designing circuits based around vacuum tubes. As a young(er) guy in England, he designed vacuum tube amplifiers when he was in college. He was also part of a design team working on navigational systems for the Royal Air Force. Smitten by the warmth and tonality tubes offer, he researched early tube designs as far back as the original RCA circuits of the 1930s. George's goal was to start with the classics of the past, but to proceed with the use of modern computer simulation techniques and the best components currently available. In other words, he wanted to design amplifiers that offer the benefits of classic tubes but that also reflect the more modern state of the art.

I had heard nice buzz about Zesto products at shows and was looking forward to auditioning the Eros 300. But before describing the amplifier's sound, it is helpful to briefly outline its circuit design. George eschews the use of negative feedback, so none is to be found in the 300. Probably the amp's most defining design characteristic is that it runs in pure Class A at all times. Counnas explains that such operation has the benefit of no crossover

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distortion, and he believes Class A is more musical-sounding than Class AB, and I have no reason to doubt him.

I quickly discovered an easy way to confirm these amps are pure Class A—they run seriously hot (zesty?). Your free-range pets should roam elsewhere, and you will definitely save on heating bills in the winter. The Eros 300s feature six KT88 output tubes per monoblock and deliver 150 watts per channel. If my time with the 300s is any indication, it appears that a Class A watt packs more punch than its AB counterpart; the 300s sound far more powerful than their rated power would indicate.

There was an element of nostalgia in seeing the KT88s light up for the first time. It reminded me of my first tube amps: a pair of Dyna Mk. IIIs that used two KT88s each to generate 60 watts. I loved those amplifiers and I have enjoyed the sound of subsequent amps that used these tubes. Nevertheless, I have not had KT88s in my system for many years and was looking forward to hearing how they would sound in a truly modern design.

So, are these amplifiers all show and no go, or do they deliver the goods? Setup was simple (especially because I didn't have to do it), and there are sufficient connectors on the back panel to work in any system. In addition to an RCA input jack and a true floating balanced input, the rear panel offers the convenience of a ground lift switch for the balanced input, making it easy to set up the amps for minimum hum. I experienced no hum whatsoever from the amplifiers. Speakers may be hooked up either by separate 4-ohm and 8-ohm binding posts or by a 4-pin SpeakOn connector.

My biggest concern (voiced to George long before he set up the amps) was whether or not a 150-watt amplifier could even drive my power-hungry Maggie 20.7s, let alone whip up the sonic magic which they are capable of. In the past, amplifiers in this power range have not been a great match for these speakers.

Once the amplifiers were warmed up, my concerns about their capabilities were put to rest in fairly short order. So long as I was not trying to blast the speakers at larger-than-life volume levels, the Zestos drove the Maggies with surprising ease. I have written in the past that the 20.7s will certainly sound good with quality amplifiers in the 200-watt range, but really come alive with more powerful amps. I still believe this to be true. Nevertheless, the Eros 300s' performance belied their nominal rating of 150 watts a side—they powered the Maggies with the ease of 300–400Wpc amplifiers. I cannot say if this prowess is a product of its Class A design, but I am guessing this gain strategy has a lot to do with it.

Moreover, the 300s deliver in spades the full musical magic of which tubes are capable. Voices and virtually all musical instruments reproduced by the 300s possess a richness of tonal color that, to these ears, solid-state has yet to deliver. This is not intended to imply that these are throwback tube amps, slow and syrupy. They are not. They are modern state-of-the-art-sounding amplifiers across every important criterion—fast, transparent, and fully extended at both frequency extremes. In fact, their tight control of the bass might lead one to (erroneously) believe that some transistors are hidden inside. But this lower-octave control and slam is combined with a bull-bodied roundness—especially on double bass and drums—that eludes many solid-state amps.

When I started my listening evaluation, the first pleasant surprise came with some material that was not terribly taxing for the amps: a very nice LP reissue of *Boss Tenor* with Gene Ammons on tenor sax [Alto]. Played at lifelike levels, Ammons' sax was three-dimensional and golden in tone while the rhythm section (bass, drums, and conga) was swinging. Every instrument was crystal clear and the stand-up bass, unlike some of Rudy Van Gelder's other recordings, remained taut and controlled without devolving into pluminess. Power-wise, there was no sense of the 300s straining or running at the limit. I was just hearing really great music playback.

Turning to more demanding material, I took an old favorite for a spin on my Kuzma Stabi M: Martinon and the Paris Conservatory Orchestra playing works of Ibert, Bizet, and Saint-Saens [London]. Those of you who have the LP know it to be one of London's finest, with great dynamic range, sweet strings, and huge stage width and depth. The Zesto Eros 300s loved this recording. Sounding fast, delicate, and surprisingly powerful, the amps placed the orchestra in an enveloping, three-dimensional space that transformed most of my listening room into a hall. The jet-black background was in stark contrast to the sometimes startling appearance of whistles and horns in Ibert's playful "Divertissement." Even "Danse Macabre," a piece I have heard so many times that I usually skip it on most recordings, had a new-found charm and excitement when heard through the Zestos. The strings were luscious and even the grave-danc-

SPECS & PRICING

Type: Mono tube amplifier
Class of operation: Class A
Power output: 150 watts continuous
Total harmonic distortion: 0.8% at 1W into 8 ohms
Gain: 29dB
Input impedance: 100k ohms (single-ended); 12k ohms (balanced)
Tube complement: Matched sextet of six KT88s, two gold pin ECC82s (12AU7)
Output taps: 8 ohms, 4 ohms
Dimensions: 17" x 10" x 20"
Weight: 59 lbs.
Price: $20,000/pr.

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Associated Equipment
Magneplanar 20.7 loudspeakers, Kuzma Stabi M turntable with Kuzma 4Point tonearm, Lyra Etna and Koetsu Rosewood Platinum Signature cartridges, EMM Labs CD playback system, Aesthetix Eclipse Io phonostage with two power supplies, Aesthetix Eclipse Callisto linestage with two power supplies, Audio Research REF 10 Line Stage, Audio Research REF 10 Phono Stage, VTL 750 amplifiers, Purist Audio Design, Transparent, and AudioQuest cabling, Sain Line Systems power cables, Stillpoints Ultra 6 isolation feet

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ing skeletons seemed more energetic than usual. The bass drum whacks were powerful and filled the room.

But, on this recording at least, the full beauty and capability of the Eros 300s were revealed in Bizet's "Jeux d'Enfants," a fanciful homage to the world of children's toys. As noted, violins were lovely throughout this recording, sounding neither metallic nor screechy. Compared with the high energy of "Danse Macabre," the lyrical passages of "Jeux d'Enfants" showcased the Zestos' ability to change pace and mood at a moment's notice, conveying all of the subtlety and joy of Bizet's light-hearted fare.

At this point in the review process I became curious as to how the Zestos compared to higher-power amplifiers. I remember the wide-open sound of the Aavik Acoustics U-300 integrated amplifier that was recently in my system. That solid-state amplifier, rated at 600 watts per channel into 4 ohms, rocked the house and never sounded ruffled. Unfortunately, manufacturers want their review gear returned and that amp no longer resides *chez moi*. Based upon recent memory, I would say that the U-300 (retail price: $30,000) presented a slightly larger soundstage and somewhat more slam at higher volume levels than the Zestos. On the other hand, the Zestos offered a somewhat richer tonal palette and a more three-dimensional presentation.

I was also able to compare the 300s with my VTL 750s, admittedly amps engineered and built years ago and not representative of the latest in design or technology. (To my knowledge, VTL's most recent offerings in this 600-plus-watt power range cost more than three times the price of the Zesto Eros 300s.) I was interested in determining if the VTL's power advantage was beneficial. The same musical selections played through the 750s sounded very good, but immediately it was apparent that the Zesto Eros 300s displayed more transparency, quieter background, and a more three-dimensional presentation than the VTLs. On the other hand, at high to unnaturally high listening levels, the larger tube amps sounded slightly more relaxed and produced a fractionally larger soundstage. This is not a criticism of the Zestos; they conveyed a very convincing sense of space. But quadrupling the output power led to a slightly more spacious presentation (if the recording captured this)—not four times as large, of course, but still the increased sense of space was noticeable.

Putting all of this into perspective, the 300s were undeniably superior to the larger tube amplifiers in many important ways: greater transparency, more body to instruments and voices, very lively with no tendency to sound dark(ish), and blacker of background. The 300s gave up only a slight sense of ease at the highest volume levels and a small but noticeable sense of space on large orchestral recordings. To be fair to the Zestos, and figuratively putting the large Magneplanars aside for a moment, most real-world loudspeakers, regardless of size and cost, are more efficient and hence considerably easier to drive than my Maggies. I am making a (hopefully) well-educated guess that with most speakers owned by most music enthusiasts the Zesto Eros will be exemplary for all musical styles at all listening levels, with no shortage of power or slam.

I played many other types of music through the Eros 300s. At no time was I let down or disappointed. Whatever I threw at them, from Shostakovich string quartets to Ella Fitzgerald to The White Stripes to Metallica, the 300s provided a wonderful listening experience. They exhibited the best quality of sonically superior equipment: They encouraged me to play LPs and CDs I had not heard in quite some time. For example, I pulled out the LP *Brazilian Soul* with Laurindo Almeida and Charlie Byrd on guitars [Concord]. I figured that any record with a "Picante" catalog number should be right at home with the Zestos—was it ever! The dueling guitars were fast, fully fleshed out in tone and overtone, against a background so quiet that Almeida and Byrd sounded convincingly present in the room. Especially satisfying was the cut "For Jeff," a tune written by Byrd that showcases both guitarists' terrific talents. Very spicy!

Switching to CD, I wanted to hear a few recordings of Yuja Wang, a young pianist whose playing is simply electrifying. I was fortunate to hear her play live twice last year and am looking forward to her upcoming recital at the historic Granada Theater in Santa Barbara. (For anyone planning to travel to hear this concert, the trip would not be complete without at least one night at the fantastic Belmond El Encanto hotel—as close as we will get to the South of France in Southern California.) Yuja has a special relationship with the city as the University of California Santa Barbara has sponsored her since she was a teenager. It's amazing to watch and hear this diminutive lady—usually clad in a runway dress and stilettos—take on the most difficult material in the piano repertoire and simply pulverize the Steinway. I am not attempt-

Equipment Report Zesto Eros 300 Monoblock Amplifier

ing to compare her with other great pianists of the present or past—to me, such comparisons are interesting but not that meaningful. She is one of the world's great musical talents *right now*, which is sufficient reason to seek out her live performances as well as her recordings.

To get an idea of Yuja's musicianship, I highly recommend the CD of her live performances of Rachmaninov Piano Concerto No. 3 and Prokofiev Piano Concerto No. 2, with Gustavo Dudamel conducting the Simon Bolivar Symphony Orchestra of Venezuela [Deutsche Grammophon]. The sound quality of this recording is very good, if not quite reference quality. Wang's playing is lyrical and sweet in the slower passages (although some critics, unfairly in my opinion, accuse her of losing some magic when her speed is below supersonic). She handles the most complex passages with an ease and fluidity that is simply stunning. Listening to both performances through the Zesto 300s was very gratifying, as they captured the full sweep, warmth, and majesty of the orchestra, while at the same time allowing Yuja's piano to take center stage with unfettered speed and dynamic range. The enjoyment level in my listening room was very nearly what it had been at the live event, which is all we can ask our sound systems to do. Truth is, after a while I just forgot about the electronics and simply enjoyed the performance and the music.

The Zestos were as enticing with voice as with instruments. Eva Cassidy does not have a classically beautiful or powerful voice, but there is a raw honesty to her singing that is very engaging. I put on her *Time After Time* LP [Blix Street] mainly to see if the Zestos captured the shy yet heartfelt feeling of many of her songs. They did. I had only intended to listen to her rendition of the Bill Withers song "Ain't No Sunshine," but ended up playing both sides of the album. The great transparency and three-dimensional body of the 300s truly made it seem as if she, and her guitar, were in the room.

To sum up, the Zesto Eros 300s proved to be amiable listening partners. They were completely reliable and silent in operation. They look good too, though this is not a necessity. Through several months of living with the 300s, listening to music was always a pleasure and each session lasted longer than planned. My notes reflect my overriding perceptions that the 300s are extremely transparent, lush, warm in the way that live music is, and more powerful than their rating would suggest. Their only downsides, in my view, were heat output (par for the course with higher-powered tube amplifiers) and a slightly reduced soundstage compared with much higher power (and generally more expensive) amplifiers. Some may feel that the often cooler presentation of solid-state amplification is more accurate, but not to my ear. Moreover, I have not heard any other amplifiers in this power and price range reproduce the sense of orchestral space and three-dimensionality that are second nature to the Zestos.

Where this sonic mix will end up on a given user's personal score card will vary, but it is undeniable that the Zesto Eros 300s offer an intriguing and inviting alternative to the army of solid-state amps out there. I can envision many music lovers being thrilled with these amps—indeed, even feeling that they have "arrived" musically. My review pair has been sold and must be returned to Zesto tomorrow. I will miss them. tas

Our Top Picks Preamps & Power Amps

Odyssey Khartago Stereo/ Monoblock Amplifier

$995/$1975

Although the 130Wpc Odyssey Khartago solid-state stereo amp has been around for better than a decade, it was new to JV until amp-connoisseur Alon Wolf (of Magico) told him he used it in his shop and it was excellent. Wolf was right. Although the Khartago doesn't have all the articulation and transparency of the standard-setting Soulution 711 stereo amplifier, it has a surprisingly similar balance, no discernible grain, high resolution, and a deep, wide soundstage. Positively, the best budget amp JV has heard, not counting the Odyssey Khartago monoblocks, which have the same power rating as the Khartago but a stiffer power supply and wider bandwidth, giving them the same basic sound as the two-channel unit with slightly more resolution, dynamic oomph, top-end air, and channel separation. Like the Khartago stereo, this is a budget monoblock for the connoisseur. (195)

Rogue Audio RP-5 Preamplifier

$3500

Combining classic vacuum-tube heritage with microprocessor control is Rogue's recipe for one satisfying and affordable preamp. The RP-5 brings its magic to bear in color saturation and tonal liquidity, providing an authentic sense of dimension and spaciousness to each image. The treble is nicely extended, quick, detailed, and replete with harmonics. Bass performance is also authoritative and controlled, with a hint of added warmth and bloom. The RP5 is a prime example of what the culture of the high end is all about—music reproduced accurately and beautifully. The RP5 is a component that should tempt a lot of people into going Rogue. (260)

Bel Canto Design REF600M Amplifier

$4990/pr.

To SS' ears Bel Canto's 15.4-pound, 300W (600W into 4 ohms) REF600M Class D monoblock is good enough to qualify as the best all-around power amplifier he's heard to date, regardless of technology or circuit topology. Its combination of extremely low noise that makes it suitable to drive even highly efficient loudspeakers, precision three-dimensional imaging, relaxed and natural harmonic balance, and power capability, makes for a potent package. Couple all its sonic achievements with its relatively modest price and you have a power amplifier that could well be a benchmark reference for many audiophiles for years to come. (269)

Our Top Picks Preamps & Power Amps

Aesthetix Calypso Line Preamplifier and Janus Signature Preamplifier

Calypso, $5000; Calypso Signature, $7000; Janus, $7000; Janus Signature, $10,000

The stalwart Calypso and new Janus Signature (which includes a Rhea Signature phonostage) share numerous qualities: speed and detail; highs without a glint of shrillness; a low noise floor; precise rhythms; dynamics that are only a skosh less lively than reference-caliber; and a laid-back perspective. The quiet background and smooth treble add up to long hours of glorious, fatigue-free listening. As for differences, the normal Calypso/Janus soundstage is big, but not huge, while the Signature soundstage is fully realized. The Signature also delivers a richer portfolio of instrumental timbres, more air, longer decays, and better-defined bass. However, these are accompanied by an upper-bass bump that adds a warmth and thickness that affects both timing and timbre. The choice between the Signature and non-Signature model will come down to personal preference, though, at $5000, the original Calypso remains a steal. (196)

Hegel H30 Reference Amplifier

$15,000

This Norwegian powerhouse of an amplifier (375Wpc into 8 ohms) combines the brute-force bass control and dynamic impact of a dreadnought design with a midrange and treble refinement, delicacy, and sweetness that are reminiscent of a single-ended triode amplifier. The midrange, in particular, is highly vivid and present without sounding the least bit pushy or forward, infusing the presentation with a palpability and directness of expression previously unheard in any amplifier near the H30's price. Perhaps the H30's outstanding sonics and high value can be traced to Hegel's SoundEngine technology, in which dynamic crossover distortion is greatly reduced through a patented circuit, coupled with a rigorous transistor-matching protocol. The H30 can be operated in bridged mode for 1000W (requiring two H30's for stereo operation), but some of the midrange magic disappears and resolution slightly diminishes. A great bargain in high-powered amplifiers. (223)

Zesto Audio Eros 300 Amplifier

$20,000/pr.

TAS reviewer Don Saltzman found the Zesto Eros 300s monoblocks amiable listening partners—completely reliable and silent in operation. Through several months of living with them, listening to music was always a pleasure and each session lasted longer than planned. Extremely transparent, lush, warm in the way that live music is, and more powerful than their rating would suggest, their only downsides were heat output (par for the course with higher-powered tube amplifiers). Some may feel that the often-cooler presentation of solid-state amplification is more accurate, but not DS, who has not heard any other amplifiers in this power and price range reproduce the sense of orchestral space and three-dimensionality that are second nature to the Zestos. The Zesto Eros 300s offer an intriguing and inviting alternative to the army of solid-state amps out there. DS thought many music lovers would be thrilled with them—even feeling as if they had "arrived" musically. (273)

Pass Labs XA160.8 Amplifier

$27,300/pr.

