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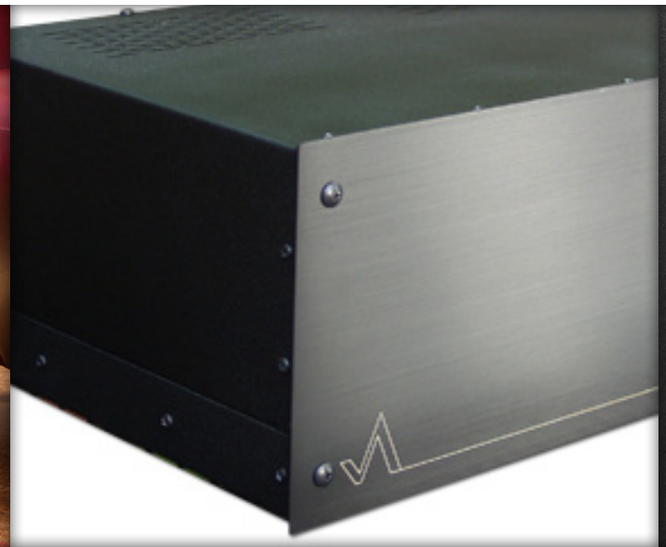
GUIDE TO AUDIO ELECTRONICS



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FROM THE Editor

Welcome to our latest Buyer's Guide, this one covering preamplifiers, power amplifiers, and integrated amplifiers. We bring you full reviews of 18 products ranging in price from the amazingly great $999 Marantz PM8004 integrated to the stratospherically priced—and stratospherically wonderful-sounding—Constellation Virgo, Centaur, and Perseus separates.

The new products in this year's Buyer's Guide reflect the rapidly changing way we access music. It's amazing how much the landscape has evolved in just 12 months. We've got a review of the Micromega AS-400 integrated amp that offers a DAC with wireless streaming capability. Then there's Naim's remarkable SuperUniti, a product that combines an 80Wpc integrated amplifier with built-in wireless UPnP (Universal Plug 'n' Play) network streaming, a USB DAC, iPhone and iPod dock, Internet radio, DAB radio, FM radio, and a preamplifier with ten inputs. And let's not forget NAD's C 390DD, a "Direct Digital Amplifier" that converts digital data from a music server or other source directly into the signal that powers your loudspeakers. Just connect your music server to one of the C 390DD's digital inputs (which are on removable cards to accommodate future technologies) and a pair of loudspeakers to the NAD's output and you've got a complete, highly advanced, high-resolution music-playback system.

Traditionalists will also find much to enjoy in this Guide, from the pure tubed PrimaLuna DiaLogue 3 preamplifier and Zesto Andros phonostage to the tube/transistor hybrid Fet Valve 600R from Audio by Van Alstine. The high-power brigade is well represented by the mighty NuForce Reference 18 amplifiers to the 375Wpc Hegel H30 from Norway. And if you've ever wondered what one-thousand-dollars-per-watt sounds like, check out our review of the $25,000, 25 watt-per-channel Class A SIA-25 integrated amplifier from Vitus.

We've also included in this special issue the Golden Ear Award winners in preamplifiers, power amplifiers, and integrated amplifiers from 2011 and 2012. These are our individual editors' and writers' personal favorites. One of our most popular features is the "Most Significant" products of all time. We reprint here "The 12 Most Significant Preamplifiers of All Time" along with "The 10 Most Significant Power Amplifiers of All Time." Did your favorites make our select list?

To provide you with the background you need for choosing a power amplifier or integrated amp, this Guide includes an excerpt from my book *The Complete Guide to High-End Audio* (fourth edition). This excerpt not only tells you how to match an amplifier's output power to a loudspeaker's sensitivity, it also might change the way you think about just how important those amplifier watts really are.

Robert Harley

Click here to turn the page.

ON THE HORIZON

Hot New Electronics Coming Your Way

Neil Gader

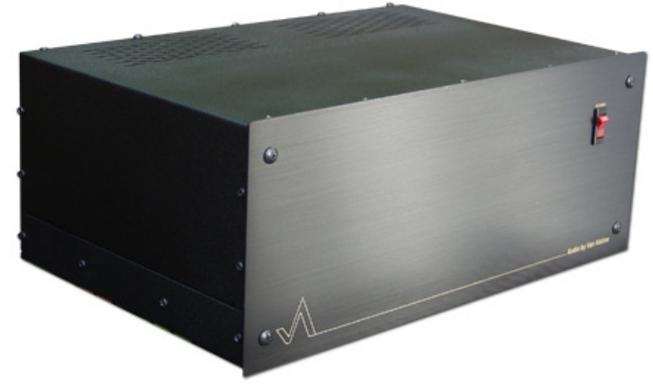
Musical Fidelity M1PWR Amplifier
The M1PWR uses a proprietary, Musical Fidelity-designed hybrid PWM amplifier topology in a half-width compact chassis. In stereo mode it delivers 60Wpc into 8 ohms, and power doubles into 4 ohms. The rear panel is selectable for monoblock operation for 100W into 8 ohms or 200W into 4 ohms, with exceedingly low distortion of 0.05% and great phase integrity, linear frequency response, and superb signal-to-noise ratio and stereo separation. Like all other Musical Fidelity power amplifiers, M1PWR will drive a huge range of loads with ease. Powerful yet nuanced, clear yet sweet, and uncolored yet textured, it is definitely not your average high-efficiency amplifier. **Price: $1299. tempohighfidelity.com**

ON THE HORIZON

Wyred 4 Sound mini Series DAC/PRE and mini-Amp
Powerful packages such as the new W4S mini-Pre and mini-Amp are raising the standard for compact size and performance. The analog section of the mini-Pre is fully balanced and incorporates a dual-mono design including separate power supplies. In true Wyrd 4 Sound fashion are carefully selected audio-grade parts throughout the circuit and highly refined input/output buffers. The digital front end employs an ESS Sabre DAC and an asynchronous 24-bit/192kHz USB interface, which is driverless for Mac and Linux. PC users need only run a quick driver install. The mini-Amp utilizes a fully balanced input buffer and produces an impressive 220Wpc into 8 ohms from a chassis that measures 8" x 3.5" x 8".The mini-Amp is monoblock only. **Price: mini/PRE and mini-Mono, (projected) $900 per unit.**

T+A CALA Receiver
The compact T+A CALA sports a built-in DAC that offers access to all modern music sources. It includes a high-quality FM tuner, a streaming client for Internet radio, network access, and facilities for hard discs, memory sticks and iPod, plus a Bluetooth module (to A2DP standard) for pairing any mobile audio device to the receiver. Two analog inputs are also included. Dual output stages with continuous power of 55Wpc will drive any normal loudspeaker, and an active subwoofer can also be connected. The case and internal chassis are all aluminum—the front panel and top cover are high-gloss acrylic. In the absence of front-panel controls, all functions are operated using the F 100 system remote. The large-format, high-resolution graphic screen displays all data and information in context-sensitive form in multiple font sizes, and offers user-variable screen brightness. All the signal processing takes place at the digital level; T+A's "Pure Path" technology ensures that all data processing is carried out at 24-bit resolution with HD audio quality. **Price: $2200. ta-hifi.com**

Van Alstine Synergy 300 and 450 Amplifiers
The Van Alstine Synergy 300 and 450 solid-state amplifiers are conceptually new and uniquely musical. They meld accuracy with a faithfulness to the spirit of the music. Both are equipped with twelve active regulated power supplies covering each internal circuit, including the output stage. The result is dynamic range, bass extension, transient detail, and air akin to the live experience. The Synergy 300 boasts 150Wpc while the larger Synergy 450 offers 225Wpc. Both are rated at 20Hz to 20kHz into 8 ohms at less than 0.01% THD. Shipping weights are 33 pounds and 38 pounds respectively. The all-new AVA-designed black chassis is accented with a black anodized faceplate and high-efficiency, black-anodized, extruded, rear-mounted heat sinks for the eight high-current, TO-3 case, double-die power MOSFET output devices. Designed for 2-ohm loads and up. **Price: $1499 and $1999. avahifi.com**



ON THE HORIZON

Primare I32 Integrated Amp
Primare's new top-of-the-line integrated is a fully balanced UFPD (Primare's proprietary Class D technology) design. It's available with an optional streaming DAC board ($1495) that adds 24-bit/192kHz UPnP streaming capability, either wired or wirelessly, along with multiple digital inputs. The board is modular and easily installable by the retailer. The amp section outputs 120Wpc into 8 ohms and 230Wpc into 4 ohms, with two XLR and three RCA inputs, includes a dimmable and color-changeable OLED display, and is available in black or silver. Also new is the Pre32 preamp, which uses the same balanced UFPD architecture. It's also available with the DAC board used with the I32. **Price: I32, $2795; Pre32, $2795. soundorg.com**

NaimUniti2 All-in-One Streaming Player
The NaimUniti was the original all-in-one player from Naim. Uniti2 represents the next generation—thoroughly updated with a full board redesign (analog, digital, and display) and sonic tweaks to the amplifier stage. Power output has been increased to 70Wpc, a full 20W increase. The CD player is new and improved and sports a new mechanism, including tray and clamp. The DAC is based on the Burr Brown PCM1793 D/A. Additionally there's 24-bit/192kHz streaming capability plus easy one-amp charging for iPods. It also sports the larger front-panel display (used in SuperUniti) and a rear-panel mini-USB for software updates (replacing the previous models RS232). Plus, there's Russian and Korean language support. **Price: $4695. soundorg.com**

Plinius Hautonga Integrated Amplifier
To celebrate Plinius' 30th anniversary the Hautonga integrated amplifier builds on its forebears, including the critically acclaimed 9200. It adopts the 9200's wrap-around-panel form factor and instant source access via pushbutton switches and pinhole LEDs for input selection. It outputs a powerful 200Wpc into 8 ohms and includes a phono input with adjustable gain. The rear panel is outfitted with five line-level RCA inputs with phono RCA and a balanced XLR pair additional as standard. The pre-out and line-out are retained. Added are trigger-in and out connectors for multi-room or home-theater simplicity. Careful attention has been paid to circuit layout with shorter signal paths, optimal component placement, and a new wiring specification. A new standby mode for true low-power operation conserves energy while keeping the circuit active to deliver peak performance with minimal delay. **Price: $5750. pliniususa@gmail.com**

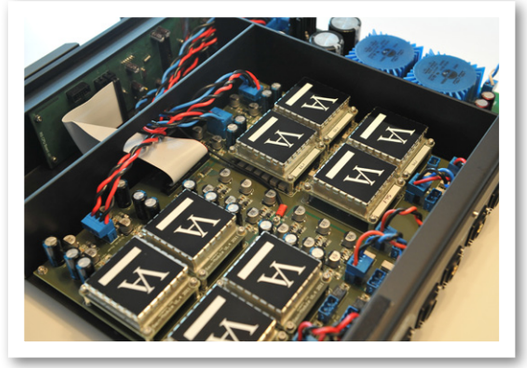
AVM Evolution PA5.2 Preamp
The AVM Evolution PA 5.2 preamp derives its superb tube output stages from the Ovation Line PA8. The machined-aluminum housing is distinct for its assembly without visible screws. The PA5.2 offers a large variety of connectivity and all functions are easily accessible via an intelligent series of intuitive menus. There are five line inputs (one XLR), two preamp outputs (cinch and XLR), a front input, and three slots for the optional plug-in modules that include a phono module (mm and mc), tuner, and USB-DAC module with 24-bit /192kHz upsampling (USB, optional S/PDIF, and coaxial). Power amps can be connected via RCA or XLR. An active subwoofer may connect to the processor I/O. The headphone input may also be used as an input for external players. Like all AVM hi-fi components the PA5.2 is carefully developed and assembled in Malsch, Germany. **Price: $4500. avmaudiousa.com**

ON THE HORIZON

B.M.C. AMP C1 Stereo Integrated Amp
B.M.C. designed and built the AMP C1 from the ground up to deliver music purely and transparently, avoiding any intrusion from the amplifier itself. The Amp C1 is perfectly balanced from input to output, runs cool and silently, and exhibits no feedback in the signal path and no compression at any volume. Listeners experience only unbridled power and music's finest details. The amplifier delivers 200Wpc at 8 ohms, or two channels of 350W at 4 ohms, supplied by a powerful, stabilized network with a 2kW torroidal transformer and balanced-current capacitors. Key features include B.M.C.'s exclusive Digital Intelligent Gain Management (DIGM), Load Effect Free (LEF) technology, and Current Injection (CI) technology. **Price: $7990. bmc-audio.com**

Zesto Audio Leto Preamp
The Leto Preamp is the second product introduced by Zesto Audio. Featuring the bloodlines and sophisticated styling of the acclaimed Andros phonostage, the Leto packs a mighty punch. Using 100% analog tube circuitry Zesto has engineered a preamp that combines the best of pro and consumer audio—one that delivers warmth without compression. Like the pros, the Leto uses "transformer floating balanced" inputs and outputs because of their foolproof ability to isolate one piece of gear from the next, resulting in a strong, clean, and quiet signal. It includes five inputs (three RCA/two balanced), four outputs, cinema bypass, built-in powers supplies, and remote-controlled volume, mute, and mono. A 16-gauge zinc-plated-steel enclosure helps isolate the electronic "chatter" from nearby equipment. Included are award-winning Isonode anti-vibration feet. Handcrafted in the USA **Price: $7500. zestoaudio.com.**

Krell Phantom III Preamp
The Phantom III is the first Krell preamplifier to include either an optional digital input module or a headphone input. The preamp is a true dual-monaural design and all signal gain is executed with surface-mount technology using proprietary multiple-output current mirrors with nearly 500 times the open loop linearity of other designs. Featuring 700kHz bandwidth in a zero-feedback, balanced Krell Current Mode design, the Phantom III shares the same design philosophy as its bigger brother, the flagship Phantom preamplifier. The volume control is a balanced resistor-ladder-type whereby bandwidth and transient response of the preamp circuitry are virtually unaffected by the volume setting. The headphone circuitry is identical to the main circuitry, offering the same performance as speaker playback. The digital module features AES/EBU, coaxial, and optical digital inputs for use with streaming devices or other digital sources and supports up to 24 bit/192kHz LPCM via the ESS Sabre DAC. A new eco-friendly standby mode reduces power consumption to 2W. **Price: $5500; $7000 with digital module. krellonline.com**



Vitus Audio RD-100 DAC/Preamplifier
The RD-100 is the latest addition to Vitus Audio's Reference Series. But it's much more than an ordinary DAC. It also features true analog inputs and volume control; hence, it is capable of driving power amplifiers directly without any need for an external linestage/preamp. The two analog inputs—one single-ended and one balanced—are not converted to the digital domain. When the analog inputs are selected, the entire digital stage of the DAC is shut down, so no digital noise is picked up by the delicate analog signals. Completing the analog portion of the RD-100 is a new version of VA's relay-based volume control, which makes the RD-100 a perfect analog linestage on top of its digital functions. The analog volume control is also functional when using any of the digital inputs—or bypassed if used with an external linestage like the RL-101. The RD-100 also uses the same modular topology found in other VA products.
This offers a future-proof product that can always be upgraded to VA's latest technology.
Price: $13,000. vitusaudio.com

ON THE HORIZON

Sonus Veritas Genoa Preamplifier
The Genoa linestage preamplifier from Italy's Sonus Veritas features very quiet circuitry for low noise with plenty of user-adjustable gain options to accommodate a wide range of power amplifiers. It establishes vacuum tube operating conditions so stable that no adjustments are ever necessary to maintain performance levels—even with periodic tube changes. Technical attributes include a single-stage, differential, transformer-coupled topology, and circuitry which rejects common mode noise. The tube amplification circuitry is supported by solid-state devices, which provide a near-ideal operating environment and flexible grounding options for I/Os to eliminate ground-loop noise. The Genoa sports the innovative TubeLife monitor that indicates when tubes should be replaced. With provisions for balanced and unbalanced inputs and outputs. Remote control optional. **Price: $15,999. info@sonusveritas.com Price: $1100. oneworldaudiousa.com**

Goldenote Demidoff Silver Plus II integrated amp
The Demidoff Silver Plus II from Goldenote is a single-ended, multi-powered stereo integrated amplifier. Handcrafted in Florence Italy, the 75Wpc Silver Plus II features a single-ended circuit, direct-coupling with no caps or filters in the signal path. Wiring is pure silver with rhodium-over-copper binding posts. The power supply features multiple custom transformers in a proprietary inductive design that provides a virtual battery effect that minimizes AC interference. The double-mono volume control ensures step-by-step high-end performance for superior resolution and perfect channel balance. The volume control features single channel 0.5dB fine steps through ultra-high precision 0.1% resistors. Its chassis is entirely made of high-mass aluminium to minimize RFI and EMI interference. Also available is the Demidoff Diamond II, a two chassis version that adds more power with 100Wpc and a separate power supply. **Price: $15,500; Diamond II, $34,000. tmhaudio.com**

Octave MRE 220 Monoblocks
The newly designed MRE 220 mono power amplifier is based on the ultra-reliable MRE 130 and the award-winning RE 290 models. The MRE 220, Octave's second amplifier designed for the KT 120 (the RE 290 was the company's first such offering), achieves a performance that was previously deemed impossible with tube amplifiers. The output power climbs up to 220W RMS into 4 ohms with 300W impulse power. Key specs include: Power bandwidth at full power ranges from 20Hz up to 70kHz. The amplifier is stable down to a 2.5 ohms and the S/N ratio is greater than -116dB. The input section can be optionally equipped with a balanced input transformer, which eliminates effective ground loops and high-frequency noise on the ground line. **Price: $24,000/pr. octave.de**

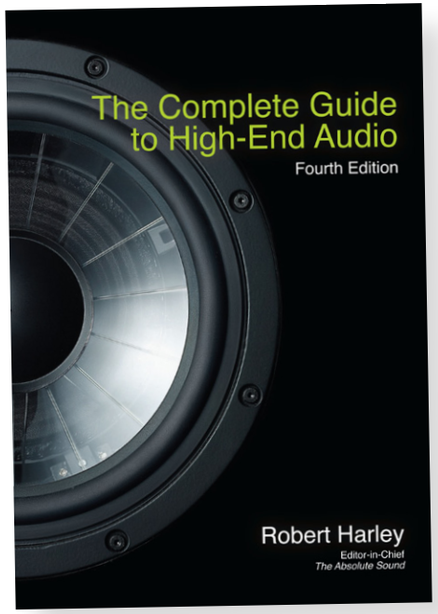
ON THE HORIZON

ALEF Orchestra Integrated Amp
ALEF, formerly Delta Sigma, is also the name of a new series of electronics developed to compete with the best. The Orchestra integrated amp is a true dual-mono design that merges the potent Duet SE amplifier with the new Director preamplifier. The Orchestra can be used as preamp, an amplifier, or as a true integrated solution. The included remote control features an ultra-precise, resistor-based, 64-step attenuator. Internally it features a pair of massive 680 VA transformers that have been floated and suspended by several silent anti-vibration blocks. Litz ultra-pure-copper internal wire is standard with silver available as an option. All sensitive key components are hand-shielded with a copper foil and grounded. Its very high power reserves are provided by a bevy of small fast capacitors wired in parallel and positioned as close as possible to the active output devices. A one-box solution without compromise. **Price: $69,000. tmhaudio.com**

Pass Labs Xs Series Power Amplifiers
First entries in Pass Labs' new Xs Series of amplifiers, the Xs-300 and Xs-150 are monoblock models delivering 300 and 150 watts, respectively. Three years in development, they were designed to measure well objectively, and subjectively sound as good as they measure—an exacting voicing process led to numerous refinements. The Xs-300 and Xs–150 both employ double-stack chassis, four in all, with separate power supplies for each channel. The power supplies reside in separate chassis for lower electromagnetic noise, twice as much storage capacitance as earlier Pass Labs amps, banks of high-speed/soft-recovery rectifiers, improved high-frequency noise filters, bigger and better transformers, improved passive decoupling, massive heat sinks, and lower standby currents. **Suggested Prices: $85,000/pr. and $65,000/pr., respectively.**

Boulder 3050 Monoblock
The 3050 is Boulder's first true "reference" amplifier, producing a continuous 1500 watts into an 8-ohm load. Amps are a mirror-imaged pair and no metalwork is shared between the two. They operate in Class A mode up to their full rated output power and each contains 120 output devices, more than 225,000uF of filter capacitance, and five toroidal transformers. A new gain stage, the 99H, was developed specifically for the 3000 Series, while new software for protection, power up/down, diagnostics, bias control, and system-wide sensing determine the proper sequence to turn on multiple amps in order to minimize power draw. Each mono amp weighs in at 450 pounds. Included is a granite base cut to match the angles of each exterior surface of the amp. Available only for 240V operation. Strictly limited in quantity.
Price: $195,000/pr. boulderamp.com

How to Choose Just the Right Amount of Amplifier Power



How Much Power Do You Need?

The first question to answer when shopping for a power amplifier or integrated amplifier is how much output power you need. Power output, measured in watts into a specified loudspeaker impedance, varies from about 20 Watts per channel (Wpc) in a very small integrated amplifier to about 1000Wpc. Most high-end power amplifiers put out between 80 and 250Wpc.

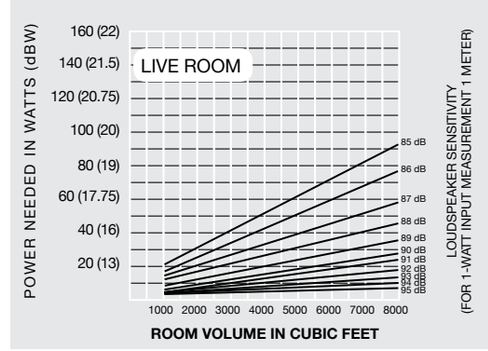
Choosing an appropriate amplifier power-output range for your loudspeakers, listening tastes, room, and budget is essential to getting the best sound for your money. If the amplifier is under-powered for your needs, you'll never hear the system at its full potential. The sound will be constricted, fatiguing, lack dynamics, and the music will have a sense of strain on climaxes. Conversely, if you spend too much of your budget on a bigger amplifier than you need, you may be shortchanging other components. Choosing just the right amplifier power is of paramount importance.

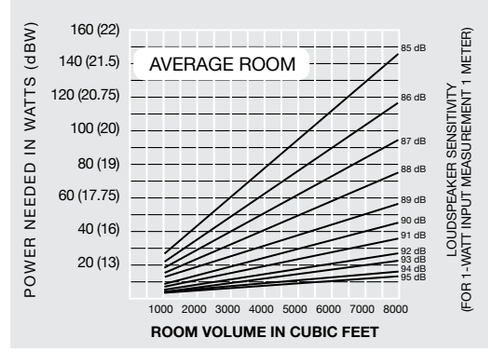
The amount of power needed varies greatly according to loudspeaker sensitivity, loudspeaker impedance, room size, room acoustics, and how loudly you like to play music. Loudspeaker sensitivity is by far the biggest determining factor in choosing an appropriate power output. Loudspeaker sensitivity specifies how high a sound-pressure level (SPL) the loudspeaker will produce when driven by a certain power input. A typical sensitivity specification will read "88dB SPL, 1W/1m." This means that the loudspeaker will produce an SPL of 88 decibels (dB) with one watt of input power when measured at a distance of one meter. Although 88dB is a moderate listening volume, a closer look at how power relates to listening level reveals that we need much more than one watt for music playback.

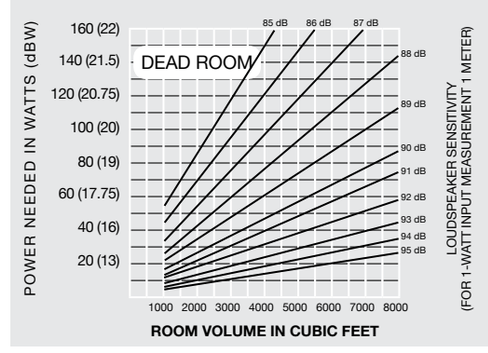
Each 3dB increase in sound-pressure level requires a doubling of amplifier output power. Thus, our loudspeaker with a sensitivity of 88dB at 1W would produce 91dB with 2W, 94dB with 4W, 97dB with 8W, and so on. For this loudspeaker to produce musical peaks of 109dB, we would need an amplifier with 128W of output power.

Now, say we had a loudspeaker rated at 91dB at 1W/1m—only 3dB more sensitive than the first loudspeaker. We can quickly see that we would need only half the amplifier power (64W) to produce the same volume of 109dB SPL. A loudspeaker with a sensitivity of 94dB would need just 32W to produce the same volume. The higher-sensitivity speaker simply converts more of the amplifier's power into sound.

This relationship between amplifier power output and loudspeaker sensitivity was inadvertently illustrated in an unusual demonstration more than







60 years ago. In 1948, loudspeaker pioneer Paul Klipsch conducted a demonstration of live vs. reproduced sound with a symphony orchestra and his Klipschorn loudspeakers. His amplifier power: 5W. The Klipschorns are so sensitive (an astounding 105dB SPL, 1W/1m) that they will produce very high volumes with very little amplifier power. Klipsch was attempting to show that his loudspeakers could closely mimic the tonal quality and loudness of a full symphony orchestra.

The other end of the speaker-sensitivity spectrum was illustrated by a demonstration I attended of an exotic new loudspeaker. During the demo, the music was so quiet that I could barely hear it. I looked at the power amplifiers—300Wpc monsters with large power meters—and was astonished to see that the power meters were nearly constantly pegged at full power. This unusual speaker converted only a minuscule amount of the amplifier's output power into sound.

The importance of loudspeaker sensitivity is also demonstrated by today's 3Wpc single-ended triode amplifiers, which can produce moderately loud listening levels through high-sensitivity speakers. These examples of huge variations in sound-pressure level and amplifier power illustrate how loudspeaker sensitivity greatly affects how big an amplifier you need. Even a small difference in loudspeaker sensitivity—2dB, say—changes your amplifier power requirements.

Why Amplifier Output Current Matters

Some amplifiers barely increase their output power when driving 4 ohms; others can double it. This means that not all "100Wpc" amplifiers are created equal. One "100Wpc" amplifier might put out 150W into 2 ohms, while another might deliver 400Wpc into 2 ohms. This ability to drive low-impedance loads (specifically, to deliver lots of current) has a large influence on an amplifier's sound and subjective power capability. Loudspeakers have dips in their impedances at certain frequencies, which puts greater current-delivery demands on the power amplifier.

This difference has real-world consequences. The ability to increase output power into low impedances indicates how much current the amplifier can deliver to the loudspeaker. It is current flow through the loudspeakers' voice coils (in dynamic loudspeakers) that creates the electromagnetic force that causes the cones and domes to move, and thus produce sound. If current flow through the voice coil is constrained, so is the music.

"Each 3dB increase in sound-pressure level requires a doubling of amplifier output power."

An analog is helpful to understanding this concept. Think of a power amplifier driving a loudspeaker as a water faucet and a hose; the water pressure is voltage, the flow of water through the hose is electrical current, and squeezing the hose forms a resistance (impedance) to the flow. In this analogy, the loudspeaker's impedance is the resistance in the hose that impedes the flow of water. The lower the loudspeaker's impedance, the less the resistance to current flow from the amplifier, and the harder the amplifier must work to deliver current to the loudspeaker. If the impedance is halved (say, from 8 ohms to 4 ohms), the amplifier is asked to deliver double the current to the loudspeaker (all other factors being equal).

If the amplifier isn't up to the job, the musical result is strain or even distortion on musical peaks, weak bass, loss of dynamics, hardening of timbre, and a collapsing soundstage. In short, we can hear the amplifier give up as it runs out of power. Conversely, amplifiers that can continue increasing their output power as the impedance drops generally have very deep, extended, and powerful bass, virtually unlimited dynamics, a sense of ease and grace during musical peaks, and the ability to maintain correct timbre and soundstaging, even during loud passages. If you have relatively high-impedance loudspeakers with no severe impedance dips, you're much less likely to encounter sonic problems, even with modest power amplifiers; the loudspeaker simply demands less current from the power amplifier.

Amplifiers with high current capability (indicated by their ability to increase output power into low impedances) are often large and expensive. Their current capability comes from massive power transformers, huge power supplies, and lots of output transistors—all expensive items.

Keep in mind, however, that not all systems require large power amplifiers. If you have sensitive loudspeakers with a fairly high impedance, the loudspeaker's current demands are vastly lower. Consequently, smaller amplifiers work just fine. Single-ended triode amplifiers with as little as 3Wpc and very limited ability to deliver current can sound highly musical when driving a load-appropriate loudspeaker.

What to Look For when Comparing Power Ratings

When comparing amplifier power ratings, make sure the specified power is continuous or RMS rather than peak. Some manufacturers will claim a power output of 200W, for example, but not specify whether that power output is available only during transient musical events such as drum beats, or if the amplifier can deliver that power continuously into a load. RMS stands for "Root Mean Square," a mathematical calculation expressing the effective, or average, power output. Very few amplifiers are, however, specified by peak power.

Another way manufacturers exaggerate power ratings is by not specifying the power bandwidth. This term describes the frequency range over which a power amplifier can deliver its power. A power amplifier delivering 200W at 1kHz is far less powerful than one that can deliver 200W over the full audio bandwidth of 20Hz–20kHz. You'll often see mass-market audio/video receivers with power-output ratings specified only at 1kHz, or from 50Hz to 20kHz. Further, stereo power amplifiers can deliver more power with only one channel driven—look for the words "both channels driven." The maximum power output should also be specified at a certain distortion level.

You can see the potential for misleading power-amplifier output claims. The abuses were so bad at one time that the Federal Trade Commission (FTC) stepped in to regulate power claims—the only example of an audio specification being regulated by a governmental body. The FTC mandate for power ratings requires that the power rating be continuous (not peak), that the load impedance and bandwidth be specified, and that the Total Harmonic Distortion (THD) be given at full power and measured over the audio bandwidth. You may see a power specification

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that reads "50Wpc continuous (or RMS) power into 8 ohms, both channels driven, 20Hz–20kHz, with less than 0.1% THD." A power specification including all these conditions is called an "FTC power rating." Some manufacturers no longer adhere to the FTC-mandated power ratings, figuring that the issue has blown over and is no longer enforced. You see fudged power ratings on mass-market audio/video receivers that must now power five or seven loudspeakers rather than two, and in single-ended triode amplifiers that cannot meet the stringent FTC power-output specification requirements.

> "The higher-sensitivity speaker simply converts more of the amplifier's power into sound."

If you're amplifier-shopping for low-impedance loudspeakers, look at the power-output specifications into 4 ohms. Make sure you see the words "continuous" or "average" in the power rating. See if the bandwidth and distortion are specified. These figures don't tell us what we need to know about the amplifier's musical qualities, but nevertheless indicate good technical performance.

Why Amplifier Power Isn't Everything

We've seen how loudspeaker sensitivity greatly affects how much amplifier power you need, and how power amplifiers with the same 8 ohm power rating can differ radically in their abilities to drive loudspeakers. Now let's look at some other factors influencing how much amplifier power you need.

The first is room size. The bigger the room, the more amplifier power you'll need. A rough guide suggests that quadrupling the room volume requires a doubling of amplifier power to achieve the same sound-pressure level. How acoustically reflective or absorptive your listening room is will also affect the best size of amplifier for your system. If we put the same-sensitivity loudspeakers in two rooms of the same size, one room acoustically dead (absorptive) and the other acoustically live (reflective), we would need roughly double the amplifier power to achieve the same sound-pressure level in the dead room as in the live room.

Finally, how loudly you listen to music greatly affects how much amplifier power you need. Chamber music played softly requires much less amplifier power than rock or orchestral music played loudly. The relationships between loudspeaker sensitivity, room size, room acoustics, and amplifier power are shown in the illustration on page 11.

We can see that a low-sensitivity loudspeaker, driven by orchestral music in the large, acoustically dead room of someone who likes high playback levels, may require hundreds of times the amplifier power needed by someone listening to chamber music at moderate listening levels through high-sensitivity loudspeakers in a small, live room. A 20Wpc amplifier may satisfy the second listener; the first listener may need 750Wpc.

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The 12 MOST SIGNIFICANT PREAMPLIFIERS of all TIME

Anthony H. Cordesman, Neil Gader, Robert E. Greene, Robert Harley, Jacob Heilbrunn, Chris Martens, Dick Olsher, Harry Pearson, Paul Seydor, Steven Stone, and Jonathan Valin

What preamplifiers and phonostages have had the most impact on high-end audio? Changed the market? Influenced future designs? Introduced new technologies or concepts? Established new sonic benchmarks?

To answer this question, our senior writers each named the preamplifiers and phonostages they thought were the most significant, and explained why. From these individual selections we chose the Twelve Most Significant Preamplifiers of All Time by democratic vote. In cases where several products received the same number of votes, the ranking was chosen by consensus of the senior editorial staff. The final verdict, presented in ascending order of significance (#1 being the most significant), is followed by each writer's individual selections. Let the controversy begin.