The 160W, Class A XA160.8 monoblock is yet another inspiring and indisputable success from the mind of Nelson Pass—a man who for the past four decades (his first commercial product was released in 1975) consistently rises to the challenge of besting himself. At the frequency extremes, the XA160.8's transient speed and pitch definition are superb, while its mids are simply extraordinary, possessing a purity, texture, and bloom that reminded reviewer GW of the best tube designs. Its paramount strengths are engaging resolution and transparency, with no vestige of glare or the faintest hint of edge. A genuine triumph that earned GW's highest recommendation. (259)

REFERENCE-LEVEL ELECTRONICS

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Equipment Report

CH Precision M1 and L1

Can You Hear Me Now?

Jonathan Valin

In Issue 239, our Alan Taffel rave-reviewed a 100W monoblock amplifier (the A1) and a DAC/preamp (the C1) from CH Precision, a Lausanne-based Swiss engineering firm founded by former Goldmund engineers Florian Cossy and Thierry Heeb, the "C" and the "H" of CH. (Not coincidentally, CH also happens to be the abbreviation, used on mail, the Internet, and license plates, for Switzerland—"Confoederatio Helvetica" being the country's Latin moniker.) Comes now CH Precision's M1 amplifier and L1 linestage preamplifier, both of which bear strong family resemblances to the products Alan reviewed. (Indeed, the M1 is rather like a doubled-up A1, with twice the power supply and, at 200W, twice the power.)

Like the A1, the M1 is what CH calls a modular amp in that it houses two identical amplifiers in a single chassis. The two amps inside a single M1 can be used together or apart. In monaural mode, which is how I ran my pair of M1s, one channel acts as a monoblock. Alternatively, both channels can be used to passively or actively bi-amplify a signal, or be bridged for a substantial increase in monoblock power, or (when an M1 is equipped with a second analog input board) be configured to function independently, turning the amp into a stereo unit. (Alan tried a single A1, which offers precisely the same configurability as the M1, as a stereo amp and wrote that it gave him 95% of what two A1s offered when operated as monoblocks.)

Once again as with the A1, the M1 incorporates certain technologies that Cossy and Heeb first pioneered at Goldmund, most prominently high-speed/high-bandwidth circuitry and elaborate mass and constrained-layer damping of chassis and boards.

I've discussed high-speed/high-bandwidth circuits in re the world-class offerings of another Swiss company, Soulution. To refresh your memories, and to clear up a common misunderstanding, this speed or bandwidth (the two are essentially the same) has nothing to do with the megahertz frequencies that some of these amps and preamps can theoretically reproduce. To quote Cyril Hammer, CEO of Soulution, "The [speed or] bandwidth is required solely to make the 'feedback loops' of solid-state designs work properly."

"Feedback loops," global and local (about which more in a moment), compare the amplified music signal at the output to the signal at the input, in order to correct any errors that may have crept in as the music made its way through the circuit. Since the music signal at the input is constantly changing, the time delay (called "propagation delay") of the amplifier or preamplifier's feedback loop must be zero or close to it; otherwise, the feedback loop will be comparing musical apples at the output to musical oranges at the input.

The way to achieve very low propagation delay times in solid-state amplifiers is via ultra-fast (i.e., ultra-high-bandwidth) circuits. In the Soulution amplifiers, for example, propagation delay in the voltage-amplification stage—where local negative feedback is highest and bandwidth is 200MHz (!)—is one to two nanoseconds (billionths of a second), a literal order of magnitude faster than the circuits of many big solid-state amps, where propagation delay is typically one to five microseconds (millionths of a second).

While Soulution amplifiers use considerable "local" negative feedback (as in the voltage-amplification stage I just mentioned) and

Equipment Report CH Precision M1 and L1

very little (less than 3dB) global negative feedback, the amount of each is fixed. CH Precision's amps, both the M1 and the A1, give users the option of adjusting the ratio of local-to-global negative feedback in ten-percent increments through a range that extends from 0% global feedback (the default position) to 100% global feedback. Gain is also adjustable in 0.5dB steps in a range up to 24dB, allowing users to better match the amplifiers to the sensitivity of their loudspeakers (and the size of their rooms).

Other novel technologies in the M1 include a circuit designed to keep bias current to the power transistors as constant and stable as possible. As I pointed out in my review of the superb Technical Brain TBP-Zero EX monoblock power amplifier, power-transistor bias current is highly dependent on the internal temperature of the output stage. CH Precision amps use a device called ThermalTrak (from OnSemiconductor) to precisely map this temperature. According to the company's literature, "a very special circuit [is] built around the output stage which [takes] into account both the temperatures of the heatsink and the transistors' dies, [allowing] the amplifier's output stage to keep its bias constant independently of the musical program and the room temperature." CH claims that this patent-pending circuit allows the M-1's Class AB circuit to "outperform a pure Class A design with usual bias compensation."

The M1's companion piece, the L1 linestage preamplifier, also uses high-speed, high-bandwidth circuitry, although the preamp's circuit runs in Class A rather than Class AB. Designed for ultimate transparency, the fully balanced L1 analog linestage (the C1 preamp that Alan reviewed incorporated a DAC) is said to employ the shortest possible signal paths between input and output, ensuring very low noise and very high slew rates. Volume is controlled by a 20-bit R-2R ladder network, using tight tolerance, high-grade metal-film resistors that allow a 118dB range in 0.5dB steps.

Once again like the M1, the L1 is a modular design, comprising two identical preamp circuits in a single chassis. Like the M1, it can be used as a stereo preamp with eight inputs or, with the addition of a second L1 (and a set of monaural analog preamplifier boards for both units), as a mono preamp with 16 inputs. My L1 arrived with the optional, outboard X1 "ultra-low-noise" regulated power supply, which is said to increase transparency, speed, and musicality.

The L1 comes with one of the smallest remote controls I've seen—a metal block about the size of a Heath bar with five tiny, closely spaced buttons on it for on/off, volume up/down, and input forward/back. All other adjustments to the amp and preamp have to be made via the little pushbuttons on the faceplates of the amp and preamp chassis. Happily, both the M1 and L1 are equipped with large AMOLED displays, for reading out the menus and submenus you navigate via these tiny buttons.

Though Alan said, in his review of the A1/C1, that in his system he preferred using the amp with 40% global feedback (an adjustment that must be made via the display and pushbuttons just described), in my system (Magico M Projects/JL Audio Gotham subwoofers) I much preferred the default setting of zero negative feedback, although I did increase the gain of the amplifier by 6dB to better accommodate the sensitivity of the M Pros.

So what does an M1/L1 sound like? In a word, realistic—with the right speakers and the right program material, sensationally so.

Seeing that I just got done anointing the Soulution Series 7 amps and preamps the new transistor champs, you're probably wondering how the two marques compare. Well, to be honest, they don't sound much alike in spite of their many technological similarities (ultra-high-bandwidth circuits, user-adjustable modular dual-monaural construction, mass and constrained-layer damping).

The new Series 7 Soulution amps and preamps are all about power, solidity, and dark, rich tone color. Pleasingly soft on top, realistically big on the bottom, they have (almost uniquely for transistor gear) a tube-like ability to reproduce the three-dimensional body and bloom of instruments and vocalists (this tube-like bloom has always been one of Soulution's calling cards), while at the same time delivering all the traditional solid-state virtues (speed, definition, slam) in spades, hearts, diamonds, and clubs.

The M1/L1 combo does not have this lifelike three-dimensional body and bloom. In imaging the CH Precision amp and preamp are more typically solid-state, meaning instruments are a bit flattened in depth and a bit constrained in bloom (rather, dare I say it, like instruments on digital recordings). Nor does the CH combo deliver quite the same slam and dense color in the bass and power range that the sui generis Soulution gear does, though it's certainly no slacker in the bottom end. (I'm guessing that the Soulution's seemingly inexhaustible switch-mode power supply and one million microfarads of capacitance are the reasons for this—the M1 uses a stout 2200VA linear power supply and a mere 200,000 microfarads of capacitance.)

On the other hand, the M1/L1 bests the Soulution in resolution, treble extension, and overall neutrality—by enough of a margin to make a marked sonic difference. Indeed, in these three respects the CH combo is highly reminiscent of Technical Brain's incredible amp and preamp, which were the highest resolution, highest transparency, and (once again with the right speakers and the right source material) most realistic-sounding electronics I'd had in my system prior to Soulution. (CH's patent-pending bias-stabilization circuit—similar in principle to what TB does with its duplex temperature-compensation bias circuit—may be the reason for this sonic similarity.)

Indeed, the CH gear very nearly equals Technical Brain electronics in transparency and resolution thanks to a tonal balance that comes as close to colorlessly neutral as anything I've heard, tube or solid-state. Neither slightly darkish like Soulution nor slightly lightish like Technical Brain, the M1 and L1 open a window on the music (at least with vinyl sources, the Audio Consulting Silver Rock Toroidal phonostage, and the Magico M Project/JL Audio Gotham loudspeakers) that seems to take in...everything—simply incredible amounts of blur-free low-level (and high-level) detail.

For example, I must have heard Kind of Blue a thousand times, but I've never before heard the "wet" reeds buzzing in Trane's tenor and "Cannonball" Adderley's alto saxophone (on the sotto voce passages of "So What") with the startling realism that the M1/L1 (and, to be fair,

Equipment Report CH Precision M1 and L1

SPECS & PRICING

M1 Amplifer

Type: User-configurable two-channel solid-state power amplifier
Inputs: One balanced (XLR); two single-ended (RCA and BNC)
Input impedance: Balanced, 94k ohms; single-ended, 47k ohms or 300 ohms
Input stage: JFET, 24dB-range adjustable gain in 0.5dB steps
Amplification stage: Ultra-low noise, full discrete Class AB design with 6 pairs of complementary output transistors
Bias: Patent-pending bias circuitry for constant bias operation
Feedback: User-adjustable local vs. global feedback ratio, from 0% to 100% in 10% steps
Bandwidth: DC to 450kHz (-3dB) at 1W into an 8-ohm resistive load
Signal-to-noise ratio:Better than 115dB in stereo and bi-amp modes; better than 118dB in bridge mode
THD + noise: Less than 0.1% with 0% global feedback; less than 0.01% with 100% global feedback
Analog outputs: Two pairs of Argento binding posts for loudspeakers connection
Protections: Non-intrusive DSP-based protection of the amplifier and connected loudspeakers; short-circuit protected; disconnected loudspeaker detected; over-temperature of the heatsink; over-temperature of the output transistors
Transformer: 2200VA toroidal transformer for output stages; 100VA separate toroidal transformer for input stages
Power supply capacitors: Two sets of 100,000uF/100V 4-pole capacitors
Regulators: Non-regulated symmetrical power supply for the power stages; eight local regulation stages for input/driver stages; seven local regulation stages for the logic/display
Display: 480x272 pixels, 24-bit, color AMOLED
Dimensions: 17.3" x 10.5" x 17.3"
Weight: 165.35 lbs. (each)
Price: $94,750/pr.

L1 Preamplifier

Type: Dual-monaural, user-configurable, mono or stereo linestage preamplifier
Inputs: Eight stereo; eight or sixteen monaural
Outputs: Four Neutrik balanced XLR connectors, two WBT single-ended RCA connectors, two high-bandwidth coaxial BNC connectors
Volume control: 20-bit R-2R ladder network with 118dB range in 0.5dB steps from -100dB to +18dB
Analog signal path: Pure Class A, fully symmetrical, discrete-transistor-based circuit with phase inversion and mono modes
Input impedance: Balanced, 100k ohms; RCA and BNC, 50k ohms
Maximum input level: Balanced (XLR), 16V RMS; single-ended (RCA and BNC), 8V RMS
Frequency response: DC to 1MHz
THD + Noise: <0.001%, 1kHz, unity gain
Display: 480x272 pixel, 24-bit AMOLED
Dimensions: 17.3" x 5.2" x 17.3"
Weight: 44 lbs.
Price: $32,975 (X-1 power supply, $14,975)

JV's Reference System

Loudspeakers: Magico M Project, Raidho D-5, Raidho D-1, Avantgarde Zero 1, MartinLogan CLX, Magnepan .7, Magnepan 1.7, Magnepan 3.7, Magnepan 20.7, JL Audio Gotham subs
Linestage preamps: VAC Statement Line, Soulution 725, Audio Research Reference 10, Siltech SAGA System C1, Zanden 3100
Phonostage preamps: VAC Statement Phono, Audio Research Corporation Reference Phono 10, Constellation Perseus, Innovative Cohesion Engineering Raptor, Soulution 725, Zanden 120, Audio Consulting Silver Rock Toroidal
Power amplifiers: VAC Statement 450iQ, Soulution 711, Siltech SAGA System V1/P1, Lamm ML2.2, Zanden 8120, Odyssey Audio Stratos
Analog sources: Walker Audio Proscenium Black Diamond Mk V, TW Acustic Black Knight, AMG Viella 12, Acoustic Signature Invictus
Tape deck: United Home Audio UHA-Q Phase 12 OPS
Phono cartridges: Clearaudio Goldfinger Statement, Air Tight Opus, Ortofon MC Anna, Ortofon MC A90, Benz LP S-MR
Digital source: Berkeley Alpha DAC 2
Cables and interconnects: Crystal Cable Absolute Dream, Synergistic Research Galileo LE, Ansuz Acoustics Diamond
Power cords: Crystal Cable Absolute Dream, Synergistic Research Galileo LE, Ansuz Acoustics Diamond
Power conditioners: Synergistic Research Galileo LE, Technical Brain
Accessories: Synergistic ART and HFT/FEQ system, Shakti Hallographs (6), Zanden room treatment, A/V Room Services Metu panels and traps, ASC Tube Traps, Critical Mass MAXXUM equipment and amp stands, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Walker Valid Points and Resonance Control discs, Clearaudio Double Matrix SE record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

Equipment Report CH Precision M1 and L1

the Audio Consulting phonostage) bring to the transients, timbre, and articulation of these instruments. Ditto, in realism, for Dean Martin's voice, particularly on a closely miked, low-reverb number like "If You Were the Only Girl in the World" off Dreaming with Dean, where every little detail—from the breaths he takes to the spit in his mouth to the way he modulates or bends notes (or simply drifts off-key)—is reproduced with the clarity of a large-format-camera contact print. Double ditto for the individual voices of the strings, winds, brasses, and percussion of the Covent Garden orchestra in the wild climax of Rossini's Semiramide Overture from Venice. Triple ditto for the crack of Omar Hakim's snare and the literally subterranean pulse of Guy Fletcher's Yamaha DX-1 on Brothers in Arms.

Not only can you hear all these musical and instrumental details with utter clarity, you can hear engineering ones just as plainly. For instance, on the last-mentioned album, Dire Straits' Brothers in Arms, it was obvious from the wafer-thin flatness, dark timbre, and recession of Knopfler's voice that this was a digital recording—actually one of the first to be recorded on Sony's 24-track digital machine. (You can hear precisely the same flatness and recession on the vocals of Ry Cooder's great LP Bop till You Drop, the first digitally recorded pop album, taped five years earlier on a 32-track 3M machine.)

Whether some folks on our staff want to admit it or not, recovering this level of timbral and transient detail has a direct bearing on creating the illusion of the real thing. And the CH Precision electronics are superb at it. Of course, every album I just mentioned—Mobile Fidelity's 45rpm reissue of Kind of Blue, Analogue Productions' 45rpm reissue of Dreaming with Dean, Analogue Productions' yet-to-be-released reissue of Venice, and Mobile Fidelity's 45rpm reissue of Brothers in Arms, even Warner's original issue of Bop till You Drop—is a superb recording that will sound just as real (albeit in slightly different ways) on Soulution's new Series 7 gear or (from what Robert has told me) Constellation's latest Reference line. With less phenomenal recordings, results may vary. You see, the trouble with neutral is that it's, well, neutral. Though not cool and analytical (or anything like that, actually), the CH Precision duo in combination with the Magico M Pros won't sweeten up the strings and winds on Witches' Brew in quite the same way Soulution Series 7 gear in combination with the Raidho D-5s does, or slam through the floor on the bass/kickdrum of Michael Jackson's "Black and White" (from a 15ips dub of the mastertape of Dangerous) with the pile-driver solidity of the Soulution/D-5 combo. In other words, this is not a quintessentially "as you like it" sound. If drama and beauty are your things—and I know they are—then the CH Precision electronics will deliver them, but not as consistently or as spectacularly as Soulution gear does.

On the other hand, if you want to hear Dean Martin or the Juilliard Quartet or the Chicago Symphony Orchestra or Ry Cooder and his crew sound so "there" they'll make you blink—if you want to hear what's on recordings (and how those recordings were miked, engineered, and mastered) reproduced with virtually no editorialization—then you really ought to listen to the M1 and the L1.

So what are my caveats? Well, I've already mentioned a couple. The Soulution 711/725 may not be as colorlessly neutral or as finely detailed as the M1/L1/Audio Consulting (this last could change, BTW, with the advent of Soulution's stand-alone 755 phonostage), but it's richer in tone color, more powerful in the mid- to-upper bass, every bit as fast and hard-hitting on transients, and a whole lot more bloomy and three-dimensional. Nor is the Soulution gear as iron-fistedly controlled as the CH Precision/Audio Consulting.

Alan, I think, liked this sense of precise control, in part because it clarifies rhythms. And so it does (along with everything else). But there is something to be said for the looser, freer-flowing energy of the Soulution (and of tube gear), which doesn't give you the vague sense that the brakes are being applied with a little too much pedal. There is no slop in the CH Precision presentation, but there's not a whole lot of give, either. And the sense of one note flowing into, rather than discretely following another is also a valid representation of the sound of music.

I don't want to hit this point too hard. The CH Precision M1 and L1 are world-class electronics—and, alongside the Soulution Series 7 components, reference-level solid-state electronics. Each marque offers a different set of virtues, just as the Magico M Pro and the Raidho D-5 do. On certain days I prefer one to the other, and vice versa. But the bottom line is I wouldn't want to be without either. Happily, I don't have to be. You, on the other hand—or at least those of you with this kind of money, a coma-tose spouse, and no sense of shame when it comes to buying yourself toys—do. As this is not a decision I can make for you, you'll just have to make it for yourself. Sally forth, listen, and decide. The truth is you can't go wrong either way. tas

Equipment Report

Air Tight ATM-2001 Reference Monoblock Amplifier

Back to the Future

Jonathan Valin

A few months ago I reviewed Kevin Hayes' superb VAC Statement 450 iQ monoblock power amplifier. Comes now a different take on very high power tube amplification—from Atsushi Miura and Masami Ishiguro of Japan's Air Tight.

As you already know if you read last month's TAS Hall of Fame feature, these two gentlemen are genuine idealists wedded to the sound of tubes. Before founding A & M Limited (which manufactures components under the Air Tight brandname), they worked together for decades at Luxman—Mr. Ishiguro designing Lux's tube products and Mr. Miura voicing and then, as president of Luxman USA, marketing them. When Luxman was sold in 1986 and its new owners decided to discontinue manufacturing high-end tube components and go mainstream, Miura-san and his long-time engineer started A & M Limited (the initials are the first letters of each man's first name), solely "to contribute something to the development of world audio culture."

At the time, semiconductors were the kings in Japanese electronics; analog had been pronounced dead; home theater and car stereo were booming; and Mr. Miura's company, Lux Audio, a bastion of high-end tube electronics for better than half a century, was (as I just noted) about to be turned into yet another solid-state marque. Wealthy, middle-aged, and successful, Miura-san had no pressing reason to continue in the hi-fi business. And yet he did so, because, in his own words, he felt that high-end audio was "losing its original peerless 'dream' in the general shift from valves to transistors."

The results of his collaboration with Mr. Ishiguro are the gorgeous-sounding and gorgeous-looking amplifiers, preamplifiers, and phonostages for which Air Tight is famous—the king of which, the mighty ATM-2001 Reference, is the subject of this review. Although he didn't know it at the time, the ATM-2001 Reference was to be Mr. Ishiguro's last project. (He passed away in 2014, not long after designing it.) But the ATM-2001 was always intended to be his and Mr. Miura's ultimate statement in tube amplification—a two-chassis (the tall amplifier section sits upon a separate power supply, forming what appears to be a single chassis

Equipment Report Air Tight ATM-2001 Reference Monoblock Amplifier

of considerable elegance, and back-breaking weight), push-pull, ultralinear, Class AB monoblock capable of outputting 330W into 8 ohms with twelve 6550 beam tetrode power output tubes (more with KT120s).

Air Tight's take on tube amplifiers has always been more traditionalist than newfangled. The lovely sound of Golden Age classics from Marantz and McIntosh (even pre-Golden Age Western Electric) has always echoed through its line. Indeed, several of its offerings are latter-day paeans to amps like Marantz's Model 8B and Model 9, though Miura and Ishiguro's Air Tights don't sound the same as Saul Marantz and Sid Smith's landmarks—or, for that matter, Kevin Hayes' latter-day masterpiece, the Statement 450 iQ.

There are technical and non-technical reasons for these sonic differences. For one thing, like Hayes, Messrs. Miura and Ishiguro were well aware of the roles that vibration and resonance play in the "sound" of tube amplifiers. To cut down on these sources of noise, the twin chassis of the ATM-2001 Reference, which together weigh over 253 pounds per side, are optimized for resonance control, magnetic shielding, and physical stability. Though I can't say that the chassis and subassemblies of the ATM-2001 have been designed with the same heroic effort that went into the VAC Statement 450 iQ—or that the Miura and Ishiguro's amp is as standard-settingly immune to noise and vibration as Hayes' fabulous creation—the ATM-2001 is quieter (in the sense of being freer from hum, RF, and microphonics) than virtually every other high-powered tube amplifier I've heard or reviewed, and much quieter than any of the Golden Age numbers.

As is the case with Kevin's 450 iQs, Miura and Ishiguro eschew printed circuit boards. All parts are point-to-point hand-soldered—a process we witnessed when TAS visited A & M in Osaka (for which see the sidebar on our factory visit). Once again, I don't believe that the ATM-2001's circuits are as heroically isolated from the chassis and from vibration as Hayes' are (the circuits in the 450 iQs are bonded to brass subassemblies), but the ATM-2001 is, nonetheless, a very high-resolution device. Once again, much higher in resolution than Golden Age Marantz amps, and when it comes to speed and inner detail on a par with the VAC.

There are other technical similarities between VAC's and Air Tight's flagships. For instance, both amps use massive power transformers and large banks of filter capacitors in separate chassis. But there are also big differences, chief among which is that the Air Tight has no "iQ"-like circuitry to maintain and monitor bias voltage and safeguard against tube failure. Bias is set the old-fashioned way, via a built-in meter and screws. In addition, the ATM-2001 has a single RCA input, where the VAC offers the option of balanced inputs. Whether these technical matters account for the variations in the way the two amps sound—or whether that is also the result of decisions about parts and voicing—I am not engineer enough to say. What I can say is that the two amps sound more different than alike.

Those of you not prepared for one of my maundering digressions may want to skip ahead a few paragraphs; those willing to stick with me consider this: For more than a decade I've been talking about the way that tube and transistor electronics have been coming closer together sonically. (The VAC 450 iQ is a perfect example of this trend.) Oh, both still maintain their inherent advantages. Tubes have more lifelike color, texture, dimensionality, and bloom (for which see my review of the VAC Statement gear in Issue 263); transistors have superior neutrality, slam and grip in the bass, transient response, PRAT, and overall resolution. But even on their own respective playing fields the gap between the two gain strategies has shrunk.

What I haven't asked—and probably should have—is whether this trend is an unqualifiedly good thing. The Air Tight ATM-2001 Reference monoblock forces this issue in ways that I didn't expect.

Before you leap to the conclusion that this is a roundabout way of saying that the ATM-2001 sounds Golden Age tubey, watch your step. What I am actually going to say is this: What has been retained in Air Tight's flagship amp of the classic tube sound is no more nor less than all that is worthy of retaining —the gloriously dense tone color, the illuminated-from-within textures, and the spectacularly lifelike three-dimensional bloom of Golden Age amplification. Just as importantly, what has been added is the speed, grip, resolution, transparency, low noise, and neutrality that solid-state excels at and that latter-day tube classics, such as the VAC 450 iQ, also have in even greater abundance.

This combination of virtues makes for a critter not quite like any other I've heard. Yes, the ATM-2001 is tubier (in the good sense I just described) than the 450 iQ—realistically bloomier and denser in timbre. It is also a little darker and fuller in overall balance and noisier than the leaner, solid-state-quiet VAC. At the same time, it is also somewhat more "freed-up" (for lack of a better word) than the VAC or than almost all solid-state I've heard, save for Soulution.

With the ATM-2001 there is a reduced sense that the electronics are sitting on the energies and colors of the music, as for instance the CH Precision transistor gear does to a degree (see my review in Issue 259), the original versions of the ARC Ref 250 tube monoblocks also did to an even greater degree, and the VAC Statement 450 iQ does (by comparison to the Air Tight, mind you) to a *much* lesser extent than either of these other two. (This is only a guess, but it is possible that this slight solid-state-like quality of *over*-control—and the consequent less fully developed sense of bloom—is in part a side effect of the additional "iQ" circuitry in the VAC, which the Air Tight does not have. Of course, it might also be the result of the VAC's different tube complement, tighter bias, and silicon-regulated power supply.)

Clearly, some of the reason for the ATM-2001's freed-up presentation is the sheer amount of power on hand, but a larger part is owed to the untrammeled way that power is being delivered. It is as if the ATM-2001 is breathing with the music, rather than holding its dynamic/harmonic breath at certain moments and then expelling it in sudden bursts at others. To put this differently, the sound of music is not being forced—or is not being forced as obviously—into an electronic mold that accentuates starting or stopping transients, or certain timbres (while scanting others). At the same time that it is delivering this

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SPECS & PRICING

Tube complement: 12x 6550/KT120, 6x 12BH7, 2x 12AX7, 2x 12AU7
Rated output: 338W (8 ohms, mono)/180W (8 ohms, stereo version)
THD: Less than 1% at rated output
Frequency response: 20Hz–20kHz (+/–1dB)
Input impedance: 100k ohms
S/N ratio: 100dB
Dimensions: 430mm x185mm x 500mm (power supply); amplifier; 430mm x 480mm x 520mm (amplifier)
Weight: 65kg (power supply); 50kg (amplifier)
Price: $135,000 the pair (with KT120 output tubes)

AXISS AUDIO (U.S. DISTRIBUTOR)
17800 South Main Street, Suite 109
Gardena, CA 90248
(310) 329-0187
axissaudio.com

JV's Reference System
Loudspeakers: Magico M Project, Raidho D-5.1, Raidho D-1, Avantgarde Zero 1, MartinLogan CLX, Magnepan .7, Magnepan 1.7, Magnepan 3.7, Magnepan 20.7
Subwoofers: JL Audio Gotham (pair)
Linestage preamps: Soulution 725, CH Precision L1, Constellation Altair II, Audio Research Reference 10, Siltech SAGA System C1, VAC Signature
Phonostage preamps: Soulution 755, Constellation Perseus, Audio Consulting Silver Rock Toroidal, VAC Signature Phono, Innovative Cohesion Engineering Raptor
Power amplifiers: Soulution 711, CH Precision M1, Constellation Hercules II Stereo, Zanden Audio Systems Model 9600, Air Tight ATM-2001, VAC 450iQ, Siltech SAGA System V1/P1, Odyssey Audio Stratos
Analog sources: Acoustic Signature Invictus/T-9000, Walker Audio Proscenium Black Diamond Mk V, TW Acustic Black Knight, Continuum Audio Labs Obsidian with Viper tonearm, AMG Viella 12
Tape deck: United Home Audio UHA-Q Phase 12 OPS
Phono cartridges: Clearaudio Goldfinger Statement, Air Tight Opus-1 Ermitage, Ortofon MC Anna, Ortofon MC A90
Digital source: Berkeley Alpha DAC 2
Cable and interconnects: Crystal Cable Absolute Dream, Synergistic Research Galileo UEF, Ansuz Acoustics Diamond
Power cords: Crystal Cable Absolute Dream, Synergistic Research Galileo UEF, Ansuz Acoustics Diamond
Power conditioners: Synergistic Research Galileo LE, Technical Brain
Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and amp stands
Room treatments: Stein Music H2 Harmonizer System, Synergistic Research UEF Acoustic Panels and UEF Acoustic Dots and ART System, Shakti Hallographs (6), Zanden Acoustic panels, A/V Room Services Metu acoustic panels and traps, ASC Tube Traps
Accessories: Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Walker Valid Points and Resonance Control discs, Clearaudio Double Matrix SE record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

free-flowing energy and color up and down the gamut, the ATM-2001 is also delivering a full measure of that Golden-Age three-dimensional bloom *without* any Golden-Age blunting of transients, smearing of detail, or larding of the bass. (The Air Tight is every bit as well defined and powerful as the VAC in the bottom octaves, and more realistically full in the power range, where the Statement 450 iQ sounds, by comparison, slightly more solid-state-thin.)

To illustrate what I mean with a representative musical example, consider how the ATM-2001 Reference handles the Yarlung recording *If You Love for Beauty, Vol. I.—Vol. II* of which is mentioned by my colleague Vade Forrester in this very issue. (The title, in case you're wondering, is the English translation of the first line of Friedrich Rückert's poem "Liebst du um Schönheit," set to music in Gustav Mahler's ravishing 1905 song cycle *Rückert-Lieder*.) According to Yarlung the recording was made "direct to two-track analog tape," which is to say that it was recorded as performed with minimal miking and no mixers, and mastered without the usual sweetening or splicing in of alternate takes to disguise lapses in intonation or other issues. As a result, the performance retains the spontaneity—the beauty and freshness, as well as the occasional lapses—of live music-making in an actual hall (in this case, the Herbert Zipper Concert Hall at The Colburn School in Los Angeles).

What you're probably expecting next is some encomium about how "realistic" this recording sounds as a result of the way Yarlung made it and the ATM-2001 Reference reproduces it. And it *does* sound breathtakingly realistic through the Air Tight amps; nevertheless, it also sounds like a recording. All recordings do. Any time you put mikes and a tape recorder between you and the performers (and at a closer vantage than where you would be seated), you're going to hear the mikes, the tape recorder, and the vantage point. Which is one of the chief reasons why reproducing the absolute sound was and is an impossible goal to achieve.

Here the microphones were two classic Neumann U-47s arrayed as a coincident pair about ten feet in front of The Colburn Orchestra (conducted by Yehuda Gilad), with the soloist, mezzo-soprano Sasha Cooke, standing another seven feet behind the mikes. (Two AKG C12s, mixed to two-channel on-the-fly, were also used to reinforce the sound of the percussion and winds.) Considering there were no mixing boards, Dolby noise reducers, compressors or expanders, ADCs or DACs or the like in the signal chain, this is about as barebones (and high-end) a setup as you can get in a stereo recording of a mezzo-soprano and an orchestra. And despite what I just said about always hearing a recording as something that has been recorded—no matter

Equipment Report Air Tight ATM-2001 Reference Monoblock Amplifier

how lifelike it may otherwise sound in various respects—the fewer the electronic devices and engineering tricks between you and the music, the fewer the "recording artifacts" there are to hear. When you add to Bob Attiyeh's minimalist recording and mastering the fact that my copy of *If You Love for Beauty* is a first-generation, 15ips, reel-to-reel dub of the original undoctored analog mastertape, I ended up listening to something even closer to the performance than Vade did on his ADC'd-to-DSD download. And what I heard via United Home Audio's magical Ultimate One tape deck feeding Soulution's 725 linestage and Miura-san's amps, with their unique blend of Golden Age and modern-day tube sonics, was something truly marvelous.

"Sitting in Zipper Hall," Bob Attiyeh told me, "about 12 rows back where I had my notes and called the takes, remains one of the highlights of my life. Hearing Sasha's sound fill that glorious space, with Yehuda and this fabulous young orchestra gives me goosebumps even remembering it." And it gave *me* goosebumps to hear her through the Air Tight 2001 References on Bob's tape.

Mezzo-soprano Sasha Cooke truly does have a beautiful voice and, thanks to the Air Tight's extraordinary free-flowing energy and color, it blossomed in my listening room just as it did in Zipper Hall. Every bit as importantly for this music, which in its gossamer textures is a far cry from the gigantism of most Mahler symphonies (the Fourth, which these songs occasionally echo, being the exception), pianissimos were just as lifelike. When timbres, durations, and intensities are this realistic and the craft of the singer is this high, the power *and* the tenderness of the music find full expression.

What was true for the soloist was equally true for the ensemble. Due to the minimalist coincident miking and the ATM-2001's excellent focus and resolution, the young players of The Colburn Orchestra were presented with an almost-EMI-like clarity and concision, in which each instrumental voice was as clear as a bell without any diminution of the sense of the entire ensemble or of its interplay with the surrounding acoustic as dynamics ebbed and flowed.

This was about as close to life as recordings of voice and orchestra come. Yes, strings and winds were gorgeous. Yes, bass-range instruments such as tuba and contrabassoon were bloomy and powerful without any old-fashioned tube-like blurring of image outlines or loss of grip. Yes, timps had lifelike snap and thunder, and orchestral bells had realistic sparkle and sustain. And yet the ATM-2001 was also transparent enough to sources and high enough in fidelity to register the inevitable recording artifacts clearly: the distinctive brightness of the Neumann U-47 microphones on vocal and orchestral fortississimos (for which see my comments on *Dream with Dean* in my review of the Invictus turntable in Issue 264), the way the coincident mikes slightly "compact" the image of the orchestra giving you a sense of the space to the outside left and right of the ensemble, and the way that small adjustments in mike location and orchestral seating (with changes in program) also change the ratio of direct-to-ambient sound. Indeed, the Air Tights resolved these recording artifacts with a fidelity that would've done the best solid-state proud.

I could go on about scores of other great recordings, from Opus 3's marvelous Dixieland band the Rhythm Kings on reel-to-reel to Lenny and crew's *Live in London* or Miles' *Kind of Blue* on vinyl. But the bottom line would remain the same: Obviously, these are great tube amplifiers that will show their best with acoustic music, be it classical, jazz, rock, or folk. Obviously, they will appeal equally to as you like it, absolute sound, and transparency-to-sources listeners (like me). While their unique combination of Golden Age and modern-day sonic virtues in a very-high-power package serves electronica quite well, too, thanks to the amp's excellent bass grip and inexhaustible power delivery, there are other competitive options for hard rock, such as the VAC Signature 450 iQ in tubes, and the Soulution, Constellation, and CH Precision gear in solid-state. (If you don't need all of the Air Tight's enormous power and have suitably damped loudspeakers, the handsome-looking, 60W, 211-based, Class A Zanden Model 9600 monoblocks will slightly out-resolve the ATM-2001 Reference and the VAC Signature 450 iQ, while also providing every bit as much of the magically lifelike presence, bloom, and density of color that the Air Tight excels at delivering.)