THE 12 MOST SIGNIFICANT PREAMPLIFIERS OF ALL TIME

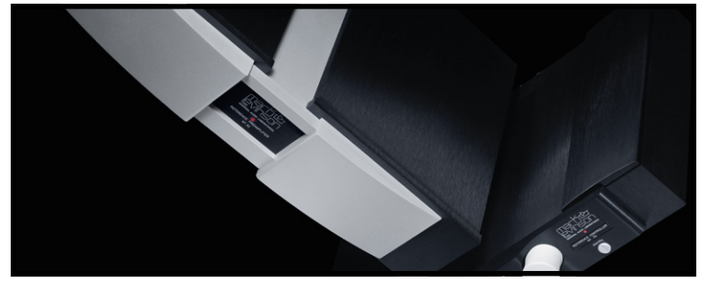
12

AUDIO RESEARCH SP10 MK II/SP11

Introduced: 1982/1984; Price: $2995 /$4995

Audio Research Corporation's reputation was, to a large extent, built upon a series of standard-setting triode-tube preamplifiers, beginning with the great SP3 in 1972 (for which see below). Introduced in the mid-80s, the SP10 and the even better SP10 Mk II were the culminations of William Zane Johnson's all-tube designs: pricey, two-chassis, 6922-based full-function preamplifiers with separate power supplies that were the *ne plus ultras* in glass-bottle preamplification back in the mid-1980s. Big and warm in tone and huge in soundstaging with an even higher "high-definition" presentation than its predecessors, the SP10 made previous ARC preamps, for all their standard-setting neutrality, sound a touch "tubey." The SP10 was also intended to be Johnson's swan song to all-tube circuits, being soon followed by the two-chassis, "hybrid" SP11, which paired 6DJ8 tubes with FETs for a less romantic, lower-distortion sound. Though you could start an argument in 1984-85 (and probably still could today) about which preamp was "better," there is no question the SP11 was a bellwether of the faster, more dead-neutral, higher-resolution, higher-energy, broader-bandwidth ARC sound that is still with us today.

—Jonathan Valin



11

MARK LEVINSON NO.32 REFERENCE

Introduced: 1999; Price: $14,950

In Mark Levinson's long history, only one preamplifier carried the "Reference" designation: the No.32 Reference. The company had good reason to call the No. 32 a Reference: This linestage (phonoboards were optional) was a *tour de force* in solid-state design from a company at the height of its formidable powers. The dual-chassis No. 32 housed the audio circuitry in one box and the power supply and control circuits in a second. The power supply regenerated the incoming AC. The audio-circuit printed-circuit boards were made from Arlon, a material that sounded considerably better than conventional alternatives. Every aspect of the No.32 reeked of fanatical engineering and attention to detail, particularly the power supply and the isolation of the audio circuits from interference. The user interface, particularly its ballistics-sensitive volume control, was revolutionary. The sound quality was as spectacular as its design and build, with a dead-quiet background, astonishing purity of timbre, whiplash speed, thunderous bass, and pin-point spatial precision. Unlike the Mark Levinson products of most of the 1980s and 1990s that had a characteristic "house sound," the No.32 was as transparent to sources as anything out there. A landmark product by any standards.

— Robert Harley

10

CONRAD-JOHNSON PREMIER THREE

Introduced: 1983; Price: $2850

The Premier Three was the first preamplifier to feature conrad-johnson's proprietary caps (polystyrene film at that point in time) throughout the analog stage and the power supply. The improvement in capacitors produced a sonic improvement that led our Mr. Pearson to say that the Premier Three set a new standard when it came to reproducing a stereo soundstage—and the "space" among instruments and choirs of instruments on that stage. "The Premier Three," quoth he (in Volume 8, Issue 29), "is the first preamplifier in my experience that approaches the goal of re-creating a lifelike illusion of a concert hall in my home." He was also greatly impressed by the Premier Three's reproduction of the top octaves, which acquired finer articulation and better delineation than the treble of the Premier Two. Indeed, HP was so impressed by the Premier Three that he not only named it his five-star reference in March of 1983; he also named it the Best Sounding Preamplifier of the Decade (the 1980s) in TAS' Tenth Anniversary Issue.

—Jonathan Valin

THE 12 MOST SIGNIFICANT PREAMPLIFIERS OF ALL TIME

9

QUAD 33

Introduced: 1967; Price: $120

Introduced in 1967, the Quad 33 stereo preamplifier is significant for many reasons, doubtless the most important being that, like its companion 303 power amp, it was the first solid-state product of its kind to sound good—not just good, but *really* good: I know, I still own one and use it happily from time to time. Then there was its "packaging": small, elegant, with uniquely imaginative ergonomic thinking (from which contemporary designers can still learn bucketsful), where the size, shape, position, and color (olive green, orange, off white) of its knobs and buttons were determined by function (e.g., volume knob largest, balance a small slider immediately underneath, mode switches in orange, sources in white, etc.). It also offered a range of sensitivities to match the outputs of differing phono pickups and high-level components. It's little wonder that 33s (and 303s) do such robust business in both the used and modification markets: They are true classics.

—Paul Seydor

8

AUDIBLE ILLUSIONS MODULUS 3A

Introduced: 1996; Price: $1895

The Audible Illusions Modulus series of preamplifiers had a long history, with more than 18,000 units sold since 1981, according to Art Ferris, the company's founder and current guiding light. The Modulus 3A (M3A) is selected here for its sound quality, ubiquity, and longevity. The unit had been in continuous production from 1996 to 2010 ($1895–$2995). The latest version, the M3B, is still in limited production. The M3A helped define as well as refine modern tube sound, first of all, by adopting the 6922/6DJ8 frame-grid dual triode for both linestage and phono amplification. The precedent had already been set by Audio Research with the SP6E, SP8, and SP10 preamps, all of which started a chain reaction toward displacing the ubiquitous 12AX7 in most high-end preamp designs. With emphasis on a simple dual-mono signal path, devoid of buffer stages, and complemented by a low-impedance sophisticated power supply, the M3A delivered reference-caliber sound quality at an affordable price point. It wasn't just that it excelled in transient clarity and soundstage transparency; its textural liquidity was also a most satisfying testimonial to a classical tube heritage.

—Dick Olsher

7

HARMAN-KARDON CITATION 1

Introduced: 1959; Price: $139 (kit), $239 (wired)

Designed by the legendary Stewart Hegeman, the Citation 1 preamp was released as a kit for $139 or factory-wired for $239. An additional $29.95 got you a walnut enclosure. Heralded as "the ultimate in high-fidelity design," the Citation 1 employed "circuit blocks" of active stages with closed feedback loops that used tubes for gain, and passive stages with resistors and "condensers" (capacitors) to provide equalization curves. The Citation supported multiple phono curves including RIAA, London, AES, and 78, making it a useful tool even today. Additional features included a unique stereo-blend control that added center-fill by varying the right-left cross-feed. The tone controls used a stepped rather than continuously variable potentiometer, and at their "flat" positions were completely out of the circuit. With DC-heated preamplifier filaments, six silicon diode rectifiers for B+, and nine tubes, four 12AX7s and five 12 AT7s housed in a roomy chassis; the Citation 1 weighs 32 pounds. According to the original specification sheets, the Citation 1 produced less than .05% distortion at full output with 85dB signal-to-noise.

The Citation 1 was one of the first audio components to employ a building-block approach to circuit design. Even today a reconditioned Citation 1 preamp will deliver a relatively uncolored and dynamic presentation that rivals many contemporary designs.

—Steven Stone

THE 12 MOST SIGNIFICANT PREAMPLIFIERS OF ALL TIME

6

CONRAD-JOHNSON ART/GAT

Introduced: 1996; Price: $14,995/$20,000

One of the chief artifacts that make tube preamps (and amps) sound "tubey" is thermionic noise—a graininess that overlays the upper midrange and treble like tape hiss on an LP. Primarily through its pioneering use of high-quality resistors and capacitors, conrad-johnson began to solve this long-time problem with its Anniversary Reference Triode preamplifier, introduced (in limited numbers) in 1996. A two-chassis (separate power supply), single-gain-stage, line-level preamplifier, the ART was something of a revelation in its day: a preamp that had what HP called "continuousness" (no hot spots in the upper midrange, no suckout in the midbass or power range) and little-to-no tubey grain. Liquid and lovely, it marked a genuine step forward in triode-preamp designs.

Thanks to Teflon caps and other improvements, the single-chassis, single-gain-stage GAT linestage, introduced just a few years ago and a present-day classic, takes the ART a big step forward in neutrality, resolution, and bass definition, eliminating grain almost entirely and reducing coloration for one of the most seamless and lifelike presentations in high-end audio. —**Jonathan Valin**

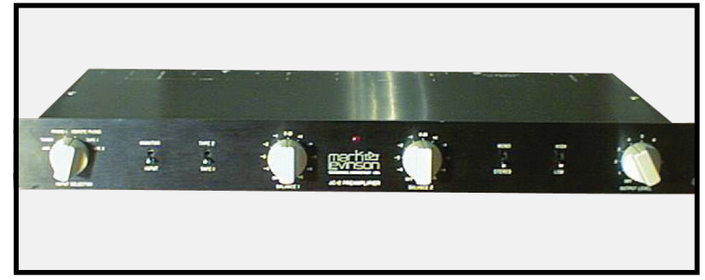
5

VENDETTA RESEARCH SCP-2

Introduced: 1988; Price: $1895

After being told he was washed up as a designer, John Curl set out to make not just the world's best phonostage, but one that would so far surpass any previous design that his talents would never again be questioned. The result of his vendetta (yes, that's how the company got its name) was the SCP-2, a phono preamplifier that stunned the audio world at its 1988 launch. The SCP-2 set a new standard in phonostage clarity, transparency, dynamics, and sheer musicality. Moreover, the SCP-2 was by far the quietest phonostage ever produced. This lack of noise, coupled with its high gain, allowed the SCP-2 to amplify even the lowest-output moving coils and maintain a dead-silent background. I had an SCP-2 in my system for five years and rue the day that I let it go. A seminal product from one of high-end audio's greatest minds.

—Robert Harley



4

MARK LEVINSON LPN-2/JC-2

Introduced: 1973; Price: $1100

Introduced in the early 1970s, the Mark Levinson LPN-2, soon followed by the diminutive, less pricey, but even better-sounding JC-2 (designed, of course, by John Curl), was the first solid-state preamp to compete sonically with the then-reigning champeen of preamplifiers, the Audio Research Corporation SP3. When the LPN-2 was introduced HP was wowed by its bass reproduction—tight, unbelievably detailed, and the first to reproduce ambience around bottom-end instruments—but less enamored with its "hooded" midrange (and its high price). The JC-2 was the breakthrough, absolutely "clobbering" (said HP) the SP3a-1 when it came to noise, bass, and upper-midrange smoothness and realism. From its introduction in 1975, the JC-2 really set the tone of the tubes-versus-transistors debate that continues to this day by establishing the sonic grounds for the solid-state case—lower noise, superior transient speed, greater bandwidth, better bass grip and definition in what was, also, a highly musical and lifelike package. Between the SP3 and the JC-2, the high end has never been the same: We're still picking among their latter-day descendants.

—Jonathan Valin

THE 12 MOST SIGNIFICANT PREAMPLIFIERS OF ALL TIME

3

DYNACO PAS-3

Introduced: 1960; Price: $60 (kit), $80 (assembled)

Designed by the late Ed Laurent, of Stereo 70 fame, the PAS-2 was Dynaco's first stereo preamplifier. It was introduced in 1960 in both kit ($60) and assembled ($80) versions. The PAS-3 followed thereafter and differed only cosmetically. The final member of the series, the PAS-3X, was introduced in 1966 and featured a revised tone-control circuit and less sensitivity to load impedance. Good sound on a budget was a Dynaco specialty. The PAS series delivered on those counts together with a suite of excellent technical measurements, including inverse RIAA accuracy. The result was considerable mass-market appeal. Dynaco is said to have sold over 100,000 units over its lifetime, probably more than any other low-cost model with high-end pretensions, and in the process has enriched the audio lives of most baby-boomer audiophiles. Sonically, its calling card was a sweet midrange that no solid-state unit could touch during the 1960s and 1970s. Today it is still a wildly popular vehicle for upgrades and modifications. A true tube classic.

—Dick Olsher

2

MARANTZ MODEL 7

Introduced: 1958; Price: $264

When Saul Marantz introduced the Model 7 stereo preamplifier in 1958, there were few who would have challenged the assertion that it was the best preamplifier in the world, a dominance it held for many years to come. All-tube, as was everything in those days, the 7 pioneered a unique three-stage phono-preamp equalizer that became known as the "Marantz circuit"—the company's legendary electronics genius Sidney Smith contributed to the circuit while Saul himself did the aesthetics, which were the very mirror of function and mold of form for any serious preamplifier, not to mention solidifying the classic Marantz look with its brushed champagne-gold finish. Despite its price—Marantz components were, along with McIntosh's, the most expensive around—the 7 sold over a 130,000 units. Marantz cognoscenti insist the 7C iteration (the "C" meaning it came in a walnut cabinet) was the best-sounding.

—Paul Seydor

1

AUDIO RESEARCH CORPORATION SP3

Introduced: 1972; Price: $650

If you go to the Audio Research Corporation's Web site, you will still find a page devoted to the preamplifier that put this company on the map and that, for many of us, launched the high end (alongside the Magneplanar 1-U, with which it was so often coupled). Introduced in 1972, the SP3, for which ARC is still offering upgrades, isn't really a preamp but a family of preamps (SP3a, SP3a-1, SP3b, etc.), each member of which was (and is) slightly better than its predecessor. It's not as if the SP3 were the first great tube preamplifier (as you can see from this very list); what it was was the first great tube preamplifier that didn't sound markedly tubey—that had the neutrality, speed, resolution, low noise floor, soundstaging, and full bandwidth of its then-ubiquitous solid-state competition and had it while fully retaining (indeed improving upon) the bloom, light, air, and delicacy of tone color and texture of glass-bottle audio. Of course, what seemed like a "less tubey" sound back then was really fairly tubey by today's ARC standards, but that doesn't change the fact that the marvelous family of SP3s changed the face of high fidelity, putting tubes securely back in the picture, where they remain to this day. Along with its progenitor, the Dyna PAS-3, arguably the single most influential electronic component in high-end-audio history.

—Jonathan Valin

THE 12 MOST SIGNIFICANT PREAMPLIFIERS OF ALL TIME

Preamps TODAY

It is well and proper to look back to the great preamps of the past six decades for those avatars that literally set the tone of the times and showed the way to the future. But the plain truth is that when it comes to preamps (or amps or phonostages or analog sources or digital sources or loudspeakers or...you name it) audiophiles have never had it better than they do today.

It's not just that circuits have gotten better—for example, though the superb Soulution 720 and 721 linestages use the large amounts of negative feedback common in 1960s and early 70s solid-state, they use it in an ingenious, computer-optimized, feed-forward scheme that reduces propagation-delay times by an order of magnitude!—it's also the quality of parts, the attention paid to vibration control, and the advances in power supplies, circuit-board layouts, and power conditioning that set today's best preamps apart from some (not all) of the preamplifiers on our historical list of the Twelve Most Significant. The ultra-high-bandwidth, ultra-high-speed, ultra-low-noise circuits of current preamps are capable of feats of resolution that few preamps from the 60s, 70s, 80s, and 90s can come close to matching—and many of today's best are capable of reproducing tone color with a beauty and realism that lets them stand unembarrassed beside the best of the past.

This isn't a knock against the twelve great monuments of audio engineering listed above, just a reminder that time does not stand still and that, as brilliant and forward-looking as the men who designed our twelve picks were and are, there are engineers now at work who are just as brilliant and forward-looking and just as devoted to the absolute sound. **—Jonathan Valin**

INDIVIDUAL WRITER'S SELECTIONS

The writers are presented alphabetically, and their product choices in descending order of significance.

Anthony H. Cordesman
Marantz Model 7, Dynaco PAS-3, Audio Research SP3, Pass Labs XP20 and XP25 (linestage and phonostage), Mark Levinson LPN-2/JC-2, Harman-Kardon Citation 1, TacT XP.2, Krell KRC-3, conrad-johnson ART, McIntosh C28

Neil Gader
Audio Research SP3, Dynaco PAS-3, Mark Levinson No.32, Hafler 101 Audible Illusions Modulus 3A, McIntosh C28, Marantz Model 7 Vendetta Research SCP-2 , conrad-johnson PV-1, Harman-Kardon Citation 1

Robert E. Greene
Dynaco PAS-2, Hafler DH101/110 Marantz Model 7, Quad 33, Leak Point One, GE upx-003, Audio Research SP3, Vendetta Research SCP-2, Bryston BP-25, Benchmark DAC-1

Robert Harley
Audio Research SP3, Mark Levinson JC-2, Vendetta Research SCP-2, Marantz Model 7C, Dynaco PAS-3 Constellation Audio Altair, Harman-Kardon Citation 1, Audio Research SP11, Mark Levinson No.32, Audible Illusions Modulus 3A

Jacob Heilbrunn
Audio Research SP10, Vendetta Research SCP-2, conrad-johnson ART, Mark Levinson No.32, Zanden 1200, Convergent Audio Technology SL-1. Aesthetix Io, Lamm L2 Reference, Ypsilon VPS-100, Boulder 2008

Chris Martens
Marantz Model 7, Audio Research SP3, Quad 33, Mark Levinson JC-2, Dayton Wright SPS, Spatial Coherence TVA-1, Spectral DMC-30SL Reference, MBL 6010D, conrad-johnson GAT/ART, Audio Research Reference 5

Dick Olsher
Audio Research SP3, Dynaco PAS-3 Marantz Model 7, conrad-johnson Premier II, c-j ART, Convergent Audio Technology SL1, VTL TL-7.5, Pass Labs XP-30, Threshold NS10, Audible Illusions Modulus 3A

Harry Pearson
Dynaco PAS-3, Marantz Model 7, Audio Research SP3, Audio Research SP6, Harman-Kardon Citation 1, conrad-johnson PV-1, c-j Premier Three, Mark Levinson JC-2, Cello Palette, Veloce LS-1/LP-1

Paul Seydor
Dynaco PAS-3, Marantz Model 7, McIntosh C22, Quad 33, Crown IC150,
Audio Research SP3, Mark Levinson JC-2, Apt Holman, GAS Thaedra, PS Audio LCC

Steven Stone
Marantz Model 7, Harman-Kardon Citation 1, Dynaco PAS-3, Mark Levinson JC-2, Dennesen JC-80 NYAL NCP-2, Audio Research SP11 conrad-johnson Premier 3, Vendetta Research SCP-2, Accuphase C-200

Jonathan Valin
Audio Research SP3, Dynaco PAS-3 Marantz Model 7, Mark Levinson JC-2, Vendetta Research SCP-2, Constellation Audio Virgo, conrad-johnson GAT, Audio Research Reference 40, Technical Brain TBC-Zero, Soulution 720/721

THE TEN MOST SIGNIFICANT AMPLIFIERS OF ALL TIME

Neil Gader, Robert E. Greene, Robert Harley, Dick Olsher, Paul Seydor, and Jonathan Valin

What amplifiers have had the most impact on high-end audio? Changed the market? Influenced future designs? Introduced new technologies or concepts? Established new sonic benchmarks?

To answer this question, our senior writers each named the amplifiers they thought were the most significant, and explained why. From these individual selections we chose the Ten Most Significant Amplifiers of All Time. The Top Ten, presented in ascending order of significance (No. 1 being the most significant), is followed by each writer's individual selections. Harry's Pearson's selections, along with commentary on each one, appear in this issue's HP's Workshop. Let the controversy begin!

10 Audio Research Reference 600/610T

This no-holds-barred assault on the state of the art in tube amplification is ARC founder William Johnson's crowning achievement. The Reference 600 is the amplifier Johnson always wanted to build—massive output power (550W), pure tube regulation, and cost-no-object implementation. Each monoblock featured 34 vacuum tubes, most of them 6550s (output stage and regulators). The result was an amplifier that produced prodigious heat, but also a very special musical magic. The 600 and its successor the 610T (now in a vertical, rather than horizontal chassis) set new standards in timbral liquidity, freedom from grain, dimensionality, and, for a tubed amplifier, dynamics and bottom-end control. Perhaps the finest high-powered tube amplifiers ever made.

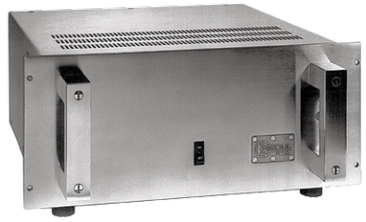
9 NAD 3020 Integrated

The modest NAD 3020 might lack the star-power of the other amplifiers on our Most Significant list, but significant it is by virtue of its tremendous influence over an entire generation of music lovers. For budget-minded listeners who cared about sound, the 3020 was the amplifier you bought instead of a mass-market receiver. The 3020 sold in unimaginable numbers—1.1 millions units (even more if you include variations on the basic circuit)—and in the process created tens or hundreds of thousands of dyed-in-the-wool audiophiles. Although not the last word in resolution or treble clarity, the 3020 rendered music with a warmth and engagement that was the perfect antidote to the bright, sterile, grainy budget electronics of the day. Moreover, the 3020 sounded more powerful that its 20Wpc rating suggested, thanks to an innovative output stage designed for reproducing musical dynamics rather than impressing on the spec sheet.

THE TEN MOST SIGNIFICANT AMPLIFIERS OF ALL TIME

8 Threshold 400A/800A

The Threshold 800A, the first product from a company newly formed by Nelson Pass and René Besne (the latter was responsible for the industrial design), took the audio world by storm upon its introduction in 1975. Here was a high-powered amplifier that seemed to defy the laws of physics by delivering lots of Class A output power from a large but still manageable chassis. The secret, which Pass patented, was to vary the bias to the output transistors based on the characteristics of the audio signal, keeping the output stage in Class A operation but reducing the bias (and thus heat dissipation) at idle and low signal levels. The result was a relatively cool-running, compact, and affordable Class A amplifier that stood in stark contrast to the 25W or so of a similarly-sized statically-biased Class A amplifier. That innovation, along with the triple-series, triple-parallel output stage, established Pass as one of the most creative minds in amplifier design.

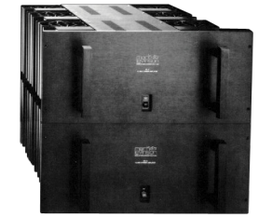


7 Krell KSA-50/KSA-100

The KSA-50 wasn't the most powerful or best-sounding product Krell ever made, but its sonic and commercial success irrevocably changed the amplifier landscape. The KSA-50 established the "dreadnought" concept of power amplifiers, specifically that an amplifier could be unfazed by any loudspeaker load. It's no coincidence that Krell and Apogee, whose ribbon speakers were notoriously difficult to drive, ascended to prominence simultaneously in the early 1980s. The first Krell also established a new standard in bass dynamics, extension, and slam. For decades Krell amplifiers had a monopoly on "center-of-the-earth" solidity and power that was the envy of other manufacturers. The KSA-50 influenced an entire generation of solid-state amplifier designers. It's impossible to imagine high-end audio in the 1980s without Krell and the KSA Series.

6 Marantz Models 8B/9

Saul Marantz and Sid Smith's two 1960s classics—the Model 9, a 70W monoblock amplifier (switchable to 40W in triode mode), and the Model 8B, a 35Wpc stereo amp (switchable to 18W in triode mode)—were relatively low-distortion, highly stable (so stable in fact that NASA ordered slightly modified versions to drive their precision arrays of tracking antennas for the space program), ultra-linear, pentode (switchable to triode) power amplifiers that are still famous for their meltingly beautiful sound. If there ever was or has since been a sweeter amp than the Marantz Model 9, very few of us have heard it. It was the essence of liquidity and loveliness—and a sonic model for some of the Class A solid-state amps that came along in the 70s and later. Like the McIntosh MC275, it wasn't a world-beater in the bass or top treble and it was definitely on the dark side in overall balance, but, oh, that midrange! The Model 8B was a drier, slightly sunnier-sounding amp than the Model 9, but like its big brother a thing of utter loveliness on voice and strings. Probably the most collectible amps in the world today, and like the McIntosh MC275 the very models of beautiful-sounding hi-fi gear.



5 Mark Levinson ML-2

This 25W pure Class A monoblock was groundbreaking in many respects upon its 1977 introduction. It demonstrated the virtues of exquisitely executed Class A amplification, set a new standard in clarity and transparency, and established an unheard-of "watts-per-dollar" price. Before the ML-2, no one had experienced a transistor amplifier with such purity and freedom from solid-state artifacts. Despite its modest power rating, the ML-2 could double its output power as the impedance was halved, all the way to 0.5 ohm. The ML-2 had less of a sonic signature than other amplifiers of the day, but also a warmth and delicacy that were never matched by the subsequent ML-3.

THE TEN MOST SIGNIFICANT AMPLIFIERS OF ALL TIME

4 McIntosh MC275

Sweet, dark, and delicious as the plums that William Carlos Williams's wife left in the refrigerator, the 75Wpc MC275 stereo amp is, along with the Marantz 9, the poster-boy for "high-powered" 1960s tube amplification. This means it is, along with the Marantz 9, also the quintessence of what some of us older-hands now think of as "old-fashioned" tube sound. The MC275 was (and is, in its current McIntosh "commemorative" version) a gorgeous-sounding thing. Though it may have had wider bandwidth and lower measurable harmonic distortion than the competition did back when, it wasn't the last word in bass definition, definitely drooped a bit on top (thus the darkish coloration), and had a touch of upper-midrange grain that you didn't hear with the Marantz amps. Nonetheless, like the Marantz Model 9, the MC275 was so very lovely sounding in the midband (particularly on strings and winds) that it has been and continues to be a crowd-pleaser to this very day, especially with electrostatic fans. Along with the Marantz 9, the progenitor of many, many, many amps that aimed, first and foremost, at making music sound beautiful.

3 Audio Research Corporation D150

Our Number Three finisher is, by consensus, *the* great high-powered tube amp of the 1970s. As HP said, there was no amp quite like this one in the midrange, where its neutrality, truth-to-timbre, presence, air, bloom, and dimensionality made voices and instruments (and the spaces they were recorded in) come alive—particularly through Magneplanar loudspeakers—like no other amp most of us had previously heard. At the time, its 150Wpc seemed (and sounded) limitless. Though it definitely gave ground to solid-state in definition and grip in the bottom octaves and the top ones, it gave nothing away to solid-state or other tube amps in the midband and lower treble, which it lit up like acoustic instruments themselves do. In HP's beautifully chosen word, a "singularity" because of its then-unparalleled faithfulness to the sound of the real thing, the D150 is one of those rare products, like Quad 57s or Maggie 1-Us, that no one ever forgets first hearing—and the first of what was to become a long line of very-high-power tube amplifiers.

2 Phase Linear 400/700

Back in the 50s and early 60s, when audiophiles were using high-sensitivity horn speakers from JBL and Altec-Lansing or infinite baffles from Bozak, power was not an issue and fly-weight tube amps like the ST-70 or the Marantz 8B were more than enough to fill the bill. But with the advent of higher-fidelity, lower-sensitivity acoustic-suspension speakers—and later of power-hungry planar-magnetics and hard-to-drive ribbons—big power (and the current to deliver it) became essentials. Bob Carver's two great solid-state amplifiers were the first to add volts and watts (200Wpc in the Phase 400, 350Wpc in the Phase 700) to the solid-state norm without exacting a Crown DC-300-like price in graininess and odd-order-harmonic roughness. That they did this at a bargain price, to boot, and set the norm for what was to come in high-power solid-state amplification are the reasons why these two classics from the early 70s finished a close second to our pick for the Most Significant Amp of all Time.

1 Dynaco ST-70

Number One on our hit parade of most significant amps, this 35Wpc EL-34-based pentode stereo amp from David Hafler was and remains the exemplar of affordable excellence. There is nothing quite like it today, because there is nothing at such a comparatively low price that can compete without excuses against today's Big Boys the way the ST-70 could against the Marantz 9s and McIntosh MC275s. A profound influence on virtually every tube amp that followed it from the classic ARC designs of the 70s and 80s to Van Alstine's Ultravalve of today, it is the very definition of an audio classic.

THE TEN MOST SIGNIFICANT AMPLIFIERS OF ALL TIME

INDIVIDUAL WRITERS' SELECTIONS

Neil Gader
Plinius 8150
Dynaco ST-70
Marantz Model 8B
McIntosh MC275
ARC D-150
Rotel RB-1090
NAD 3020 integrated
Phase Linear 700/400
Mark Levinson ML-2
Heathkit amps

Robert E. Greene
The Williamson Amplifier (1947-1949)
McIntosh M50W1
Dynaco ST-70
Quad 303
Phase Linear 400/700
ARC D Series and conrad- . johnson Premier Series
Hafler XL-280
Carver Sunfire, Lightstar, and A Series
TacT Millennium
Sanders Magtech

Robert Harley
Dynaco ST-70
Threshold 800A
ARC D150
Krell KSA-50
Phase Linear 700
NAD 3020 integrated
ARC Reference 600/610T
NAD M2
Hafler DH-200
BAlabo BP-1 Mk.II

Dick Olsher
Futterman H3 OTL
Dynaco ST-70
Marantz Model 8B
Harman Kardon Citation II
McIntosh MC275
ARC 76A
GAS Ampzilla II
Threshold 400A
Cary Audio Design CAD-805
EAR Yoshino 509

Paul Seydor
Dynaco ST-70
McIntosh MC275
Marantz Models 8B and 9
Quad 303
Harman Kardon Citation 12
ARC D150
Phase Linear 400
NAD 3020
Mark Levinson ML-2
Krell KSA-100

Jonathan Valin
Marantz Models 8B/9
Dynaco ST-70
Phase Linear 400
ARC D150
Mark Levinson ML-2
Krell KSA-50
c-j Premier Four
Lamm Industries ML-2
ARC Reference 610T
Technical Brain TBP-Zero

AMPLIFIER DESIGNER ROUNDTABLE

How have amplifiers improved over the last decade? What is the state of audio amplification today? Have tube sound and transistor sound become more alike? What innovations will the future bring?

To gain some insight into these and other issues, I posed the same set of questions to nine of the world's top amplifier designers. Each of these internationally recognized engineers has produced world-class preamplifiers and power amplifiers, and each takes a different approach to the challenge of creating cutting-edge audio electronics—in some cases, radically so.

—Robert Harley

BOB CARVER / Bob Carver LLC

JOHN CURL / Parasound, Constellation

CYRILL HAMMER / Soulution

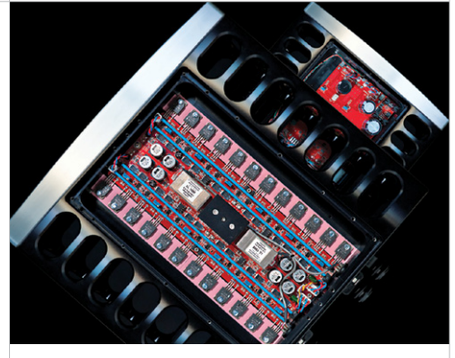
LEW JOHNSON / conrad-johnson design

VLADIMIR LAMM / Lamm Industries

FUMIO OHASHI / BAlabo

NELSON PASS / Pass Labs

JÜRGEN REIS / MBL



JEFF ROWLAND / Jeff Rowland Design

AMPLIFIER DESIGNER ROUNDTABLE / BOB CARVER

We are no longer interested in facsimile reproduction; rather we find that reproduction that sounds enchanting and real is far more interesting and serves our passions far better.

I received my undergraduate degree in physics from the University of Washington and my Master's and an honorary Ph.D. from the University of British Colombia and the UW. I started the Phase Linear Corporation in 1970 to build, market, and sell my first invention, a 700 watt amplifier. After that I started Carver Corporation followed by a small bio-technology company Carver Genetic Physics. Finally, I started Sunfire to build and sell my new invention, the high pressure, high back-EMF subwoofer. I successfully sold each company. My main inventions were the magnetic-field amp, the high-pressure subwoofer, the asymmetrical FM detector, the DC restorer, the dipole woofer system in my panel loudspeaker with a full-range ribbon driver, the autocorrelator noise-reduction system, the tracking down-converter subwoofer amplifier, and the Sonic Hologram. Last year I partnered with Bob Farinelli (former president of Elan) to start a new company, Bob Carver LLC. Our new designs are tube amps with the DC restorer and a floor-to-ceiling line-source speaker.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

What I'm going to say next will fly in the face of much conventional wisdom regarding neutrality, nay, even the desirability of absolute neutrality.