It is a big world out there in the ultra-high end, filled with lots of tough choices if you have the requisite dore-mi (and no sense of shame when it comes to treating yourself to fancy toys). For the nonce, the Air Tight ATM 2001 just nudges out the VAC Signature 450 iQ as my high-powered tube reference, though I can see how others would opt for the quieter, slightly more neutral, more precise VAC presentation. (And I certainly prefer the sound of the VAC Statement Line Stage and the VAC Statement Phono Stage to Air Tight's preamplifier offerings.)

Still and all, this is a highest recommendation product—a genuine classic with a unique presentation that just happens to serve the sound of acoustic music exceptionally well.

Equipment Report Air Tight ATM-2001 Reference Monoblock Amplifier

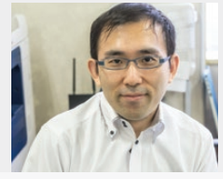
TAS VISITS AIR TIGHT! Robert Harley, Julie Mullins, and Jonathan Valin Visit A & M Limited in Osaka

Jonathan Valin and Julie Mullins

Founded in 1986 by Atsushi Miura and Masami Ishiguro (for more on which, see the review), A & M Limited engineers and manufactures all of the products marketed under the Air Tight brand name. Mr. Miura employs ten full-time employees in his little factory in Osaka prefecture. Assembly, all by hand including point-to-point wiring, is done exclusively by women, presumably for the same reason that the Swiss firm Micro-Benz and the German company Clearaudio employ women for many of these same tasks—because with their smaller hands, keener eyesight, and superior patience they do a better job at such painstaking work. In addition to the ladies, Miura-san currently employs two engineers: Mr. Yoshihiro Hayashiguchi in the factory and Mr. Minoru Kida in Tokyo. (Miura-san's longtime engineer and partner, Mr. Ishiguro unfortunately passed away in December 2014.)

As a side note: On our last night in Osaka we all enjoyed dinner at a little gastro-pub called Fujiyama that had craft beers from California and Oregon on draft. Julie asked Mr. Miura if he knew of the 1957 song "Fujiyama Mama" by Wanda Jackson, which she'd heard had been a big hit in Japan. I overheard this and told Julie not to insult the man's culture (or something to that effect). Suddenly 82-year-old Miura-san broke out singing, "'Cause I'm a Fujiyama Mama, I drink a quart of sakey!" We all burst out laughing. Apparently, music really does transcend culture, time, and place. tas

Air Tight's new ATM-X amplifiers in A & M's listening room. (Note the Apogees behind them, one of several speakers that Mr. Miura uses for listening.)

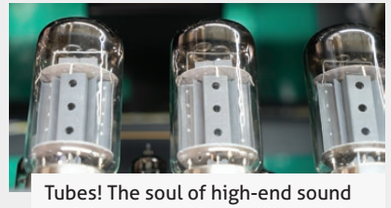


Yorshihiro Hayashiguchi, along with Minoru Kida, one of the two engineers that Miura-san used to design and develop his newest projects, such as the ATM-X.

The ladies of the A & M team with Robert, Miura-san, and JV. (In case you're wondering, Julie isn't in the picture because she took the photo.)

An ATM-2001 Reference in the process of being built. Note the point-to-point wiring.

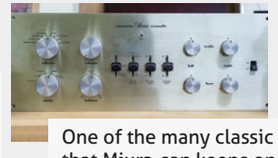
Robert admires a completed Air Tight ATM-2001 Reference that is being made ready for shipping. In the background Douglas Tomita, our wonderful translator and Miura-san's right-hand man, stands beisde Joe Lavrencik of Critical Mass Systems.



Tubes! The soul of high-end sound and the reason why Mr. Miura and the late Mr. Ishiguro founded A & M.

Soldering in a transformer. Every single solder joint in an Air Tight product is done by hand.

The exterior of the A & M Limited facility in Osaka, Japan. Arturo Manzano of Axiss Audio (Air Tight's American distributor) is standing outside the front door, with Miura-san to his left.



One of the many classic Golden Age components that Miura-san keeps on the shelves of his offices as symbols of what high-end audio at its best was and should continue to be.

Atsushi Miura, the heart and soul of A & M and the very epitome of Japan's high end.

A Takatsuki 300B. Vintage NOS tubes from GE, Siemens, Western-Electric, Gold Lion, Amperex, etc. are stocked in abundance in the A & M facility.

The ladies at A & M are highly skilled workers. Many of them have been with the company for decades.

Air Tight's new 300-B Anniversary Amplifier (with Western Electric 300Bs!).

Equipment Report

Soulution 755 Phono Preamplifier

Crème de la Crème

Jonathan Valin

This has been a very good year for phonostages chez Valin. Over the past twelve months or so I've had the opportunity to audition four outstanding units: the Audio Consulting Silver Rock, the Constellation Perseus, the VAC Statement, and the primary subject of this review, the Soulution 755. Although I could happily live with any of them, no two sound alike. While there are folks on our staff who would be dismayed by such sonic variety, I relish it. But then I'm not as doctrinaire as some. The world is filled with different kinds of listeners and different kinds of music; the absolute sound is filled with different vantages and points of interest; there is, in short, no single canonically "right" presentation.

If, for instance, you are a fidelity-to-sources kind of listener, you will probably gravitate to the $35k Audio Consulting Silver Rock or the $32k Constellation Perseus, both of which have extremely high resolution of musical and engineering detail (thanks in part to very low noise floors). Though there are TAS writers who believe (quite correctly) that such ultra-high detail is something we generally don't hear in a live concert, I've always felt that is rather beside the point. On LP, CD, SACD, DSD, reel-to-reel tape, or whatever, we're not listening to a live performance—we're listening to a *recorded* one, in which the recording process is part and parcel of the presentation. On something like Analogue Productions' superb LP *Dream with Dean*, for example, we *ought* to hear the slight upper-midrange emphasis of the very closely positioned Neumann U-47 microphone used to pick up Deano's voice; we *ought* to hear the way it clarifies and occasionally exaggerates sibilants, breath control, and aspects of enunciation (or mispronunciation, in Dean's case).

The irony is that while such artifacts make Dean sound more recorded, they also make him sound more "there," precisely because the component qualities of his singing style are being more minutely observed. It seems to me that the preservation of such fine aural detail goes a long way toward making up for The Big Blank Spot at the heart of every recording (which is also the biggest perceptual difference between hearing someone live and hearing someone canned)—our inability to see the musician performing. By giving the listening ear and mind more information than it would ordinarily take in at a live concert, a high-resolution compo-

Equipment Report Soulution 755 Phono Preamplifier

SPECS & PRICING

Analog inputs: Two unbalanced moving coil; one unbalanced moving magnet
Analog outputs: One balanced output (XLR); one unbalanced output (RCA)
LINK-system: Two RJ45
Gain: 62dB (moving magnet); 78dB (moving coil)
Output voltage: 4Vrms balanced; 2Vrms unbalanced
Peak output current: 1A
Impedance: 10 ohms balanced; 10 ohms unbalanced
Frequency response: DC–2MHz
Total harmonic distortion (THD+N): <0.002%
Noise floor: -140dB
Price: $72,000

AXISS AUDIO (U.S. Distributor)
17800 South Main Street, Suite 109
Gardena, CA 90248
(310) 329-0187
axissaudio.com

JV's Reference System
Loudspeakers: Magico M Project, Raidho D-5.1, Raidho D-1, Avantgarde Zero 1, MartinLogan CLX, Magnepan .7, Magnepan 1.7, Magnepan 3.7, Magnepan 20.7
Subwoofers: JL Audio Gotham (pair), Magico QSub 15 (pair), JL Audio CR-1 active crossover
Linestage preamps: Soulution 725, CH Precision L1, Constellation Altair II, Audio Research Reference 10, Siltech SAGA System C1, VAC Statement
Phonostage preamps: Soulution 755, Constellation Perseus, Audio Consulting Silver Rock Toroidal, VAC Statement Phono, Innovative Cohesion Engineering Raptor
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nent is also reducing the size of that Big Blank Spot; it is turning sound into a substitute for vision, allowing listeners (in a well-worn phrase) to "almost see" the performer.

In the midband, the essentially passive (one active solid-state device in an interstage-transformer-coupled circuit), battery-powered Audio Consulting is superb at this. Coupled with CH Precision's L1 linestage and M1 monoblock amplifiers, it reproduces something like Dean's voice with a level of "you can almost see him" realism that has only been equaled in my experience by the Technical Brain TBC-Zero/TMC-Zero. There is a transparent purity about the Silver Rock—a direct connection to performers and performance—that really sets the unit apart from the other competitors. Of the units in this survey, it is my second favorite—and my alternative reference.

This is not to say that the Audio Consulting is without flaws. While it is not one-dimensionally "flat" sounding (it does have a touch of bloom, mostly in a forward direction), the Silver Rock is not as 3-D as the VAC Statement or Soulution 755, both of which we will come to in a bit. It is also a touch thin through the power range and the bass, giving it a slightly leanish, "top-down" tonal character (once again with CH Precision's linestage and amplifiers, which are also slightly lean and top-down).

Inherently warmer and fuller in timbre than the Audio Consulting preamp, the Constellation Perseus extends the Silver Rock's "you can almost see him" resolution to the frequency extremes. Its preservation of detail is so high, its bandwidth so extended, and its soundstaging so panoramic, it can even turn an old chestnut like *The Weavers Reunion at Carnegie Hall 1963* [Analogue Productions] into a brand-new listening experience. In large ensemble numbers, such as the stirring finales "Goodnight Irene" and "'Round the World," the Perseus reproduces every singer, every instrument, every foot tap, every pluck on banjo, guitar, or bass fiddle, every voice joining The Weavers from the Carnegie Hall audience with crystalline clarity. Though this album has always been deeply moving to me for its end-of-era idealism—the hope that "one union can unite us" was already more pipedream than possibility in 1963 (or today)—the sound of all those singers and all those concertgoers briefly united in song has

Equipment Report Soulution 755 Phono Preamplifier

never affected me more powerfully than it did through the Constellation Perseus (and the Constellation Altair II linestage preamplifier and Hercules II Stereo amplifier), simply because of the heightened sense of "many" joining together as "one." All recordings and electronics should serve music this well.

Once again, the Constellation is not perfect. Though balanced slightly toward the warm side, incredibly clear and fast on transients top to bottom, and plenty hard-hitting in the low bass, it doesn't have quite the same jaw-dropping resolution in the midband as the Audio Consulting Silver Rock, or the three-dimensional bloom of the VAC, or the density of color and power of the Soulution 755 in the all-important power range. In addition, it is not quite as liquid as some of the other preamps being discussed, with a touch of fine solid-state grain that the other three units don't have.

I've already talked at length about Kevin Hayes' $80k VAC Statement Phono Stage (and its companion VAC Statement Line Stage) in Issue 263. This is the only tube unit in the group, and, as noted in my review, it has a fair measure of the lifelike timbre and texture of Golden Age tube gear. What it doesn't have are the noise and coloration that also came with those Golden Age tube classics. Indeed, the VAC Statement Phono Stage (along with its companion Reference Line Stage) is the lowest noise/highest-resolution tube preamp I've yet heard.

In the paragraph devoted to the Audio Consulting Silver Rock, I talked about the way in which components with ultra-high resolution can compensate for the Big Blank Spot in our perception of artists on records—our inability to see the performers, to watch them play and coordinate what they are doing with how they sing and sound. The VAC Phono Stage introduces an attribute that makes musicians that much more "almost-see-them" real: three-dimensional bloom.

I'm not going to reprint the charts (from John Eargle's great book *Music, Sound, and Technology*) that I used in my review of the VAC Statement gear in Issue 263, but the point I made there remains the same: In life and on disc, instruments do not image in a single flat plane; they have volume, body, directionality, and dimensionality that changes with changes in register, timbre, and dynamic. The addition of this third dimension, combined with its near-solid-state like speed and resolution, and richer and more saturated tonal palette, brings the VAC Statement Phono even closer to the absolute sound without any sacrifice in fidelity to sources (indeed, in my view, with an increase in fidelity to sources).

Yet again, the VAC is not perfect. It falls a bit short in the power range and the low bass, where (because of inherent limitations in current delivery) it simply can't supply all the transient speed and dynamic impact of something like the Constellation Perseus, or the dense color and astonishing grip of the Soulution 755.

Speaking of which.

Like the Constellation Perseus (which was designed by John Curl and Peter Madnick) and the Swiss-made Audio Consulting Silver Rock, the Soulution 755 is a solid-state phono preamp. And there, folks, the similarities—technical and sonic—end.

Like all Soulution electronics (see my interview with Soulution's Managing Director Cyril Hammer, who also happens to have designed the 755), the 755 uses very high speed, very high bandwidth (into the megahertz range) circuitry. (Speed and bandwidth are the same thing in this context.) Soulution doesn't do this because it expects its components to be called on to reproduce a 2MHz tone; it does it because it wants to make negative feedback work as it should.

Rick Danko's Fender bass sound not just incredibly dense in color, but ropelike in texture—thick, rounded, there.

As you all know, negative feedback has a bad rep. Some amps (tube and solid-state) dispense with it entirely (at a substantial cost in THD). Cyril Hammer and the other engineers of Soulution have taken a different approach. It is their view that NFB has gotten a bad rep because it has been improperly applied. To make feedback, which compares the output signal to the input signal in order to correct errors, work properly, it must occur instantaneously. Otherwise, the input signal will have changed with the passage of time, and you will be comparing an apple at the output stage to an orange at the input. Very high bandwidth (which, as noted, translates to very high speed) allows Soulution to compare apples to apples. All Soulution components reduce propagation delay (the time it takes to make corrections) from the typical-for-solid-state 1–5 microseconds to 1–2 nanoseconds (one thousand times faster). The result is standard-settingly low distortion levels in preamps and amps that, unlike some, don't give up the ghost and go into runaway distortion *precisely* when you hit their rated power limits.

Thanks to Soulution's circuitry, the 755 is, in fact, a marvel of low distortion, with a noise floor of -140dB (quite phenomenal in a phonostage). Of course, the 755 isn't just a phonostage. Unlike every other preamp considered in this review, the 755 is a stand-alone phono-preamp. Like those dedicated preamps with built-in DACs that are so popular today (one of which, the 760, Soulution also makes), the 755 is a phonostage *and* a linestage. Its large chassis houses a highly linear phono equalizer circuit (with a gain of 78dB) and the exact same output circuitry, highly sophisticated PGA (programmable gain amplifier) volume control, and power supply (with more than 500,000 microFarads of capacitance!) found in Soulution's 725 linestage preamplifier.

The long and the short of this is simple: If you listen to LPs exclusively, the 755, which is able to accommodate up to three phono sources at the same time (two moving coil and one moving magnet), allows you to play back your vinyl with complete control of level and balance. At $72,000, the unit is quite expensive, yes. But you can go directly from it to your power amp (or, since it has two analog outputs, to your power amp and your subwoofer) without degrading the signal by connecting to a separate linestage through a pricey pair of interconnects. (I can tell you from experience that going directly to amplifiers from the 755 is a big sonic step up compared to going from phonostage to linestage to amplifiers, though the 755 can also

Equipment Report Soulution 755 Phono Preamplifier

be used as a traditional phonostage in a system that includes digital sources.)

As for the way it sounds, well, if you take the extraordinary midband resolution of the Audio Consulting Silver Rock, the top-to-bottom transient speed, detail, and soundstaging prowess of the Constellation Perseus, and the bloom, color, and dimensionality of the VAC Statement Phono, then add the most solid power range and powerful low bass you've heard from a phonostage preamplifier, you've got something like the 755.

Whether it's because of their successful implementation of NFB or their very short signal paths or their dual-mono configuration or their virtually unlimited power supplies, Soulution components have always done several things better than the other solid-state and tube units I've reviewed. First, they have the kind of three-dimensional imaging that you generally only hear with valves. Second, they have an incredibly hard-hitting bottom octave. Third, they have an extraordinary power range that adds lifelike foundation and color to the midband and makes the transition to the low bass more continuous (albeit at the price of a somewhat "bottom-up" tonal balance).

When connected directly to an amplifier, the 755 does all three of these things, making it the most realistic-sounding phonostage of the lot. It not only fills in the Big Blank Spot by offering superb resolution, lifelike bloom, three dimensionality, dense tone color, lightning transient speed, and wall-to-wall soundstaging in a single package—making it appealing to fidelity-to-source and absolute sound listeners alike—it also has the midbass slam, low-bass extension and grip, and power range fullness that musicality-first listeners adore. I must say that I haven't heard anything else quite like it.