Today, a well designed solid-state amplifier will be all but perfect from a performance and listening perspective. It will have power to spare; it will have nearly a zero-ohm output impedance and a bandwidth far beyond any rational requirement for perfect sound. The protection circuits will not color the output signal when playing speech or music into any rational loudspeaker, and the maximum possible output current will be far beyond the needs of any rational music! This extreme performance will be called upon only from time-to-time when the audio signal is extremely difficult.

The science of solid-state amplifiers has grown enormously over the last several decades. Such an amplifier is expensive though, because delivering this level of performance requires expensive components—big heat sinks to keep it cool, huge power transformers to deliver the current and voltage, as well as massive energy storage associated with the main power supply. I could go on and on, but you get the picture, *n'est-ce pa*?

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

Now for the fun! Tube amps! Over the years many tube amps have become more and more like solid-state amps in terms of all the things mentioned above. This has been done quite deliberately on the part of designers as the performance of their amps has improved

AMPLIFIER DESIGNER ROUNDTABLE / BOB CARVER

in many important ways to become as perfect as solid-state amps. Against all odds, it was done with vacuum tubes, a far more difficult job than doing it with transistors, and only a small handful of creative and talented designers have been able to pull it off. Other designers have become so enthralled with the unique and inviting sonic signature of vacuum-tube amps that they have taken a uniquely different path for great sound. This is evidenced by the many remarkable designs that have very low output power, as well as individual frequency responses and distortion profiles that depend on each speaker they're used with.

What began about ten years ago as an interest in the simple intrinsic nature of tube amps has evolved into almost unbelievably passionate work to extract the most possible realism using vacuum-tube topology. We find that in order to evoke the absolute sound from our tube designs, we are forced to let go of long held and cherished ideas about what an amplifier should do. We find that we are no longer interested in facsimile reproduction; rather we find reproduction that sounds enchanting and real is far more interesting and serves our passions far better. In other words, we listen for something that *could* have been real somewhere in time and space, even if in the moment it's not in our living room. Great tube amps, against all odds, can deliver music with a majesty and sweetness that is truly difficult to believe.

You choose to work today with tubed amplifiers. What are the advantages you see to your chosen technology?

I design amplifiers with tubes as well as transistors, and in each case I have built my amplifiers so they present a musical performance that could have existed in another time and space. Since we are not there in that time and space, we can only infer that it represents the real world, and the best we can know is that the sound we hear is deeply satisfying and very moving. That's the secret.

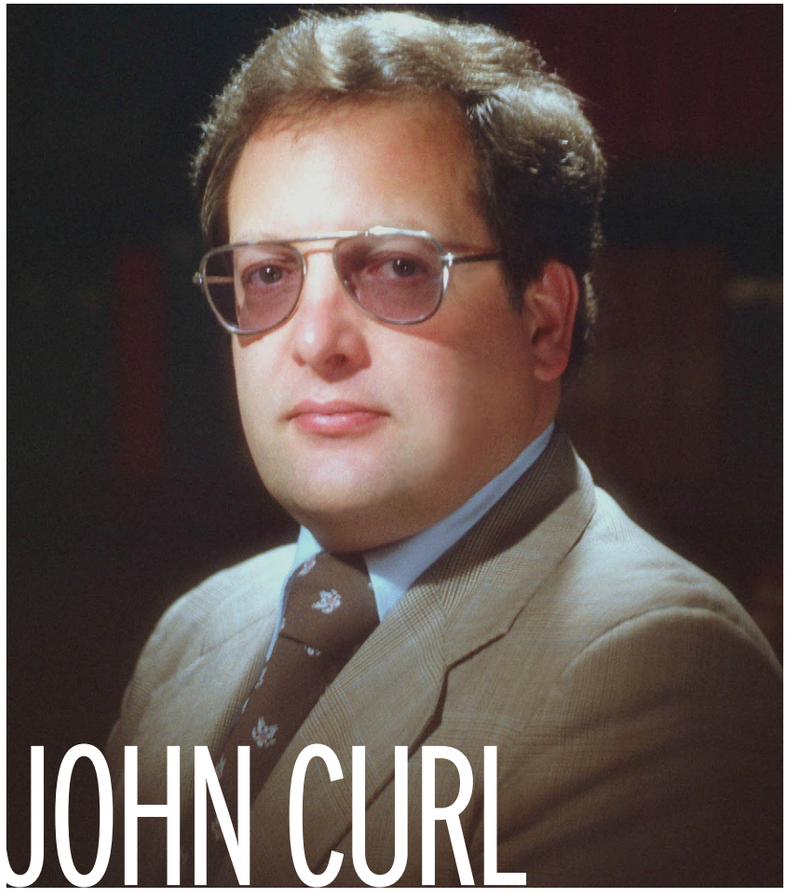
Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

For over twenty five years I have waited for Class D amplifiers to come of age. Each year I read the many scientific papers on the latest developments in switch-mode amps, and could not help but believe that just around the corner the promise of great sound and cool efficient operation would come true. I built many of them right here in my own laboratory with the thought they could and would fulfill that final promise. I was never able to build a Class D amplifier that sounded as good as a linear one. There are several obscure, yet easily understood reasons for this, and just as soon as I find the time I plan to return to my latest switch-mode design and try one last time before this year is finished! I have not given up yet.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

Your last question is the most intriguing one for me; has our amplifier science reached its zenith? Of course not. There is always that next step; everything changes in science and audio, and the next amplifier design changes everything.

AMPLIFIER DESIGNER ROUNDTABLE / JOHN CURL



Some version of hybrid Class A and Class D looks like the future in optimum audio design.

John Curl has been designing high-end audio electronics almost since there was an American high-end. He earned a degree in Physics with a minor in Electrical Engineering in 1966. After designing the sound-reinforcement system for the Grateful Dead in the late 1960s, he worked as a design consulant to Mark Levinson Audio Systems where he created, among other products, the seminal JC-2 preamplifier. He has spent the last 40 years as a design consultant to a number of high-end companies including Parasound, Audible Illusions, and Constellation Audio. His Vendetta Research SCP-2 phonostage is considered one of the great breakthroughs in phono reproduction.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

Preamplifiers and power amplifiers have only modestly improved in quality over the last 10 years, at least the analog designs that I work with. The reason is the limitation of development of even more advanced active devices that can be utilized for superior audio products. In fact, most active devices normally used in audio have been discontinued, and poor quality or expensive equivalents have been introduced to replace them, instead. IC's have evolved, but not in any revolutionary way, in my opinion, for the last 10 years.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

I think it is mostly improvements in the power supplies and the capacitors used for both tube and solid-state products that make the difference, and make tubes and solid-state actually sound more similar.

You choose to work with solid-state amplifiers. What are the advantages you see to your chosen technology?

I choose to make solid-state analog circuitry, exclusively. I design Class A if possible; Class AB for a power amp output stage is most practical. I just push the limits as much as I can without overheating.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

Class D has improved considerably over the last ten years. Some version of hybrid Class A/D looks like the future in optimum audio design. For me, I will stick mostly to analog, but in future, we will run out of quality audio parts and some version of Class D will be necessary.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

No, amplifier design continues to be improved on. When we ultimately go to hybrid Class A/D designs, we will have both relatively light weight, high power, low heat, high efficiency, and extremely high-quality audio designs that will win listening contests, much like sophisticated turbocharged auto engines have replaced the muscle car engines of the past.

AMPLIFIER DESIGNER ROUNDTABLE / CRYILL HAMMER

We are deeply convinced that the technically better amplifier–this implies also better measurements results–does sound better.

Cyrill Hammer was born 1965 in Switzerland and earned Master of Science in Electrical Engineering and Economics degrees at ETH Zurich. Before he joined his family business (Spemot AG) in 2002 Cyrill was active in several management positions for Swiss SMEs and as a business consultant with BCG, focusing on strategic repositioning of major financial services institutions and telcos. Within Spemot he manages and develops the new business unit, Soulution.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

We have seen a tremendous improvement over the last ten years. New companies like Soulution have introduced unconventional, innovative, and better approaches to resolve several technical issues of the amplification process that have never been considered before.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

The understanding of how a high-end system should sound has considerably evolved. New products which have pushed the envelope showed that there is more to be expected from amplifiers than the old stereotypes of solid-state products being powerful but less musical, whereas tube amplifiers are claimed to be more natural sounding but are lacking control over the speakers. These products have clearly shown that all relevant virtues of the two approaches can be combined in one product without compromising in any dimension of sound reproduction. Over time, customers will get used to this new quality of listening and will generally expect that from products participating in the market. This automatically raises the bar in performance for all manufacturers and heavily fosters the convergence of solid-state and tube electronics.

You choose to work exclusively in Class AB solid-state. What are the advantages you see to your chosen technology?

Taking into consideration all aspects of amplification we are convinced that a properly done solid-state design is superior to its tube-based counterpart. We are deeply convinced that the technically better amplifier—this implies also better measurements results—does sound better. However, good measurement results, which are quite easy to achieve with solid-state amplifiers, do not in and of themselves automatically guarantee superior sonic results. Most measurements performed today for the assessment of audio components are done in the frequency domain. It is, of course, most important to have perfect behavior here, but it is only half the truth. Perfect performance in the time domain is no less important. This is especially true of amplifiers based on negative feedback. The theoretical concept of negative feedback is very powerful, and the simplified mathematical

AMPLIFIER DESIGNER ROUNDTABLE / CYRILL HAMMER

equations describing this concept do hold true. But they are only valid if the design addresses the limitations of the concept. The time delay from input to output must be zero! Obviously in real life this is not possible. There are two ways to deal with this problem. Either you just do not apply any negative feedback at all to your design (while giving up the advantages of the concept) or you do speed it up to the level (200MHz in the case of the Soulution 700 and 710) of a few nanoseconds of time delay from input to output, where timing errors are so small that they do not have any audible impact on the sound. Once you decide to go the latter way a whole bunch of new challenges suddenly arise. Thermal conditions, stability of supply voltages, high-frequency designs, noise induction etc., etc. With tubes as active components such designs would never ever be controllable and stable; they must be done with solid-state devices. The result of such a project is a product that seems to be ridiculously complex vis-a-vis the "simple" task of amplifying "slow" music signals. We at Soulution strongly believe that all of this is required to perform this task the best way possible.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

Several companies have already shown that it is possible to design Class D amplifiers with decent sound quality. However, if you want to have your product performing at the cutting edge it is not possible with today's known switching technologies. In order to come close to the performance of the best linear design we would need high-current semiconductors that provide switching frequencies of several MHz or even GHz. Even if this kind of semiconductor could become available at some point, such a design would still require a low-pass filter in the output with a cut-off frequency of about 0.5–1MHz and that also passes current peaks greater than 40 Amperes. Such a filter is not impossible to design, but would be very demanding and expensive.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

The best preamplifiers available today offer residual noise and distortion levels that are really minimal. We see some potential to further reduce the noise floor resulting in better soundstaging, and also in reducing harmonic distortions. This will lead to even more natural and realistic sound quality.

The design of a power amplifier is much more demanding. There has been more margin for improvement here and there still is. The Soulution Series 7 amplifiers were a real quantum leap when we introduced them in 2005. I do not expect that another improvement of the same magnitude will be possible; however, it could be quite substantial. We are currently working on several areas involving the power supply of these amplifiers with quite promising potential for improvement. Today we do not know when this new technology can be introduced to the Series 7 amplifiers. In any case there will be an upgrade path for existing products owners.

AMPLIFIER DESIGNER ROUNDTABLE / LEW JOHNSON

The sound of the very best tube and solid-state electronics is converging. This is not surprising because among serious audio designers there is a common goal of reproducing a musical event.

Lew Johnson - Bachelor of Chemistry, University of Minnesota 1968; Bachelor of Arts, University of Minnesota 1968; Ph.D. Economics, University of Washington 1972. Co-founder of conrad-johnson design, inc. 1977. Musical instruments attempted: clarinet, banjo, electric bass; mastered: none. Active in the audio industry for over three decades, both in private capacity as co-designer, co-owner at conrad-johnson, and in leadership positions in industry associations (AAHEA, CEA).

How much have preamplifiers and power amplifiers improved over the past decade, and why?

At conrad-johnson, we have made significant progress in the past decade. Circuit refinements have offered significant improvements. In preamplifiers, a new approach to the basic circuit design has enabled us to build on the quantum change in performance that we managed back in 1996 with our ART preamplifier. In amplifiers, ongoing improvements to the voltage-gain stages have resulted in more evolutionary progress. Much of the improvement in the last decade is attributable to the proprietary Teflon dieclectric capacitors that we helped develop, which have found application in both our amplifiers and preamplifiers. Unfortunately, these capacitors are very costly, limiting their application to higher-end products. We introduced these capacitors in our top models starting in 2003. We find that in recent years, a few other manufacturers have also begun to use similar capacitors.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

The sound of the very best tube and solid-state electronics is converging but with some ways to go yet. This is not surprising as among serious audio designers there is a more or less common goal of reproducing a musical event. There remains, however, some difference in approach between those who, like ourselves, seek to honor the musical performance (trying to preserve the emotional element of the music) and those who seek to replicate the "objective" details of the recording (tending to focus on minimizing distortion, maximizing bandwidth, etc.). Presumably the intent of the recording is to honor the musical performance, so ultimately these come to same objective, though from a somewhat different angle. I think this difference in approach accounts as much for the differences in character among electronics as the technologies employed.

You choose to work primarily in tubed circuits. What are the advantages you see to your chosen technology?

At conrad-johnson, we have worked in both tube and solid-state circuits, though certainly with tubes to a greater extent. Tube circuits offer several advantages. First, the size, heat dissipation, and cost of the devices tend to

AMPLIFIER DESIGNER ROUNDTABLE / LEW JOHNSON

dictate relatively simple circuits, and our experience is that simple circuits sound better. Second, tubes are inherently superior voltage-amplifying devices. Typically a tube voltage amplifier with no feedback is roughly an order of magnitude more linear than a solid-state device (the transfer function is about 1/10 as curved). This is simply because they operate comfortably at much higher voltages, making the output voltage a much smaller percentage of their range (a shorter segment of a curve is a better linear approximation than a longer segment). To get around this problem, transistor circuits usually involve more elaborate circuits (see first point above) with more devices and heavy-handed application of negative feedback which has its own drawbacks. Finally, vacuum tubes produce predominantly even-order distortion, which is musically related to the original tone and thus unobtrusive. (FETs share this property with tubes, but, like bipolar transistors, are less linear than tubes.) That said, I personally believe that the greatest strides in amplifier circuits will be in hybrid circuits with solid-state devices employed to do what they do best (current gain). We have had already had considerable success with such circuits.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

I tend to think that Class D circuit design is an approach best relegated to producing low-cost, physically manageable multichannel amplifiers—where one might accept some compromise in sound quality for the sake of squeezing five, six, or seven 100 watt channels into one moderate-sized package for a budget home-theater installation.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

On more than one occasion I have thought that we had reached the zenith of design and that further improvements would only be marginal in nature. In each case this period of malaise was soon followed by truly exciting breakthrough developments resulting from new materials technology and new insights into circuit design. There is ample historical precedent for this kind of self-deception. In the early 1900s, the Edison company conducted live vs. recorded demonstrations of its new Edison Diamond Disc recordings played back on spring-motor-driven Edison acoustical phonographs. Listeners swore they could not distinguish the live performance from the recorded one, implying that any further improvements would be marginal. We see that position as laughable today, even though it recurred in the 30s, and in the 60s, and with "perfect sound forever" in the 80s. In reality, it is still the case that playback of a recording rarely fools the careful listener into perceiving it as live. There is still plenty of room for improvement throughout the audio chain and no doubt we will continue to see that improvement in the coming decade.

AMPLIFIER DESIGNER ROUNDTABLE / VLADIMIR LAMM

VLADIMIR LAMM

The advantage of single-ended topology using triodes lies in the real possibility of achieving the level of sound reproduction that closely approximates the actual sound of live instruments in space.

Vladimir Lamm was born in the former Soviet Union and holds an M.S. in Electronics and Solid-State Physics. He was a professional table-tennis player; for many years played in a symphony orchestra; was involved in the Russian Space Program; studied psychoacoustics in depth; developed a theory called Absolute Linearity of the System, on which his audio designs are based with predefined and predictable parameters (eliminating the need for a trial-and-error approach to design). Founded Lamm Industries, Inc. in 1993.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

I believe that I have dealt with this question to some extent in my answers to questions 2 and 5. I would just like to note that in light of a very rapid growth marked by the proliferation of increasingly affordable digital technologies, audio equipment has been enriched with various features, the implementation of which would've been quite problematic as recently as 15–20 years ago due to price and overall dimensions.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

Partially. The improvements that have been made on this path are in generally related to a couple of aspects: (1) a growing understanding of the necessity to re-examine the role of feedback in the audio path, with such awareness itself already providing an opportunity to scratch at least the tip of the iceberg; and (2) a gradual realization by the engineering community that the interaction between a man and a sound-reproducing system takes place on many levels—those that have already been studied and supposedly understood, as well as those that are largely unknown and mostly hidden from us for the time being.

You choose to work primarily in tubes, but you have produced single-ended tube and solid-state Class AB designs. What are the advantages you see to each of these technologies?

I am working with tube, solid-state, and hybrid technologies utilizing single-ended (Class A) and push-pull (Class A and Class AB) topologies. However, my personal preference is for the single-ended topology that employs vacuum triodes in the output stage. The advantage lies in the real possibility of achieving the level of sound reproduction that closely approximates the actual sound of live instruments in space.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

No, it is not. And I would like to respond to the second part of this question with an allegory. Any field of human activity defines a number of requirements which, when properly implemented, guarantee a positive outcome. For example,

AMPLIFIER DESIGNER ROUNDTABLE / VLADIMIR LAMM

the basic requirement in the army and sports is an able-bodied individual. So, it would be quite natural to concentrate on searching for such an individual (especially as we know where to find him). However, out of the blue we decide to choose a feeble-bodied person who, on top of that, is encumbered by various diseases. Having made this decision (which is *a priori* improper) we start justifying it to ourselves and others by citing the great state of our medicine, which is capable of curing many ailments.

Of course, this allegory illustrates the utilization of Class D topology in high-end audio only. There are many technical applications in which implementation of high-efficiency power amplifiers is not just very desirable but sometimes *the* only reasonable solution.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

For the sake of brevity, I will once again use an allegory. We know the names of great masters—Amati, Guarneri, Stainer, Stradivari, etc.—who became universally known and respected for their unparalleled creations of bowed string instruments. These instruments have passed the test of time, which is generally a determining factor in evaluating the real worth of any object and/or idea. In this day and age, while possessing very impressive scientific and mathematical knowledge, along with access to powerful technologies, we nonetheless can only approach the previously accomplished mastery level when producing the same type of instruments.

Please note that whether we are talking about musical instruments or electronic audio equipment, we are dealing with devices that interact with the human structure itself—in all its complexity. I think that if future research in the field of high-end audio will take this—and all related factors—into consideration, and begins work in this vein, we can expect very interesting and serious results.

AMPLIFIER DESIGNER ROUNDTABLE / FUMIO OHASHI

Simply put, solid-state (vs. tube) offers the designer finer control of the musical signal. This is particularly valuable in music with complex waveforms such as classical.

I built my first amplifier in junior high school. Back then, it was about my love of music, as it is today. After majoring in electronic engineering, I worked at Nagaoka, a manufacturer of phono styli and head amplifiers. There I learned about signal conveyance at extremely low levels. Eight years later I went to Luxman and after another twenty years, became Luxman's chief engineer. It was great preparation to start BAlabo where «Sky is the Limit» is our maxim.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

A great deal. Why? Because it was ten years ago we founded BAlabo! But seriously, you can observe that many of the companies at the extreme high end have been founded within the last decade. There is probably not a precise metric to quantify "how much" other than to say that improvements have been realized across the board in resolution, musicality, usability, and aesthetics.

At BAlabo, we have endeavored to push our vision of what is possible in each of these areas. Although analog circuit design has evolved very little in the past 30 years, there is much room for improvement in implementation of these circuits. Interestingly, and this is a key point, *improvements in specifications do not always equate to better sound*. Therefore, not only do we measure, *we listen*. Individual parts selection is done by thousands of iterative listening trials. Our process includes tireless examination of materials, including lead length and gauge in every resistor, capacitor, transformer, and hookup wire. In the end, every single part inside our components is custom-made. We have nurtured our relationships with parts manufacturers to get exactly the products that we specify. Then there is circuit topology. Best practices in shielding and micro-signal grounding are widely observed, but the designer's experience and intuition still play a dominant role. Altogether, the fine-tuning process, even after the main circuit and chassis designs are complete, takes us two to three years.

This extreme effort is devoid of the primary concern that many "established" manufacturers must live by—keeping the cost of the parts low. That's not a primary consideration at BAlabo. The result is a component that offers an audio experience unique to our brand, that cannot be copied or imitated, and can be immediately appreciated by the discerning audiophile.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

Yes. I believe that the *primary* principle that guides this convergence is the designer's prowess combined with his ability to judge good sound, whether tube or solid-state. Personally, I'm not a fan of either the 300B or KT-88 tubes.

AMPLIFIER DESIGNER ROUNDTABLE / FUMIO OHASHI

You choose to work primarily in solid-state Class AB. What are the advantages you see to your chosen technology?

Simply put, solid-state (vs. tube) offers the designer finer control of the musical signal. This is particularly valuable in music with complex waveforms such as classical. Even the best tube designs begin to have difficulty with full-scale orchestral and symphonic music. This is most evident in power amplifiers, as most listeners know, but during critical listening, even tubed preamplifiers will fall short of the best solid-state in control, structure, and individuation of instruments in a large and complex soundfield.

We chose Class A transitioning to AB because it offers the best of each technology. Class A improves low-level crossover distortion and Class AB offers vigorous sound quality with explosive dynamics. Guided first and foremost by sound quality and after many listening trials we decided on the optimal "crossover" point for the handoff between Class A and AB. Interdependent variables include the size of the power supply, the amount of current used in the output stage, and the type of output devices. These all react dynamically with one another and must be carefully designed in harmony and with ample headroom. The larger size and heat dissipation characteristics of pure Class A designs were considered negative factors in targeting a 500Wpc amplifier.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

No. Class D can't really be considered for super-high-end performance in its present stage of development, although it can be fine for mid-market products. In the future Class D may have some promise if the carrier signal can be stripped away without affecting the sound quality. This could mean larger and heavier devices in the output stage though—thus defeating some of the practical advantages of Class D.

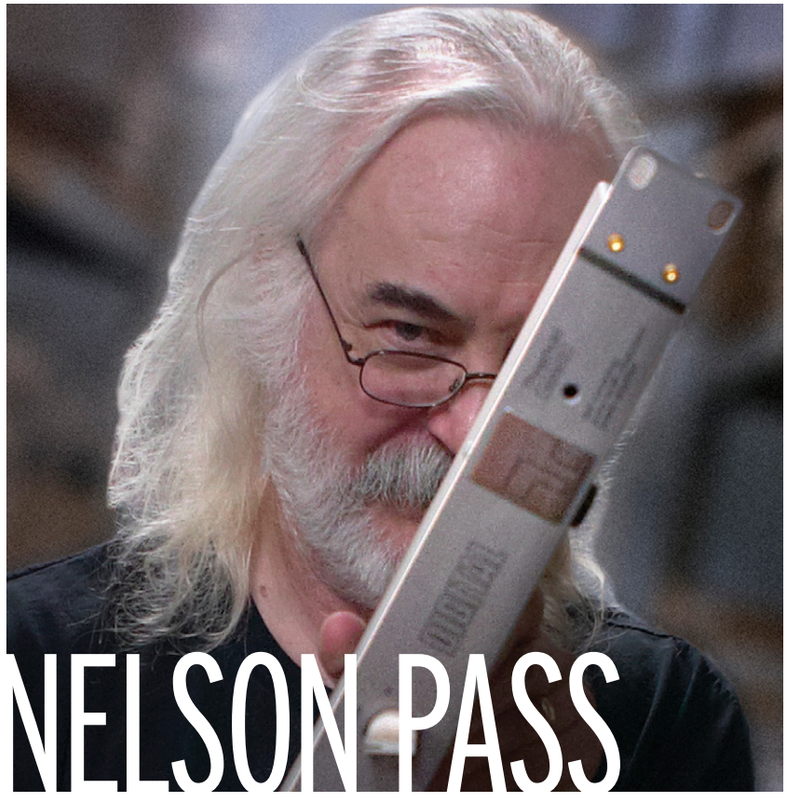
Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

There is no limit to performance improvement in the analog world. An engineer should always aggressively pursue better sound and *never* consider a design to have reached its zenith.

There are still many conditions that are not readily measureable that affect the quality of sound. In the future, one thing I would look toward is the ability to control the direction of spin of the electron. This level of control would help to eliminate some of the random variations we hear when similar parts sound different from one another.

On a related precursor, the recording industry should also take drastic measures to improve the signal conveyance chain through the mastering process in order to preserve the signal between source and consumer storage media. Once signal integrity is lost, it can never be restored no matter how good the playback devices.

AMPLIFIER DESIGNER ROUNDTABLE / NELSON PASS



NELSON PASS

The last ten years have once again demonstrated that high-end amplifiers with part-per-million distortion numbers and other superlative specifications are not very popular. It's like pure distilled water—it has no character and most people don't want to drink it.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

The last ten years have once again demonstrated that high-end amplifiers with part-per-million distortion numbers and other superlative specifications are not very popular. It's like pure distilled water—it has no character and most people don't want to drink it.

If there has been progress, it has been where the subjective character has been refined in the service of the listener's experience. To paraphrase McLuhan, we are turning our mature technologies into art.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years?

No, just the opposite. Anything resembling convergence to objective neutrality occurred in the late 60s and early 70s, and since then tubes and solid-state have diverged, catering to different needs and tastes. Tube preamplifiers have assumed a popular role—warming up the sound when mated to a solid-state power amplifier. You could speculate that this results in a subjective neutrality in the ears of the listener.

You choose to work primarily in solid-state/single-ended Class A. What are the advantages you see to your chosen technology?

At some point in the past I lost interest in complex amplifiers, so now I enjoy extracting really good sound from simple amplifiers. This naturally leads to solid-state Class A, where I can make a good-sounding low power amplifier with as little as a single FET and a light bulb.

And I do.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

Does a $10 bottle of wine compete with a $100 bottle? Of course it does, and it often wins based on price. Right at the moment Class D designers seem to be still focusing on the objectively measured performance of their amplifiers. I expect that at some point the economics of the marketplace will encourage them to pay more attention to the subjective qualities, and then they will probably play a greater role in the high end.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

I am optimistic. I think the power amplifiers will be mine, and the preamplifiers will be Wayne Colburn's.

AMPLIFIER DESIGNER ROUNDTABLE / JÜRGEN REIS

When speaking about the top high-end companies, you can say globally that tubed electronics are more neutral and solid-state electronics are more coherent and less sterile than twenty years ago.

Jürgen Reis has always played and listened to music. At University, he studied Electro-Acoustics and Electrical Engineering. Jürgen became Chief Engineer at MBL in 1984 when he invented the carbon-fiber radial tweeter. Since then, Jürgen has been responsible for the technique and sound of all MBL products. 2012 marks his 30th MBL anniversary. Jürgen doubles as a recording engineer (in the studio he built), shreds on electric guitar, sings in a chorus, and cycles.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

Wow. Broad question. Volumes have been written about this. Simply put, I think this is a secondary benefit of the great improvements in loudspeakers and some recordings, and these two facts have given engineers better tools to improve the quality of preamplifiers and power amplifiers.

The very, very small parts make a huge difference, especially in the preamp—for example, a resistor with brass, copper, or steel "holders." Today you can hear large differences between small parts and their construction materials that were not so easily apparent ten or twenty years ago.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years? If so, what accounts for this trend?

Yes they have. When speaking about the top high-end companies, you can say globally that tubed electronics are more neutral and solid-state electronics are more coherent and less sterile than twenty years ago. The differences between them are shrinking.

Why? Designers have much more experience now than ever before, and both sides are listening to the other's electronics—tube guys listen to solid-state and vice versa.

You choose to work primarily in solid-state Class AB. What are the advantages you see to your chosen technology?

Bigger question! I work in lots of techniques, A, AB, now Class D, as well. I have two main reasons why I don't like to work with tubes. MBL products are designed so that our customers have a long enjoyable time with their gear, and changes come slowly and carefully. Tubes are constantly aging and changing over time, and the differences between several tube manufacturers and factories are large—even today—so any time they change the manufacturing spec, tooling, material, etc. the behavior and sound will change and I would have to completely change my design to accommodate the change in the tube to maintain the sound I want the customer to enjoy.

Also, with tube designs you mostly have transformers at the output and often at the input. Transformers have a huge influence on the sound quality. Quality control of transformers is very difficult to maintain, so that next year you get the

AMPLIFIER DESIGNER ROUNDTABLE / JÜRGEN REIS

same iron and copper on the windings as you did this year or last year. It's much more difficult to have a tube amp sounding the same this year and last year, if you are planning for a constant sound.

With solid-state, the circuits are more repeatable. You can better control the quality, so next year's products will sound very similar to or the same as last year's. This stability is the main reason I choose solid-state.

Between classes, you must understand the principal differences. Roughly, if you can comprehend what causes the main differences, you can build a "hybrid" of Class A and Class AB. MBL preamps run Class A up to 7 volts, and in our Reference power amps the signal quality is determined by Class A, and is sort of "swimming" on a Class AB power supply. I prefer the sound of Class A, but you can design Class AB circuits that sound similar at high and low levels. With solid-state vs. tubes, you have different circuitry for the plus and minus, and this always sounds different when you change the polarity of the sinewave. With Class A, you don't have the differences between positive and negative voltage swings. With PNP and NPN transistors you always face the problem of dealing with different times of charge and discharge; in one direction you always have too much current, the other, not enough. With Class A, you eliminate this crossover.

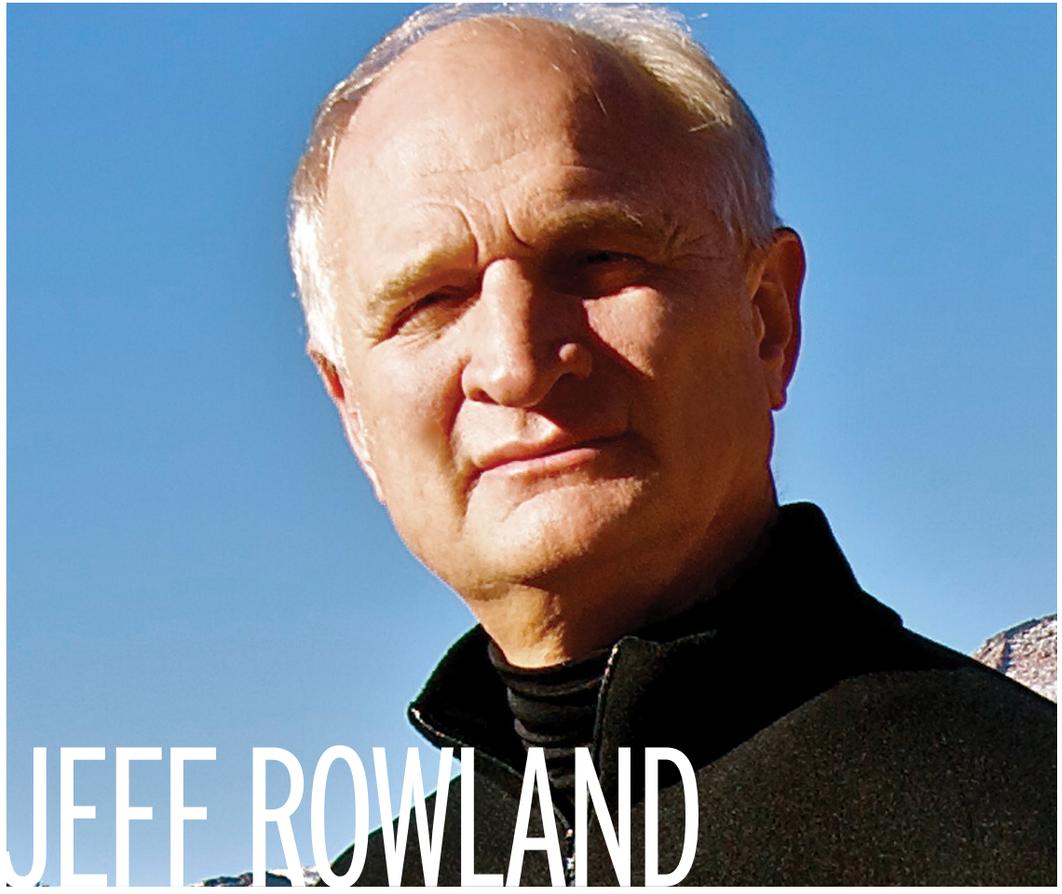
Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

I have worked a lot lately with Class D. Ninety-nine percent of Class D circuits are not competitive with linear circuits. There are some exceptions and, of course, I like to think the new MBL Corona Line is one of them. At CES this year, I heard a few other Class D designs that I thought sounded good. In three years, we might have five-percent sounding okay and ninety-five percent sounding poor. Look at solid-state thirty or forty years ago—it sounded awful compared to tubes. We had no idea why the tubes sounded more "pleasant" to the ear in some areas, even though they had 100 times the distortion. It took many years to understand. Only companies that deal with both sides can develop an understanding. Most Class D sounds sterile. It's tricky to figure out what to do to compensate for that.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

The next decade will produce better-sounding preamps and power amps, but perhaps not as large-scale different as in past decades. I am always working on something better, more natural, more human, more coherent, more lifelike.

AMPLIFIER DESIGNER ROUNDTABLE / JEFF ROWLAND



Strict adherence to a class designation for an audio designer is like asking a painter to reduce the number of colors on his palette. The end result may be less vivid than you had hoped for.

"How does this work?" Asking this question, at age 12, led to my lifelong devotion to uncovering the mysteries of electronic design. My background includes working as an engineering assistant with Ampex Corp. and studying electronic engineering at the DeVry Institute. I formed Rowland Research in 1981 which became Jeff Rowland Design Group in 1987. Since then, I have developed more than 35 critically acclaimed audio components that are now enjoyed by countless listeners around the globe.

How much have preamplifiers and power amplifiers improved over the past decade, and why?

First, let me thank *The Absolute Sound* for including me on this august list of designers. I consider it both an honor and a privilege.

I've been an audio designer for 40 years and never in that time have I felt a greater sense of promise for the future of high-end audio. Recently, it's been my pleasure to hear a number of sound systems I believe are approaching true greatness in audio reproduction. The possibility that audio components may soon capture all the emotional power of live music is a dream never closer to being realized.

Our reference system at Jeff Rowland Design Group is revealing to such a degree that it seems eerily capable of transporting the listener to the musical event itself. Understand, our reference system is a collaborative work, featuring components and design ideas from a wide range of audio engineers. With our continued collective devotion to musical fidelity over time, I see no limit to the compelling listening experiences yet to be enjoyed.

There are many purely technical reasons audio designs are improving. For example, my company's current designs benefit greatly from electronic parts unavailable until quite recently. However, it is also true that designers themselves, in this relatively young industry, have grown more mature and capable.

New components, technologies, and design concepts are just pieces of a greater puzzle. It takes years to understand the complex relationship between component parts and the end product. Audio design is an art form that requires a lifetime to master. There are no shortcuts.

Have the sounds of tubed and solid-state electronics converged toward a common neutrality in the past 20 years?

I believe there is a trend toward the creation of a more natural representation of the original performance. This seems to represent the overarching aim of all audio designers, whether working with tubes or solid-state. We are all trying to climb the same mountain. Our paths may be different, but I believe we certainly respect one another's efforts.

You choose to work primarily in solid-state Class AB and in Class D. What are

AMPLIFIER DESIGNER ROUNDTABLE / JEFF ROWLAND

the advantages you see to your chosen technologies?

Over my career I have designed using a wide variety of technologies. I prefer to believe that my work displays a willingness to explore audio design regardless of class designation. While my basic design goals seem best suited to the solid-state domain, I am not overly concerned about which class of technological platform I work within. You might say I am a proponent of the classless society of audio design, taking the best that each has to offer in an attempt to create the finest components possible.

Is Class D competitive with linear designs in sound quality, and if not, will it ever be?

I consider Class D to be highly competitive in the present, and to offer an evolutionary pathway of audio design that may produce even more astonishing results in the future. Again, it is not a matter of class distinction. The application of technology is what is important. It can produce brilliant or poor results depending on its implementation. Strict adherence to a class designation for an audio designer is like asking a painter to reduce the number of colors on his palette. The end result may be less vivid than you had hoped for.

Has amplifier design reached its zenith where further improvements are marginal, or will the next decade produce even better-sounding preamplifiers and power amplifiers?

Although high-end audio is a relatively young industry, many high-end products from mature companies have achieved our longtime shared objectives. These current products are beautiful and reliable, and offer exceptionally high performance and pride of ownership.

However, I'm confident that much remains to be discovered. Engineering is a discipline that seems to move in fits and starts. There are slow periods followed by incredible breakthroughs. Science and art have always been restless bedfellows, but when they come together it can be breathtaking and worth the wait. We can never truly appreciate the next level of art and design until we actually arrive.

The passion for discovery is a silent but powerful motivator for both science and art. The art of engineering is especially exciting as we have the opportunity to daily manifest abstract ideas into reality. Through our passion for our work we can hope to inspire the next generation of designers and listeners on their own journeys to musical revelation.

EQUIPMENT REVIEWS

Integrated Amps & All-In-One Systems

Marantz PM8004 Integrated Amplifier

High-End Sound at a Real-World Price

Paul Seydor

I had a satisfying experience of *déjà vu* upon unpacking the new Marantz PM8004 integrated amplifier, companion to the company's SA8004 SACD/CD player about which I waxed so enthusiastically in TAS 211 (and Product of the Year Award winner in Issue 219). Like the digital player, the new integrated is priced at a reasonable $999 and inspires the same impression of real "quality goods," beginning with its weight, a hefty 27 pounds owing to the beefed-up chassis to help damp resonances and the substantial toroidal transformer. Styling is contemporary industrial, the severity of the black chassis softened by curved side cheeks and large feet claimed to help isolate it from external vibrations. Setup, even easier than the SACD/CD player, is so intuitive novices could almost bypass the manual. Scarcely five minutes elapsed between slitting the tape on the shipping carton and playing music.

There are several unusual aspects to the design for a component at this price. For one thing, quite a number of discrete parts (as opposed to integrated circuits) are employed throughout. For another, Marantz claims the 70Wpc amplifier section can supply over 25 amps of current for momentary bursts. Third, there is a built-in moving-magnet phonostage, again with all-discrete circuitry. And, fourth, while it's not unusual to find integrated amplifiers with bass and treble tone controls, this is first I've seen in about forty years to include a *midrange* control (about which more anon). Attention to quality parts extends to the heavier-duty-than-usual speaker jacks on an amplifier in this price range. The usual complement of inputs and outputs are here, including preamp-out/amp-in jacks and a front-panel "source-direct" button to bypass balance and tone circuits. A front-panel headphone jack is also provided. The remote handset will operate the SACD/CD player as well; together the two components make a matched "stack" to form the nucleus of a very fine two-channel system.

The PM8004 has a sound that reflects its genre: a solid-state amplifier of medium power, fully contemporary in design, that is tonally neutral, clean, clear, transparent, very low in perceived distortion and noise, rather more dynamic into low-efficiency speakers than its power rating might suggest, with nothing of tube personality as it is conventionally understood, including even the smidgen of warmth I detected in the SA8004. Its presentation invites adjectives such as "uncolored," "impartial," "even-handed" as opposed to "tasty," "magical," or "characterful." Putting it this way I by no means wish to suggest that it's cold, clinical, edgy, grainy, or uninvolving—it's none of those but neither does it have a particularly identifiable tonal "personality" as such. This is typical solid-state circa 2011, not thirty or forty years ago.

Which means among other things that it boasts considerable resolving capability, something I discovered early when I played Mitsuko Uchida's coupling of Beethoven's Opus 101 and 106 ("Hammerklavier") sonatas. Although both pieces were recorded in the same venue, it's obvious the setup was changed from one piece to the other, the 101 closer, higher in level, with less atmosphere and air. Of course even a modest system will reveal the differences, but the Marantz combination revealed them at once and unmistakably. I also appreciated how at low listening levels when Uchida plays really softly the atmosphere does not tend to dry up slightly as can happen with less than adequate resolution.

Whenever I review an integrated amplifier of moderate power I usually begin by testing its mettle with big stuff like operas and nineteenth-century symphonies. The "Forging Song" from the Solti *Siegfried* held no terrors for the Marantz, which placed Siegfried back and center, the hysterical Mime running about as the sword is beaten, both positioning and choreography rendered with great precision and stability. The sledgehammer and anvils the producer John Culshaw procured to simulate the forging can really frazzle some amplifiers, but the PM8004 reproduced them cleanly without letting go, as it were, of the orchestra behind and around them. And all this driving my inefficient Quad 2805s.

Even more impressive in some respects is the recording of the Mahler Fifth by Frank Shipway and the Royal Philharmonic Orchestra. Dynamically this is one of the most astounding recordings of a Mahler symphony I know, all up and down the frequency range, with see-through transparency. In the hair-raising opening of the second movement, with shrieking strings and piercing brass, the physical force and immediacy of the presentation practically knock you sideways, yet the sound of

EQUIPMENT REVIEW - Marantz PM8004 Integrated Amplifier

the orchestra remains at all times very beautiful and truthful in timbre.

Throughout the evaluations the PM8004 kept surprising me by how really wide its dynamic window could get. This is a very large statement, especially if you stop to consider that I began the review period immediately following that for the fabulous Ampzilla 2000 monoblocks rated at 300 watts and costing $3750 each. No, the Marantz is not as "good" as the Ampzillas—very few amps are—but never did the contrast (or come-down, if you insist) leave me feeling deprived.

The PM8004 also acquitted itself on completely different repertoire. The Anonymous Four's new *Silent Voices* is projected with the producer Robina Young's typically golden mean of clarity and focus on the one hand and atmosphere and blend on the other. The program was recorded in two different venues and there was no mistaking this with the Marantz. Sitkovetsky's string orchestra version of the *Goldberg* Variations came three-dimensionally alive across the front of my listening room. The illusion of Alice Sara Ott's piano being in the room, albeit with inevitably reduced size and volume, was thrilling from her sensational new recording of Liszt's *Transcendental Etudes*.

The same virtues of tonal neutrality, wide dynamics, and low distortion and low noise extend to the exceptionally smooth-sounding phonostage. Right at the moment I have neither a high-output moving-coil nor a moving-magnet pickup, so I used an Ortofon Windfeld through a Quicksilver transformer. With no music playing, I cranked the volume control all the way up and heard *nothing* at my listening chair. Very few phonostages at any price, even in this day and age, can pass a test like that. Obviously not a tossed-in afterthought to generate sales, this phonostage is competitive with some others I've heard costing as much as the entire PM8004.

The tone controls are exemplary of their kind. By this I mean that the bass and treble turnover frequencies are confined to the extremes: 50Hz and 15kHz. This indicates, among other things, that it's almost impossible for them to make an unmusical contribution to the sound, because they leave the upper bass through the mid-treble unaffected unless you apply a really heavy hand or have no taste. I actually found myself using the bass control quite a bit. My Quads are not supposed to have any low bass, but in fact they are specified as being only about 6dB down in the mid-thirties. Boosting the bass to a moderate two o'clock setting lent a pleasing and natural weight, richness, and foundation to the presentation without any thickening in the mid and upperbass or the lower midrange, an effect I enjoyed so much that for long stretches during the evaluations I just left it there.

On the aforementioned *Goldbergs,* the one doublebass in the complement of strings sounded appropriately big and present, while the basses, tympani, and bass drum in the Mahler certainly exhibited a satisfying crunch. Such are the benefits of tone correction properly designed and implemented. And it says much for the strength and stability of the amplifier section that it could sustain such grip, control, and projection at these low frequencies while driving an inefficient speaker.

By the same token, the treble control would prove very useful in taming the rising top end of far too many moving-coil pickups and contemporary loudspeakers. Such as are the benefits of well-designed tone controls.

But what about that midrange control, here centered at 900Hz? In the old days these used to be called "squawk" controls, and for good reason. Marantz's literature says its function is to help correct for midrange dominance from iPods and other such devices. As I hardly ever listen to iPods, I can't comment. What I can say is that the Marantz's has been very conservatively designed, starting with restricting the range of adjustment to a 12dB swing (i.e., +/6dB), as opposed to the 20dB range of the bass and treble controls. Provided you use a *very* light hand, it can bring the presentation forward without making it nasal or honky or, alternately, push it back without creating an obvious suckout. A number of mini-monitors, for example, have a projection in the 1kHz range in order to make them sound more open and efficient. If this bothers you (and it sometimes does me), the midrange control here could be just the ticket. It's also instructive: If you've ever wondered how much the reproduction of depth is a function of frequency response, play around with a midrange control like this one. Just a slight reduction (say, to eleven o'clock) and suddenly there is "depth." And also, of course, mischief if you don't know what you're doing.

There has been a lot talk lately about the amount of coverage TAS allegedly gives to outrageously priced audio gear. Fair enough, but I don't believe that even a cursory glance through the contents of any given issue will support the charge that we ignore moderately priced equipment. There has never been a time in the history of high-end audio when you get more sheer value for your dollar than right now when it comes to moderately priced electronics such as these 8004 Series Marantzes. They are good enough to let you put the lion's share of your hard-earned audio budget where it really counts, which is toward speaker systems, without having to feel that you've compromised in any essential way when it comes to reproducing music in your home. tas

SPECS & PRICING

Power output: 70Wpc into 8 ohms, 100Wpc into 4ohms
Preamp out: 1.6V into 600 ohms
Inputs: Amp direct, 1.6V/15k ohms; phono, 2mV/47k ohm; high-level, 200mV/20k ohm
Tone controls: Bass (50Hz +/10dB), mid (900Hz +/6dB), treble (15kHz+/10dB)
Dimensions: 17 3/8" x 5 1/8" x 14 15/16"
Weight: 26.9 lbs
Price: $999

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Rotel RCX-1500 CD Receiver

Your Digital Audio Concierge

Neil Gader

Rotel calls the RCX-1500 CD receiver the "most versatile component we've ever offered," and I don't doubt the claim. The RCX-1500 is a veritable multi-tasking, digital Grand Central Station. All comers welcome. Whether you want to play back a USB thumb drive or tap the RCX-1500's high-performance Wolfson 24-bit/192kHz DAC via digital inputs, you're covered. Want to wirelessly stream music from your laptop or just peruse the gazillion offerings on Internet radio? No problem-o. CD more your thing? The smooth, slot-load-drive adapted from Rotel's excellent RCD-1520 player has got your back. The RCX-1500 is like a digital audio concierge—the consummate greeter who never gets ruffled and always has the answer.

The RCX-1500 may be a technological pack mule, but its brushed-aluminum looks are both handsome and unassuming. On the power side the amplifier boasts 100Wpc via Rotel's Class D design, which when paired with Rotel's legendarily beefy transformers will easily handle lower-impedance speakers down to 4 ohms. I can imagine users feeling a little intimidated by the mission-control-like front panel. The array of aluminized buttons *is* a bit overwhelming, but there is logic to the layout—inputs to the left, playback functions to the right next to the slot drive, and additional menu functions at the upper right. However, the remote control needs modernizing—calling it adequate is being generous.

Where the RCX-1500 departs from the traditional textbook CD-receiver is in its range of digital-audio connectivity. The Rotel's tuner section expands beyond terrestrial FM/AM to include Internet radio, plus access to premium music services like Pandora, AUPEO, and SiriusXM. Thankfully, the RCX-1500 includes thirty user-selectable presets to recall preferred stations. The front panel houses a USB input for media storage devices ranging from thumb drives to iPod and iPhones, plus a mini-jack for headphones. On the back panel is a pair of digital inputs, coax and optical, as well as a USB Ethernet port for streaming Internet radio.

Streaming capability is supported by UPnP (Universal Plug 'n' Play) technology that has been optimized for PC use via Windows Media Player 11-12. Both wireless and wired LAN dongles are supplied with the unit. Once the RCX-1500 is connected, music begins streaming wirelessly and music playlists from your PC appear on the unit's front panel. Although Macs are not compatible with the latest Windows Media players, Apple users needn't despair. There's a good work-around using EyeConnect for Mac 1.6.7—a piece of third-party UPnP software that bridges the Apple/Windows gap. It was an easy download, its icon appearing in the bottom row of System Preferences. It identified the Rotel as part of my network, and I was off and streaming from my Airport Express. Supported codecs vary depending on setup, but include RealAudio, WMA, MP3, AAC and AAC+ (non-DRM), AU, WAV, and AIFF. However, 16-bit/44.1kHz WAV files were the preferred currency aboard my MacBook. If I created a playlist that had both AIFF and WAV files, my EyeConnected RCX-1500 skipped over the former and went straight to the WAV. Truth be told, not every electronic- or software-driven function on the RCX has the silky elegance of a Mac or a Meridian, but in this price segment no cheap shots are deserved.

The bonanza of Internet radio (15,000+ stations) and streaming services is both a blessing and a curse. Navigating the terrain a single alphanumeric button at a time is like trying to find a file in Dickens' Office of Circumlocution. However, Rotel offers a nifty Web site at rotelradio.com that allows personalization of favored digital audio sites. Just log in initially by entering the unit's registration key code, create a user name and password, and you're good to go. The site is highly searchable and selections will be saved to My Stations and My Streams within the My Stuff top-level menu.

Sonically, the RCX-1500 is comfortable with smaller floorstanders of moderately high sensitivity, but my sense is that the ever-popular stand-mount monitor will be its most common stablemate. And this was proven by the field day it had with a smartly designed Fritz Speakers Carbon 7, a robust two-way with musically warmish overtones, lush bass response, and smooth controlled highs. When putting on the Fritz, the Rotel had a neutral, inviting sound. The Rotel amp section provided a springboard for the Carbon 7 to launch low frequencies even at smack-down levels; it also offered good articulation and nimble responsiveness with jazz quartets or smaller orchestral ensembles. Images and staging were stable. The RCX-1500 handled virtually every audiophile criterion in a balanced, workmanlike way, which is essentially what I've come to expect from team Rotel. Tonally the unit was at its most richly expressive in the midrange. Winds and strings were smooth, brass lively. Transient response was quick though not hair-trigger. Dynamic energy from the upper bass onward was very good.

Mildly subtractive at the tonal extremes, the Rotel didn't open up fully in the top octaves. (There was a sense of image constriction, less air, and a lower ambient ceiling.) Though its midbass was rich and lively, the bottom octave was also dynamically dampened a bit, and big rolling

orchestral percussion tympani, bass drums, and the like tend to slightly thicken, although this is a characteristic that will depend on loudspeaker resolution.

As luck would have it, I had on hand for review the Wilson Audio Sophia 3. In the real world, this would be an unlikely pairing with the RCX-1500 (no letters of outrage, please), but at 87dB sensitivity this iconic full-range, high-transparency loudspeaker is a relatively easy load for most amps, as many Wilson speakers are today. Was the Rotel up to the challenge? It was. Actually these observations convinced me yet again that modern amplification, even at budget levels, is more than capable of eliciting very good performance from the most exotic speakers. Bass response was quite good with a warm combination of pitch, timbre, and impact. On an all-acoustic recording like *Appalachian Journey* [Sony] with its dovetailing violin, cello, and bass viol, some traces of image vagueness crept in, the soundstage narrowed, and the space and air between players was a bit compressed. The Rotel's greatest sonic vulnerability when driving the Sophias was a reduction in dynamic nuance (a primary Wilson Audio strength) and a general contraction of soundstage dimension, which, together, reduced ambient information. As with the Carbon 7 there was a hint of opacity on top, a lowered acoustic ceiling. Similarly, during Nils Lofgren's "Wonderland" on *Acoustic Live* I noted softened transient attack off his lively acoustic guitar.

In sum, while the RCX-1500 is not the final word in resolution, what shouldn't be overlooked is the consistency of its overall sonic performance across so many digital audio formats—quite an accomplishment in this price segment.

On another sonic front I took advantage of the opportunity to compare the Rotel's CD performance with the same tracks ripped to my MacBook's hard drive, first outputted via USB into a Musical Fidelity V-link convertor and then into the Rotel's S/PDIF connectors. The sonic results were close, but I gave a slight edge to the hard drive/Rotel S/PDIF combo vis-à-vis the Rotel CD player. On a track like Norah Jones' "My Dear Country" [Blue Note], for example, there was more ambience, cleaner transients and backgrounds, and essentially a stronger breath of life to the performance. This result should come as particularly good news for hobbyists leaning towards the server for source material.

Today it's not enough to market a receiver bundled with a CD player. Digital media and the Internet have seen to that. For a company to remain competitive, it needs to continually take the pulse of the market, as Rotel has. By adding cross-platform connectivity Rotel restores the venerable receiver to relevance. The RCX-1500 is nothing less than what I've come to expect from Rotel. I'd call it an old friend with benefits. tas

SPECS & PRICING

Power output: 100Wpc
Inputs: Analog, digital, USB, coax, and optical
Outputs: USB, Ethernet
Dimensions: 17" x 5.6" x 12.25"
Weight: 18 lbs.

Price: $1500

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NAD C 390DD Direct Digital Integrated Amplifier

Chip Off the Old Block

Robert Harley

It was only a matter of time before NAD brought the groundbreaking technology and architecture of its M2 Direct Digital Amplifier to a lower-priced product. The $6000 M2, which I reviewed in Issue 198, is unique in part because it converts standard-resolution or high-res digital bitstreams directly into signals that can drive loudspeakers. This approach eliminates from the signal path all the circuitry of a digital-to-analog converter, preamplifier, and most of a power amplifier, not to mention the interconnects, jacks, and wiring of separate components. Moreover, the M2 upended the traditional system configuration of a digital source feeding a preamplifier that then drove a power amplifier. With the M2, you simply connect a digital source to one of its inputs and loudspeakers to the output terminals. The unit's functions mimic a DAC and integrated amplifier, with source-switching and volume control.

NAD's new C 390DD brings the M2's technology and features to a unit costing less than half that of the M2. Significantly, the $2600 C 390DD adds some new capabilities beyond those of the M2, including extensive room-equalization functions as well as modular construction that allows you to tailor the C 390DD to your particular connectivity needs as well as update the C 390DD's hardware and software to accommodate technology advances. NAD calls this MDC for Modular Design Construction. In this era of rapidly evolving technology, it seems a no-brainer to provide an upgrade path through user-replaceable digital-interface circuitry.

In practice, the C 390DD has three rear-panel slots that will accept an optional input module (DD AP-1 Analog Line/Phono Module) or the module containing three HDMI inputs and one HDMI output (DD HDMI-1). Each optional module is $300. The analog-input board offers one stereo balanced input on XLR jacks, one unbalanced input on RCA jacks, and one phono input, also on RCA jacks. The phono input will accept moving-magnet or moving-coil signals. Because the C 390DD operates entirely in the digital domain, the analog input board performs analog-to-digital conversion. The sampling rate and word length are user-selectable, up to 192kHz/24-bit. The HDMI inputs are useful when using the C 390DD as part of a "2.0" or "2.1" theater system in which the soundtrack is reproduced by the left and right loudspeakers, foregoing a center channel and surround loudspeakers. Note that the rear-panel USB inputs (marked "Computer," on a USB Type B connector and a USB Type A jack for connecting a FAT 32 storage device) are also on a removable board (included as standard) to accommodate possible hardware changes in the USB format (or entirely new digital interfaces). A second USB input on the front panel will play music from memory sticks. All three USB inputs are asynchronous, and can accommodate resolutions up to 96kHz/24-bit.

A stock C 390DD provides eight inputs; a fully loaded unit sports a whopping 14 inputs. The fixed inputs (those integral to the C 390DD rather than being on replaceable boards) include two digital coaxial on RCA jacks, one AES/EBU, and two TosLink optical. These inputs can accept resolutions up to 192kHz/24-bit. Digital outputs are also provided on RCA and TosLink optical jacks. To keep this input flexibility from becoming overwhelming, unused inputs can be removed from the front-panel display and input-scroll function, allowing you to more quickly and easily select between sources. Each input can also be named by the user.

In addition to this wide array of inputs, the C 390DD offers a line-level output as well as a line-level stereo (or mono) subwoofer output. An onboard crossover can be engaged to split the frequency spectrum appearing at these outputs; the C 390DD thus functions as the crossover between the subwoofer and main speakers in a 2.1-channel system.

The C 390DD is rated to deliver 150Wpc into 8 ohms. As with other NAD amplifiers, this continuous power rating doesn't adequately reflect the C 390DD's real-world power delivery when reproducing music. Part of the C 390DD's generous dynamic headroom is owed to NAD's Digital PowerDrive circuitry, which automatically senses the loudspeaker's impedance and adjusts the amplifier's characteristics to more efficiently drive that particular loudspeaker load. The C 390DD also features NAD's Soft Clipping circuit, which gently compresses peaks that would otherwise clip. If you overdrive the amplifier, Soft Clipping compresses the dynamic range rather than allowing the output stage to flatten the waveform tops (heard as a crunching sound on peaks). Soft Clipping can be engaged via the front-panel display.

The C 390DD's on-board DSP provides extensive equalization possibilities. In addition to bass and treble controls, the C 390DD allows you to boost or cut six selectable frequencies below 240Hz to reduce room-induced peaks and dips. Each filter has adjustable bandwidth. As with the C 390DD's other features, the room equalization is

EQUIPMENT REVIEW - NAD C 390DD Direct Digital Integrated Amplifier

The $6000 M2 vs. the $2600 C 390DD

Although the M2 and C 390DD share the same technology platform, there are a number of differences between the units. For starters, the C 390DD's output stage is exactly half that of the M2. The M2 featured a bridged output stage employing four FETs; the C 390DD uses two FETs without the bridging topology. This change is reflected in the two amplifiers' rated output powers: 250Wpc vs. 150Wpc.

This lower output power not only puts less demand on the power supply, but also reduces the need for shielding. The M2 chassis was highly compartmentalized, with extensive electromagnetic shielding between sub-sections. The C 390DD's shielding is more modest, but shielding is less crucial because the C 390DD's output stage radiates half the switching noise of the M2. Speaking of the chassis, while the M2 was housed in lavish (for NAD) Masters Series casework, the C 390DD is pure traditional NAD in which the chassis is a functional rather than an aesthetic statement.

The M2's DSP that performed the PCM-to-PWM conversion was a general purpose field-programmable gate array. In fact, the FPGA was the technology's development platform. The C 390DD now supports a dedicated integrated circuit that is more efficient. The chip has additional DSP power that is put to good use with bass and treble controls, room equalization, subwoofer output, and other features.

Where the M2 included an integral A/D converter, the C 390DD's A/D is on an optional board. Similarly, the M2 doesn't benefit from the C 390DD's Modular Design Construction that puts the digital-interface electronics on removable boards to accommodate technology evolution.

In addition to these large differences, it's natural that in the more than two years between the M2 and C 390DD, the designers would find a number of small ways to improve the performance. This is particularly true with such a new technology. Among these small benefits (small technically, not necessarily small sonically) are improved jitter rejection in the C 390DD.

accessed via the unit's large front-panel display. The manual makes reference to an integral test tone useful in setting the equalization, but that feature had not yet been implemented in the review sample. NAD says that the test tone will be available as a software update.

A number of other miscellaneous features are also included. For example, the unit has IR inputs and outputs, an RS232 input, and 12V triggers, all useful for integrating the C 390DD into an automated system.

The remote control is outstanding for its ease of use, volume control ballistics, and comfort. Although this is the same generic remote supplied with NAD's AV receivers and disc players, the superfluous buttons didn't interfere with operating the C 390DD. Incidentally, when I was using the NAD remote it struck me how much more functional and comfortable it is compared to many high-end remotes that are machined from aluminum and have tiny points for buttons, illogical layouts, and difficult-to-read legends.

Listening

The C 390DD replaced in my reference system the Berkeley Alpha USB USB-to-S/PDIF converter, Berkeley Alpha DAC Series 2, Hegel H30 linestage, and Hegel H30 power amplifier. With cables, this signal chain has a retail price of about $30,000, eleven times the C 390DD's price. I fed the C 390DD with the USB output (AudioQuest Diamond USB) from an iMac running iTunes and Pure Music, as well as with analog signals from the Aesthetix Rhea Signature phonostage. As mentioned earlier the C 390DD operates only on digital signals, requiring that analog inputs be converted to digital. The review sample was fitted with the optional analog-input board that offers balanced and unbalanced line-level inputs as well as a phono input.

I controlled the iMac music server from my iPad with Apple's free Remote app. With this app, your iTunes library interface appears on the iPad. My system was reduced to the iMac, the NAD C 390DD, a pair of Venture Ultimate Reference loudspeakers, and the iPad for remote-control music selection.

After living with NAD's M2, I was interested to hear how that unit's impressive technology translated into a unit of half the cost. In addition, my friends Scott and Kerry have been asking me for some time how to upgrade the sound of their existing system and at the same time transition into a music-server. They have a Pioneer Elite AVR with a Pioneer CD changer driving GoldenEar Triton 2 loudspeakers. They want better sound quality for music than this setup delivers, and are ready to replace the CD changer with a computer-based digital source that can be controlled wirelessly. They

SPECS & PRICING

Output power: 150Wpc into 8 ohms, 20Hz–20kHz, 0.005% %THD
IHF dynamic power: 165W into 8 ohms, 250W into 4 ohms
S/N ratio: >95dB referenced to 1W
Inputs: Two coaxial digital, two TosLink, one AES/EBU, one computer (USB Type B), two mass-storage input (USB Type A), IR, RS232
Optional I/Os: DD1 Analogue Phono Module with one balanced input on XLR jacks, one unbalanced input on RCA jacks, one phono input (mm or mc); DD HDMI-1 HDMI Module with three HDMI inputs and one HDMI output
Formats and resolutions supported: MP3/WMA/FLAC up to 48kHz (USB mass-storage inputs); USB output from Macintosh or PC up to 96kHz/24-bit (computer input); up to 192kHz/24-bit (TosLink, coaxial, AES/EBU)
Outputs: One coaxial digital, one TosLink digital, one line-level, one subwoofer
Dimensions: 17 1/8" x 5 3/16" x 15 5/16"
Weight: 17 lbs.

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How the C 390DD Is Different from Other Amplifiers

The C 390DD eliminates from a traditional signal path all the electronics of a DAC as well as the active analog gain stages of a preamplifier and power amplifier. It does this by converting the PCM signal from a digital source directly into a pulse-width modulation (PWM) signal that turns the C 390DD's output transistors on and off. That's it—no digital filter, no DACs, no multiple stages of analog amplification, no interconnects, no jacks, no analog volume control, no preamp. The conversion from the digital domain to the analog domain occurs as a byproduct of the switching output stage and its analog filter. This is as direct a signal path as one could envision.

The C 390DD is different in two important ways from other amplifiers that use a Class D switching output stage. In a conventional switching amplifier, analog input signals are converted to a series of pulses that turn the output transistors fully on or fully off. The signal's amplitude is contained in the pulse widths. An output filter smoothes the pulses into a continuous waveform. But in the C 390DD, PCM digital signals fed to the amplifier's input (from a CD transport, music server, or other source) stay in the digital domain and are converted by digital signal processing (DSP) to the pulse-width-modulated signal that drives the output transistors.

This difference might not seem great at first glance, but consider the signal path of a conventional digital-playback chain driving a switching power amplifier. In your CD player, data read from the disc go through a digital filter and are converted to analog with a DAC; the DAC's current output is converted to a voltage with a current-to-voltage converter; the signal is low-pass filtered and then amplified/buffered in the CD player's analog-output stage. This analog output signal travels down interconnects to a preamplifier with its several stages of amplification, volume control, and output buffer. The preamp's output then travels down another pair of interconnects to the power amplifier, which typically employs an input stage, a driver stage, and the switching output stage. In addition to the D/A conversion, that's typically six or seven active amplification stages before the signal gets to the power amplifier's output stage.

With the C 390DD, PCM data are converted by DSP into the pulse-width modulation signal that drives the output transistors. That's it. There are no analog gain stages between the PCM data and your loudspeakers. The signal stays in the digital domain until the switching output stage, which, by its nature, acts as a digital-to-analog converter in concert with the output filter. The volume is adjusted in DSP.

> "There's no digital filter, no DACs, no multiple stages of analog amplification, no interconnects, no jacks, no analog volume control, no preamp. This is as direct a signal path as one could envision."

The second point of departure between the C 390DD and all other Class D amplifiers is the switching output stage itself. The C 390DD uses direct digital feedback amplifier (DDFA) technology and chipset. The primary innovation is the use of feedback around the output stage to reduce distortion. Feedback, used in virtually all analog amplifiers, takes part of the output signal, inverts it, and sends it back to the input. The technique lowers distortion. But conventional feedback isn't practical in digital amplifiers because of the delay required for the DSP processing. The DDFA innovation is to compare the actual high-level PWM signal (at the transistor outputs) to a low-level reference PWM signal. Any difference between the actual and reference PWM signals represents an error. The actual PWM signal can deviate from the theoretical ideal because of power-supply noise or droop, slight changes in the pulse widths, transistor tolerances, or variations in the rise-time of the pulse edges. All these potential sources of errors affect the area under the pulses, which is how the analog signal's amplitude is encoded. This error shows up as a voltage, which is digitized at a conversion rate of 108MHz, then continually processed to compensate for the error by adjusting the width of subsequent modulation cycles.