Take a listen, for example, to The Band's "King Harvest (Has Surely Come)" on the outstanding MoFi reissue of *The Band*. This fabulous ballad, with its hard-knock mix of calamity, endurance, and salvation, has something of the same vibe as The Weavers' "Union Miners." Using the sparest of musical means—the tapping of Levon Helm's cymbal and the climactic thud of kickdrum and bass in the chorus, the swirl of Garth Hudson's organ (evocative of the sound of the wind on the water), the autumnal dry-leaf crackle of Robbie Robertson's guitar (the polar opposite of "guitar-hero" pyrotechnics), the clean, rope-like lines of Rick Danko's Fender, and Helm and Richard Manuel's hesitant, troubled delivery of the almost imagistic lyrics ("Scarecrow and a yellow moon. Pretty soon the carnival on the edge of town")—"King Harvest" is a masterpiece of composition, performance, and, in the MFSL reissue, sound. But you won't get the mysterious, almost overwhelmingly powerful effect of this great song without hearing the way these musical means work individually and together to create the dark, almost Biblical landscape of plague and fervently hoped-for (but not quite certain) redemption.

The Soulution 755 (in combination with the Soulution 711 amplifier) delivers the muscular ache and beauty of "King Harvest" better than I've ever before heard it delivered. It is simply magical to hear Helm sitting beside his drums and cymbals in three dimensions—you can almost see him cocking his head and scrunching up his face toward the microphone. To hear Danko's Fender bass sound not just incredibly dense in color, but ropelike in texture—thick, rounded, there. (Bass strings just don't get reproduced with this kind of three-dimensionality without a sacrifice in speed, color, and definition.) To hear Robbie Robertson's elliptical guitar work (about which he wrote: "This was the new way of dealing with the guitar for me, this very subtle playing, leaving out a lot of stuff and just waiting until the last second and then playing the thing in the nick of time") with its lightning-flash-in-the-clouds suddenness and luminosity intact.

Like the other three preamps in this review, the Soulution 755 is not perfect. As noted, it tends to be a little dark or "bottom-up" sounding (because of the fullness of its power range and bass). It is not as nakedly detailed as something like the Audio Consulting Silver Rock or the Constellation Perseus, but that is because it is incorporating detail into a three-dimensional image rather than delivering everything "upfront" in a single plane. When you listen to it closely, you'll find next-to-nothing is being omitted. It is also ungodly expensive. But given that it can drive an amplifier directly—obviating the need to purchase a linestage and a pair of expensive interconnects—some of that price tag seems more reasonable, especially given its superb sonics.

As I said at the start I could easily live with all four of these phonostages, but were I forced to choose one for the long haul, the Soulution 755 would be my pick. It is not only the most complete-sounding phono-preamp I've yet heard; it is also, in my opinion, the single best product Soulution has thus far made and marketed. It goes without saying, or should, that it gets my highest, most enthusiastic, and most affectionate recommendation. Why affectionate? Because I love the thing.

Equipment Report Soulution 755 Phono Preamplifier

A Short Chat with Soulution's Cyril Hammer

The 755 is, I believe, your own design. Can you tell me how it differs (if it does differ) from the basic Soulution formula of high-speed/high-bandwidth, high-local-feedback circuitry? And how does the 755 phono preamplifier differ from the optional phonostage built into your 725 linestage?

Over the years we have worked with several designers with individual strengths and audiophile "beliefs." The only way to ensure that the sound characteristic does not change completely over time or from one product to the other is to rigorously stick to our basic design principles. This also holds true for the 755 phono preamplifier, which was in fact designed by me. However, because they use the same design principles does not mean that two products are the same. The 755 differs considerably from the 725 with its optional phonostage. For optimal input separation, each of the six inputs in the 725 has its own dedicated input buffer, but this uses up a lot of PCB space, especially for the balanced inputs. As a result, there is actually no room on the 725 preamplifier board for the additional RIAA equalizer circuit. We had to go for a piggyback configuration in the 725, where the phono section sits above the main preamplifier board. The 755 phono preamplifier has just three inputs, all of them unbalanced, which frees up a lot of PCB space. Thus, the RIAA equalizer in the 755 is integrated on the main audio board, which leads to much shorter signal paths than what we have in the 725. Although we use the same type of RIAA equalizer in the 755 that we use for the 725, we also had the chance to employ better, more precise, and higher-grade components. In the case of the capacitors, this means bigger components, which simply did not fit into the 725.

The 755 is unique in being a stand-alone phono-source preamplifier, which is to say it has a high-quality linestage built into it that allows it to be connected directly to an amplifier (rather than to a linestage first). What can you tell our readers about the linestage in the 755? Is it the same circuit found in the 725? And why did you make such a uniquely interesting, albeit highly specialized product? Why would a customer choose to buy the 755 instead of a 725 with optional phonostage?

The linestage in the 755, as well as the volume control, are the same as we use in the 725. This allows the 755 to drive the power amplifier directly without any losses compared to a setup with an additional line preamplifier. The 755 is, of course, a highly specialized and, at its price point, an extreme niche product. However, during the past few years we have seen many clients in the "high end" starting to build dedicated systems exclusively for playback of analog or digital sources. The 755 phonostage, as well as the 760 DAC, perfectly fit in such a system, where you will most probably work without any line preamplifier. This does not mean that these products are limited to "direct-use" only, as the volume control can be bypassed in case it is not needed. When compared with the 755, the optional phonostage in the 725 or the 750 phonostage seem to be somehow compromised products, which is of course not the case. Both the 725 phono option and the 750 phonostage are still great-sounding, outstanding products at their respective price points. But if you are looking for the best possible sound performance with LP playback, they simply cannot compete with the 755.

The 755 is an RIAA-only phonostage. Unlike many other units, it has no alternate EQ curves (e.g., "Decca," "Columbia," "EMI," etc.). Why did you decide not to include such alternate curves?

The RIAA characteristic is well defined by IEC 98, whereas precise data about the characteristics of most other equalization curves is often not available and/or contradictory. The literature describes many, many different recording characteristics that have been in use for a certain period of time at specific recording companies. If you do not know for sure which equalization characteristic a particular record has been recorded to, it can be quite challenging to assess which playback EQ curve is the correct one. While going through different EQ curves for a specific LP and discussing the results with friends could be a lot of fun, we based our decision purely on these technical aspects.

Designing an RIAA equalizer which performs at highest accuracy and provides lowest noise is quite a challenge in itself and requires a rather complex feedback network for an active design like the one we use in the 755. Changing from one EQ curve to another would require changing every single value in this network in order to achieve the requisite accuracy. As compromising RIAA performance was, of course, not an option, we would have had to build separate EQ stages for every single EQ curve. Although the 755 is rather big for a phonostage, PCB space is nonetheless limited (and we didn't want to build a phonostage the size ofthe 711 stereo amplifier). For the sake of optimizing the performance of the RIAA equalization stage, we decided not to implement any non-RIAA EQ curves. tas

Equipment Report

Accuphase C-3850 Preamplifier and P-7300 Power Amplifier

Soundly Engineered Design and Performance

Andre Jennings

The Accuphase brand was originally marketed under the company name of Kensonic Laboratory, Inc. in 1972. To celebrate its tenth anniversary, the company changed its name to Accuphase Laboratory, Inc. The name Accuphase was chosen as a merging of the words accurate and phase. One of the basic ideologies of the company has been quality over quantity, from the first C-200 preamplifier and P-300 amplifier to the latest products under evaluation—the C-3850 preamplifier ($43,500) and P-7300 power amplifier ($32,000).

First introduced in the U.S. at CES 2015, the C-3850 preamplifier is the company's newest flagship model, replacing the C-3800 (introduced in July of 2010). Accuphase says the C-3850 exemplifies the knowledge gained over the nearly 45 years of the company's existence in product construction, circuit design, component selection, and technology, yielding "an audio instrument that admits no compromise in the pursuit of peerless performance." While I can't confirm that statement for every reader, I believe that Accuphase takes a fundamentally sound design approach with methods and practices that are on a level with today's best manufacturing, engineering, and quality-assurance processes.

One of the primary functions of a preamplifier is volume control. The C-3850 accomplishes this using what the company calls an Accuphase Analog Vari-gain Amplifier (AAVA). AAVA takes the input voltage of the music signal and converts it into weighted current using 16 types of voltage-to-current (V-I) amplifiers. Each of the 16 weighted current output stages are turned on and off by individual current switches. These V-I current stages are summed to form a variable gain circuit that adjusts the volume of the input music signal, yielding 65,536 (2^{16}) individual current levels. Before the music signal is transferred through the next stage of the preamplifier, the signal is converted back to a voltage using a current-to-voltage (I-V) amplifier. With this level (no pun intended) of refinement, the microprocessor that controls the input-signal current level is able to maintain proper channel balance throughout the operating range, to precisely set signal level, to adjust and maintain L-R balance, and to control the signal attenuator button without adding more circuitry to the signal path.

Equipment Report Accuphase C-3850 Preamplifier & P-7300 Power Amp

Accuphase feels this AAVA approach to volume control removes the effects of impedance changes, frequency response inconsistencies, and large variances in signal-to-noise ratios when listening at low levels. The C-3850 evolves the AAVA principle by using dual AAVA (balanced AAVA) circuits in parallel to achieve the same performance when using balanced input to balanced output signals.

Internally, the C-3850 is a dual-mono design with individual power supplies (including toroid transformers) with 60,000 microfarads of capacitance per channel. Each channel (left and right) has nine unit-amplifier printed-circuit board (PCB) cards per side that are made from glass-cloth fluorocarbon resin with gold-plated copper-foil surfaces. The channels are separated by 8mm of hard aluminum that is said to increase rigidity and reduce vibration. A main PCB serves as the motherboard that ties the 18 unit amplifier cards, the power supply circuit cards, the front panel PCB and display, and rear-panel input and output interfaces together.

Externally, the C-3850 follows the Accuphase tradition of refined visual appeal with its golden-hue metal front panel and high-gloss natural-wood-grain cabinet—with vented grilles on top to dissipate heat generated by the internal circuitry and unit amplifier cards. Scanning the front panel from left to right one sees the input selector knob with power button directly below; the subpanel cover with the display panel above it; a subpanel access button; a headphone jack; and the volume knob with attenuator button below it.

Accuphase put a lot of thought into the volume knob, which is connected to a sensor that sends position information to the microprocessor for proper volume adjustment. Accuphase says the volume knob is extruded from a solid aluminum block and mounted to a large diameter shaft. This is said to provide the right amount of inertia when combined with the low-friction internal mechanism, and to ensure smooth feel and quiet motor operation (when using the remote control). The operation of the volume knob during evaluation seemed to confirm the stated goals of the manufacturer.

The display panel shows a digital readout of the selected input and volume level. Additionally, there are indicators for output (inv, off, and external pre), recorder (on and play), attenuation (-20dB), and the loudness-compensation network (a three-position loudness compensator that boosts low-end presence). Pressing the button for the subpanel opens the drawer and reveals button controls for display, phase (phase inversion can be set individually for each channel), mono, and recorder. Rotary switches for output (ext. pre, all, bal, line, off), gain (12dB, 18dB, 24dB), balance (+/– 4dB L-R), compensator (off, 1, 2, 3), and 'phones level (low, med, high) are also accessible. The rear panel features four balanced XLR inputs, six single-ended inputs, two sets of balanced XLR outputs, two sets of single-ended outputs, one set of recorder playback-and-recording single-ended inputs and outputs, a set of external preamplifier inputs (single-ended and balanced), and the AC power supply IEC connector.

The supplied remote control (RC-210) has buttons for input selection (direct or toggle), volume adjustment, and attenuator on/off. There are five additional buttons for CD/SACD player control (stop, play, pause, back, and next) that will operate Accuphase disc players.

Setting up the C-3850 is relatively straightforward. In addition to making the usual connections for input source components and output, the user has options for a few additional settings. The loudness compensator can be engaged at various levels if the user needs/desires more low-frequency presence. (In this evaluation the compensator feature was tested for functionality but not used during normal listening sessions.) Depending on the output cable configuration, the output control can be set for an external preamp (e.g. home-theater bypass—not tested), balanced, single-ended, or balanced and single-ended. The volume level display can be adjusted to work in attenuation mode (default) or gain mode; both modes were used in this evaluation. The C-3850 is set for pin-3 "hot" on the XLR input and output. Depending on the input source and the amplifier connected to the output, the individual input phase inverter can be activated to adjust for any condition. If the user gets confused, the instruction manual has a usage table to help set the phase (inverted or non-inverted) for all of the connections. The gain setting can be set for 12dB, 18dB, or 24dB. In every configuration in which the C-3850 was used, the preferred gain setting was 24dB, which yielded more dynamic and rhythmic drive on all types of music.

The P-7300 stereo power amplifier is rated at 125Wpc into 8 ohms, 250Wpc into 4 ohms, 500Wpc into 2 ohms, and a stable 800Wpc (music signal) into 1 ohm. Maximum output power in normal operating mode is listed as 220Wpc, 383Wpc, 620Wpc, and 899Wpc respectively.

SPECS & PRICING

Preamplifier
Type: Solid-state
Analog inputs: Four pairs of balanced XLR and six pairs of single-ended RCA
Dimensions: 18 3/4" x 6 1/8" x 16 1/48"
Weight: 55.1 lbs. net
Price: $43,500

Power amplifier
Type: Solid-state
Output power: 125Wpc into 8 ohms, 250Wpc into 4 ohms, 500Wpc into 2 ohms
Inputs: Two balanced XLR and two single-ended RCA **Outputs:** Two pairs of speaker terminal binding posts per channel
Dimensions: 18 5/16" x 9 3/8" x 20 9/32"
Weight: 107.2 lbs. net
Price: $32,000

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Equipment Report Accuphase C-3850 Preamplifier & P-7300 Power Amp

The P-7300 replaces the P-7100 introduced in 2006. Like the C-3850, the P-7300 improves on the older design, utilizing the same advancements and experience Accuphase has gained over the years. The P-7300 boasts improved signal-to-noise ratio and a higher damping factor than the P-7100 it replaces.

Internally, the P-7300 contains a large newly developed toroid transformer in the power supply with a total of 112,000 microfarads of filter capacitance. The input stage is a low-noise instrumentation-amplifier topology designed with discrete components in a balanced configuration. Further improvements in the Multiple Circuit Summing (MCS+), which uses multiple circuits paralleled in the same configuration to reduce noise and improve performance, have been extended to the Class A drive stage of the I-V converter. The output stage uses 10 parallel push-pull (20 total) bipolar output transistors per channel. These transistors are directly mounted to the large die-cast aluminum heatsinks on either side of the amplifier that dissipate heat generated by the circuits. A current feedback circuit is utilized to achieve negative feedback in an effort to keep the feedback circuit impedance low and phase shift at a minimum.

The outside of the P-7300 has a golden-hue metal front panel with the die-cast aluminum heatsinks integrated into the chassis to form the side panels. On the rear of the amplifier are two sets of speaker terminal binding posts (for bi-wiring) for both left and right channel outputs, single-ended (and balanced) inputs for each channel, a balanced input phase selector switch, and an IEC AC power supply. Additionally, there is a rotary selector switch for the amplifier configuration: normal mode for stereo operation, dual mono mode for bi-amping, and bridge mode for monoblock operation (500Wpc into 8 ohm, 1000Wpc into 4 ohm). On the front panel, the amplifier has a 4-stage gain-selector rotary switch that has a max setting (28dB of gain) with additional adjustable settings of –3dB, –6dB, and –12dB (relative to the max setting). Next to the gain-selector switch is an input-selector button (single-ended or balanced), a main power button, and a power-meter-control rotary switch. The power-meter-control selections are off, normal, 3 SEC (peak hold for 3 seconds), and infinite (infinite peak hold). The center of the front panel houses the power meters for both channels. Above the left power meter are hold indicators for the power-meter-control settings (3 seconds or infinite), while function indicators (bridge mode, dual mono, single-ended, and balanced) are above the right power meter.

In setting up the P-7300, the speaker outputs were used in a bi-wired (and single-wired) configuration with balanced XLR inputs. The phase selector switch was set according to the preamplifier used at the time. The majority of the time it was set to the default (pin-3 "hot") for use with the C-3850 and pin-2 "hot" when used with the Placette Audio Active preamplifiers. The power meters were set to normal mode for most daily operation. Listening tests favored the –3dB or –6dB setting for the gain-selector switch. The max setting tended to add a bit of edge to the sound while the –12dB setting tended to sound a bit less dynamically robust. The speakers used during the evaluation were Vandersteen Model 3A Signature and the Magnepan 20.7. Occasionally, a pair of Vandersteen 2Wq subwoofers were employed to add additional bottom-octave drive to fill my rather large 18' wide and 43' deep and 8' high listening space. The P-7300 was able to control and drive any of the above speakers without sounding as if it were having any difficulties. The level of bass control the amplifier had on the 20.7 (as well as on the 3A Signature) was as good as any other amplifier I've used with these speakers.

When combined, the C-3850 and P-7300 become the heart of a soulfully solid, bottom-up sounding reproduction system. The solidity of the presentation from multiple sources (music and source equipment) appeared to be palpable in all cases. One of my first observations was the more forceful drive and vigor the Accuphase pair presented. Chris Isaak's "Kings of the Highway" from the *Heart Shaped World* LP had the characteristically saturated soundstage it always has but with more expansion of the soundstage in all directions. Additionally, the added presence in the bass and lower midrange gave the music perceptively more powerful drive. This same characteristic was noticed on Mighty Sam McClain's "Too Proud" from the *Give It Up to Love* LP with the bass and drums commanding attention when called for. On "So Far Away" from Mobile Fidelity's reissue of Dire Straits' *Brothers in Arms* LP, the Accuphase gear further solidified the foundation, maintaining low-octave energy throughout. The track seemed rooted to the bass drum, with no noticeable overhang, and the bass guitar.