The reference PWM signal must be essentially perfect or else the system will correct "errors" that aren't present. The pulse widths must exhibit jitter of less than ten picoseconds, a level of performance commensurate with the lowest clock jitter in high-performance digital-to-analog converters. In fact, you can think of the C 390DD as a DAC with gain and judge its technical performance using the same metrics as those employed in evaluating D/A quality.

The C 390DD's topology has interesting ramifications for a system's overall noise performance. In a traditional system of digital source, analog preamplifier, and analog power amplifier, any noise introduced ahead of the power amplifier greatly degrades the system's signal-to-noise ratio (SNR). For example, if we start with a CD player with a SNR of 115dB, feed its output to a preamplifier with a SNR of 108dB, and then drive a power amplifier whose intrinsic SNR is 115dB (all great specs), the system's overall SNR is only 84.1dB referenced to 1W (all SNR numbers are un-weighted). Noise at the front of the chain gets amplified by the power amplifier, no matter how quiet that amplifier is. In the C 390DD, the only source of noise is in the DSP and the switching output stage, and the noise level is completely independent of the gain. That is, the SNR doesn't degrade at low volume. The DSP's noise is kept low in part because of the 35-bit data path. The C 390DD has a SNR of 95dB (un-weighted, referenced to 1W) at any signal level.

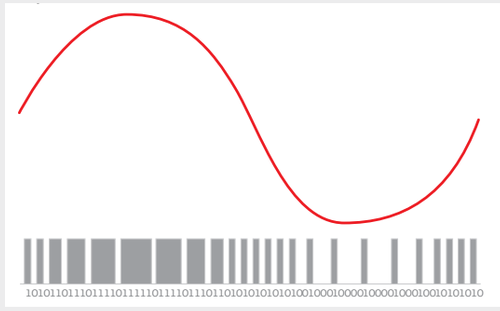
There's no free lunch, however. Switching amplifiers require a serious output filter (typically a large inductor and a capacitor) to remove high-frequency switching noise from the output, and to smooth the waveform. This filter is conceptually similar to the reconstruction filter in traditional DACs. Switching amplifiers are also very susceptible to audible degradation if the power supply feeding the output transistors isn't perfectly clean. That's because the output transistors either connect the output transistors' power-supply rail to the loudspeaker (in the "on" state) or disconnect them (in the "off" state). Any noise or ripple on the supply rails is connected directly to the loudspeaker. Switching amplifiers thus require an extremely quiet supply.

Pulse-Width Modulation

How can a series of pulses represent the continuous waveform of music? In exactly the same way that Direct Stream Digital (DSD), the encoding format behind SACD, produces music from a bitstream. In fact, PWM and DSD are conceptually identical.

Fig.1 shows the relationship between a DSD bitstream and the analog waveform that bitstream represents. The bitstream is a series of pulses of varying lengths, with the pulse length encoding the analog signal's amplitude. The pulse-train generated by DSD encoding looks remarkably "analog-like." That is, you can look at the pulse train and get an idea of what the analog waveform looks like. The relationship between the analog signal and the bitstream is so close that in theory, a DSD signal can be converted to analog with a single capacitor (DSD-to-analog conversion is more complex in practice). The bit rate of DSD as used in SACD is 2.8224 million bits per second.

In a switching amplifier, the output transistors are turned fully "on" or fully "off" by the pulse-width modulated signal. The analog signal's amplitude is encoded as the "area under the pulses"; longer pulses (longer "on" times for the output transistors) represent a higher analog-signal amplitude. This is contrasted with traditional "linear" amplifiers in which the output transistors are in a continuously variable state of conduction.



The output of the PWM stage is a series of high-level pulses that must be smoothed into a continuous waveform. Every amplifier with a switching output stage employs a large filter (an inductor and a capacitor) between the output transistors and loudspeaker terminals to perform this smoothing function and to remove switching noise.

In the DDFA system, the pulses are quantized with a master clock frequency of 108MHz. This frequency determines the number of discrete pulse widths available to represent the audio waveform. That number is 128, which appears at first glance to be too low to encode a complex musical signal. But even at 20kHz, there are many modulation cycles available within the period of a 20kHz waveform.

primarily use their system for music (and they play lots of vinyl on a Pro-Ject turntable). I've had my eye on a number of products for them (mostly separate USB DACs and integrated amplifiers), but I advised them to hold off until just the right product came along. (Many readers are also exploring ways to get better sound and at the same time make the leap to computer audio.) The C 390DD, with its unique technology, functionality, and future upgrade potential via the modular construction, could be a highly appealing option if its sound quality was anything like that of the M2.

> "The NAD C 390DD is an extremely sophisticated, forward-looking product whose feature set perfectly matches the needs of today's music listener."

But out of the box the C 390DD sounded dark and closed-in through the upper treble, and bright and grainy in the upper midrange and lower treble. This character diminished over the first few days, and after four days, disappeared. The transformation was more dramatic than I have experienced with any other component. If you audition the C 390DD, but sure that it is fully broken-in and warmed up. In fact, I thought that the C 390DD continued to improve over about a ten-day period.

After the C 390DD was fully broken in, there was no mistaking its heritage; it sounded very much like the M2. The C 390DD's greatest strength was undoubtedly its authoritative bass and startling bottom-end dynamics. This amplifier sounded like a powerhouse, with rock-solid solidity to bass guitar and tremendous impact to kick drum. The C 390DD took iron-fisted control of the Venture Ultimate Reference loudspeakers' four 9" woofers per side, serving up a visceral, body-involving experience on albums such as Talking Heads' *Speaking in Tongues* (96kHz/24-bit). Even at high levels, the kick drum's ability to cut through the bass guitar lines was phenomenal. The C 390DD's terrific bass and wide dynamics were also on full display when I listened to large-scale orchestral music; I heard no strain on even the most demanding passages. In fact, I experienced a kind of disconnect when listening to an album like Jeff Beck's *Performing this Week...Live at Ronnie Scott's*; it seemed hard to believe that the massive kick-drum impact and rock-solid bass lines were being produced by this diminutive and lightweight (compared with the huge monoblocks flanking the C 390DD) integrated amplifier. A phrase came to mind when I was marveling at the C 390DD's bass: "Krell-like." Krell amplifiers have, since their introduction in the early 1980s, represented the pinnacle of "center-of-the-earth" solidity and bottom-end dynamic impact. Improbably, the 17-pound C 390DD invited this prodigious comparison.

It wasn't just that the bass had depth and impact; it also exhibited texture, definition, nuance, and dynamic flow. I love the sense of swing and movement that bassist Ray Brown brings to music, a swing that the C 390DD conveyed with aplomb. On the Kenny Burrell tune "Bass Face" from Bill Evans' *Quintessence* [Analogue Productions 45-rpm LP], Brown locks the group into a deep groove that sets a foundation for solos from Burrell, Evans, and tenor player Harold Land. The C 390DD conveyed this aspect of the music so well largely because the amplifier was so dynamically agile and precise sounding, revealing both Brown's perfect timing and the full measure of attack of each note. Moreover, the bass sounded like a large wooden body resonating with rich density of tone color and clear pitch definition.

The C 390DD shared another characteristic with the M2: a dead-quiet background. As described in the sidebar, the C 390DD's architecture confers advantages in signal-to-noise ratio, advantages that are heard in the listening room as a blackness against which the music seems to hang in space, detached from the loudspeaker. The silent

background also aided in low-level resolution, which was outstanding for an integrated amplifier of this price.

In overall tonal balance, the C 390DD had a somewhat subdued character through the upper-midrange and treble. This was not a forward or bright-sounding amplifier by any stretch. The upside of this tonal balance was a sense of ease and lack of fatigue during long listening sessions. I listened to music through the C 390DD exclusively for about two weeks and never found it aggressive, hard, or tiring. The downside is a slight diminution of palpability and presence in the midrange along with a minor reduction in treble air. Interestingly, the M2 sounded more forward and assertive through the midrange and treble than the C 390DD. Concomitantly, the C 390DD had greater liquidity and warmth than the M2. Midrange forwardness and a reduction in liquidity can be a jitter-induced artifact; it is perhaps no coincidence that the C 390DD has less jitter than the M2. Whatever the reason for this overall tonal balance, the C 390DD should mate well with mid-priced loudspeakers that often have a bit of midrange prominence and extra sparkle in the lower treble. The C 390DD's tone controls can provide a treble boost to restore the top-end extension, but I found that even the smallest boost increment was too much for most recordings—which gives you an idea that the character I'm describing is not significant in magnitude.

The C 390DD was not identifiable as a Class D amplifier by its sound. That is, it lacked the characteristic "fingerprint" of most switching amplifiers. Although you wouldn't mistake the C 390DD for a tubed amplifier, the NAD had an organic and natural rendering of timbre free from the "chalky" coloration of some switching amplifiers. I also found that the C 390DD's sound quality didn't vary as much with loudspeakers and cables as other Class D amplifiers (I drove a pair of GoldenEar Triton2s with Kimber speaker cables as well as the Ventures with Shunyata and FIM cables).

Conclusion

The NAD C 390DD is an extremely sophisticated, forward-looking product whose feature set perfectly matches the needs of today's music listener. It is ideally suited as the core of a music-server-based system, yet will also accommodate those with multiple analog sources including vinyl playback. In addition to a wide range of connectivity options, the ability to replace the digital-interface boards and update the software assures that the C 390DD won't be left behind in technology's inexorable march forward.

All this great functionality wouldn't mean much if the C 390DD didn't deliver musically, but on this count the new NAD is a winner. The C 390DD's sound quality is easily commensurate with conventional integrated amplifiers near its price. You might find a similarly-priced integrated with greater midrange presence and more treble air, but to equal the C 390DD's bass quality—dynamic impact, muscularity, and texture—you'd have to spend four figures for massive monoblocks. The C 390DD's bass is that good.

This combination of sound quality and features makes the C 390DD a very capable and compelling package. I can't think of another integrated amp anywhere near the C 390DD's price that I'd rather own. tas

Micromega AS-400 Integrated Amplifier/Wireless DAC

A High Wire-Less Act

Neil Gader

What do you get when you combine an integrated amplifier, premium DACs, and a cutting-edge wireless network? Micromega calls it the AS-400. Based on the Micromega IA-400, a 200Wpc (400Wpc into 4 ohms) Class D integrated amplifier, the AS-400 raises the ante by adding the company's core wireless network connectivity, AirStream, to the package. Like the original stand-alone WM-10, the Airstream standard (Micromega calls it WHi-Fi) is based on Apple's iTunes software and AirTunes wireless transmission protocol. However the latest incarnation is an entirely different animal. It's been thoroughly revised in-house by adding three-stage R-core power-supply regulation, a custom-made 25MHz master clock to reduce jitter, superior Cirrus Logic CS 4351 24-bit/192kHz DACs, and a lower-noise analog section. All the user needs to supply is an Apple or Windows-based computer running iTunes music software. A Windows machine without iTunes will not connect to the AS400.

Visually the AS-400 is a home run. It sports a clean and direct front panel—its hefty volume knob has a nice action and is augmented only by the necessary input buttons plus dual mini-jacks for an iPod and a set of headphones. The solidity of the chassis and casework is impressive, and a marked improvement over the Micromega preamp/amp separates I reviewed in Issue 199. Like the IA-400, the AS-400 features a large blue fluorescent display, with easily readable, 7mm-tall characters that indicate input and volume.

Some may well ask: Do I need this level of network connectivity when I already have a wireless network in my home? Can't I just piggyback my music streaming onto that network? The short answer is yes, but you'll miss the payoff. Because the AS-400 creates its own dedicated network, music doesn't compete with the home network for bandwidth. And that's a big plus given the potential bottleneck created by multiple family users who might otherwise be gaming, surfing, or number-crunching. The result is fewer potential dropouts. In fact, so much faith has Micromega placed in its AirStream technology that it opted to exclude digital inputs. There's no S/PDIF, TosLink, or USB. Now that's what I call a high wireless act.

Limitations? Sort of. The Apple AirTunes encoding algorithms currently used to transmit to the Marvel IC inside the AS-400 and Apple AirPort Express don't support high-resolution music sampling rates above 16-bit/44kHz—at least for the time being. But not to worry, thanks to its internal Cirrus Logic 24/192 DACs, the AS400's wireless AirStream will be compatible with high-resolution streaming content whenever iTunes makes that option available.

Trouble-free setup is everything for a computer-phobe like yours truly. Happily, Micromega has endeavored to make wireless connectivity as routine as plugging in any traditional source component. And it has largely succeeded, assuming you have some basic familiarity with a computer and iTunes. The initial handshake between your computer's WiFi and the AS-400 takes just a moment. As the AS-400 powers up

EQUIPMENT REVIEW - Micromega AS-400 Integrated Amplifier/Wireless DAC

Inside the AS-400

Micromega is a company on the move. In recent years it's been rejuvenated by new owner and CEO Didier Hamdi, and guided in the States by its importer/distributor Audio Plus Services.

In Issue 199 I reviewed Micromega's PA-20 preamp and PW-400 power amp quite favorably. The AS-400 is a continuation of that upward trend. The AS-400's preamp stage features a low-noise gain section matched with low-noise power supplies. An R-core transformer is dedicated to all low-level signals, thus avoiding cross-coupling between the two sections and preventing any hash from the mains line from disturbing the circuit. Ultra-low-noise regulators feed the preamplifier section to allow accurate low-level resolution. Input switching is done by relays, and the 100k ohm input impedance means that the preamplifier section will not adversely load the various sources connected to it. The output of the preamplifier section is buffered by JFET amplifiers and then balanced to avoid ground coupling between the preamplifier section and the power amplifier modules. A moving-magnet phono section is included. Volume control is by a digitally controlled resistor ladder.

The power amplifier section uses a robust 1kVA toroidal "quiet design" power transformer, ultra-fast soft-recovery rectifiers, and four 10,000pF smoothing capacitors in a dual-mono configuration. The Class D modules are rated at 200W into 8 ohms and 400W into 4 ohms. A DC detection circuit prevents any damage to the loudspeakers in case of a failure occurring to the power modules.

Using the processor bypass and subwoofer I/O permits volume-control switching for a sub in two-channel and multichannel configurations. Via software control, inputs can be renamed from a library list stored in the AS-400's memory, while unused inputs can be switched off. A headphone amplifier is available with a front output, and its separate volume control setup is stored in the AS-400. A true monitor loop is accessible for users willing to insert an external unit in the signal path. The unit is equipped with a full-featured remote control that's comprehensive enough, though with such a dizzying number of identical buttons it's more than due for an upgrade. NG

for the first time it activates the AirStream network and the small icon on the front-panel display changes from red to blue. Then, if you're running a Mac, simply click on the WiFi icon in the upper right portion of the Mac's desktop and select the AS-400 network "Music," which appears as an available network connection. The first time you do this, the computer will prompt you for the password "airstream"; after that, you're off to the races. Then open iTunes and select the AS-400 in the pull-down menu located in the lower right corner of the iTunes window. If you prefer controlling iTunes via an iPhone/iPad/iTouch, you have two options. The first is to stream audio directly from your handheld device to the AS-400 via Apple's AirPlay. The second, and better-sounding option, is to download the "Remote" app (free at Apple's Web site) that sends just the commands to your laptop or desktop machine running iTunes. In this scenario, the audio data are not transmitted wirelessly, just the track selection, volume, and other commands.

I evaluated the sound of the AS-400 on two levels: as a traditional integrated amplifier from a CD source and in wireless mode. With compact disc, right out of the block the AS-400 had a powerful sense of midrange presence and stability, lively dynamics, and a pleasingly propulsive energy. For me, these attributes created a resolution of vocal nuances that instantly made this amp a top contender in its segment. Whether I was listening to the darkly sensuous styling of Shelby Lynne singing "How Can I Be Sure" from *Just A Little Lovin'*, or the homespun sweetness of James Taylor's "If I Keep My Heart Out of Sight" from *JT*, or Marc Cohn's throaty cover of "The Only Living Boy In New York" from *Listening Room*, the AS-400 never failed to uncover the subtlest micro-information about vocal inflection and interpretation. Tonally, the AS-400 was neutral through most octaves with only a slight darkening on top and small losses of air at the frequency extremes. Piano harmonics were rich and full-bodied with a sweetness in the treble that I didn't typically hear with earlier switching amplifiers. There was a reassuring sense of resonance and harmonic weight throughout. The top end was clean with just a hint of coolness and a slightly brittle complexion on leading-edge details. Transient behavior was elsewhere uniformly excellent—clean, concise, and well integrated into the performance.

The Rutter *Requiem* [Reference Recordings] with the Turtle Creek Chorale is pivotal for my listening evaluations, and the AS-400 didn't disappoint. The vast assembly of pipe organ, choristers, and strings was anchored firmly to the soundstage and there was little to no smearing among adjacent instrumental or vocal images—which is no small accomplishment. Lateral soundstage presentation was excellent, as well. Only at the frequency extremes did the AS-400 lose a little ground. The Chorale's upper reaches were just a shade dry and constricted. And the full dimensions of the cavernous acoustic and stage of Meyerson Center were just not as faithfully replicated as I've heard with other gear. During Vaughan Williams' *Antartica* the landscape of symphonic images lacked the sense of near-topographical relief that defines the layering of string sections, and the ability to reproduce the corners and boundaries of the venue, as well as the sensation of ceiling height and of the backwall upstage behind the musicians.

Bass control was excellent, something I've come to expect from Class D power—the rolling thunder of tympani during Copland's *Fanfare* being a prime

SPECS & PRICING

Power output: 200Wpc into 8 ohms, 400Wpc into 4 ohms
Inputs: Three analog, one phono, one processor
Outputs: Preamp, headphone, subwoofer
Dimensions: 17" x 3.75" x 14.5"
Weight: 33 lbs.
Price: $4995

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example, the steady kick of the bass drum during Steve Winwood's "Higher Love" being another. The Wilson Sophia 3, on the other hand, is a speaker that demands an awful lot from an amplifier. In most instances the Micromega was a model of unflappable consistency and the Sophia sounded fabulous. But if concert-level rock 'n' roll is your thing, then you'll find the AS-400 bottom octaves a little soft.

Turning to the AS-400's wireless AirStream performance, the sonics maintained the essential character established with the disc player in the system; yet now the music was streaming from my kitchen to the listening room some 25 feet away while I controlled it via an iPad using Apple's Remote app! The AS-400's wireless sonic abilities weren't just a rough approximation of the CD source, or vaguely in the ballpark, or a "close-but-no-cigar" attempt. Rather, they were *stunningly* close. Image placement was spot on, as was the rendering of three-dimensional space. The tonal distinctions between wireless and the CD reference were small enough that it might just as easily be ascribed to a simple choice of disc player interconnect or the individual personalities that the DACs might be contributing.

That's not to say the character of the AirStream was identical. As I listened to solo piano and the acoustic space that enveloped it, the sound via wireless was actually a little more weighty, as if the midrange had a slightly thicker waistline. The top end was a bit sweeter and more harmonically complex—something I never would have predicted. Moreover, the sound was more coherent, as though each piano note was more clearly defined. Likewise, during singer Jen Chapin's cover of "Renewable" her sibilance range was more finely textured and cleanly aligned with her voice's body.

Only in the lowest register did the CD source narrowly edge out the AirStream. For example, when pianist Evgeny Kissin comes down hard on the keyboard, the instrument was a bit more explosive in the dynamic sense, the soundboard resonance suggesting a little more body and bloom. To tell the truth no one was more surprised than I was when I kept reaching for my iPad rather than the disc player's remote control. I kept thinking to myself while gleefully scrolling through my iTunes playlists that I could really get used to this. (Tip: If you're running a Mac make sure the format setting in iTune's MIDI setup matches the sampling frequency you're streaming—most likely 44.1kHz/16-bit. I speak from experience when I say that an incorrect setting degrades the wireless sound quality.)

The Micromega AS-400 is not just about musicality and performance. It's equally about the user experience. For many of us the mere mention of music, computers, and wireless networks sets off fire alarms. Micromega, however, has done its homework with the AS-400 and removed any lingering reservations. Now anyone can contemplate a computer-based music collection and step fearlessly into a future of wireless possibilities—or not. The AS-400 happily let's you have it your way. And believe me, that's a tough act to follow. tas

Naim Audio SuperUniti "All-in-One Player"

Versatile, Capable, Musical

Wayne Garcia

As a certain scruffy young bard once sang, "The times they are-a changin'." Although many aspects of our hobby remain constant, especially the continuing health of analog and two-channel sound, there's no doubt that digital-audio reproduction is on a pathway of serious change. CD sales, while not dead, diminish every year; more and more streaming devices are hitting the market; and this very magazine devotes serious coverage to the evolving world of computer-driven digital-audio playback and HD downloads. And not just upstarts but iconic manufacturers—and at this point in the company's history England's Naim Audio certainly qualifies as the latter—are embracing this new world order. The latest in Naim's now three-year-old and frequently augmented Uniti series, the $5995 SuperUniti joins the NaimUniti 2 ($4695, with built-in CD player) and UnitiQute ($2695, no disc drive), along with two versions of Naim's UnitiServe Hard Disc/Server ($3695 and $3995). I can't think of another audio company with such a long track record that has so firmly and expansively embraced the word of computer audio. Nor of another one that's done it so gracefully.

Like the UnitiQute, the SuperUniti contains no disc drive. You can, of course, as I did, hook up a CD player via analog inputs, as well as a turntable, and I suspect that many users may do just that. But I imagine a whole other, and dare I add younger, flock of SuperUniti customers will be drawn to this sleek model's streaming audio and other digital capabilities because, after all, Naim calls the SuperUniti an "all-in-one," music player that simply needs speakers—and externally generated sources—to make music.

The heart of the SupertUniti, however, is firmly grounded in Naim's classic componentry, most specifically the 5 Series amplifier found in the 80Wpc SuperNait integrated amplifier, from which the SuperUniti's guts derive. But as Naim points out, in addition to the SuperNait the SuperUniti also draws inspiration from the UnitiQute, the NDX network music player, and the Naim DAC. Like the latter, SuperUniti employs Naim's "Zero Jitter" buffering technology, which clocks incoming digital signals into the unit's buffer memory, before then clocking them out to provide a stable conversion stream. Proprietary digital filtering provides up to 16x oversampling, and D-to-A conversion is via the same Burr-Brown DACs found in Naim's NDX and HDX. Naim also boasts of the SuperUniti's newly designed, digitally driven, analog volume control, which uses discrete resistors for the highest sound quality.

To encapsulate the SuperUniti's features, here's what this handsome and cleanly arranged component comprises: An integrated, wireless, UPnP-network stream player able to stream audio files from any hard-disc server—such as Naim's UnitiServe, HDX, network attached storage (NAS), or laptops/computers via a home network; a front-panel USB port that accepts direct digital files from iPods and iPhones using Apple Lossless encoding; a multi-format tuner for iPod and USB-stored audio featuring FM/DAB/Internet radio; a ten-input digital and analog preamplifier with six S/PDIF digital inputs for external digital sources, including three back-panel optical inputs and a fourth front-panel optical input; internal architecture for high-res audio playback up to 24-bit/192kHz over the network—a Naim first; a digital-to-analog converter; and, of course, the 80Wpc power amp, which makes this the strongman of the Uniti series. Should the amp's 80 watts be less muscle than you need, you can drive an external amp via a preamp output, and there is also a dedicated subwoofer output.

Moreover, the SuperUniti offers a variety of control options—conventionally from the neatly arrayed front panel, from a standard remote control, as well as from Naim's N-Stream app for Apple's iPhone and iPad. As of now SuperUniti does not support Apple Airplay, but that is said to be in the works. Although its wireless capability is a cool feature, Naim recommends Ethernet network connectivity for both reliability and the best sound quality. As to the formats supported, SuperUniti plays/streams WAV, FLAC, Apple Lossless, AIFF, MP3, Windows Media-formatted content, AAC, and Ogg Vorbis from any suitable UPnP device or USB-connected storage device. And gapless playback is available on all supported file formats. Super, indeed.

Luddite that I am, I began my time with the SuperUniti in a rather conventional way, by playing back LPs and CDs via the unit's pair of analog inputs. It also gave me the clearest chance to hear

EQUIPMENT REVIEW - Naim Audio SuperUniti "All-in-One Player"

how the SuperUniti sounds compared to other Naim components I'm familiar with over my years of reviewing them.

As I guessed, the SuperUniti's sonic style is Naim through and through. It has the same exceptional sense of dynamic ebb and flow and rhythm and pace one expects from Naim gear, along with a low noise floor, and a fine sense of transparency to the recorded event. For instance, on Harmonia Mundi's terrific CD *Gershwin by Grofé*, the SuperUniti created an impressively large soundstage with a good display of air around each instrument. During *Rhapsody in Blue* the opening clarinet theme was rich but nice and reedy, too, while the brasses were creamy, fat, and throaty. The piano was convincingly life-sized, with great clarity to each note and fine percussive power. Cymbals had notable sizzle and snap, and when the orchestra busted loose you felt a good sense of weight and power. And though Naim's 80-watt rating is relatively conservative, the amp did a decent job powering my Maggie 1.7s, although I can see how that preamp-out connection might, for users with either power-hungry speakers such as these, large rooms, or both, feel the need for a larger power amplifier.

More intimate music was likewise well served by the SuperUniti—be it the haunting beauty of Antony and the Johnsons' *The Crying Light* [Secretly Canadian LP], where Antony's one-of-a-kind voice weaves an otherworldly web from strands of tenor and falsetto harmonies, or the recently reviewed Analogue Productions SACD of *Getz/Gilberto* (Issue 224), which found the Naim SuperUniti practically drawing me into the speakers with the sheer beauty and subtle artistry of this near-perfect record. This a component that invites you in, rather than bludgeoning you with power.

With the invaluable help of Chris Morris, who works for U.S. importer The Sound Organisation, I was able to download Egalto's EyeConnect UPnP AV Media Streaming software, which allowed me to transfer my (currently small) iTunes library on the network so the SuperUniti was able to access it. I also downloaded Naim's N-Stream app onto my iPad. This is a super-cool free app that lets you access your iTunes library, control volume, and so forth.

Since this is something of a new world for me I consulted the Downloads section of TAS' music review department, where I know I can count on the recommendations of my colleagues Alan Taffel (pop) and Andy Quint (classical). Intrigued by Taffel's high praise for Cat Stevens' *Tea for the Tillerman* (Issue 223), and his comparison of different formats, I downloaded both the 96/24 and 192/24 versions of the album. Whoa, Alan was right on—the 96/24 is indeed outstanding, with great clarity, a lovely sense of detail, tonal richness, and immediacy beyond anything I'd heard before from this classic recording (note that I have not heard the latest Analogue Productions vinyl edition). Taffel was right again when he said the 192/24 rendering was better, cleaner, more immediate and detailed. This was one of those jaw-dropping experiences, and I admit hearing digitally reproduced music in this way, over a fine component such as the SuperUniti, is a new thing for me, and one that will take a bit of getting used to. It's simply a different experience from hearing CDs. Certainly not the same as analog, but something rather different from any disc format.

I was also intrigued by Andy Quint's review in the same issue of Albéniz's *Iberia* played by Peter Schaaf. This was another eye-opener, and a truly great-sounding recording of a piano—life-sized, full, percussive yet harmonically rich, dynamically explosive as well as intimate as the music dictated.

These are but two examples of the many fine recordings I've started to enjoy in what is for me a new fashion (yes, I know I'm behind the times). And while I'm not ready to give up my LPs, and doubt I ever will be, with the help of the SuperUniti and knowledgeable friends on this magazine I am thoroughly enjoying listening to music via these new formats. Bravo to Naim for making it fun, easy, and so very musically compelling. (Chris Morris says that the SuperUniti's ultimate performance is achieved with Naim's own UnitiServe. I'm getting a review sample, so watch for my follow-up report.)

SPECS & PRICING

Type: All-in-One Streaming Audio Player
Power output: 80Wpc into 8 ohms
Formats supported: WAV, FLAC, Apple Lossless, AIFF, MP3, Windows Media-formatted content, AAC, and Ogg Vorbis from any suitable UPnP device or USB-connected storage device (gapless playback available on all supported file formats)
Maximum sample rate: 192kHz (coaxial) 96kHz (optical)
Maximum bit depth: 24 bits
Analog inputs: One 5-pin DIN, two RCA pair, one 3.5mm front-panel jack
Digital inputs: Six S/PDIF (one coaxial BNC, one coaxial RCA, three optical TosLink, one 3.5mm front panel mini-TosLink)
Analog outputs: Preamp output (4-pin DIN), subwoofer output (RCA pair)
Digital outputs: S/PDIF (coaxial BNC 75-ohm)
Dimensions: 17" x 3.4" x 12.33"
Weight: 28.2 lbs.
Price: $5995

THE SOUND ORGANISATION
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ASSOCIATED EQUIPMENT
TW-Acustic Raven One turntable; Tri-Planar Ultimate VII 'arm; Benz Gullwing, and Transfiguration Phoenix moving-coil cartridges; Sutherland 20/20 phonostage; Cary Audio Classic CD 303T SACD player; Apple MacBook Pro and iPad; Magnepan MG 1.7 loudspeakers, Tara Labs Zero interconnects, Omega speaker cables, The One power cords, and BP-10 Power Screen; Finite Elemente Spider equipment racks

AVM Inspiration C8 CD-Receiver

Euro-Class

Wayne Garcia

Talk about cool! AVM's Inspiration C8 is a beautifully designed, intuitive to operate, sleekly compact, all-in-one preamp, amp, CD player, FM tuner, and neatly tricked-out audio control unit. In a nod to vinyl's ever-growing popularity, the C8 comes equipped with a built-in phonostage that accepts moving-magnet as well as higher-output moving-coil cartridges. And, yes, you can use the C8 with your iPod or other device via a USB input, or wirelessly with the addition of AVM's $395 wireless module. Based on your needs this may or may not be of concern, because in all other ways the Inspiration C8 is one classy component that's about ideal for a relatively well-heeled music lover's small-apartment needs or even as the engine of an excellent small second system. Oh, and most importantly, the Inspiration C8 also happens to sound very good.

Although the company may not be widely known in the U.S., Audio Video Manufaktur was founded in 1986 in the town of Malsch, Germany, and is highly regarded in its home country for its electronics and digital-playback gear. The company also makes a couple of turntables, and recently released a compact loudspeaker designed as a companion to the C8. Although the company was purchased in 2009 by Udo Besser, who for many years was a key player at Burmester, AVM's original founders still work at the factory—Günther Mania as chief engineer, and Robert Winiarski as head of production.

The $4100 Inspiration C8 is one of those components that exude a special feel even as you unbox it. As Besser put it to me in an e-mail exchange, "The craftsmanship is as German as it gets." Indeed. The satin-brushed all-aluminum chassis not only reveals a sensitive eye for industrial design—note the tray-free CD slot, ultra-simple layout, elegantly curved lower left portion of the chassis, and the beveled line that accents it—but the front, top, and side panels show no visible assembly screws. Silver and black are standard finishes, and an all-chromium front panel is also available. Moreover, rather than a generic plastic bag, the C8 comes protected by a soft, black fabric sack bearing the AVM logo; even the equally elegant remote control wand has its own little cloth pouch. These simple yet important details point to a similar attention paid to what's inside the chassis.

Rated at a robust 150Wpc, the C8's power amp section is a Class D design with an analog feedback loop that AVM says makes the unit essentially immune to variations in speaker load—and hence able to drive essentially all loudspeakers equally well, while generating little heat. More on this shortly, but for now I will say that not only did the C8 prove its muscle while driving my Maggie 1.7s, its switching amplifier is among the best-sounding I've heard.

The C8's Red Book-only CD drive is a Philips unit manufactured in Vienna, Austria, and is nearly completely enclosed to minimize the amount of emitted noise. In addition, AVM states that the slot-loaded CD feed, combined with the spring-mounted transport, isolates discs from footfalls. The unit's digital circuitry upsamples all signals to 192kHz/24-bits for conversion by the DACs.

In addition to the phono input, the C8 offers three line-level inputs as well as three digital inputs (S/PDIF, optical, and USB), as well as an external processor loop. You may also assign your choice of names and adjust sensitivity, gain, and even tone control slopes for each input. The standard USB input is limited to datastreams up to 48kHz/16-bit. An optional high-res USB upgrade is available for $395 that supports up to 192kHz/24-bit.

Other nifty features include automatic playback when a CD is inserted, a global tone control, a dimmable display, two trigger outputs (for additional power amps), and connection for an external infrared eye should you choose to place the unit inside a cabinet. But given the C8's attractive design and ease of use, why hide it?

When you're reviewing a fully integrated unit, it is hard to single out the individual parts creating the sound. That said, there was a consistent excellence to the presentation regardless of source or speakers. (I was able to evaluate the C8 with two speaker systems: my reference Magnepan 1.7s and the excellent Electrocompaniet ESB-1 two-way compact I reviewed in Issue 209.) I would describe the C8's overall character as polished and suave, solidly in control, and neutral to the source material, be it broadcast, digital, or analog LP. Speaking of analog, while it may not be compatible with lower-output moving-coils I found the C8's phono section to be quite good—clearly not a token inclusion or afterthought.