Another plus was the way string instruments and organs were presented with clarity while not being pushed forward in the musical mix. Guitar separation and multitrack layering of the instruments on "Kings of the Highway" and "So

Equipment Report C-3850 Preamp & P-7300 Power Amp

Far Away" were easy to observe, and all instruments had an additional amount of weight and presence. The Hammond B-3 played by Bruce Katz on "Too Proud" filled the soundstage with this instrument's captivating sound and made it a primary underpinning ingredient, setting the mood for the performance.

On vocals, there appeared to be a shift toward presenting more power through the chest of the singer rather than a thinner head tone. On all of the songs mentioned above, the vocals were in natural proportion and easily enjoyable. The Speaker's Corner reissue of the Decca recording of Ravel's *Scheherazade* conducted by Ernest Ansermet featuring French soprano Régine Crespin produced exceptional sound through the C-3850/P-7300 combo. Crespin's voice was very powerful yet sweet and smooth all the way through her dynamically impressive fortissimos. The playback through this Accuphase combination had the most strikingly solid vocal foundation I've heard from this LP. Crespin's voice filled the performance venue the way one observes during a live performance, with an additional amount of fullness that was captivating. The accompanying orchestral performance was just as convincing, with similar characteristics. Instrument placement was where one would expect with a proper representation of a performance venue.

The Accuphase C-3850 and P-7300 operated flawlessly during the evaluation period. In its website literature, it seems Accuphase prioritizes quality over quantity. One example is the use of vibration testing during the manufacturing process on every component. Accuphase's belief that a single failure for the customer is a 100% failure rate drives its desire for bullet-proof product reliability. I've heard four Accuphase products in my listening space and all of them have performed without issue.

The Accuphase combination delivers the distinctive cues that reveal the individuality of the music (or source component) being played. During multiple listening sessions, the C-3850/P-7300 never ventured into the bright and fatiguing—nor did it veer into the soft and dull. The presentation tended to stay close to the sonic lane that provides long-term listening satisfaction with enough resolution, warmth, and soul to allow full exploration of the music being presented. With this setup, the user can tilt to the left brain or right brain depending on mood and desire. An audition is recommended. tas

Equipment Report

The David Berning Company 211/845 Power Amplifier

The Third Dimension

Robert Harley

Just when I thought I'd heard virtually the entire spectrum of power amplifiers, along comes the 211/845 from The David Berning Company. With 60W of pure Class A push-pull tube power, no output transformer, and zero global feedback, the 211/845 certainly occupies a little-explored corner of high-end audio. But I'm glad that I gave this offbeat amplifier a listen, because it opened my ears to the starling qualities of vacuum tube power when freed from the sonic bottleneck that is the output transformer. No other amplifier is built like the 211/845—and no other amplifier sounds quite like the 211/845.

On paper, the Berning 211/845 is scintillating. For starters, it is the ultimate implementation of David Berning's patented ZOTL circuit, which allows a tube output stage to drive loudspeakers without an audio output transformer (see sidebar). An earlier and less ambitious implementation of the ZOTL circuit (in the $8360 Berning ZH-230) was praised mightily by Dick Olsher in Issue 210. Others who have heard Berning's amplifiers, particularly the ZOTL variety, have been similarly enthusiastic. (See also Vade Forrester's Golden Ear Awards in Issue 265.) Berning pulled out all the stops in creating the 211/845; in his nearly 50-year career he has never created an amplifier this sophisticated, or lavished such expense on the execution.

The silver chassis (black is also available) is nicely finished, but the 211/845 is decidedly not a piece of audio jewelry. Visually, this amplifier exudes a no-nonsense vibe that reflects its status as an instrument for reproducing music. In keeping with the amplifier's instrumentation feel, the power switch is on the rear panel. Balanced and unbalanced inputs are provided, selected via a toggle. Two pairs of silver WBT binding posts are provided for loudspeaker connection. The 211/845 sells for $75,000 per pair.

The amplifier's pedestrian name derives from its ability to operate with either 845 or 211 output tubes. No user adjustment is required other than swapping the two tubes per chassis. The amplifier is shipped with pairs of both tube types, hand-matched and selected by David Berning using a curve tracer. The 211 and 845 output tubes are Western Electric replicas made by Psvane, which cost more than triple the price of Psvane's standard versions. When turning the amplifier on, an auto-bias sequence gradually ramps up the output-tube bias, extending tube life. Once the amp is fully turned on, the user can select one of three bias currents, with the lower settings reducing output power but extending tube life. These reduced-bias modes are presumably for background listening, or if you have extremely sensitive loudspeakers. Output tube life is projected at 10,000 to 20,000 hours even when the amp is operated at the maximum bias setting.

This all-tube amplifier is shipped with the small-signal tubes in their sockets, but the user has to install the output tubes. These tubes extend above the chassis *au naturel*, or can be protected by a removable cage. The amplifier's small-signal tubes are a vintage 12AT7 and a pair of 6V6 beam-power tubes (all NOS from the 1960s), along with a modern-production 6SN7. A backup set of the small-signal tubes is included, although these are current-production Tung-Sol and Sovtek units, not vintage tubes.

No expense was spared in this new design's execution. The tube sockets are unlike any I've seen before, made from ceramic with spring-loaded gold contacts that wrap around the tube pins. The circuit is point-to-point wired with silver wire rather than relying on thin copper circuit-board traces. Caddock resistors and Solen Teflon capacitors abound. The mechanical isolation is extraordinary, with 36 Stillpoints standoffs used in the circuit, more Stillpoints in the power-supply sub-chassis, and Stillpoints Ultra 5 isolation devices for feet (Stillpoints Ultra 6 isolation is a $2000 option). Importantly, the height of the Ultra 5 feet can be adjusted so that the amplifier is firmly coupled to whatever it is resting on. The entire circuit and chassis assembly, including the tube sockets, have been cryogenically treated.

I've recently explored the state of the art in solid-state amplification (the Constellation Hercules II and Soulution 701, for examples) and wanted to experience the pinnacle of vacuum-tube technology. The Berning 211/845 looked like a good candidate, and the amplifier sounded spectacular at the 2015 Munich show driving Avantgarde Trio loudspeakers. I also

Equipment Report The David Berning Company 211/845 Power Amplifier

heard the 211/845 sound wonderful driving the big Tidal Akira loudspeakers at the home of Rick Brown of Hi-Fi One, the amplifier's worldwide representative. Calling Rick Brown the worldwide representative is technically correct, but understates the role he played in bringing the 211/845 into existence. Brown has sold David Berning's amps for years to his select clientele, but urged Berning to create a no-holds-barred amplifier based on the ZOTL circuit. Brown funded the two-year development effort, and played a pivotal role in shaping the final product, including the extensive use of Stillpoints technology in the amplifier, the cryogenic treatment, and selection of key passive components through critical listening comparisons.

Although rated at 60W into 8 ohms, the 211/845's output power is somewhat higher than that, dependent on which output tubes are installed. With the 845 tubes, the amplifier clips (with clipping defined as 3% THD) at 83W into 8 ohms. With the 211 tubes, onset of clipping occurs at 72W. The 211/845's output impedance is 1.7 ohms with the 845 tube, and 3.5 ohms with the 211 installed. This is a high value when contrasted with solid-state amplifiers (whose output impedance is often less than a tenth of an ohm), but actually quite low when compared with other tube amplifiers that employ little or no feedback.

An amplifier's output impedance is a concern because this impedance interacts with the speaker's own impedance, which varies with frequency, leading to deviations from flat frequency response. The higher an amplifier's output impedance, the greater this effect. Moreover, the greater the variation in the loudspeaker's impedance (as a function of frequency), the greater the frequency-response deviations. Which frequencies are boosted and which are attenuated by this interaction are determined by each speaker's unique impedance curve. Thus, the tonal balance will change with each speaker the amplifier drives in ways unrelated to the speaker's intrinsic frequency response.

The take-home message from all of this is that an amplifier with a high output impedance must be carefully matched to the loudspeaker. This is doubly true if the amplifier's output power is modest. The ideal speaker for an amplifier like the 211/845 has a flat impedance-magnitude curve (nearly the same impedance at all frequencies), a highish impedance overall, and high sensitivity. Unlike a big solid-state behemoth amplifier, which will drive any speaker regardless of the speaker's impedance or sensitivity, the 211/845 must be matched to the right loudspeaker—not just to make the system work technically, but to fully realize the amplifier's potential. You have to carefully create an environment that allows the 211/845 to flourish.

As it happens, my reference speaker meets these criteria. The Magico Q7 Mk.II has a fairly flat impedance, no severe impedance dips, and has a sensitivity of 94dB. This sensitivity doesn't approach that of horn speakers (which often exceed 100dB), but it is nonetheless higher than that of most dynamic loudspeakers. (A change in sensitivity of a few dB can make a big difference in an amplifier's perceived performance.) Keep in mind that a 60W amplifier driving a speaker of 94dB sensitivity will produce the same sound-pressure level as a 240W amplifier driving a speaker of 88dB sensitivity. (Each 3dB

SPECS & PRICING

Output power: 60W into 8 ohms. Output power at clipping (3% THD) 84W into 8 ohms with 845 output tubes; 72W into 8 ohms with 211 output tubes
Distortion: .3% THD with 845 output tubes, 1% with 211 output tubes (typical at 50W output into 8 ohms)
Signal-to-noise ratio: 86dB, unweighted, 20kHz bandwidth
Bandwidth: 60kHz, 50W into 8 ohms, +0/–3dB
Output impedance: 1.7 ohms with 845 output tubes, 3.5 ohms with 211 output tubes, measured at 1A, 60Hz
Input impedance: 50k ohms
Gain: 26dB (845 tubes), 31dB (211 tubes)
Dimensions: 19" x 8" x 19" (tubes extend 2" above case top)
Weight: 36 lbs. each (net)
Price: $75,000 per pair

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ASSOCIATED EQUIPMENT
Loudspeakers: Magico Q7 Mk.II, EnigmAcoustics Sopranino self-biasing electrostatic supertweeters
Preamplifier: Constellation Altair II
Analog source: Basis Inspiration turntable with Basis Superarm 9, Air Tight PC-1 Supreme cartridge; Moon by Simaudio 810 LP phonostage, KL Audio KL-CLN-LP200 ultrasonic record cleaner
Digital sources: Meridian Sooloos and Aurender W20 music servers; Berkeley Alpha DAC Reference Series 1 and Series 2 DACs, Meridian 808v6 MQA CD player/DAC, T+A MP 3000 HV CD/SACD player/DAC
Support: Critical Mass Systems Maxxum equipment racks (x2), Maxxum amplifier stands (x2)
Loudspeaker cables: MIT Oracle MA-X SHD
Interconnects: MIT Oracle, AudioQuest WEL Signature and AudioQuest Wild
Digital interconnects: Audience Au24 USB, AudioQuest Wild Digital AES/EBU
AC: Four dedicated AC lines; Shunyata Triton 2, Triton DP, Typhon (x3) conditioners, Shunyata Sigma power cords
Acoustics: ASC 16" Full-Round Tube Traps, ASC Tower Trap, Stillpoints Aperture Panels
Accessories: Shunyata cable lifters, Stillpoints Ultra2 and Ultra6 isolation

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increase in sensitivity is equivalent to doubling the amplifier power.) Also keep in mind that 60 triode watts sound a lot more potent than 60 solid-state watts. I would not have reviewed the 211/845 unless I had a loudspeaker that was a good match for the amplifier. Similarly, if you are considering the 211/845 you must also assure that it's driving a speaker appropriate for the amplifier.

Listening

I won't mince words: The Berning 211/845 is the most beautiful sounding amplifier I've ever heard. One could easily invoke the stereotype of a triode amplifier that has no feedback and lacks an output transformer, and immediately jump to the conclusion that the word "beautiful" means that the amplifier imposes itself on the music in a flatteringly euphonic way, like a soft-focus filter on a lens. But that's not the case. The Berning sounds beautiful because music sounds beautiful; this amplifier simply introduces less artifice and coloration that would diminish that beauty.

The 211/845 is unique in the way it strips away a kind of electronic tincture, leaving in its place a totally natural and believable musical presentation. With most superb systems, certain recordings can, at certain times, create a "fool-you" realism that sounds so lifelike you experience a sudden *frisson*. The 211/845 delivers such delights regularly, and with apparent ease. Moreover, the experience doesn't last for a brief moment before the illusion collapses, but is sustained for entire pieces of music. It's quite a magic trick, conjuring a startling palpability by stripping away the last vestige of an electronic signature. It's as though instruments and voices have been laid bare, with a natural and organic quality.

Reproduction of the human voice is a particularly stark example of this amplifier's utter transparency. I could cite any number of instances, but two come immediately to mind as particularly vivid: Ella Fitzgerald on the 45rpm Analogue Productions LP of *Ella and Louis* and Jennifer Warnes on *The Hunter* [Impex LP]. On the track "Moonlight in Vermont" Ella's entrance is genuinely startling, so convincing is the illusion of a living, breathing human being standing between the loudspeakers. The more modern recording of Warnes was rendered by the Berning with such immediacy that I felt that I heard her voice's beautiful and unique timbre fully for the first time. On both examples, the Berning conveyed nuances of timbre, dynamics, inflection, phrasing, and expression in previously unparalleled abundance. Thanks to these qualities, the Berning is a crystal-clear window back through time to the original musical event. The 211/845 experience is like that of the best direct-to-disc LPs or first-generation analog tapes; you can immediately hear that a layer has been removed between you and the music. In its ability to reproduce instruments and voices with this level of believability, the Berning has no equal in my experience.

I can't help but speculate that the extremely simple signal path of a triode amplifier, coupled with the absence of the output transformer, is the technical foundation for the 211/845's sense of hearing music directly rather than listening through electronics. No doubt the 211/845's other design features and implementation are allowing this topology to reach its zenith.

In addition to this vivid sense of presence, tone color is dense, natural, and organic. Instruments and voices have an ease and clarity, unobscured by a patina of glare, grain, or electronic haze. This absence of glare and the deep saturation of instrumental timbre can be mistaken for a slight darkish tonal balance, but it's simply the 211/845's lack of the "whitish"-hued timbres we've become accustomed to in reproduced music. The upper harmonics of instruments sound fully "of a piece" with the fundamentals and lower harmonics, creating a seamlessness to timbres. This quality is particularly evident on instruments rich in upper harmonics, such as saxophone and violin. Sonny Rollins' superbly recorded tenor on *Way Out West* was creamy rich and warm. Massed strings lacked the metallic sheen often heard in reproduced music but never in the concert hall. I think that the cleanliness and purity of the treble is partly responsible for this sense of top-to-bottom tonal coherence. The sound just has a musical ease that makes it easy to slip into that zone of total involvement and to stay there for long periods without listening fatigue.

The midrange is ravishingly beautiful, but in a different way from what you may expect given the 211/845's topology. The mids are somewhat reminiscent of an SET in the directness of communication, but not entirely so. The difference is that the Berning possesses the SET's liquidity, but with more clarity and, without question, far greater neutrality. The result is a sound that is warm, rich, and gorgeous but also tremendously transparent to sources and high in resolution. There's no trace of excessive thickness or fattening of timbres, which is often the result of the SET's high level of second-harmonic distortion. The Berning's warmth is an honest reflection of the recording, not an artifact of the amplifier. Although the 211/845 is not an SET, it offers the SET's virtues through the midrange without that nagging feeling that the reproduction is just a little too voluptuous to be real.

The 211/845's stunning sense of realism isn't just the result of its transparency and naturalness of tone color, but is heightened by the amplifier's extraordinary soundstage dimensionality. This dimensionality is manifested as remarkable separation of instruments from each other, tremendous depth, expansive space, and the impression that the reverberation is distinct from the instrumental images rather than being fused to them. The Berning's "see-through" quality amplified this spatial rendering, allowing me to hear with vivid clarity very fine instrumental lines at the back of the hall.

But perhaps more importantly, the 211/845 renders the images themselves with remarkable "roundness" and a corporeal body that give them a tangibility that I've never heard from any other amplifier. Jonathan Valin wrote so cogently on this subject in his review of the VAC Statement electronics in Issue 262. After explaining how instruments project energy in all dimensions, complete with charts, he wrote: "In a recital or a concert hall, this vertical and horizontal dispersion of sonic energy, what I call 'action' or dynamic/harmonic bloom, creates a kind of sonic nimbus—a loosely defined sphere of energy, some vectors of which are

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directed toward you like a beam and some of which illuminate the surrounding air of the hall, like light shed from a bulb. In life, voices and instruments always 'image' in three dimensions." That's as good a description of the phenomenon as you'll find (and just one small example of why I think that Jonathan's audio writing is unmatched). That description could have been written about the 211/845. I haven't heard the VAC Statement electronics, but I can't imagine a more lifelike reproduction of image three-dimensionality than that of the 211/845. This reproduction of image body, coupled with the timbral realism described earlier, is the Berning's defining achievement.

Another of the 211/845's great virtues is its reproduction of transient information. This amplifier sounds solid-state fast, but with no hint of edge or etch. Cymbal strikes, from the most gentle taps on a ride cymbal to powerful impacts on a crash cymbal, are uncanny in their realism. This range is on full display on the Keith Jarrett CD *My Foolish Heart* with Jack DeJohnette and Gary Peacock. DeJohnette has such a wide range of expression, from the most gentle brush strokes to the highest of high-energy rhythmic power and drive. The 211/845 was fully up to the task of conveying this wide dynamic contrast. This quality brings percussion instruments to vivid life. Listening to familiar recordings, I became more aware of the fine rhythmic nuances and delicate cymbal work of great drummers. A good example is drummer Antonio Sanchez's performance on Gary Burton's *Common Ground*; his playing is extremely intricate, nuanced, and endlessly fascinating. The 211/845 brought Sanchez's artistry to the fore.