I was consistently impressed by the AVM C8's ability to get out of the way and let the music shine through. The sound is quite uniform across the spectrum—precise and smooth, neither overtly warm nor cool but balanced and pure of tone. It's capable of fine dynamic nuance and will play quite loudly when asked to, though it doesn't have the

EQUIPMENT REVIEW - AVM Inspiration C8 CD-Receiver

sheer "slam" one normally gets from conventional Class A/B designs of a similar power rating.

The upper end can express both the sweetness and the rougher edges of a solo violin when playing something like Gidon Kremer's traversal of the Bach Sonatas and Partitas [ECM], yet it can also sting like the proverbial bee if you decide to settle in with Stevie Ray Vaughan's "Tin Pan Alley" from *Texas Flood* [MoFi Hybrid SACD]. By the way, the latter track also revealed the C8's delicacy with this song's quieter passages, and the naturalness with which it reproduced Vaughan's Fender Telecaster, which can also have its sweet, richly jazz-inflected moments, as well as an excellent and tuneful, rather creamy bass guitar, and ultra-clean power delivery behind the lightning-strike drum thwacks.

Vocals proved to be quite gratifying, too, and given the C8's balance both male and female singers were well represented. From Marianne Faithfull's whiskey-and-cigarettes delivery on ORG's terrific 45rpm reissue of *Strange Weather*, to Dylan's drugged-out but electrifying "Visions of Johanna" from *Live, 1966: The "Royal Albert Hall Concert"* [Columbia LP], to Sinatra's *Only The Lonely* [MoFi LP], to the Janowitz performance of Strauss' *Four Last Songs* [DG Originals CD], each singer's tonality, range, phrasing, and dynamic shadings simply sounded "right," and of a piece. And the Janowitz/Karajan Strauss was as ravishingly beautiful as it should be.

As for soundstaging and depth, I would call the C8 plenty good if not outstanding. On something like Mahler's Symphony No. 2 [SFS Media], one gets the *gestalt* of Davies Hall if not quite the ultimate feeling of expansive space, depth layering, instrumental texture, and halos of air around the instruments. During the huge climaxes, when large choral forces and organ join the orchestra and vocal soloists, sure, those 150-watts began to hit a wall—most amps will be pushed to the limit here—but I must emphasize that the C8's switching engine remained remarkably poised. There was no gross clipping or some of the other amusical qualities I continue to associate with many of these Class D designs. No, the C8 remained musical under pressure, and more than anything seemed to simply run out of steam.

As noted earlier, the bottom end is nicely defined, textured, and tuneful but not thunderously powerful or weighty. Not something I consider a drawback. But then I don't view the Inspiration C8 as the center of a hard-core audiophile's system but rather as a component designed for the true music lover, who wants a compact, hassle-free, and satisfying piece of gear that won't break the bank—or the shelf it finds a home on. tas

SPECS & PRICING

Type: All-in-one compact CD-player/receiver
Power output: 150Wpc
Inputs: One phono, three line-level, three digital (S/PDIF, optical, USB), processor
Outputs: Two digital (S/PDIF, optical) processor, banana-plug-only speaker terminals
Compatible discs: CD, CD-R
Upsampling: 192kHz/24-bits
Phono loading: 47k Ohms, 100pF
FM tuner sensitivity: 1.5uV
FM tuner signal-to-noise ratio: 73dB/68dB(A) (mono/stereo)
Weight: 18 lbs.
Price: $4100 (192kHz/24-bit USB upgrade is $395, wireless streaming option is $395)

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ASSOCIATED EQUIPMENT
TW-Acustic Raven One turntable; Tri-Planar Ultimate VII arm; Rega P3-24, Benz Gullwing, Transfiguration Phoenix, and Lyra Delos moving-coil cartridges; Sutherland 20/20 and SimAudio 310LP/320S phonostages; Magnepan MG 1.7, and Electrocompaniet EBS 1 loudspeakers, Tara Labs Zero interconnects, Omega speaker cables, The One power cords, and BP-10 Power Screen; Finite Elemente Spider equipment racks

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Vitus Audio SIA-025 Integrated Amp

What Does $1000 A Watt Sound Like?

Neil Gader

The subject of power looms large in audio. If you're in the market for an amp, watts-per-channel output is likely the first number you'll look for after, ahem, the price. And, frankly, the notion that watts-per-channel is the magic bullet to better high-end sound is an easy line to fall for. But like most issues in audio it isn't quite so simple. There are watts on the page of a brochure and watts in your listening room. Just like there's ground beef and then there's Kobe. For oenophiles, there's two-buck Chuck and first-growth Bordeaux. In either example these items could be from different planets. The same goes for power. There are amps that output a flaccid twenty-five watts, and then there are the *twenty-five* watts of the $25,000 Vitus Audio SIA-025 integrated amplifier—pure Class A watts that have been transistor-optimized, vibration-isolated, voltage-regulated, transformer-reinforced, and probably Shiatsu-massaged—watts the likes of which I've never heard before.

But before I touch on some of the tech that make the SIA-025 what it is, let me first spell out what I am hearing that makes the amp so exceptional. This Vitus Audio integrated is a remarkable study in contrasts—harmonic, dynamic, and transient contrasts from the most delicate to the heroically intense, from short percussive attacks to long decays of overtones. The moment I began playing the Argo pressing of Stravinsky's *Pulcinella* I could hear a range of timbral and dynamic expressiveness that made the St. Martin in the Fields ensemble sound infinitely fluent and fluid. Section layering was exactly defined, winds soared, brass snapped to attention, and the architecture of fundamental tones and overtones always remained a continuous unbroken curtain, seemingly unimpeded by anything electronic in the signal path. There were no noise contrails glomming onto notes. The SIA-025 was pure glassy stillness at idle—dead-bang quiet—and as a conveyance for music, utterly uninhibited. As it peeled back layers of electronic gauze it restored the wonder of unpredictability to the musical event.

Even when I cued up my most familiar recordings, the chestnuts that represent what lured me into this hobby in the first place, I was confronted with fully fleshed out musical moments only hinted at before. For me it was the first two Peter, Paul and Mary albums on Warner Bros. that initially turned my head. Whether it was "500 Miles" or "Lemon Tree," I was able to hear more of the underlying soundboard resonance from the acoustic guitars and stand-up bass, and more specific placement cues within the trio. I could tell that Mary was farther from her microphone than Peter and Paul and that each voice was yielding more diaphragm and chest sounds. It was a strong initial impression that had me eating out of the SIA-025's hand and coming back for more.

Inside the SIA-025

The minimalist appearance of Vitus Audio SIA-025, of all Vitus gear, in fact, conveys substance and permanence. Constructed wholly of slabs of non-magnetic aluminum and stainless-steel—with heat sinks massive enough to cool a reactor—this amp conveys the distinct impression that the only way to budge it is with the help of a sudden shift of the Earth's tectonic plates A handful of flush-mounted pushbuttons are hardly discernable at a glance, but the hefty custom-made and AC-rechargeable remote control makes amends with full functionality to drive the sophisticated menu-driven software. The back panel houses a pair of RCA and three pairs of balanced XLR inputs—the latter attesting to the Vitus Audio philosophy of silent running. The dual-mono layout uses Vitus' own Andromeda proprietary wire throughout. Unique to this segment and usually reserved for loudspeakers is the color selection—three standard finishes and sky's-the-limit as an extra-cost option.

As described earlier the SIA-025 operates in Class A. Quick refresh: Class A operation means that the output stage is amplifying the entire musical waveform, both the positive and negative halves. Thus there is no crossover distortion because there is no transition between operative pairs of output devices. This contrasts with Class B or Class AB where the waveform is split evenly between matched pairs of transistors, so that one amplifies the positive half of the waveform , the other the negative half. But in a surprise twist, the SIA-025 can also be instantly switched into Class AB mode, offering up 100Wpc. The advantage is this: Class A is hideously inefficient, and the amp runs hot enough to be uncomfortable to the touch. With concern over rising energy costs, if you're just using the amp for background music having the switching option is a handy perk.

EQUIPMENT REVIEW - Vitus Audio SIA-025 Integrated Amp

Class A topology requires, and the SIA-025 uses, superior bipolar transistors that can handle the constant current flow, plus a power supply robust enough to keep up with the high current demand—not to mention heat sinking to dissipate the heat and keep the amp in a thermal comfort zone. Also, Vitus Audio uses no global feedback. The reason? Phase distortion. TAS readers may recall a statement Vitus Audio's president Hans Ole Vitus made in a Back Page interview (in Issue 212), where he said that his affiliation with the hearing-aid industry in Denmark taught him the significance of how even the smallest phase errors can be detected by the ear, more so than small amplitude differences.

Vitus opts for a custom-designed UI transformer over the ubiquitous toroid, primarily due to the much lower voltage drop from no-load to full-load in the UI transformer vis-à-vis the toroidal. For the UI the maximum voltage drop is under 2% while the average toroidal Vitus found often droops around 25% (12.5% per secondary winding, with two secondary windings for a typical "split" power supply). The consequent stability and control, particularly in the low bass and with difficult speaker loads, helps explain why the Vitus sounds so robust in most situations. The volume control is relay-based and employs only a single resistor in series with the signal at any one time. Finally thicker PCBs (2mm versus the standard 1.6mm) feature no sharp corners in routing and use the thickest possible copper layers—up to 210um.

Keep in mind, the SIA-025 is not without SPL limits. It's not designed to fill a cathedral (unless horn loudspeakers are your thing) and thus requires a speaker of suitable sensitivity. The Wilson Audio Sophia (review to come) at 87dB sensitivity did more than a fine job in that respect, but I wouldn't go much lower in sensitivity. And terrific associated components are a must for the Vitus to make its magic.

Details, details, details

The sonic character that the Vitus SIA-025 exhibits is a slightly romantic one, and lends a warmer cast to orchestral sound. It has a little of a hybrid personality that suggests tube bloom with solid-state control. In this regard it reminds me of the Pass Labs INT-150, a solid-state powerhouse that runs a lot of Class A bias up to about 10 watts or so. The treble has a slight roundedness and sweetness, a trait underscored by the complete absence of nasty edges to instruments.

The Vitus Audio conveys the most tactile inner details—virtually down to the fingerprints on a performance. For example, during Joni Mitchell's "California" there is the percussive slap of the plectrum against the narrow fingerboard of the dulcimer and the momentary blur of image focus when her soprano fully opens and pins the microphone. And during k.d. lang's "Love Is Everything" from *Hymns Of the 49th Parallel* [Nonesuch], there's the articulation and delicacy of the twelve-string being fingerpicked. On Lyle Lovett's "North Dakota" from *Joshua Judges Ruth* [Curb], the opening piano can sound electronic and brittle on many systems, but with the SIA-025 it regains its soundboard and acoustic signature. Following the breathy nuances of Lovett and Ricki Lee Jones' low-level harmonization is a major test of an amp's low-level resolving power, and I could hear every intimate inflection up to the last instant of every held note.

Switch-Hitter

Being able to toggle between Class A and AB allows you to restage the Class A versus AB argument over and over if you're so inclined. But it's really no contest. To its credit, on big, beat-driven pop music, where the tracks are compressed to heighten tightness and control, AB mode does offer a greater rumble quotient from low bass pulses and a gutsier seat-of-the-pants experience during the finale to *Pictures At An Exhibition* [Reference]. But in bloom and ambience the insights of AB are more generalized. For example, during pianist Evgeny Kissin's rendition of "The Lark," there was no mistaking the cooler piano harmonics and hint of dryness as some of the air of the recording seemed to escape the studio. On Copland's *Fanfare for the Common Man* [Crystal Clear], the Vitus in Class A dealt with the winds and brass section with a plum-like fullness and harmonic authenticity, while in Class AB it sounded just a little bleached. During *The Wasps* Overture [RCA], the Class A soundstage was a continuous curtain of tight images, harmonic interplay, ambience, and dimensionality, while the AB curtain seemed a bit more porous.

A final surprise: Image separation and soundstage width are comparable to any separates I've reviewed. And this is not the norm. Typically integrated amps crimp the boundaries of a symphonic performance. The dimensional space between musicians squeezes ever tighter, as if the oxygen were being drawn from the room. But the Vitus Audio breathes the rarefied air normally granted to separates. It's a trait that serves it especially well on high-resolution recordings and LP playback.

The SIA-025 is a superb component brimming with enough finely wrought performance skills to challenge all comers. It's the first integrated amplifier that makes no apologies at any level. Yes, its price is lofty, but every self-respecting audiophile should consider it an obligation to listen to one—if just for the hedonistic pleasure of bearing witness to the seductive musicality of one of the high end's finest offerings. tas

SPECS & PRICING

Power output: 25Wpc Class A, 100Wpc Class AB
Dimensions: 17.12" x 5.12" x 16.9"
Weight: 77 lbs.
Price: $25,000

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vitusaudio.com

ASSOCIATED EQUIPMENT
Sota Cosmos Series IV turntable; SME V tonearm; Sumiko Palo Santos, Air Tight PC-3; Parasound JC 3 phono; Wilson Audio Sophia, MBL 120, Fritz Carbon 7; Synergistic Tesla Apex, Wireworld Platinum speaker cables; Synergistic Tesla & Audience au24 powerChord power cords

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EQUIPMENT REVIEWS

Preamps & Power Amps

Audio by Van Alstine Fet Valve 600R Stereo Power Amplifier and Transcendence Eight+ Preamplifier

Tubes and Transistors in Harmony

Dick Olsher

According to the late Harvey Rosenberg of NYAL fame, none other than Julius Futterman was enamored in the early 1980s with the development of a hybrid tube/MOSFET power amplifier. Apparently, Futterman had wanted to modify his OTL (output transformerless) circuit to replace the power tubes with MOSFETs in order to increase reliability and power output into low-impedance speaker loads. A cascode tube front end driving a MOSFET output stage became the successful recipe for the first true hybrid power amplifier, dubbed by Harvey as the "Moscode." Conceptually this makes perfect sense: Allow triodes to do what they do best (small signal-voltage amplification), while relegating current drive to transistors. Sounds simple enough, yet what is surprising is the paucity of successful hybrid designs to have emerged over the past 30 years. Past designs, to be honest, were mostly mixed bags bringing together some of the worst aspects of both tubes and transistors. One contributing factor was probably the lack of contemporary designers who were proficient with both tube and solid-state circuitry. Frank Van Alstine is clearly skilled in both design arenas, and by my estimation, has earned a position of prominence in the hybrid field with the introduction of the Fet Valve 400R and 600R power amplifiers.

Frank tells me that the only significant difference between the 400R and 600R is the peak voltage swing into an 8-ohm load—60V peak for the 400R and 70V peak for the 600R, both channels driven in phase. This translates to about 225Wpc for the 400R and 307Wpc for the 600R. The 600R uses a larger power transformer and has some parts upgraded for higher-voltage operation. Both amplifiers are rated for safe operation into 4-ohm and 2-ohm loads as long as maximum 6-amp quick-blow speaker fuses are used. No current limiting or protection circuits are in the circuit. Frank says that "larger output fuses offer no speaker protection at all. For rational speakers, we recommend using the smallest fuse values that do not blow often."

The amplifier circuit is based on AVA's patented forward transimpedance design, U.S. Patent Number 5,017,884. According to Frank, "this circuit has been improved here many times over the many years we have used this topography. Essentially it is an input triode, followed by the forward transimpedance amplifier consisting of another triode with a power MOSFET inside that loop. This provides the high drive-current and low output-impedance to drive the gate capacitance of the fully complementary power-MOSFET output stage. Most hybrid amplifiers fail because a simple vacuum tube just cannot drive this capacitive load linearly. The Fet Valve amplifiers include everything we have learned and now carry this design to what some might consider an extreme, but…it works!"

The output stage is push-pull and uses the latest Exicon "double-die" power MOSFETs, which were designed specifically for audio-

EQUIPMENT REVIEW - Audio by Van Alstine Fet Valve 600R Stereo Power Amplifier and Transcendence Eight+ Preamplifier

amplifier applications. Note that older Fet Valve or Ultra hybrid amps may be upgraded to the equivalent new R model for $1999. Bandwidth for both amps is said to be 3Hz and 300kHz (down 3dB), and exhibits a damped 6dB-per-octave roll-off at both extremes. The design obviously takes advantage of the complete power bandwidth of the devices used. Input impedance is very high (1MOhm) due to the 12AT7 triode input stage. Output-stage source impedance is "too low to matter," according to Frank, meaning that the damping factor is very high.

The power supply features a hefty toroidal power transformer and a total of ten, active, regulated power supplies. Each channel benefits from a low-voltage and high-current 12V tube-heater supply, two high-voltage regulated supplies for each tube, another high-voltage regulated supply for the small-signal MOSFET in the transimpedance loop, and (new to this design) a high-voltage, high-current regulated power supply for each power MOSFET output section. Frank believes that operating the output MOSFETs from a regulated power supply has added significantly to the sonic prowess of the design.

Cosmetics have been improved significantly over previous models. An IEC power-cord socket is now standard on all new AVA products, as is a ground-lift switch to address potential ground-loop hum. I can report that the amp is exceptionally quiet, even when driving high-sensitivity speakers, and that there are no annoying turn-on or turn-off thumps. However, it is unlikely to win any ergonomic awards. The input and output connectors are positioned on the rear directly beneath protruding heatsinks, whose sharp fins have gotten the better of me several times.

I auditioned the 600R with several preamps, including AVA's Fet Valve and Transcendence Eight+ (T8+). Of the two AVA designs, I actually preferred the T8+ for its smoother, more tube-like presentation. The T8+ differs from the T8 I reviewed several years ago in two respects. The spacers for the main motherboard have been lowered and low-profile tube sockets are used to accommodate a much taller 6CG7 dual-triode versus the original 6N1P. The optional solid-state phono section was updated three years ago. In fact, not only the RIAA phono but also the tape buffers and inverters consist of Burr-Brown OPA627 op amps followed by National LME49600 ultra-fast, low-distortion, unity-gain current buffers inside the feedback loop.

The T8+ is shipped with an Electro Harmonix new production 6CG7, which I found to be overall a better choice relative to the 6N1P. To be sure, the 6N1P sounded warmer and offered fatter lower mids, but the 6CG7 was clearly more refined in resolution with tighter image focus. Since the 6CG7 tube is a 9-pin version of the 6SN7 tube, these two tubes being electrically equivalent, the question of 6SN7 substitutions arises. Frank suggested and asked me to participate in an experiment aimed at expanding the available sonic possibilities by incorporating the capability to roll in 6SN7s. Physically, the mod was quite simple. The T8+ review sample had pins 9 and 5 jumpered, something that can easily be done on the topside of the board, says Frank, by any user with minor soldering skills, or AVA will do it for him for free (excluding shipping costs). Frank also provided me with a set of 9-pin to 8-pin adapters, and sets of new production Electro Harmonix and vintage GE 6SN7s to experiment with. Of course, with the adapters in place, there isn't sufficient height clearance, and the chassis cover must be left off. I also went to the trouble of obtaining a pair of RCA clear-top 6CG7s to include in the listening tests, and getting in the spirit of things, I even threw in vintage Sylvania chrome-top 6SN7s and CBS 5692s from my own personal collection.

I did not find the EH 6SN7 to offer any advantage over the stock EH 6CG7. And while both the vintage GE and Sylvania 6SN7s resulted in enhanced focus, improved treble air, and a more satisfying big-tone balance relative to the EH 6CG7, the winner turned out to be the RCA clear-top 6CG7. This is one sweet tube and fairly easy to source at a reasonable price. It obviates the need to go fishing for 6SN7s and eliminates all the fuss involved with adapters and tube-socket jumpers. Configured with the RCA 6CG7s, the T8+ line section

SPECS & PRICING

600R Fet Valve Amplifier
Power output: 300Wpc
Voltage gain: 28dB
Dimensions: 17" x 7" x 13.5"
Weight: 38 lbs.
Price: $3499

Transcendence Eight+ Preamplifier
Dimensions: 17" x 3.5" x 12"
Weight: 17 lbs.
Price: $1299
Options: Phonostage $199; motor-driven remote control, $299

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ASSOCIATED EQUIPMENT
MartinLogan Summit X, Analysis Audio Omega, and BassZilla Platinum Edition mk2 loudspeakers; Sony XA-5400 SACD player with ModWright Truth modification; Kuzma Reference turntable; Kuzma Stogi Reference 313 VTA tonearm; Symphonic Line RG-8 Gold & Ortofon SPU Royal N MC phono cartridges; SoundTradition Live! MC-10 step-up; Experience Music Passive Aggressive volume control, Concert Fidelity CF-080LSX2 and Pass Labs XP-30 preamplifiers; FMS Nexus-2, Wire World, and Kimber KCAG interconnects; Kimber KCAG speaker cable; Bybee Speaker Bullets; Sound Application power line conditioners

competes effectively with far costlier designs. I was also enamored with the new phono section, which while priced as a $199 option, sounded far better than its price might suggest. Its sound was a tad hard through the upper midrange, but as compensation it offered exceptional dynamic range, tight image focus, and a transparent soundstage.

The 600R did not sound like a tube amplifier, and I mean that as a compliment. The Carver Cherry 180 monoblocks happened to be in the house and made for an interesting contrast. The 600R was actually the smoother and more refined-sounding of the two in the context of a high-sensitivity speaker load. Its low-distortion spectrum was easy on the ears even with less than perfect recordings. And while the Carver amps managed to generate a more believable spatial impression, the 600R countered with superior speed, killer bass, and superb dynamics. It was able to rev up an orchestral crescendo with the greatest of ease. Its ability to delineate depth and width perspectives was well ahead of that of most solid-state amplifiers. But what set it aside from a host of solid-state designs was its soulful midrange, its ability to retrieve the music's drama and tension. Too many solid-state designs are detail freaks, and seem to excel at the frequency extremes and nothing else. The 600R impressed me as a complete package. It typically took about 10 minutes to warm up before it really started to sing, at which point it delivered a midrange that was texturally liquid and passionate.

Right out of the box the 600R seemed to lack treble air, but it improved considerably in this regard over an extended break-in period. Tonally, however, harmonic colors remained a bit on the dark side of reality. Yes, I did wonder if the stock JJ Electronic 12AT7 was responsible, and I did roll in a few vintage types as an experiment. Let me first say that in hindsight the stock 12AT7 is a fine tube, and I would not be in any rush to replace it. For example, it was possible to liven up the treble a bit using a GE 6201, but at the cost of giving up a measure of harmonic purity. Since I happened to have a pair of Sylvania gold-pin 12AT7 on hand, I rolled them in as well. And that turned out to be a synergistic coupling, my favorite, yielding a richer, more saturated harmonic palette. The 600R was quite revealing of front-end substitutions. A particularly memorable coupling was with the Experience Music Passive Aggressive autoformer volume control. In fact, in this setting the 600R sounded much like a $20k power amplifier, possessing superb clarity, transparency, taut bass lines, and a spacious soundstage.

Frank Van Alstine's "rock superstar" product has got to be the R line of amplifiers, as exemplified by the 600R. It delivers on the promise of a hybrid tube-transistor amplifier, adding sufficient tube magic to an otherwise impressive resumé of solid-state virtues such as potent bass impact, detail resolution, and power delivery into difficult loads. World-class power amplification at an affordable price adds up in my book to a no-brainer recommendation! A must-audition at any price point. tas

PrimaLuna DiaLogue Three Preamplifier

Tube Seduction

Jim Hannon

How often have you loved a company's power amplifiers but been less enthusiastic about that same company's preamplifiers? I've bought into the one-brand electronics philosophy often enough to have accumulated my share of successes and disappointments—enough of the latter to no longer assume that just because I really like one product that a company makes I will automatically be bowled over by its companion pieces. Thus, having been quite taken with PrimaLuna's DiaLogue Seven monoblock amplifiers, I wondered whether the company's upgraded preamplifier, the $2699 DiaLogue Three (DL3), would equal its sibling's fine performance. In short, would the DL3 prove a formidable switch-hitter or could it only bat from one side of the plate?

Physically, the DiaLogue Three preamplifier looks quite similar to the DiaLogue Series amplifiers, is built like a tank, and has a quite attractive polished finish. The DL3 is a true dual-mono design; only the power cord, power switch, and volume control are shared by both channels. When I first lifted the DL3, I thought it was as heavy as one of the DiaLogue amplifiers. Well, not quite, as the amplifiers weigh in at 63.8 pounds each and the preamplifier at a mere 52.9 pounds. Why so much heft in a preamplifier? As with the DiaLogue amplifiers, the power transformers account for much of the unit's weight, but these separate toroidal units for the left and right channel power supplies are also keys to the preamp's ability to reproduce music effortlessly and with wonderful dimensionality. With these huge power reserves, the DiaLogue Three cruises through the music without any stress or strain, and is seemingly unflappable even in complex, dynamically challenging musical passages.

Like other DiaLogue components, the DL3 offers high-quality point-to-point wiring, a feature that I prefer in my tube electronics, not only for its sonic benefits but also for ease of servicing and modification over the long haul. Not that I think you'll need to worry about servicing, because in my experience with the DL3 and the other DiaLogue Series electronics I haven't had to change so much as a tube, perhaps owing to PrimaLuna's innovative SoftStart circuit that powers the unit up gently to help preserve tube life. The tubes are not driven hard in the DL3, which along with the massive power transformers, contributes to the unit's sense of ease and natural musical flow. The DL3 is also one of the quietest tube preamplifiers I've auditioned, the result of using two 12AU7s per channel as inputs to produce a modest 12dB of gain, as well as other design elements like tube rectification, a high-quality volume control, sealed relays, and more.

The overall quietness of the DL3 helps contribute to one of its most salient sonic virtues. Music emerges from a silky-black background—no distracting tube rush here—with such beautiful timbre and harmonic richness that extended listening sessions are a real pleasure. While its timbre and richness are reminiscent of the magical midranges of some classic tube preamplifiers, the DL3 extends this timbral envelope to the bass and highs, avoids any vestiges of upper-midrange glare and bass sluggishness, lifts several veils, does not blunt the leading edges of transients, and significantly improves high-and-low frequency extension, inner detail, and dynamics.

When the DL3 was coupled with the remarkable UHA-HQ Phase 6 reel-to-reel deck and playing mastertape duplicates from The Tape Project, I was in sonic heaven! The massed strings in *Exotic Dances from the Opera* [TP-007] were sumptuous and finely detailed, and rode on a cushion of air across a soundstage of such tremendous width

EQUIPMENT REVIEW - PrimaLuna DiaLogue Three Preamplifier

and depth that it came surprisingly close to the dimensionality of my highly-modified reference preamplifier. The highs were naturally extended and balanced without any grain or forwardness, allowing the timbre of instruments like woodwinds to remain seductive yet lifelike; at the same time, the DL3 tracked the demanding dynamics swings of the music with aplomb.

When I listened to Dave Alvin on *Blackjack David* [TP-002], his voice and guitar had such immediacy and palpability that I felt, at times, that I was listening to a live performance. It doesn't get much better than that! While the UHA-HQ deck is the best front end I've had in my system, the DiaLogue Three kept pace with this outstanding analog source on multiple levels.

Turning to digital sources, the DL3 had an appealing richness that made me appreciate it even more. Yes, there's a dollop of tube warmth here, but it helped many digital recordings sound more natural. Listening to the Water Lily SACD recording of Dmitri Shostakovich's Symphony No. 7, I was impressed by the lack of digital artifacts in the upper midrange and highs, which helped to narrow the gap between digital and analog. Here, too, the stage was very broad and deep, and the percussion had very nice transient quickness, without any rounding of the leading edges. In the lower registers this warmth made cellos and basses sound luscious and powerful. However, it proved to be a little too much of a good thing on solo piano recordings, like Nikolai Lugansky's Chopin Études [Erato], and I preferred the slight increase in clarity and the more neutral tonal balance in the lower registers of both my reference preamplifier and the VTL TL5.5 Series II Signature, units that cost much more than the DL3.

To further assess the DL3's sonic signature, I performed a bypass test with the Esoteric SA-50 CD/SACD player driving the DiaLogue Five stereo amplifier directly and the SA-50 going through the DL3 to the amplifier, using short lengths of Nordost Valhalla interconnects in both instances. While not a perfect test, it was illuminating. In his review of the SA-50 (TAS 203), RH concluded that the Esoteric sounded better without the intervention of a preamplifier stage, and praised its incisive, upfront, and vivid presentation driving amplifiers directly. I agree with his findings, but in my tests, the inclusion of the DL3 in the chain also produced some pleasing sonic results. Listening to the Reference Recordings recording of H. Owen Reed's "La Fiesta Mexicana" track on the excellent *Dallas Wind Symphony Sampler,* I could not hear a difference between the two test systems in dynamics, bass extension, or transients on percussion instruments, and both systems were highly palpable and engaging. While the direct-connect system offered a clearer window on the soundstage with slightly more transparency, detail, and bass articulation, the sound was harmonically richer and the soundstage was more expansive when the DL3 was added to the chain. Moreover, the overall presentation sounded more relaxed with less of that slight digital edge and forwardness in the upper midrange and highs that RH noted. I realize that these "additions" with the DL3 in the system are euphonic colorations, but I preferred them and did most of my digital listening with the DiaLogue Three in the chain. It made me feel more like I was listening to analog rather than digital—and that's a good thing in my opinion.

The DL3 sports a heavy-gauge steel chassis, premium parts (including high-quality Solen polystyrene and tinfoil capacitors), gold-plated RCA jacks, and a substantial metal remote with lots of useful functionality, particularly with other DiaLogue Series amplifiers and CD players. I liked being able to switch the DiaLogue Series amplifiers from ultralinear to triode mode through a unified remote, while being able to change inputs and volume from the listening position. While the DL3 doesn't have a balance adjustment like the VTL preamplifier (via its remote) or the dual volume controls of my reference, it does use a single high-quality Alps Blue Velvet volume control to reduce noise—a very good tradeoff in this price class.

The DiaLogue Three does not offer balanced outputs, and while it can be configured with an optional moving-magnet phonostage, my unit was not equipped with one. (The optional internal phono-board, designed by Marcel Croese, in the DiaLogue Two integrated is both a solid performer and a great value. However, if you prefer low-output moving coils, you must go with a separate phonostage.)

With the addition of the DiaLogue Three preamplifier to its lineup, PrimaLuna clearly demonstrates that it can produce both stellar amplifiers *and* preamplifiers. Like its DiaLogue Series siblings, the DL3 has a tremendous *wow* factor—it's difficult to believe that such engaging, gorgeous sound, coupled with a wonderfully expansive soundstage, can be had for such a relatively modest price. What the DL3 does that I found so compelling is let the music "breathe" effortlessly. Admittedly, it may make many recordings sound better than they should, and if you want to hear exactly what is on the mastertape, the DiaLogue Three may not be your cup of tea. But if you want to listen for hour on hour without any aural fatigue and be transfixed by the musical performances and the gorgeous timbres of instruments and voices, you've come to the right place. tas

SPECS & PRICING

Frequency response: 10Hz to 130kHz (+0/-3dB)
Inputs: Five pair RCA, one pair HT bypass
Outputs: Two pairs of RCA main outputs, one pair RCA tape monitor out
Tube complement: Four 12AU7s, two 5AR4s
Input impedance: 220k ohm
Output Impedance: 2500 ohm
Dimensions: 15.9" x 15.2" x 8.3"
Weight: 52.9 lbs.
Warranty: Two year limited (six-months on stock vacuum tubes)
Price: $2699

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T+A Audio P 1260 R Preamplifier and A 1560 R Power Amplifier

Plain-Jane on the Outside, Elegant on the Inside

Wayne Garcia

To ward off potentially kinky thoughts from louche readers, let's get this out of the way right now: T +A Audio stands for "Theory and Application in Electro-acoustics," shortened to "T+A."

Founded in German Westfalia in 1978, T +A manufactures a complete line of audio gear. As Michael Manousselis of Dynaudio USA (the company's North American importer) emphasized in an e-mail, "Each and every T+A product is developed and designed in-house, with all engineering and manufacturing conducted at the company's state-of-the-art factory in Germany—including both loudspeakers and electronics."

T+A also boasts serious design innovations: "It was the first manufacturer to offer high-end components incorporating RS-232 control, the first to offer CD players with re-clocking and selectable filters, and a trailblazer in the field of fully digital loudspeakers. More recently, T+A pioneered high-end streaming network/client audiophile sources." These bold claims will no doubt raise the eyebrows of certain other manufacturers, and I have no way to prove or disprove them. Regardless, T+A is clearly at the forefront of leading-edge audio design (or among those who are).

First introduced in 1999, the R Series preamp and power amp under review here represent the third-generation of T+A's longest-lived product range, and incorporate what T+A calls "Ultra-Wide Bandwidth" circuit designs.

T+A believes, as do I, that the preamp is the core of the amplification system. Not, of course, that power amps are unimportant, but that the basic sound of an electronics package starts at the preamp. Improvements to the P 1260 R ($4000)—which I received as a seven-input linestage, but which can also be outfitted with optional mm or mc cards—are said to derive from the latest generations of operational amplifiers (op-amps). To give them an optimal working environment, T+A places its op-amps "on their own double-sided circuit board with power plane, voltage de-coupling, and constant-current bypass." The company calls this technique OAD (Op-Amp Decoupling). Other internal component-part upgrades include Vishay metal-film resistors and Wima FKP, silver-electrode mica, and Elna Cerafine capacitors.

With the A 1560 R power amp ($6000) T+A designs its broad-bandwidth circuit to deliver both high speed and high power. Rated at 170Wpc into 8 ohms, and 280Wpc into 4 ohms, a pair of 1560s can be operated as bridged mono amplifiers delivering a walloping 500W into 8 ohms and 600W into 4 ohms. By any measure that's a lot of juice. But T+A's design team is equally focused on "neutrality, high output power, and performance independent of load," with a newfound attention to peak-power and optimal dynamic performance regardless of the speaker system used. The firm likes to note how these properties, combined with meticulously matched output stages, make their units suitable for bi- and multi-amp applications. Similar op-amp decoupling and parts selection are employed herein, as are toroidal transformers, with the use of non-magnetic boards and contact points to eliminate potential distortions caused by ferro-magnetic non-linear effects.

T+A's industrial design is deliberately simple, functional, and notably compact compared to most high-end gear. Although some T+A designs have pizzazz, there is nothing at all sexy-looking about the items reviewed here—except, perhaps, for the narrow peek-a-boo windows that allow a glimpse at the precision internal construction. The brushed-aluminum P 1260 R preamp offers an array of push-button controls with corresponding green LEDs, a volume control, and, somewhat unusually, small rotary pots for separate left/right-channel bass and treble tone control, and for balance. In another throwback

EQUIPMENT REVIEW - T+A Audio P 1260 R Preamp and A 1560 R Power Amp

feature, the A 1560 R power amplifier allows for two sets of speaker hook-ups, switchable from the front panel, which also offers a spring-operated flap to access the headphone jack, buttons for choosing between mono or stereo operation, and, again rather unusually (and somewhat NAD-like), "slow" and "normal" speaker protection against clipping.

If one were to judge audio components based on their looks, one might assume at first glance that the T+A gear is cool, perhaps even clinical-sounding. And though the sound is precise, it isn't cool, but remarkably elegant and refined. Leading me to conclude that T+A views its gear as serious tools with which to enjoy music.

There is a notable consistency of sound here, no matter the volume level. Indeed, finding the sweet spot in volume is critical with this T+A combo. For example, while playing Analogue Productions' terrific 45rpm-cut of *Monk's Music*, I kept goosing the volume pot in an effort to get the music to swing a tad more. Until I found the right loudness zone, all the right pieces were in place—a nice soundstage, creamy brass, Monk's funky piano, nimble bass, and snappy drums—but the tune lacked drama and drive. Which is another way of saying that the T+A components don't need to be played loudly to sound good, but that the right level can really make them sing. Granted, my speakers are Maggie 1.7s, which like a certain amount of electronic prodding, but that doesn't change the fact that, in my experience, the T+A units are more sensitive to the Goldilocks effect than most. And by the way, this is the case whether you're playing something like the Monk LP, or a classical piano work, or rock.

As to the latter, "Mojo Pin," from Jeff Buckley's *Live at Sin-é* [Columbia/Legacy CD], showed good air and ambience from the in-club recording venue, a nicely detailed guitar sound, and a fine sense of presence to his vocal. But again, the presentation seemed to lack a bit of verve, the fire that made Buckley such an electrifying performer. I had the same feeling with Argerich's recording of Ravel's *Gaspard de la nuit*, where the opening "Ondine" movement did not have quite the same air between notes, harmonic overlay, or dramatic dynamic leaps I'm used to.

Direct comparisons with Cary's SLP 05 linestage preamplifier,

inevitably revealed trade-offs, but also showed—interestingly, given T+A's focus on preamp performance—that the performance of the A 1560 R amp was superb. When matched with the Cary preamp, which, granted, is not as low-noise or precise-sounding as the T+A 1260, the 1560 sprang to life. Revisiting previously mentioned music, the pair delivered great throatiness and individuality to the brass on the Monk, as well as a more defined feeling of air, depth, and dynamic swing.

I don't usually use the word "polite" to describe audio gear, but for my taste the P 1260 R preamp is just that; noteworthy in many ways but reserved, especially when compared to the excellent A 1560 R amplifier, which enjoys all the fine virtues of the preamp—low noise, purity of tone, outstanding balance across the frequency spectrum, and fine detail—but with the added ability to cut free and soar with the music. tas

SPECS & PRICING

P 1260 R Linestage Preamp
Inputs: Seven pairs RCA (optional mm/mc phono cards)
Outputs: One pair RCA, two tape (RCA)
Dimensions: 17.33" x 3" x 15.5"
Weight: 15.75 lbs.
Price: $4000

A 1560 R Power Amplifier
Power output: 170Wpc into 8 ohms; 280Wpc into 4 ohms (stereo); 500W into 8 ohms and 600W into 4 ohms (bridged mono)
Number and type of inputs: One pair single-ended RCA; one pair balanced XLR; T & A RLINK
Number and type of outputs: Two pairs of 5-way binding posts; T & A RLINK
Dimensions: 17.3" x 5.9" x 15.5"
Weight: 40.5 lbs.
Price: $6000

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NuForce Reference 18 V3 Monoblock Amplifier

Keeping Faith With The Recording

Chris Martens

I have been following the gradual evolution of NuForce's Class D Reference 9 Series monoblock amplifiers for years and have been impressed with the progress the NuForce team has made with the design over time. From the outset, I felt the NuForce amps had much to offer in detail, transient speed, expressive dynamics, and rock-solid bass, though I recognize that their sound was also considered controversial by some critics who felt the amps were overly analytical, mechanical, even bright—as if delivering what one writer termed "highs under glass." Taking these criticisms to heart, the NuForce team labored, successfully in my view, to give successive versions of the Reference 9 a smoother and more mellifluous sound intended to deliver "sweeter highs" and "a more natural and relaxed presentation." Each new iteration of the amplifier offered small but worthwhile incremental improvements, which were all to the good. Still, over the past year or so, NuForce decided to develop a new amplifier that would be capable of taking much bigger sonic steps forward—an amplifier meant to compete directly with statement-class amplifiers regardless of price. The result of that design effort is the new Reference 18 monoblock amplifier ($7600/pair), which is the subject of this review.

Thus far NuForce's monoblock amps have traditionally been extremely compact, featuring deep but narrow enclosures roughly one-half rack-space wide. The Reference 18, however, uses a considerably larger, 17-inch-wide chassis that gives the amp the appearance of a wide, flat, metal slab finished in satin black, with the NuForce logo set in recessed letters on its top plate. At the front of the amplifier is a sharply beveled faceplate whose sharp angles remind me of the shape of Lockheed's F-117 Nighthawk "stealth fighter." The only oddity is that the amp appears, at first glance, not to have a front panel on/off switch of any kind. If you look closely at the amplifier's "stealth" faceplate, however, you'll see what appears to be a slim gloss black trim strip that in actuality turns out to be a touch-sensitive power switch. If you swipe your finger across the trim strip from left to right, the amp will power up as denoted by a red NuForce logo that illuminates from within; reverse the finger-swipe process (moving from right to left) and the amp shuts down. It's a cool and clever design touch that's fun to use. At the rear, the Reference 18 provides a pair of WBT speaker terminals and switch-selectable single-ended (RCA) or balanced (XLR) inputs.

Why did NuForce go with a larger chassis for its new amp? The short answer is that the firm wanted to equip the Reference 18 with a bigger and better power supply than the one used in the Reference 9. This high-performance power supply features an extremely elaborate array of capacitors that would never have fit within the tight confines of the small Ref 9 enclosure. NuForce calls its special bank of capacitors a "Cross-Matrix Array" (or CMA, for short)—an array said to minimize potentially audible "parasitic resonances" of all kinds and thus to offer a "no-compromise route to the ultimate in performance." NuForce's Web site provides the following description of the CMA capacitor bank:

"The Ref 18 CMA employs the highest-quality capacitors of various values arrayed in a quasi-random pattern in order to spread resonances over a wide range of low-amplitude frequencies. In order to minimize stray magnetic fields, and hence, to reduce parasitic inductance, the capacitors are positioned so that their polarities are reversed with respect to each other. By lowering inductance, any remaining resonance is elevated to frequencies where its elimination becomes an easier task. Finally, low-value resistors combine with capacitors in strategic locations in order to dampen residual resonances."

EQUIPMENT REVIEW - NuForce Reference 18 V3 Monoblock Amplifier

Interestingly, the purpose of the CMA array is *not* to increase the amp's power output *per se* (both the Reference 18 and the Reference 9 produce an identical 175 watts at 8 ohms or 335 watts at either 4 or 2 ohms), but rather to improve *qualitative* aspects of power delivery. NuForce says the array enhances the amp's ability to resolve low-level textural and transient details and to handle both small and large-scale dynamic shifts with grace, speed, and finesse. Are these claimed sonic benefits borne out in real-world listening? Indeed they are, and with results that are far more dramatic than you might at first expect.

Let me begin by noting that the Reference 18, like all NuForce amplifiers, benefits from a good bit of run-in time (our samples were trade-show demo units that had received plenty of burn-in in advance). I found that from the moment I powered-up the Reference 18s they immediately produced a more detailed, three-dimensional, and dynamically expressive sound than any of the NuForce amps I've reviewed in the past. What is more, those sonic differences became even more fully fleshed out and refined after the amps were allowed to warm up for several hours. In short, the Reference 18 left behind the world of incremental improvements and instead offered a substantial sonic leap forward.

One of the first things I noticed was that the Reference 18, despite having the same rated power output as the Reference 9, seems significantly more powerful and expressive. When dynamic shifts in the music occurred, whether large or small in scale, the forceful Ref 18s instantly responded with an almost startling degree of speed, power, and control. There was never any sense that the amplifier was working hard, not even in the midst of taxing or highly complicated dynamic passages, so that at every point the Reference 18 seemed ready, willing, and able to do the music's bidding—no matter how sudden or severe the demands on its power reserves happened to be. In fact, this agile, "energy-on-demand" quality is one of the Reference 18's signature characteristics—one that makes other amps sound, by comparison, as if they are struggling to keep pace with the music (or to overcome internal dynamic constraints). I found the Reference 18's dynamic agility not only benefited large-scale orchestral works and the like, but also gave quieter, more contemplative material greater impact and realism.

To appreciate the Reference 18's benefits on large-scale material, try listening to the second (Scherzo: Allegro molto) movement of the Copland *Organ* Symphony with Tilson Thomas and the San Francisco Orchestra [SFS Media, SACD], where you will hear relatively quiet passages unfold to become full-fledged crescendos of thundering proportions. What I found particularly interesting about the Reference 18's handling of the movement was not just its ability to navigate the crescendo sections with muscular grace, but also—and perhaps even more importantly—its ability to highlight the dynamic *contrasts* between crescendos and the quieter passages that preceded them. Dynamic contrasts are one of the things the Reference 18 does best, so that at times the amp creates the illusion that it has, in a subtle and entirely appropriate way, unlocked and expanded the dynamic range of familiar records.

But there is more to the Reference 18s than dynamic expression, because these amps also offer two more vital and interconnected characteristics that help to enhance realism: namely, terrific transient speed and excellent resolution of very fine, low-level details—areas where the Reference 18 comfortably exceeds the performance of the already good Reference 9 V3 SE. When first powered up, the Reference 18 sounded detailed with a capital "D," so that I couldn't help but notice how much sheer sonic information the amplifier was conveying. Long experience has taught me, however, to be cautious when details draw too much attention to themselves, even in seemingly good or pleasant ways, since this can be an indication that there are elements of artificial "highlighting" or "spotlighting" present (qualities that can be exciting at first, but that foster listening fatigue over the long haul). However, given adequate warm-up time, the amp undergoes a subtle yet significant sonic transformation, so that its sound—while still exhibiting tons of resolving power—becomes noticeably more liquid, easygoing, and relaxed. As a direct consequence, musical details are allowed simply to *happen*, unfolding effortlessly and naturally without the amplifier imparting any excess edge enhancement or unnatural brightness that isn't part of the recording itself. As this transformation occurs, several beneficial things happen at once.

First, the amplifier does an increasingly good job of capturing the sense of air surrounding instruments or reverberating within the confines of recording spaces. Second, previously veiled nuances not only become easier to hear, but also become more smoothly and fluidly integrated within the musical whole (this is the "liquid" quality I mentioned above). Third, imaging and soundstaging cues sound more whole, complete, and realistic, so that sounds no longer arrive with an unnatural and almost mathematical precision (as in, "Attention listeners: this sound just originated from a point defined by coordinates X, Y, and Z"), but rather arrive from believable locations within equally believable soundstages (as in, "The conch player just stood up to play a few solo notes before sitting down, back on the far left side of the stage just behind the conga player"). The fascinating result is that both lateral and front-to-back imaging become at once more focused and specific, yet also exhibits a more natural and organic sound (or at least that's what happens on good recordings). Finally, timbres and tonal colors become purer, better defined, and truer to themselves.

For a good example of all these qualities in action try listening to the track "Palmyra" from Bela Fleck and Edgar Meyer's *Music for Two* [Sony Classical] through the Ref 18s. The track opens with Meyer stating an elegantly simple theme on solo piano, only to be joined several measures later by Bela Fleck offering soaring, lilting, and almost ethereal lines on his banjo. Then, as the song unfolds, Meyer switches from piano to his primary instrument—an acoustic bass that, on this track, is played *arco* rather than *pizzicato*-style. It is a delicious study in contrast to hear the Reference 18 delineate the very different and yet equally evocative voices of these three instruments, and one fascinating aspect of the performance—as rendered by the NuForce amps—is that the sound of each instrument remains perfectly stable, full, and complete whether the other instrument is playing at the same moment or not. This might seem an obvious point, yet it is not. With many amps one has the sense of there being a painfully finite reservoir of clarity to draw upon, so that as more instruments join the mix the amount of resolution that can be devoted to any one of them gradually decreases. But not so with the Reference 18; it seems able to provide clarity-on-demand to fit the requirements of the record.

EQUIPMENT REVIEW - NuForce Reference 18 V3 Monoblock Amplifier

In "Palmyra," for instance, it is easy to get lost in the distinctive, plaintive textures and timbres of Fleck's banjo, whose sounds begin with a fast-rising attack as the instrument's strings are first plucked, with the fuller envelope of the note unfolding an infinitesimal split-second later as the banjo's signature head and resonator begin to release energy. By comparison, Meyer's bass has a radically different way of delivering sound (not to mention its typically lower-pitched voice), so that you first hear the bow start to move, then hear the bow gain traction on the string, and finally hear the bow generate a mounting wave of acoustic energy as the string and the large wooden body of the instrument begin to vibrate. The Reference 18s give you an up-close view of the collaboration between Fleck and Meyer, where Fleck's fast fluid banjo lines have the quick dancing quality of leaves caught in a gust of wind, while Meyer's bass lines supply an almost hypnotic surge, much like the ebb and flow of waves on a seashore. The sonic effect is both riveting and realistic, creating the illusion that the listener is seated just a few rows back from the front of the performance stage. *Music for Two* is an extremely well made live recording, and the NuForce amps let you hear the voices of the instruments unfold within the natural acoustics of the performance venue, making the spatial relationship between the players clear and explicit.

Finally, let me come right out and tell you that the Reference 18 offers some of the best—if not *the* best—bass reproduction I've ever heard from any amplifier at any price. This is an area where NuForce amps have traditionally been very good, but where the 18 takes things to an even higher level. What is so satisfying, here, is the amplifier's nearly unbeatable combination of extension, depth, power, nuance, and, above all, control. No other amplifier I can think of does a better or more consistent job of getting woofers to behave themselves and to follow the music, rather than allowing them to wander off on uncontrolled low-frequency excursions on their own. In short, you can trust the NuForce to get the foundational elements of bass right.

To hear what I mean by these comments, try playing "Temple Caves" from Mickey Hart's *Planet Drum* [Rykodisc] and listen for the ultra low-pitched "Earth drum" to sound. The instrument is exceedingly low-pitched and powerful—qualities that, with some amplifiers, would be a recipe for sonic mush. But the Reference 18 wades right in, grabs hold of the sound of the drum, and simply nails it, so that you not only hear the attack and gradual decay of the drum, but also experience the full depth and weight of its presence. Yet even when caught up in the sheer power of the drum's notes, the NuForce preserves a sense of proportion and detail, so that you also hear very subtle modulations within the envelope of the notes. The Reference 18 adds dramatic impact, not by overstating low frequencies, but rather by rendering them powerfully, yet with consistent nuance and precision.

Are there drawbacks to the Reference 18? Well, as with many great audio components, the Reference 18 has some of the qualities of a double-edged sword. The good news is that it will tell you exactly what's going on in your recordings. The not-so-good news is that, as I just said, it will tell you *exactly* how your recordings really sound (whether for good or ill). This is perhaps a roundabout way of saying that the Reference 18 has a certain tenaciously revealing quality that just won't quit,

and in this respect the NuForce amps do invite what might be considered an analytical or perhaps "diagnostic" style of listening. After you live with this amp for a while, you may find you instinctively become a connoisseur of fine mixing and mastering efforts, since the amp renders well-made records with stunning and at times breathtaking beauty, but also exposes any flaws that may be present for exactly what they are—flaws. The amp doesn't browbeat you with defects in recordings, but it makes no effort to conceal them. For my part, I'd rather have the Reference 18's pure, unvarnished honesty, but you might make a different choice. But remember this: When your recordings are up to the task, the Reference 18 will make them sound mind-blowingly good.

The Reference 18 is hands down the finest amplifier NuForce has made, and I think it is good enough that it deserves to be included in most any discussion of top-tier amplifiers. Even if you have heard (and perhaps disliked) Class D amplifiers in the past, this is one I think you will find worthy of your time and consideration. Above all, the Reference 18 keeps faith with the truth of the recording itself, which is all anyone might ask of a fine power amplifier. tas

SPECS & PRICING

Frequency response: 20Hz (-0.3 dB)-120kHz (-3dB)
Power output: 175 watts at 8 Ohms, 335 watts at 4 or 2 Ohms
Inputs (switch selectable): One unbalanced analog audio (RCA jack), one balanced analog audio (XLR)
Dimensions: 2.95" x 17" x 15"
Weight: 16 lbs.
Price: $7600/pair

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Zesto Audio Andros PS1 Vacuum Tube Phono Preamplifier

An Instant Classic

Paul Seydor

Every now and then a component comes along that makes you reevaluate many of the values you bring to assessing audio equipment. Some personal examples include Quad ESL (of every vintage), Harbeth Monitor 40, and Spendor SP1/2 speakers; the Linn-Sondek (at a crucial moment in time, anyhow) and the SOTA turntables with vacuum hold-down; the Ortofon Windfeld pickup; the Basis Vector 4/2200 arm-turntable combination; the Super Audio Compact Disc; the late (very much lamented) Sigtech DSP device. These designs are not so much revolutionary as radical in the sense of returning you to origins or basics, reminding you of certain fundamental values that it's too easy to take for granted or forget about as review products come and go.

Zesto Audio's new Andros PS1 vacuum-tube phono preamplifier may be one such design, at least in the area of vinyl reproduction. It's one of the loveliest-sounding electronic components I've ever had the pleasure of reviewing. Almost miraculously, it seems to exhibit virtually no discernable electro-mechanical artifacts. Its sound is unbelievably smooth and velvety; harmonically rich, full, and vividly textured; marvelously rounded, tactile, and dimensional, with great body and solidity; and completely natural in its musicality and freedom from any of the usual sonic hype, audiophile style. There is also an extraordinary homogeneity to the presentation, although a better word here might be "integrality," as I wouldn't want to suggest the Andros is in any way thick or undifferentiated. I mean, rather, to call attention to the way it reproduces musical events as organic, seamless *wholes*. There are, I believe, solid technical reasons why it sounds as it does, which I'll get to later.

With well-recorded orchestral sources—I am now listening to the classic Stokowski recording of Liszt's *Hungarian Rhapsody No. 2* [Classic Records reissue]—the orchestra is spread across the front of the listening room, though by necessity restricted in size and volume. Regardless of what optimistic designers and starry-eyed copyrighters tell you, the literal scale and dynamics of a full symphony orchestra cannot be replicated in any domestic setting that remotely falls within the range of normal or typical. That said, however, the ease with which disbelief is here suspended is quite uncanny: the strings are set slightly behind the plane of the speakers with the rest of the ensemble stretching back behind them, all appearing as a cohesive group deployed in a setting that seems to be a real (as opposed to virtual) space. Yes, there is spot-miking and the top end is a little bright (whether owing to the mikes or the engineers' equalization or both I cannot say), characteristics the Andros reveals, but not distractingly so, for this is a muscular recording of truly fabulous performances.

Perhaps more to the point is the sheer beauty of the sound, the richness of the orchestra, the texture of the instruments both individually and as an ensemble, the power of the brass, percussion, and low strings, the warmth of the cellos, the brilliance of the violins, the color of the winds. And despite his age, how rhythmically vital that old wizard Stokowski was! Interpretively, it's a wildly imaginative, even willful ride, but realized with such style, virtuosity, and panache as to be irresistible, adjectives that also apply to the companion rhapsody, Enesco's *First Roumanian*.

It being the season to be jolly, I hauled out a thirty-year favorite, the *Hodie* by Ralph Vaughan Williams in its first recording, conducted by David Willcocks. Vaughan Williams had long wanted to write a big Christmas piece, and this one has the feel of a dream realized. The forces, including full orchestra, two choirs, soloists, and organ, are huge, starting with a jubilant brass fanfare with choral interjections of "Nowell, Nowell" and ending with a spectacularly triumphant setting of Milton's *Ode on the Morning of Christ's Nativity*. The Andros did not disappoint, bringing this vintage EMI recording magnificently to life. Yet for all the size of the forces, it may be the intimate numbers that are the most deeply felt, in particular the meltingly beautiful "Lullaby" for children's chorus and mezzo-soprano, here the incomparable Janet Baker. Notice, to take one small but telling example, how, almost imperceptibly, Baker's voice emerges from the texture of the children's voices.

Turning to popular voices, I went through several of the new Mobile Fidelity reissues of

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classic Sinatra, starting with *Sinatra at the Sands*. Hardly a great recording *qua* recording, it nevertheless does capture Sinatra at the peak of the Reprise years in a nightclub setting, the focus on the voice razor-sharp but still very attractive in a flesh-and-blood way, even if far too close up to be "realistic" (as with most live recordings in clubs, the perspectives are weird, with the audience appearing behind the performer). But so beautifully does the Andros reproduce The Voice that it's easy to forget about all that audiophile stuff and just enjoy Sinatra, who is in great form even if the instrument is obviously no longer in the shape it was ten years earlier at Capitol (compare this "Angel Eyes" to the one on *Only the Lonely*).

A different baritone in *Belafonte at Carnegie Hall* [Classic Records reissue], that legendary voice at once husky and honeyed, likewise beautifully clean, clear, present, and superbly projected. The same for Julie London in Boxstar's superlative reissue of *Julie Is Her Name*, reproduced with all the purity of pitch for which she is renowned. Soon I found myself bringing out records I hadn't heard in much too long a time and wondering why I hadn't: *Growing Up in Hollywood Town*, for example, Amanda McBroom's first outing for Sheffield. I had all but forgotten the fantastic presence and immediacy of these direct-to-discs, to say nothing of their wide dynamic envelope (try the opening of "Amanda"). I was lucky enough once to hear McBroom at or near her prime in a small club in Santa Monica, doing her heart-wrenching "The Portrait," the first cut on this Sheffield. Rarely have I heard a singer lay herself out so openly, with such raw and unflinching emotion. I've replayed that performance—more intense than the one on this Sheffield—in the theatre of my mind many times, but the recorded rendition is certainly intense enough so as not to suffer in the comparison.

Voices to instruments and Ben Webster's glorious "How Long Has This Been Going On?" from the classic *Ben and Sweets* [Classic Records reissue], the same adjectives keep cropping up: smooth, velvety, yet Webster's tenor sax still big, expansive, and voluptuous. Another sax, Sonny Rollins' on *Way Out West* [Acoustic Sounds reissue], is vibrantly present. You could argue that the Andros is maybe a little too smooth here, because even when Rollins is relaxed and enjoying himself, as on this album, he's still got a bit of bite to his tone, and so it is through the PS1, if ever so slightly *ma non troppo*. But turn to the Juilliard's great sixties album of the Bartók quartets and you'll find the Third reproduced with all the severity and acidity of tone for which this thorny piece is either famous or notorious. And despite the closeness of the recording, it nevertheless opens out with a surprising bloom and, perhaps owing to its very closeness, puts the performers in the room rather startlingly (especially if you get the playback levels just right, which doesn't necessarily mean very loud). Regis Pasquier's violin in his Harmonia Mundi set of the Bach Unaccompanied Partitas and Sonatas has the requisite warmth of tone and, where called for, brilliance.

If it seems that I have been talking mostly about the music and relatively little about the component, then you are on to my strategy. I've rarely auditioned a piece of equipment that has from the get-go made it harder for me to stay in reviewer mode as opposed to just plain music lover mode, causing me to scribble fewer (illegible) notes than I have in I can't remember when. And I must confess that no one could be more surprised than myself by this, because, to put it frankly, I do not quite "get" the use of tubes for amplifying very low-level signals such as those from low-output moving coils. I make this admission not to my credit, only to put my bias out there as a context for my enthusiasm.

The Andros is the first product from Zesto Audio, a new firm, based in Southern California, owned by George and Carolyn Counnas. George grew up in Great Britain where as a young man he designed vacuum-tube circuits and worked for DECCA Navigator, one of Britain's largest electronics companies, as part of a research and development team designing airborne navigational systems for the Royal Air Force. But music was an abiding passion and he long wanted to design his own products, electing to begin with a phonostage. Despite what he freely acknowledges as the many advantages of digital, vinyl long ago won and still holds his heart. The same is true for vacuum-tube technology. "I started doing research on past phonostage designs going back to the original RCA circuits of the 1930s," he says. "These guys got a lot of things right, even though their tools were slide rules and trial-and-error." He claims some 71 circuit revisions and hundreds of parts upgrades before he arrived at the production Andros. Paying as much attention to the outside as the in, Counnas enlisted the help of his wife Carolyn (an artist) and Musky Mistry (an industrial designer) to come up with a look both unusual and unusually pretty. The black chassis consists of a lower layer adorned with a grey graphic of undulating curves on the fascia. The upper layer is shaped like a grand piano (viewed from the top) with a mirrored finish on the front edge that reflects the four softly glowing tubes located within the hollow curve. The graceful, gently curvy style belies the ruggedness, the chassis made from 16-guage steel and supported with IsoNode isolating feet. Parts quality and workmanship appear first-class.

The PS1 will accept both moving-magnet and moving-coil pickups (you can hook up two complete phono setups, provided one is high output, the other low), and there are even balanced inputs to parallel the RCA inputs (but RCA-only outputs). There are a two-position level switch for MCs and a novel grounding switch that allows you to isolate the ground if need be. Of great importance to me, Counnas is most definitely not a subscriber

SPECS & PRICING

Inputs: Moving magnet and moving coil
Noise: -75dB
MC stage: Transformer
Tube complement: Four JJ ECC83S/12AX7
Frequency response: +/-0.5dB referenced to the RIAA curve
Dimensions 17" x 5" x 12"
Weight 20 lbs.
Price: $3900

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to the one-size-fits-all approach to loading, the PS1 offering eight options from 20 to 1000 ohms. Technical specifications are impressive, the price is $3900 (which includes 50 hours of factory burn-in), and each unit is "hand-built in the USA."

As the Zesto factory is not far from where I live in Los Angeles, the Counnases themselves delivered the unit and set it up, though there was hardly any need for this, so easy is the job, out-of-the-box to music taking scarcely fifteen minutes. There is literally nothing to do but plug it in, attach all the appropriate signal cables (not provided), select pickup type (and loading option if applicable), turn it on, and put on a record. Since the unit is burned in at the factory, you might want to give the tubes fifteen or twenty minutes of warm up if you want to hear the Andros in all its glory the first time you cue stylus to groove (about the same warm-up time is required after it's been off for awhile). Once you recover from the sheer beauty of that initial sound, what may strike you next is how quiet this thing is, noise being one reason for my bias against tube phonostages. No, you cannot crank the volume all the way up with your ear right against the speaker and hear silence (you can't do that with most solid-state phonostages, either). But unless playback levels cross over into the insane, the impression of background blackness is without precedence in my experience of tube-based phonostages.

At the outset I said I believed there are good technical reasons why this unit sounds as it does, reasons not unrelated to that impression of low noise but not necessarily related to the use of tubes as such. Rather, I believe they have much to do with Counnas' decision to use transformers to step up the low-output moving-coil signals. It has always surprised me that so many phono preamp designers eschew transformers in favor of active stages. To begin with, transformers are passive and do not generate electronic noise, which makes them, all other things being equal, quieter than even solid-state circuits, including those that are battery-powered. They are also far more tolerant of the vagaries of loading than active stages and suppress the resonances endemic to all moving coils much more effectively. Although some transformers are very expensive, there's little evidence to suggest that they must be so to do their job effectively—design know-how definitely trumps exoticism of parts and materials.

Detractors of transformers will insist that they ring and that by comparison to active stages tend to be midrangy, with the frequency extremes suffering (highs rolled, bass soft or down in level), likewise dynamics, transparency, resolution, and "speed." Those of us who like transformers grant some of these shortcomings as regards units of less than competent design but counter that none of them is intrinsic to the technology. We would also argue that transformers yield a more natural, musical, and altogether pleasing sound than any active stage.

As with so many audio debates, this one is unlikely to yield any sort of consensus. Each side can cite evidence in support of its position, even if the "evidence" consists in nothing more than listening impressions. Here's my two dollars' worth: I have for over twenty years used as one of my reference step-up devices Mike Sanders' Quicksilver Audio transformer. This excellent design, priced at a mere $695, consistently makes for some of the most tonally neutral and musically natural reproduction of vinyl sources I know and is not deficient in any aspect or category of audio performance important to me. Its only potential drawback is that its fixed 470-ohm input impedance does not ideally load every MC, though it works very well for most I've used, including some I've regarded as reference caliber. Further, as noted, whatever their impedance specification, transformers do seem to damp or otherwise control MC resonances far better than inadequately loaded active stages do.

What I hear from the Andros PS1 are many of these same qualities—the ease, the relaxation, the unforced naturalness and musicality—only better, one large reason being that Counnas has designed the active stage to synergize optimally with the transformer (see Sidebar). And I surely find no sonic evidence here for any of the putative compromises at the frequency extremes: the organ pedal at the opening of the justly famous Decca *Also Sprach Zarathustra* (conducted by Zubin Mehta), where the 32Hz note is actually *on* the recording, is shudderingly powerful and never lost hold of while the full orchestra blazes above it. Articulation and definition, not to mention so-called "speed" and "punch"? I've already cited Stokowski's Liszt. How about *Soular Energy* in the Pure Audiophile reissue? Ray Brown's peerless bass offers no challenges the Andros isn't up to, by which I mean that the foot-tapping brigade isn't going to have much to complain about. Up at the top, the same applies to cymbals, brushes, hi-hats, bells, triangles—all these are set forth with an entirely persuasive naturalness. The truth is I consistently find the reproduction of components celebrated for their ability to "carry the tune" overly etched and articulated in a way that can sometimes be appealing but is certainly not realistic or natural. This is especially true of components reputed to reproduce rock music especially well: I often hear a thinnish upper bass; an overly pronounced, even brash upper midrange; and a rising top end, all of which accentuate the very qualities of rock music that, I suppose, its fans like and that can certainly convey an impression of considerable incisiveness even if it's patently artificial. Music through the Andros betrays no such artifice or artificiality.

Transparency? Well, let me put it this way, while reviewing the Andros, music was always so involvingly *there* that "transparency" as a category of reproduction never occurred to me throughout the evaluations, which is to say that nothing made me think about it one way or another. There are many other components I've heard that excavate detail with rather more obviousness than the Andros, but none that has dug out anything the Andros has missed. On *Way Out West*, you clearly hear the players mutter to one another (or themselves) while they perform; on his recording of the Opus 131 with the full complement of the Vienna Philharmonic strings, Bernstein's hushed breathing is still there, as loud as it needs it to be but no louder; on that spooky Belafonte recording of "Dark as a Dungeon," when the thunderstorm approaches and it starts raining, the differentiation of sounds emanating from outside the studio and those from inside is wholly unambiguous, the storm manifestly approaches from a distance. When the rains starts, it's light at first then obviously gets heavier as the song reaches its conclusion. I've rarely heard this last effect reproduced to more convincing effect than here, the rain sounding like real rain.