But other instruments benefited as well from the 211/845's speed. Take, for example, Roy Hargrove's beautiful and expressive trumpet playing on Jimmy Cobb's *Jazz in the Key of Blue* [Chesky]. Some of the trumpet attacks have a startling verve, just like you hear in life. The Berning also beautifully conveys the sense of expanding bloom around the trumpet's dynamic envelope, further heightening the sense of realism.

The 211/845 was, however, better at reproducing the steep attacks of instruments with little bass energy than it was at delivering bottom-end dynamic impacts. After living with the two best solid-state amplifiers I've heard, the massive 1100W Constellation Hercules 2 and the 550W Soulution 701, the 60W 211/845 was a step down in bottom-end authority and dynamic impact. The 211/845 doesn't have the same control over the woofers, or the virtually unlimited current capacity, of the solid-state amplifiers. However, I encountered the 211/845's dynamic limitations only on classical music. The amplifiers didn't clip or distort, but rather sounded constrained dynamically during the most demanding passages. Again, the amplifier's dynamic performance will be determined to a large degree by the loudspeakers it is asked to drive, the playback level, and the room size.

This is the point in a review of a tube amplifier where I usually deliver a jeremiad on the amplifier's bass performance—a little soft, ill-defined, overly warm in the midbass and lacking extension. But that's not the case with the 211/845; its bass defies the usual stereotypes of a tube amplifier, never mind the often deal-killing caveats about conventional output-transformerless amplifiers. Indeed, perhaps because it lacks an output transformer, and eschews the typical OTL output-stage topology (relying instead on the ZOTL circuit), the 211/845's bottom end is well defined, extended, and completely free from bloat. In fact, I would characterize the bass as a bit on the lean side. If a conventional tube amplifier (one with an output transformer) sounds overly ripe in the bass much like a big ported speaker, the Berning sounds like a slightly over-damped sealed-enclosure speaker. As with a sealed-enclosure loudspeaker, the Berning has superb transient characteristics and excellent pitch definition. It was easy to hear nuances of pitch and dynamics in bass playing, from the flowing swing of Ray Brown on Duke Ellington's *Duke's Big Four*, to the exuberance of Stanley Clarke on *The Rite of Strings* (an acoustic album with Jean-Luc Ponty and Al DiMeola). As tuneful and expressive as the 211/845's bass is, however, the amplifier doesn't deliver the weight and sense of authority of a big solid-state amplifier. The 211/845 didn't fully exploit the Magico Q7 Mk.II's dynamic range capabilities nor its ability to deliver a visceral whole-body experience that can be thrilling on some music. The Berning's bass is nuanced, polite, and refined rather than characterized by raw primal energy.

This description is of the 211/845 with the 845 tubes installed—the tube I ultimately preferred. The 211 lacks the last measure of voluptuous warmth and body of the 845, rendering tonal colors as a little leaner and drier. With the 211, the bass was a little less well-defined. Soundstage depth was slightly foreshortened, with less sense of expansive space between the front and back of the soundstage. The presentation was more forward and immediate. The 211 is a little analytical and dry by comparison with the 845. And yet...and yet...the 211 has an exquisite beauty all its own, from the stunning sense of immediacy to the precise clarity of musical lines. The 845 is more aurally beautiful, but in some ways the 211 is more musically beautiful. The 211 definitely tells you more about what each musician is doing, and with that revelation comes greater involvement and appreciation. There's no single right tube choice for all listeners and all systems, but this amplifier lets you make that choice. Also keep in mind that the 211's higher output impedance relative to the 845 (3.5 ohms vs. 1.7 ohms) will introduce greater frequency response deviations in speakers with impedance peaks and dips. That phenomenon could be partly responsible for my opinion of the two output tubes.

Finally, I'd like to note that these impressions of the 211/845 were made with the Constellation Altair 2 linestage feeding the Berning, which, given my description of the system here, speaks volumes about that linestage's transparency. I drove the 211/845 directly from the Berkeley Alpha Reference DAC Series 2 as well, but preferred the sound with the Altair 2 in the chain.

Conclusion

As you've read, I'm completely enamored of the Berning 211/845. It sounds like no other amplifier I've heard, rendering instruments and voices with a vivid and tangible realism. The 211/845 simply gets out of the music's way, presenting the music without imposing an electronic-sounding signature.

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Lest anyone think that I've gone overboard for what must be some kind of euphonic coloration, I should note that the 211/845's "sound" changed dramatically with the recording, rather than imposing a common signature on all music. This, along with the way music reproduced through the 211/845 sounds so much like live instruments, suggests to me that this amplifier's extraordinary performance is the result of its transparency to the signal driving it rather than a pleasant coloration.

As enthusiastic as I am about the 211/845, I cannot overstate the need to match this amplifier to an appropriate loudspeaker to realize its performance. Don't even consider this amplifier unless you have a loudspeaker that is compatible. This is a finicky amp. It's also dead-quiet, which suggests that it would be a good match with very high-sensitivity horn loudspeakers. And as with any component of world-class caliber, the associated equipment and setup must be commensurate in quality. Finally, don't expect the last measure of bass impact from the 211/845. The bottom end is well defined and satisfying (surprisingly so), but not the last word in authority and dynamics. But given the Berning's truly magical sense of realism and directness of expression, that's a tradeoff I'd be willing to make.

All the specific sonic attributes described in this review are simply corollary to every audio component's fundamental goal of conveying the musicians' expression, and to engage the listener in that expression. When judged by that criterion, I can say that the 211/845 is the finest amplifier I've ever heard. tas

Tech Tour

Virtually all tube amplifiers employ a transformer to match the tubes' output impedance to the loudspeaker load. Tubes produce a high-voltage, low-current output signal, but loudspeakers require a low-voltage, high-current drive signal. The output transformer "transforms" the tubes' output signal into a form required to drive speakers.

But transformers exact a large sonic penalty, and over the decades designers have attempted several techniques to remove the transformer from the signal path. The most common technique is to parallel many output tubes to generate sufficient current, and to drive those tubes very hard. Such output-transformerless (OTL) amplifiers generally offer low output power, a very high output impedance (and one that varies with frequency), and abbreviated tube life. In addition, they are often based on tubes such as the 6AS7 that are not ideal for an amplifier's output stage. The most ardent proponent of OTL amplifiers was the late Julius Futterman in the early 1950s, who likened the challenge of removing the output transformer to the Arthurian legend of pulling the sword Excalibur from the stone.

David Berning's ZOTL circuit, patented on March 18, 1997, emulates the way a transformer performs its impedance-matching function. It's quite sophisticated; understanding how it works is difficult to grasp without a background in electrical engineering. (Those interested in the details can read the patent and white papers on Berning's website.) Suffice it to say here, the circuit precisely matches the amplifier's output stage to the loudspeaker load, with two-way communication between the speaker and amplifier. It superimposes the audio signal on an RF carrier, and then puts that signal through a hand-made transformer. This transformer doesn't suffer from the limitations of an audio transformer that must work over a wide range of audio frequencies. Rather the transformer in the ZOTL circuit is optimized to work at just one frequency, the RF carrier frequency. The ZOTL technique has been highly praised by those whose ears I trust, notably Dick Olsher in his review of the $8360 Berning ZH-230 in Issue 210. David Berning writes in the 211/845 owner's manual, "After 47 years of building amplifiers, and almost half of those years building with audio transformers in the signal path, I am a firm believer that removing the audio transformer from the signal path results in a much higher degree of transparency and neutrality, thus allowing one to look into the recording being played with far more certainty of its merits of capturing the musical event."

Berning's website contains many technical documents describing the ZOTL circuit, along with measurement comparisons between a transformer-coupled amplifier and a ZOTL amplifier. In addition to providing ideal matching between the output stage and the loudspeaker, the ZOTL circuit allows the use of very linear triodes such as the 845 and the 211.

The 211/845 has other tricks up its sleeve beyond the ZOTL circuit. The output tube filaments are heated with AC at a very high frequency (in the radio range) rather than with line-frequency AC (50Hz or 60Hz), which can introduce hum. DC-heated filaments don't suffer from this problem, but the technique reduces tube life and results in unbalanced operation of the tube.

A fully regulated switch-mode power supply with power-factor correction (PFC) supplies the fully balanced circuit. Power-factor correction allows the amplifier to operate on any line voltage for global compatibility. PFC also causes the reservoir capacitors to be charged continuously rather than in spikes twice per cycle of the incoming AC power. One of the benefits of this fact is that less noise is put back onto your AC line. The supply also features a five-stage power-line filter and surge suppressor. A shielded sub-enclosure houses the power supply.

The amplifier's input stage is built around a 12AT7, which is coupled via a pair of Teflon caps to the grids of a differential 6SN7 stage. The 6SN7 is in turn DC-coupled to the grids of a pair of 6V6 beam tetrodes. These tetrodes drive the 211 or 845 output tubes. A pair of ZOTL impedance-converter circuits couple the output tubes to the speaker terminals. Berning provides a highly detailed technical description of the amplifier in the owner's manual, complete with schematics.

Equipment Report

A LANDMARK REFINED

2015 the absolute sound PRODUCT of the YEAR award

Constellation Altair II and Hercules II

Robert Harley

Photography by Dennis Burnett

Equipment Report Constellation Altair II Linestage and Hercules II Power Amplifier

No other electronics manufacturer in recent memory has risen from start-up to major global brand as quickly or as decisively as Constellation. The company appeared on the scene in late 2010 with the ultra-tweaky (and ultra-expensive) Altair linestage and Hercules monoblock power amplifiers. In my review of those electronics in Issue 215 (September, 2011), I concluded "the Altair and Hercules set new standards in transparency, resolution, absence of grain, and sheer realism, in my experience."

Constellation leveraged this early success by creating a full line of components based on the same circuits found in the Reference Series Altair and Hercules. (The Performance and Inspiration Series are simply less elaborate implementations of the topologies developed for the cost-no-object Reference.) As we enter 2016, Constellation is armed with the $12,500 Inspiration Integrated amplifier at one end of its line, and the newly revised and updated Altair II linestage and Hercules II monoblocks at the other. The Altair II's price of $70,000, and the Hercules' tag of $170,000 per pair position them at the top end of the price scale. Are the revised components better-sounding than the originals? Do they still hold their status as the state of the art in solid-state amplification?

Before tackling those questions, let's look at the key differences between the new products and the originals. The most obvious change is the Altair's more traditional user interface. The first Altair was housed in a monolithic chassis with no display or readily apparent controls. Despite the exceptional two-handed touchscreen that controlled the Altair, the lack of controls or of a display on the Altair was a bit unnerving. Customers apparently agreed that that approach was a bit too avant-garde; the new Altair features a touchscreen similar to that of the old remote, but now integrated into the front panel. The new remote, a slim wand beautifully machined from aluminum, is much easier to use. Overall, the move to the front-panel display and a more conventional remote control is welcome.

Inside, the Altair's volume control is now a monolithic stepped-attenuator under digital control rather than the elaborate light-dependent-resistor circuit of the original. The light-dependent-resistor volume control took a long time to stabilize and sound its best, leading to the decision to implement the new attenuator. Other changes include additional power-supply buffers around the volume control as well as another regulation stage in the supply powering the audio circuit. The result is reportedly wider dynamics and lower noise. The floating "raft" on which the audio circuitry is suspended has had its suspension retuned, with a heavier weight to the raft and optimized mechanical damping. Apart from a few component swaps, the circuit is unchanged.

The Altair's power supply is still housed in a separate enclosure, and connects to the main chassis via three umbilical cords. Constellation offers a product called a DC Filter that looks identical to the power supply. It fits in line between the power supply and the Altair's main chassis, and provides additional filtering of the DC supply voltages before they get to the preamplifier. The optional DC filter can be added at any time, and is priced at $9000. In a typical

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configuration, the Altair linestage sits atop the power supply and DC filter. When viewed this way, the Altair's extraordinary industrial design and chassis-work are on full display. The three chassis together almost look like sculpture.

The Altair offers eight inputs, four unbalanced on RCA jacks and four balanced on XLR connectors. You can scroll through the inputs from a button on the remote, but that's tedious if you want to go from Input 2 to Input 1. A better method is to press a small button concealed beneath the Altair's front-panel display, which brings up the eight inputs on the touchscreen. The touchscreen also shows you the volume setting, selected input, and balance control (which, incidentally, is adjustable in 0.1dB steps). I missed the ability to select any input directly from the remote, which was possible with the original Altair. On the plus side, the new wand remote is easier to hold and use than the two-handed Pyxis remote.

The Hercules II has undergone more extensive revisions. For starters, the original's vertical form factor has been replaced by a more traditional chassis. The power rating has increased from 1000W to 1100W. Although the output stage and heatsink area of the two amplifiers are identical, the Series 2 features more robust Plitron power transformers that can deliver higher current.

One of my criticisms of the original Hercules was a bass response that was polite rather than visceral. The bottom end lacked the weight, extension, and authority one would expect from a "super-amp." That shortcoming has been addressed in the Hercules II by tripling the power-supply filter capacitance and adding another regulation stage in the supply for the front-end audio circuitry. Interestingly, according to Constellation, making either one of these changes without the other rendered only a marginal improvement in bass and dynamics. But together the two changes reportedly resulted in significantly wider dynamics and more robust bass.

Hercules has two sets of inputs, one of them marked "Constellation Direct." This input is designed for connection to a Constellation preamp; it simply bypasses the amplifier's input buffer for one less gain stage in the signal path. The output binding posts are big and robust, but the slots in the posts for inserting spade lugs are oddly positioned to face toward the outside of the chassis in opposite directions, making it tricky to connect certain speaker cables. The AC input jack is a 20A connector rather than the typical 15A type. (See the sidebar for a recap of the two products' technical features.)

Listening

I've had extensive experience with the Constellation line, from the Inspiration Series (Issue 249) all the way to the flagship Altair and Hercules in the Reference Series (Issue 215). The family shares many common sonic attributes, which isn't surprising since all the linestages and power amplifiers feature the same circuit topologies, and in some cases the same parts (the output transistors, for example). The differences are in the level of execution, parts-quality, chassis work, and power-supply sophistication.

I'll refer you to my review of the Altair and Hercules in Issue 215 for a detailed sonic description of the originals. The new Mk.2 versions sound very similar, with one notable exception, which I'll describe later.

The common thread in all Constellation products, which reaches its zenith in the Altair II and Hercules II, is truly astonishing transparency to sources. These electronics are as colorless as you're likely to find. The word "crystalline" comes to mind when I think of the Altair II and Hercules II, like a perfectly colorless and flawless diamond. They impose so little of their own character on the music that listening to them is like hearing directly through the amplification to the music-making. With an outstanding source like the Basis Inspiration and Superarm 9, and highly resolving loudspeakers such as the Magico Q7 Mk II or MartinLogan Neolith, the effect is quite startling. The system produces a frisson of lifelike immediacy and vividness. Some listeners may prefer a bit of added midrange warmth, or a slight softening of transient detail, or a subtle darkening of timbres. Although, amplifiers that sound richer and more voluptuous can have a certain appeal, ultimately I think that they are less musically engaging and rewarding than electronics that tell you everything that's on a recording.

In addition to this transparency to sources, the Altair II and Hercules II exhibit two other qualities that vault them into state-of-the-art territory. The first is resolution, and the second is their treble performance. These qualities are directly related, working together in a synergy that is truly extraordinary.

In Issue 260's From The Editor I posit that a hi-fi system can never have too much resolution of detail. Those who argue that past a certain point resolution becomes amusical clinical analysis, or isn't important to musical communication, haven't heard the kind of resolution delivered by the Constellation electronics driving a first-rate loudspeaker. The Altair II and Hercules II are stunningly dense in the amount of information presented to the listener. The finest microstructures of how sounds are created are gloriously revealed. Take a simple instrument such as wood blocks. How hard could they be to reproduce? Through the vast majority of amplifiers, wood blocks and similar percussion instruments sound like transient pops without much texture or inner detail. Through the Constellation electronics, they unmistakably become two pieces of wood striking each other. I'll give you another example: On the wonderful Analogue Productions 45rpm reissue of Phoebe Snow's 1974 self-titled album, the track "Poetry Man" includes maracas played very gently underneath other instruments. Through the Constellation electronics, I could clearly hear

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beads moving within hollow wooden spheres. The maracas add an almost hypnotic quality to the track.

I use these examples not because I listen to music with an ear to how natural wood blocks or maracas sound, but to convey the realism with which these electronics reproduce the timbre and transient detail of all instruments. Greater realism in tone color and dynamic shading translates directly into a more lifelike rendering of the sound and deeper musical involvement. This resolution isn't limited to the micro-level; the Altair II and Hercules II allow me, to an unprecedented extent, to hear individual instruments and voices even within dense musical passages with startling clarity.

The second quality that sets the Constellation electronics apart is their reproduction of the treble. If the level of resolution I've just described is accompanied by the slightest bit of glare, etch, grain, hardness, emphasized transient zip, or forwardness, the sound quickly becomes annoying and fatiguing. Rather than fostering musical intimacy, such brightness precludes it. And here's where the resolution of the Altair II and Hercules II becomes so magical; all that wonderful detail is presented in a supremely subtle, refined, suave, and sophisticated way that never calls attention to itself. There's no need to soften the presentation of the Altair II and Hercules II to mitigate an electronic patina because there is no electronic patina. Moreover, the treble has a delicate filigreed quality that is unique in my experience. Although the top end has a full measure of energy and life, it's also rendered with a sweetness and grace that are departures from the stereotype of a big solid-state amplifier. The combination of resolution with ease is, in my view, what distinguishes a really great hi-fi system from one that becomes transcendental. That quality is also what makes the Mk.II upgrade to the Magico Q7 such a triumph; it delivers more information and a more relaxed sound. One quality isn't sacrificed to advance the other. In both the Q7 Mk.II and the Constellation electronics, resolution combines synergistically with ease to foster total musical involvement. The presentation is musically vivid without being sonically vivid.

The Altair II and Hercules II's overall character is one of lightness, illumination, clarity, and transparency. Many years ago, before I worked in the industry, I read in The Absolute Sound a description of a component as having a "deep chocolate midrange." I thought it humorous at the time, but the phrase comes to mind here because the Altair II and Hercules II do not have a "deep chocolate midrange." Rather, they have a lighter, fresher, and more radiant quality that is at the other end of the spectrum from "deep chocolate." The Constellation pair is harmonically rich and dense, but not in a way that dilutes realism by rendering textures as slightly darker than life. In fact, their reproduction of instrumental timbre has a kind of effervescence that is simply sensational. Listening to ensembles with woodwinds and brass, I can hear each instrument's individual timbre with vivid clarity, and the combinations of those instruments' tone colors take on a new sense of organic wholeness.

My only reservation about the original Hercules was a slight lack of weight and authori-

SPECS & PRICING

Altair II Linestage
Inputs: Four balanced on XLR jacks, four unbalanced on RCA jacks
Outputs: Two balanced on XLR jacks, two unbalanced on RCA jacks (both main outputs); one record output on XLR jacks, one record output on RCA jacks
Input impedance: 200k ohms balanced, 400k ohms unbalanced
Output impedance: <50 ohms
Volume control resolution: 0.1dB, 0.5dB, 1dB (level-dependent)
Weight: 84 lbs. (linestage), 26.2 lbs. (power supply)
Dimensions: 17.5" x 5.53" x 14.82" (linestage); 17.5" x 2.82" x 14.5" (power supply)
Price: $80,000

DC Filter for Altair II
Dimensions: 17.5" x 2.82" x 14.5"
Price: $9000

Hercules II Power Amplifier
Output power: 1100W into 8 ohms, 1500W into 4 ohms, 2000W into 2 ohms (1kHz, 1%THD)
Gain: 32dB
Input impedance: 100k ohms unbalanced, 200k ohms balanced
Output impedance: 0.05 ohms
Inputs: Two balanced on XLR, one unbalanced on RCA
Dimensions: 19" x 13" x 32"
Weight: 220 lbs. each, net
Price: $180,000/pr.

CONSTELLATION
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ASSOCIATED EQUIPMENT
Digital front end: Aurender W20 music server, Berkeley Alpha Reference DAC, Berkeley Alpha USB converter
Analog front end: Basis Inspiration turntable with Basis Vector IV and Superarm 9 tonearms, Air Tight PC-1 Supreme cartridge, Moon by Simaudio 810LP phonostage
Support: Critical Mass Systems Maxxum equipment racks (x2), Maxxum amplifier stands (x2)
Cables: MIT Oracle MA-X and Oracle SHD, AudioQuest Wild Digital AES/EBU, WireWorld Platinum Starlight USB
AC: Four dedicated 20A AC lines; Shunyata Triton 2, Triton DP, Typhon (x3) conditioners, Shunyata Sigma power cords
Acoustics: ASC 16" Full-Round Tube Traps, ASC Tower Trap, Stillpoints Aperture Panels
Accessories: Klaudio ultrasonic record cleaner; Shunyata cable lifters, Critical Mass Systems Rize isolation

Equipment Report Constellation Altair II Linestage and Hercules II Power Amplifier

ty in the bottom end. Constellation has addressed this issue with the Hercules II, tripling the power-supply filter capacitance and adding additional power-supply regulation in the amplifier's front end. (These techniques have now been implemented throughout the Constellation line.) I'm pleased to report that the Hercules II's bass now has much more weight, power, and dynamic authority. The improved low end gives the music a more solid tonal and rhythmic foundation. The sense of lightness and illumination described above is still a hallmark of the design, but in the new amplifier that character is supported by richer and fuller bottom octaves.

I mentioned this in my original review, but it bears further discussion here. The Hercules II doesn't sound like an 1100W amplifier. It's not that it doesn't sound powerful or has trouble driving loudspeakers. The Hercules II is a powerhouse, reproducing the most demanding bass dynamics with completely effortless grace and authority. When I say that the Hercules II doesn't sound like an 1100W amplifier, I mean that as a compliment. Many high-power "dreadnought" amplifiers can sound hard and artificial, a character perhaps introduced because the transistors in the output stage all exhibit slightly different operating characteristics. The more transistors in the output stage, the greater the potential for the individual transistors not to work together in unison. There are many examples of an amplifier line in which the amplifiers are identical to each other except for the number of output transistors (along with the size of the power supply and heatsinks). The lower-powered amplifiers always sound better, the most famous example being the Adcom GFA-535 (60Wpc), GFA-545 (100Wpc), and GFA-555 (200Wpc). Cognoscenti knew that the GFA-535 was the sweetest-sounding of the line. Despite an output stage of 64 MOSFETs, the Hercules II is capable of the delicacy and finesse of a low-powered unit, yet can deliver seemingly unrestricted dynamics with grace and ease.

Finally, I should note that the Hercules II takes a very long time to sound its best. The treble purity and resolution are apparent within half an hour or so, but after about four hours the amplifier really opens up, with a greater sense of space and an overall increase in ease and relaxation.

Conclusion

The Constellation Altair linestage and Hercules monoblock amplifiers in their updated version maintain their status as world-class references. They are a convergence of beautiful design and build-quality, practically unlimited power delivery, and, most importantly, state-of-the-art sound. Yes, these electronics are priced in the stratosphere—better than a quarter of a million dollars. That number is breathtaking, but then again so is the performance. If there are electronics that are more resolving and transparent, or that have a cleaner and more filigreed treble, I haven't heard them.

I concluded my review of the original Altair and Hercules by writing that these electronics have "established a benchmark against which all other linestages and power amplifiers can be compared." Nearly five years and one update later, along with extensive experience with reference-grade associated equipment under my belt, that conclusion still holds true.

Equipment Report Constellation Altair II Linestage and Hercules II Power Amplifier

Inside Cost-No-Object Design and Execution

As I reported in my original review in Issue 215, the Altair's chassis is made from a two-piece clamshell structure, with each block machined from solid aluminum billet. Within this 60-pound framework is a shielded sub-enclosure that hangs inside the main chassis on an elastomeric suspension. The sub-enclosure is made from two non-magnetic steel plates laminated with a polymer sheet between them. This sub-enclosure is then divided into two more sub-sub-enclosures, with the top half containing the audio signal electronics and the bottom half housing power-supply regulation. This entire "raft" structure "floats" within the massive 8.2mm-thick outer chassis. In addition, the mass-loaded, vault-like, solid-aluminum outer chassis is airtight. The anti-resonance engineering of this system was designed in conjunction with Michael Latvis of Harmonic Resolution Systems, maker of state-of-the-art equipment racks and vibration-control products. HRS feet are also featured underneath the Altair's chassis.

The audio circuit is fully balanced and built from FETs that are hand-selected for low noise and matched gain. When Constellation found this FET they bought out the manufacturer's entire stock and the manufacturer discontinued the device.

The outboard power supply features three separate R-core transformers, one each for left channel audio, right channel audio, and control circuitry. Three umbilical cords connect the power supply to the linestage. The power supply's output is unregulated; all regulation occurs next to the audio circuits. The Altair features cascaded discrete regulation, with the regulated voltages supplying the audio circuits through solid-copper bus bars. ("Cascaded" means that the output of one regulator feeds another regulator for even greater isolation of the DC supply from the AC source. "Discrete" means that the regulators are built from separate transistors rather than integrated circuits.) The result of this heroic power-supply design and execution is DC so pure than any noise is down more than 140dB, the limits of the Audio Precision analyzer. (Constellation shared with me the noise plots.)

All of these techniques, from the massive aluminum chassis with sub-enclosures, the floating raft, and the extensive power supply design are all designed to isolate the audio circuitry from vibration and noise.

Hercules Power Amplifier

Just as the Altair incorporates innovative, cost-no-object design and execution, so does the Hercules power amplifier. For starters, when driving the Hercules through the Constellation Direct input, the power amplifier's input buffer is bypassed. (Removing this active stage can be done because the Altair outputs a signal that doesn't need buffering.) A second XLR input is available for driving the Hercules with another brand of preamplifier. This input adds an input buffer, which is based on the same topology as the Altair's gain module. Selecting between these inputs is done via a rear-panel control. This system removes an entire active gain stage from the signal path compared with a conventional preamplifier and power amplifier system.

The Hercules' output stage is highly unusual. Virtually all push-pull output stages employ complementary pairs of P-channel and N-channel transistors that work together. These designations refer to the transistors' polarity. The P-channel transistor amplifies the positive-going half of the waveform, and the N-channel amplifies the waveform's negative-going half. Unfortunately, P-channel and N-channel transistors exhibit different operational characteristics, specifically the amount of time they take to turn on and to turn off. This disparity results in a waveform discontinuity at the zero-crossing point. Single-ended amplifiers sound so good in part because one device (tube or transistor) amplifies the entire waveform, and thus cannot exhibit zero-crossing distortion.

Constellation has attempted to merge the purity of a single-ended output stage with the high power of a Class AB gain stage. The output stage is built entirely of N-channel MOSFETs, and split into two completely separate amplifiers per monoblock. One amplifier is fed the positive phase of the balanced signal, and the other amplifier receives the negative phase. The two amplifiers in each monoblock "float" (are not referenced to ground) and are connected to each other by the loudspeaker load. This configuration is identical to using two separate amplifiers in bridged mode.

It's well known that low-power models within an amplifier manufacturer's line often sound sweeter and more refined than their more powerful efforts. Constellation wanted to build an amplifier with massive power that exhibited the delicacy of low-powered designs. It therefore started by developing the best-sounding 125W amplifier it could, and once satisfied with the results, grouped many of these 125W single-ended modules together to achieve the Hercules' 1100W rating. The design is reportedly scalable with no change in sound quality. In fact, the Centaur amplifier, rated at 250Wpc, uses two of these modules per channel rather than the Hercules' eight. Each module is based on eight output transistors, giving the Hercules a mind-blowing 64 MOSFET output transistors per monoblock. Unlike most power amplifiers Hercules requires no stabilizing inductor on the output; the output transistors are connected directly to the speaker binding posts via solid-copper bus bars.

As you might imagine, this gargantuan output stage requires a big power supply and lots of heat sinking. The power supply features dual 3kW transformers with multiple secondary windings. Each transformer supplies one "side" of the output stage. These transformers account for much of the Hercules' 270-pound heft. The heat sinking is readily apparent just by glancing at the Hercules' side panels, which are perforated with hundreds of ventilation holes.

The level of design and execution in the Altair and Hercules is unprecedented, in my experience. The truly cost-no-object realization provides an interesting insight into how the world's best audio designers apply ingenious solutions to advance the audio art. tas

Our Top Picks Reference-Level Electronics

Soulution 755 Phonostage

$72,000

A new arrival to JV's system, the 755 phonostage is an entirely re-thought and greatly improved version of the Soulution 750. It now arrives with user-selectable loading via its AMOLED panel and controls, improved bandwidth, distortion, and separation figures, and enough gain to drive a power amplifier directly (thus obviating the need for a linestage). Its performance is phenomenal, combining all of the traditional Soulution virtues (color, bloom, body, slam, lightning transient speed) with extremely high resolution of detail and superb pitch definition in the bass. The thing about Soulution is that that detail is woven into the fabric of the music (rather in the way tubes present detail), rather than riding analytically on its surface. At first, this might make Soulution gear seem "less" detailed than some other marques. It is not. On LP playback the 755 is certainly capable of the fool-ya realism absolute sound listeners long for. It is also capable of delivering the thrills and chills that musicality listeners crave. One of Soulution's truly great products and JV's other reference. (270)

The David Berning Company 211/845 Amplifier

$75,000

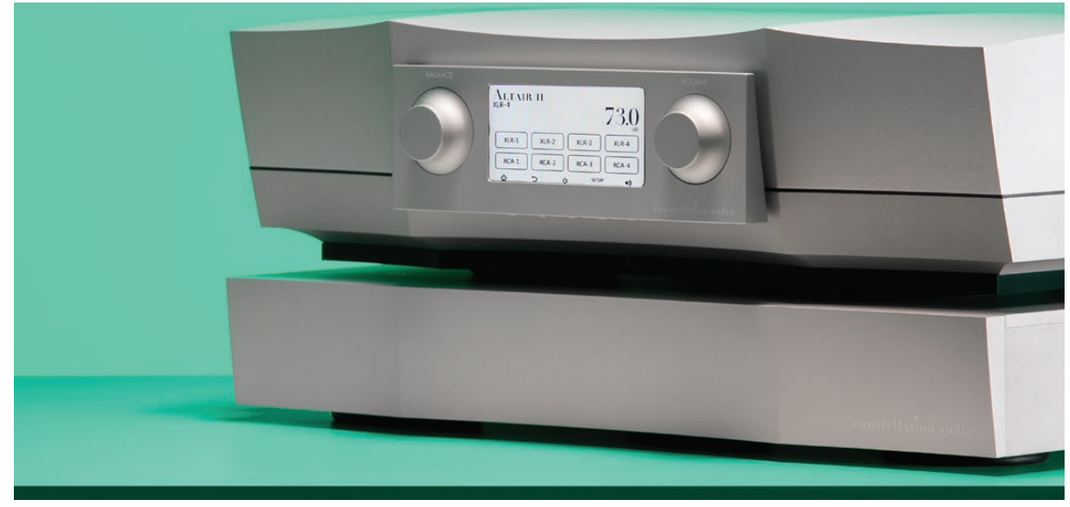
In the new 211/845, David Berning has created the most ambitious realization yet of his brilliant ZOTL circuit that allows a tube amplifier to operate without an audio output transformer. The 211/845 offers 60W of pure Class A triode tube power (via either 211 or 845 output tubes) with no feedback. The 211/845 conveys the beauty of instrumental timbre and voices with a stunning realism and immediacy. The impression that everything between you and the music has been stripped away is astonishing. In this regard, the 211/845 simply has no peer, tube or solid-state. Surprisingly, the bass is well defined and tuneful, although not the last word in dynamic impact. The high-ish output impedance and limited current delivery dictate that the 211/845 be matched with a loudspeaker of appropriate sensitivity and impedance. But when given the right load, the Berning 211/845 is nothing short of magical. (265)

Our Top Picks Reference-Level Electronics

VAC Statement Electronics

$75,000–$120,000

Used to be that if electronics stood in a police lineup, the solid-state stuff would be the shifty-eyed speed freak with the finger-in-the-socket hairdo, and the tube gear would be the Caspar-Gutman-looking fat guy with the gold watch-fob stretched across the pinstripes of his bulging vest. My, how times—and the usual suspects—have changed. Kevin Hayes' Valve Amplification Company $75,000 all-tube Statement line preamplifier, $80,000 all-tube Statement phono preamplifier, and $120,000 450 iQ all-tube 500W monoblock amplifiers—Hayes' answer to the question of what audio gear would be like "if there were no constraints with respect to expense, time, or difficulty of manufacture"—offer the low noise, transient speed, overall resolution, and colorless neutrality that were once the exclusive purview of solid-state, without any sacrifice in the low-level textures and natural timbre, lifelike imaging and soundstaging, and uncannily realistic three-dimensional bloom of the very best tubes. For absolute sound listeners, JV found the VAC Statement electronics to be no-brainer highest-of-the- high recommendation. Indeed, for any kind of listener who longs to hear acoustic instruments sound more like the real things, this very-pricey-but-worth-it trio of electronics will be hard to beat. The VAC Statement electronics are JV's current reference for acoustic music—and, indeed, the most lifelike tube gear he has yet heard with classical or pop. (260)



Constellation Altair II Linestage and Hercules II Power Amplifier

$80,000 ($9000 for optional DC filter)/$180,000/pr.

The Altair II is improved over its predecessor, in both sound quality and user interface. As colorless a component as you're ever likely to hear, with no sonic flavor of its own, the Altair II allows the finest micro-details of timbre, transient information, and spatial cues to pass through without imposing its own signature on the music. Most preamplifiers shave off some low-level detail, add a bit of grain to instrumental textures, and drape a fine scrim between you and the music. Not the Altair II; what you put in is what comes out. The sheer amount of detail the Altair II resolves, the transparency to sources, speed, clarity, and dynamics are breathtaking. Moreover, the resolution comes without a trace of etch. The Altair II and the matching Hercules II amplifiers are world-class, reference-quality electronics that would be at home in the most demanding systems.

The massive Hercules II is a dreadnought, delivering a whopping 1100W into 8 ohms, yet has all the power, dynamic impact, and effortless ease one would expect from such a behemoth. But the Hercules II is much more than a brute; this amplifier has the greatest delicacy, resolution, and finely filigreed rendering of treble that RH has heard. The Hercules II's transparency and resolution of fine musical detail are simply sensational—in a class of their own. The polite bottom end of the original Hercules has been replaced by a full-bodied and weighty presentation that provides a more solid tonal and dynamic foundation. RH's reference. (260)