Every now and then (mostly then) I sometimes wondered if the Andros

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Transformers

I asked George Counnas about the transformers and his decision to use them. He replied, "The transformers we use are designed by Deane Jensen (1942–1989). I chose them because Deane was a brilliant designer with a long history of outstanding products. Also, I wanted to do something to support the local community and that is made here in the USA.

"Why did I go the step-up transformer route? Because I could increase the gain without creating more noise. I wanted a unit that's quiet, musical, and affordable, though the Jensen transformers we use are by no means cheap—for example, they are shielded with mu-metal. But it's not like you can go out and buy these transformers and then just plug them into any phonostage and get the same results. I've integrated them into the overall circuit in such a way as to optimize the performance of the whole combination, from the cartridge to the output of the active stage.

"The way I've designed the circuit, the loading is on the secondary of the transformer. This means that the cartridge 'talks' to the transformer directly without any other parts or components involved (except the signal cables and connectors). Technically, this is called an AC rather than a DC load and it allows the cartridge to work to its best performance. The loading options allow the customer to resolve dynamic range, frequency response, and distortion according to his own conditions or preferences. For example, you can sometimes eke out a bit more dynamic range by choosing a loading value higher than the theoretically ideal match without seriously compromising frequency response and distortion or vice-versa. We encourage a little experimentation here for those who are so inclined."

Because tonal neutrality is important to me, I prefer loading at the theoretically correct value of ten times the internal impedance of the cartridge (e.g., 5 ohms translates to 50 ohms), which typically results in the flattest frequency response and the best damping of the high-frequency resonance. But you can get some interesting and musically valid results with other options. And thanks to how cannily Counnas has designed Andros, not too much mischief results when departing from the so-called "correct" values. PS

could be a tad bit more dynamic, detailed, or "fast." But when I played the same sources on components that brought out these qualities, they sounded all to varying degrees wrong: too much, too hyped, too everything . . . and soon found myself returning to the Andros for music as it really is. More than once I recalled an observation my colleague Robert Greene made of a component that especially struck his fancy: "It sounds totally unscrewed around with," he said, which for him is fulsome praise indeed. And which brings me full circle to my opening theme and why the Andros made me wonder how many artifacts of reproduction we take for granted as being the only way things can be because they are so routinely the way things are, as opposed to the way they might be.

A hundred shy of four grand is nobody's idea of a bargain for a stand-alone phonostage. But having been privileged to hear—at extended length in systems and surroundings with which I am intimately familiar—phono preamps costing tens of thousands of dollars that I would not choose over the PS1, I have no hesitation judging it to be worth its asking price, particularly when you factor in economy of scale, its domestic origin, its quality of parts, and its hand-built craftsmanship. The last thing I played before wrapping up this review was an old Musical Heritage Society recording called *Christmas at Colorado State University*, featuring the university's (I assume) student choir and chamber orchestra and also its glorious Casavant Organ, widely recognized as one of the world's greatest. The program opens with a powerful rendition for organ alone of *Adeste Fidelis,* which gives way to the chamber choir singing *a cappella* the French children's carol "Il Est Né" ("He is Born"), and oh my, the *way* they sing it: with sweetness, innocence, and purity of tone, as befits the lovely melody and the lyrics, sounding out from medium distance, at once focused yet utterly open and radiantly clear. The music, the performance, the recording, and the reproduction were so beautiful that I played the cut three times before returning to the task of finishing my review. tas

Hegel H30 Reference Power Amplifier

Scandinavian Surprise

Robert Harley

I'm fortunate to be able to choose from the roughly 700 high-end products introduced annually approximately ten or twelve components to review myself. These are the components I'm going to live with for many months, not just for critical listening but for daily musical enjoyment. So, how do I choose the roughly one product in 70 that makes it to my listening room?

The Hegel H30 power amplifier reviewed here is a case-in-point. The Norwegian company's integrated amplifiers sounded good at shows and received highly positive reviews from our own Kirk Midtskog (in Issues 206 and 211), with the H200 earning a Product of the Year Award in 2011. Hegel also has an interesting technical story with its patented "SoundEngine" circuit and meticulous transistor-matching. Hegel's founder and designer, Bent Holter, seemed technically astute and musically sensitive. And then I began hearing from seasoned industry veterans that the H30 was outstanding, even in the context of six-figure loudspeakers and the world's finest sources. I was intrigued by the possibility that a world-class power amplifier could be had for $15,000. Although not inexpensive, the H30 would represent quite a value if it lived up to its quietly growing reputation. Thus I asked for a pair of Hegel H30s for review.

The H30 is a 350Wpc stereo amplifier that can be bridged for mono operation. In the bridged configuration the amplifier delivers a whopping 1100W into 8 ohms. Hegel markets the H30 primarily as a reference monoblock amplifier, but unless you need massive power, a single stereo unit will drive most loudspeakers more than adequately. Not only is 350Wpc hefty output power, the H30 meets the challenge of driving current-hungry loudspeakers by nearly doubling its 8-ohm-rated output power when driving 4 ohms (675Wpc into 4 ohms). This ability to nearly double the output power when the impedance is halved is indicative of a robust power supply, a generous number of output transistors, and substantial heat sinks.

The H30 is a model of Scandinavian minimalism. The nearly square black chassis is adorned with only a gentle bulge in the front-panel's mid-section, a large round power button, and the engraved Hegel logo. The heatsinks are contained within the chassis. The rear panel sports balanced and singled-ended inputs, separate inputs for monoblock use, a stereo/mono switch, and large binding posts. Although attractive and well built, the H30 is about as far from "audio jewelry" as you can get.

This somewhat self-effacing outward appearance gives no hint at the special technology inside. The H30 is the ultimate expression of Hegel's patented SoundEngine output-stage topology described in the technical sidebar. This new implementation of SoundEngine is coupled with a transistor-matching protocol that is unprecedented in my experience. The H30's designer, Bent Holter, is a semiconductor physicist who has applied his insight to develop audio circuits that take into account transistors' internal workings.

Listening

I'll start by describing the H30 as a 350Wpc stereo amplifier and later comment on a pair of H30s bridged for mono operation.

The first thing that struck me about the H30 after dropping it into the system was its ultra-clean, even pristine, rendering of timbre. Instrumental textures were totally devoid of grain, hardness, and glare. In fact, certain instruments on familiar recordings were reproduced with startling clarity along with a delicious combination of liquidity and fine resolution. Take Roy Hargrove's trumpet on the wonderful Jimmy Cobb Quartet SACD *Jazz in the Key of Blue*. Through the H30 the instrument had a gorgeous bell-like purity that immediately vaulted the H30 in my mind into the upper echelons of power amplifiers in timbral reproduction. What made the H30's rendering of timbre special was a warm, lush, and involving quality without a hint of overly romantic coloration, thickness, or grain. Even more remarkable, the H30 was totally lacking in that sense you get from most solid-state amplifiers of timbres being overlaid with an electronic texture. The overall impression these qualities fostered was one of a sound that was organic, effortless, and natural. Music just seemed to flow in a way that didn't call attention to the playback system.

These are characteristics of mega-priced amplifiers; much of what you're paying for in the ultra-expensive units

EQUIPMENT REVIEW - Hegel H30 Reference Power Amplifier

Inside the H30

The H30's designer, Bent Holter, approaches amplifier design from a different perspective than most high-end designers—one that gives him a unique insight into circuit behavior. Holter's background is in semiconductor physics; he is a senior semiconductor research scientist at Scandinavia's largest research organization, SINTEF. He considers the transistors that go into a circuit not as simple building blocks, but as devices that exhibit complex and varying behavior when amplifying musical waveforms. By creating circuits that take into account the transistors' internal workings, Holter believes he can make a better amplifier.

The H30's output stage topology addresses a classic problem in Class AB amplifiers: crossover distortion, which is a discontinuity in the waveform at the signal's zero-crossing point. This phenomenon occurs when the transistors amplifying the positive-going half of the audio signal "hand off" to the transistors dedicated to amplifying the negative-going half of the signal. The "hand-off" isn't perfectly seamless, creating distortion that is particularly detrimental to low-level signals. (Pure Class A amplifiers don't suffer from this problem.) Crossover distortion can be minimized by selecting just the right amount of bias current as well as by measuring each transistor and finding matched pairs with similar characteristics. Holter has capitalized on his insight into the physics of transistor behavior to create a topology that reportedly eliminates crossover distortion. This Hegel technology, called SoundEngine, is explained by Holter in the accompanying sidebar.

The H30 is a Class AB design based on a balanced FET input stage, MOSFET voltage-gain stage, and a bipolar output stage. The input stage's single complementary pair of matched FETs per phase requires measuring and characterizing the performance of 1000 FETs to find one matched pair. The voltage gain stage is entirely separate from the input and output stages.

The power supply appears to be quite robust, and features separate supplies (fed from separate secondary windings on the power transformer) for the input stage, driver stage, and output stage. The dual toroidal transformers (one for each channel in stereo, one for each half of the amplifier when operated in bridged mono mode) are stacked atop each other in the chassis center. Rather than use a few soda-can-sized filter capacitors, the H30 features a distributed array of smaller caps (it looks like each output transistor has a dedicated filter cap). Incidentally, Steve McCormack used this technique with his DNA series of amplifiers starting in the early 1990s (DNA, or Distributed Node Array, describes McCormick's capacitor topology).

A total of 56 high-speed 200W output transistors form the output stage. As mentioned, the heat sinks are inside the chassis, with ventilation above and below the heat sinks for convection cooling. The H30 runs surprisingly cool, suggesting that the output-stage bias is quite low.

Looking inside the H30, the parts-quality is rather ordinary; you won't find tweaky $10 resistors and $50 capacitors throughout the amplifier. Hegel suggests that its SoundEngine circuit allows them to achieve high performance without resorting to esoteric passive components. RH

is precisely this combination of textural liquidity and clarity. Many amplifiers deliver the liquidity, but with a diminution of resolution and presence. Others err in the opposite direction, sounding pristine but also a little dry and sterile. The H30's core achievement, and one that defines the listening experience through it, is this pairing of vivid clarity and resolution on one hand, and liquidity and freedom from electronic artifacts on the other. Until the H30, these often mutually exclusive qualities commanded a significant price premium.

There's more to say about the H30's reproduction of timbre. Although the amplifier had a startling transparency and clarity, tone colors were dense, rich, and saturated. Instruments with complex harmonic structures—Art Pepper's sax on *Art Pepper Meets the Rhythm Section* [Analogue Productions LP], for example—were reproduced with warmth and richness. The H30 exhibited no trace of that thin, pinched, dry, clinical sound often associated with solid-state amplification. Timbres were so free from electronic artifacts that they took on a startling palpability and presence. In this regard, the H30 was reminiscent of a pure Class A design.

The H30's treble rendering was very much like that of its midrange—clean and detailed, yet smooth and rich. A characteristic of a great amplifier is the sense that the treble doesn't exist independently of the rest of the music, but rather is seamlessly integrated with it. This was the case with the H30; the treble was a natural extension of the upper midrange. The H30's treble integration resulted from a lack of hardness in the upper registers, a freedom from glare, and the absence of electronic artifacts that call attention to the playback system rather than to the music. Jimmy Cobb's delicate brush work on the previously mentioned *Jazz in the Key of Blue* illustrates the H30's wonderful ability to convey lots of information, but in a completely relaxed and unforced way with no etching of transients. I could hear the brushes moving against the snare-drum head in remarkable detail, but with a naturalness that fostered a sense of realism and music-making rather than "hi-fi" resolution.

SPECS & PRICING

Output power: 350Wpc into 8 ohms (stereo), 675Wpc into 4 ohms (stereo), 1100W into 8 ohms (mono)
Inputs: Balanced on XLR jacks, unbalanced on RCA jacks
Signal-to-noise ratio: >100dB
Distortion: <0.003% at 100W into 8 ohms
Damping factor: >1000
Power consumption: 120W (power on, at idle)
Dimensions: 16.9" x 8.25" x 21.6"
Weight: 121 lbs.
Price: $15,000

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Designer Bent Holter Describes Hegel's SoundEngine Technology

"Matching the power transistors in a normal-topology high-power solid-state class AB output stage is an extremely difficult issue. For best performance the output devices should be closely matched at all current levels, at all collector-to-emitter voltages, and at all different transistor internal die temperatures. Unfortunately it is practically impossible to match output devices for Beta [gain], current level, and collector-emitter voltage at the same time, because every single output transistor will have a different current/voltage transfer curve. You could, for example, match for Beta at a given current level/emitter-collector voltage/temperature. But this would make the output transistor-matching perfect for only this static current level, voltage, and temperature.

"The main problem of using power transistors for audio amplifiers is that the music signal is dynamic and asymmetrical most of the time. These kind of dynamic signals make the temperature of the transistor silicon go up and down with the signal. Unfortunately the current/voltage transfer curve of the power transistor changes when temperature changes.

"Because of this temperature change there will be a kind of memory effect where the instantaneous and recent dynamic signal history will determine the actual temperature of the transistor silicon. Because the temperature will change the transfer curve of the transistor, the transistor will always move away from any static matched transfer curve. The movement away from the static transfer curve will be dynamic and will depend on the audio signal's recent history.

"The dynamic temperature modulation of the transistor transfer curve will have the largest impact during the zero-crossing region, where the upper NPN transistors should seamlessly transfer the signal to the lower PNP transistors. When the music signal is close to zero, any distortion or dynamic non-linearity will be large compared to the music signal itself. This is the region of signal microdynamics.

"In a traditional Class AB topology output stage the crossover distortion is minimized by adjusting the bias current of the NPN and PNP push-pull output transistors. There is an optimal point of bias current that will make the crossover distortion lowest possible. The problem in traditional-topology Class AB is that the bias current is factory-adjusted with a symmetrical sinewave test signal at a certain output level and with a certain resistive test load. So now the amplifier bias is adjusted to have low crossover distortion with the factory test-bench sinewave test signal. Since the test sinewave is a symmetrical signal, the power dissipation in the upper NPN and lower PNP in the push-pull stage is the same, so the transistors' internal die temperatures will be similar in the NPN and PNP transistors. This will make the bias adjustment work OK and keep the crossover distortion low for this symmetrical sinewave test signal.

"Now comes the problem: Music signals are mostly asymmetrical signals. So the power dissipation in the NPN and PNP transistor will not be the same when playing an asymmetrical music signal. For example for a snare drum beat, the upper NPN transistor will take a large positive signal while the lower PNP only has a small negative signal. The temperature of NPN and PNP transistors will therefore be different, and the temperature effect will change the NPN and PNP transistor transfer curves. This makes the static output-stage bias current setting wrong for asymmetrical music signals, and it will generate dynamic crossover distortion.

"We have overcome the problem of dynamic crossover distortion with a patented output-stage topology called SoundEngine. We use a dynamic feed-forward technology that removes temperature-dependent dynamic crossover distortion as well as intermodulation distortion, and at the same time increases the distortion-free dynamic range. SoundEngine combines high linearity and low distortion at high signal levels with high linearity and zero dynamic crossover distortion at micro-levels."

At the other end of the frequency spectrum, the H30 had a taut, solid, and dynamic bottom-end that emphasized rhythmic drive and power. This was coupled with a slightly lean midbass that favored precise pitch definition and dynamic agility over weight and body. Kick drum cut through with sudden impact, emphasizing the instrument's rhythmic contribution. Immediately after switching to the H30 from the BAlabo BP-1 Mk-II I was struck by how the different power amplifiers changed the musical perception. For example, the H30's leaner midbass and tauter low bass brought out the kick drum. The BAlabo tended to emphasize the weight, richness, and body of electric and acoustic basses. The Hegel had a slightly greater expression of rhythmic drive in rock; the BAlabo was more adept at conveying the swing in jazz, the warmth and richness of acoustic bass, the power range of the orchestra, and the palpable textures of bass-rich instruments.

The H30's lean yet muscular bass, coupled with the amplifier's wide bottom-end dynamics and sense of sudden impact, gave the impression of great dynamic agility. The amplifier responded quickly to transient signals, starting and stopping on a dime. I also had the feeling that the H30 had virtually unlimited power reserves, which isn't surprising considering that I was driving the 94dB-sensitive, four-ohm Focal Stella Utopia EM with 675Wpc.

These qualities were all presented within a soundstage of crystalline-like transparency. Not only was there no sense of a fine veil between me and the music, but the palpability of timbres and images toward the back of the soundstage was phenomenal. Amplifiers that are less-than-

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transparent inhibit musical communication by diminishing the contribution of quieter instruments toward the back of the soundstage. The H30's ability to maintain the palpability of images by virtue of its transparency was remarkable, and an important ingredient of the amplifier's overall musicality.

Resolution of low-level detail was excellent, though not equal to the similarly priced ($20,000) Spectral DMA-360, for example. The Spectral amplifier digs a little deeper into the finest layers of musical and spatial information.

Throwing the H30's rear-panel stereo/mono switch converts the stereo amplifier into a monoblock by bridging the left and right channels into a single amplifier (the speaker load is the "bridge" that connects the two amplifiers channels). In this configuration, two H30s are required for stereo, but the pair delivers 1100W each into 8 ohms. This power increase is accompanied by a doubling of the output impedance and a halving of the damping factor. But considering that the H30 in stereo starts out with a damping factor of a whopping 1000, this isn't an issue.

Comparing a stereo H30 to a pair of mono H30s, I thought that a single H30 offered greater treble delicacy, more bloom and space around image outlines, and an increased sense of ease. The monoblocks still had the wonderfully clean treble and pristine quality I so enjoyed in the stereo amplifier, but not quite to the same degree. Switching to the monoblock mode, the soundstage wasn't as infused with air between images, or with the sense of bloom around those images. Image outlines were less tightly focused, which also tended to blur the distinction between an instrumental image and the space surrounding it. The presentation took a step down from the magical ease I so enjoyed with a single stereo H30. With 350Wpc into 8 ohms, and 675Wpc into 4 ohms, a single H30 should drive just about any loudspeaker without problems.

Conclusion

The Hegel H30 is not just a great-sounding amplifier, it's also a tremendous bargain. I know I'll get letters complaining that a $15k power amplifier by definition can't be a bargain. But what else can you call a $15,000 amplifier with massive output power, unflappable stability, and a gorgeous musical presentation that vaults it into a select league of world-class power amplifiers? Or one that is fully at home in the context of my reference system that includes the $54,000 Basis Inspiration turntable and $95,000 Focal Stella Utopia EM loudspeakers?

As adept the H30 is at all aspects of portraying the music, it's the H30's rendering of midrange and treble textures that makes this amplifier a standout. The Hegel coupled a warmth and lushness of timbre with tremendous clarity and resolution, a combination that is rare in an amplifier of any price. The sense of timbral realism and palpability was world-class by any measure. Moreover, it's difficult to overstate just how greatly these qualities induced a sense of ease and deep musical involvement.

If your amplifier budget is anywhere near $15k, the Hegel H30 should be on your short list of products to audition. You may find, as I did, that this unassuming and understated black box contains a Scandinavian surprise. tas

Constellation Audio Performance Series Electronics

The Best For Less?

Jonathan Valin

Those of you who've read Robert Harley's review of Constellation Audio's Reference Series Altair linestage preamp and Hercules monoblock power amps in our September issue already know that our Mr. H.—a man not given to the injudicious use of superlatives—considers both to be "benchmark" products to which all other aspirants for the title of "State-of-the-Art Electronics" must be compared. Designed by a constellation of high-end-audio engineering "stars" (including Bascom King, John Curl, Demian Martin, and Peter Madnick), who were given blank sheets of paper and unlimited budgets to create the best circuits they could devise, the Altair and Hercules set new standards "in transparency, resolution, absence of grain, and sheer realism" according to Robert. Of course, they should set standards, given what they cost—$60k for the preamp and $140k for a pair of the monoblocks.

Let's face it: At those prices very few of us are going to be buying the Altair and Hercules no matter how wonderful they are. But what if I were to tell you that you can now buy these same circuits (and about 90% of this same "benchmark" sound) for the kind of money that you'd typically spend on Spectral, top-line Pass, mid-line Boulder, and new-gen Rowland gear? Well, folks, say hello to Constellation Audio's littler friends—the Performance Series electronics, comprising the $24k Centaur amplifier, the $19k Virgo linestage, and the $19k Perseus phonostage (with the $24k Cygnus file player/DAC soon to come). No, they aren't completely identical to the Reference Series gear. You won't get that ultra-cool Pyxis "system controller" with built-in touchscreen display (although you will get a massive back-lit conventional remote and touchscreen panels built into the faceplates of preamp and phonostage), and you won't get those 275-pound, room-dehumidifier-sized 1000W monoblocks (you'll have to settle for a strikingly handsome 100-pound stereo amp that puts out a mere 250Wpc into 8 ohms, 500Wpc into 4 ohms, and 800Wpc into 2 ohms, with the first 10 to 15 of those watts running in Class A), and you won't get all of the cost-no-object resistors, capacitors, and hand-tweaked LDRs (Light Dependent Resistors) that you'll find populating the Altair and Hercules circuit boards (though the circuits themselves are exactly the same). What you will get are the highest-resolution electronics I've yet heard.

After wonderful showings in Munich last year and at CES this, I expected the Centaur, Virgo, and the Perseus to be very, very good. But quite honestly I didn't expect them to be *this* good. From the moment I turned them on and started playing back familiar LPs—first on my reference speakers, the Magico Q5s, and then on the newly-arrived Raidho C1.1 stand-mount two-ways from Denmark (which themselves have to be the highest-resolution mini-monitors I've had in my home, at least with Constellation's Performance Series electronics driving them)—I not only heard a tidal wave of details I've never heard before on every single album I listened to; I also heard a density of tone color, a three-dimensional solidity of imaging, a complete absence of grit and grain in the upper midrange and treble, and yes, an overall realism (with realistic LPs) that are unexcelled in my previous experience of ultra-high-end solid-state electronics.

Very high resolution and voluptuous tone color generally don't go together in hi-fi gear, and when they do—as in Class A triode tube or Class A solid-state circuits (or Class AB ones that are heavily biased toward Class A, such as the BAlabo gear)—they do so at a sonic price. Such amps and preamps seem to have what Raidho's brilliant chief engineer Michael Børresen wittily calls a "bottom-up" kind of sound. That is, their sonic "center of gravity" seems to lie in the bass and lower midrange, which tends to give them a darkish overall tonal balance, a sense of iron-fisted "grip" that can make them sound very solid in imaging and hard-hitting on dynamics but somewhat over-controlled (not particularly airy or bloomy on top or bottom), and a slightly soft, closed-in treble with a somewhat recessed presence and brilliance range. Most Class AB tube and solid-state amps, on the other hand, tend to have a "top-down" sound. Their sonic center of gravity seems to lie in the treble and upper mids, which makes them sound brighter, airier, bloomier, and, often, more freed-up and expansive than Class A amps, at the cost of less grip and control on dynamics (particularly in the bass), less density of tone color in the mids, less

EQUIPMENT REVIEW - Constellation Audio Performance Series Electronics

solid imaging overall, and, sometimes, more audible grain.

Though the Constellation Performance Series would probably qualify as "bottom-up" amps and preamps, in that they have a very strong Class A vibe, tremendous solidity and density of tone color in the mids, and a very slightly darkish balance overall, they don't trade off as much upper-midrange and treble air and bloom as typical Class A or Class A-like amps do. While still somewhat more recessed than Class AB solid-state and tube amps, they have gorgeous color and texture on top, coupled with an uncanny ability to resolve very fine details without etching or "spotlighting" them as some very-high-res amps do.

Take, for instance, the great Hungaroton recording of Attila Bozay's "Improvisations for Zither" (about which I've written often and at length). This is a fabulous test record because the zither, by its nature and by virtue of the way it is here played (plucked, strummed, rubbed, knocked), is extraordinarily rich in transient and timbral detail. Since the instrument is closely and artfully miked, you can hear every little thing that Bozay—who, as I've said before, is rather like the Jimi Hendrix of zitherists—is doing, from pizzicatos that set the whole instrument ringing like a bell (and Bozay often doesn't sound the next note until that wash of overtones slowly bends into weird, wispy stopping transients and then decays into silence) to strummed chords that swirl through the large wooden body of the zither like the powerful cross currents in a tide pool.

Now I've listened to this record on a lot of very fine, very-high-resolution playback systems, both in my home and at trade shows, and thought I'd heard everything there was to hear. But through the Constellation Performance gear, the resolution of pitches, colors, intensities, and decays was so fine that even the tiniest performance-and-instrument-related details immediately became more apprehensible. For instance, although I could hear through other great preamps and amps that Bozay was on occasion using his fingernails to make various queasy glissandos, through the Constellation components I could tell *precisely* how he was doing what he was doing—how he was deliberately letting his fingernail catch against the "bumpy" high-friction surface of the zither's roundwound strings to produce those sibilant squeaks and shushes. And, as I just noted, I could hear this without the forwardness and brightness that often accompanies the recovery of such ultra-fine details.

What was true on a micro-level held just as true on a macro one. Take the RCA LP *Venice* (actually a Decca recording made in Kingsway Hall). The record is famous for the beautiful tone of its string sections, and, once again, through other great systems those strings have always sounded dense in number and gorgeous in timbre. But not as individuated or as unflaggingly lovely as they do through the Constellation gear, where you can not only count the heads of the first and second violins; you can also hear their spectacular ensemble playing (and that of the violas, cellos, and basses) much more clearly by virtue of hearing their individual contributions to that ensemble much more clearly.

The sense of ensemble is just as obvious in the explosively dynamic moments for which *Venice* is also famous, where the Constellation Performers clarify exactly who is doing what in the midst of what can often sound like a dark murky roar of low-pitched voices—separating the wall-shaking strikes of bass drum and tymp, doubled by the blasts of brasses and winds, from the churning ostinatos of doublebass and cello choirs.

These are not trivial differences, folks. Better understanding how and how well instrumentalists are playing their instruments not only increases our enjoyment of the music being performed; it increases our appreciation of the musicians themselves, who, once upon a time (and now again, thanks to the magic of the stereo LP), brought notes on a page to inimitable life. This is the gift of musical time travel that only the finest audio systems are capable of bestowing.

The way I'm describing the Constellation Performance Series electronics may lead you to think that they are primarily analytical components. But once again let me emphasize that this considerably higher resolution of detail is not being purchased at the cost of density of tone color or added presence/brilliance. On the contrary, with the right recordings the Constellation's timbral palette is so rich and full that, on first listen, you may think that you're hearing a latter-day descendant of one of those gorgeous-sounding 50s/60s era tube amps and preamps, like the great Marantz 9 and 7C, that have somehow been blessed with the resolution and transparency

SPECS & PRICING

Centaur Stereo Amplifier
Inputs: Two XLR (one for Constellation Link); one RCA
Outputs: Metal binding posts
Power output per channel: 8 ohms (1kHz @ 1% THD+N), 250W; 4 ohms (1kHz @ 1% THD+N), 500W; 2 ohms (1kHz @ 1% THD+N), 800W
Frequency response: 10Hz to 100kHz, +1/-0.5dB
Gain: 14dB (Constellation Direct)/26dB (balanced and RCA)
Output impedance: 0.05 ohms
Damping factor (8-ohm load): 160
Input impedance: 100k ohms unbalanced, 200k ohms balanced
Dimensions: 17" x 11" x 20"
Weight: 98 lbs.
Price: $24,000

Virgo Linestage Preamplifier
Inputs: Four XLR stereo, four RCA stereo
Outputs: Two XLR stereo, two RCA stereo
THD + Noise: <0.001%, 20Hz-20kHz @ 2V out
Frequency response: 10Hz to 200kHz, +/-0.5dB
Input impedance (balanced): 200k ohms
Input impedance (unbalanced): 100k ohms
Volume control resolution: 0.5dB from 0dB to -90dBF S
Dimensions: Preamp, 17" x 5.5" x 15.75"
Power supply, 6" x 5" x 14.5"
Weight: Preamp, 35 lbs.; power supply, 22 lbs.
Price: $19,000

Perseus Phonostage
Inputs: Three XLR stereo, three RCA stereo
Outputs: One XLR stereo, one RCA stereo
Gain: 65dB max.
THD + Noise: <0.005%, 10Hz to 20kHz
Load impedance, mc inputs: Zero ohms to 1000 ohms
Load impedance, mm inputs: 10k ohms to 100k ohms
Load capacitance: 100 to 400pF
EQ curve: RIAA
Dimensions: Preamp, 17" x 5.5" x 15.75";
power supply, 6" x 5.5" x 14.5"
Weight: Preamp, 35 lbs.; power supply, 22 lbs.
Price: $19,000

EQUIPMENT REVIEW - Constellation Audio Performance Series Electronics

of great contemporary solid-state amplifiers and preamps, such as the Technical Brain TBP-Zero and TBC-Zero or the Soulution 700 and 720. And, in a way, you are.

Though equipped with all the modern conveniences, such as wide bandwidth (down 0.5dB at 100kHz) and very low distortion (typically less than 0.05%, even at low volumes), the Centaur stereo amp (like the Hercules monoblocks) actually started life as an intriguing triode tube circuit from the 1930s discovered by the amp's chief designer, Bascom King. King's objective was to turn this promising tube circuit into a small, paradigmatic, single-ended, 125W solid-state amplifier that could be used as the "building block" for more powerful amps, in which a number of these "modules" would be ganged together in a bridged array.

The thought was that by using several of these sonically superb 125W amps, rather than one large gain stage with a multitude of transistors, the colors, textures, and microdynamic details that simpler, smaller, lower-powered amps are famous for (and that larger, more complex, higher-powered amps sometimes sacrifice for sheer drive) would be better preserved—and so they have been. However, since bridged amps have phase issues that smaller amps with single gain stages don't, every effort was made to ensure that the two phases of the signal remained perfectly matched from input to output. To this end, the Centaur's unique, balanced, fully complementary output stage uses the same N-type MOSFET output transistors for both the positive and the negative halves of the signal, rather than (as is typical in complementary circuits) using N-types for one half and P-types for the other (which makes the perfect matching of transistors next to impossible to achieve).

To further ensure perfectly balanced, perfectly phase-accurate output, the Centaur (like the Hercules) has a "Constellation Direct" input that allows the user to bypass the amp's input stage and drive the Centaur's output stage directly from the Virgo preamp's output stage (which is identical to the input stage of the amplifier). Though there is a 12dB loss of gain via the Constellation Direct input (meaning you'll have to turn the volume up more to achieve the same SPLs you'd get via the amp's balanced or RCA inputs), the elimination of an entire gain stage has obvious advantages and is clearly sonically superior.

The primary difference between Constellation Audio's Reference Series and Performance Series products is parts-quality. In the Reference Series cost was no object; in the Performance Series it was. While the circuits used in the amplifiers (or, rather, in the single-ended 125W "modules" that the amplifiers are made up of) are identical, the parts are not. The same holds true for the preamplifiers. Though the Peter Madnick-designed Virgo does use the same costly hand-tweaked LDRs in its volume control that are found in the Altair to eliminate mechanical contacts and the low-level losses that such contacts entail, it uses fewer of them.

The Perseus phonostage—which has to be the most transparent, highest-resolution, most purely beautiful-sounding solid-stage phono preamp I've yet heard—has the same all-JFET John Curl-designed circuit found in the Reference Series' $60k Orion phonostage, but once again with less highly select parts. As is the case with the amp and preamp (in both the Reference Series and the Performance Series), all circuit boards are mounted on metal "rafts" that float on elastometric suspensions, isolating the circuits from the effects of vibration (which is especially critical in a phonostage, given the very-low-level signals it is amplifying).

Engineering by committee isn't always a great idea. Here, the results have proven to be uniformly sensational. All three of these Performance Series components—amp, linestage, and phonostage—share the same sonic "character" (and, I'm told, much the same sonic character as the Reference Series components, with which they can be freely mixed and matched). All three are a little dark in balance, a little recessed (as opposed to forward) in the upper midrange and treble. All three are incredibly high in resolution, top to bottom, and (because of this) in transparency to the sources ahead of them. All three of them are (once again with the right sources) exceptionally beautiful in tone color—and yet, magically, that rich timbre doesn't seem to get in the way of the clear reproduction of fine textures or small-scale dynamics or, for that matter, large-scale dynamics. As I said, it's like getting a Class A triode amp and preamp with the low distortion of a Soulution and almost the same speed of attack as a Technical Brain. Frankly, I've never heard electronics quite like these, which might have been designed to appeal equally to all three of my different types of music lovers— "fidelity to mastertapes" listeners because of their resolution and transparency, "as you like it" listeners because of their timbral beauty and dynamic range, and "absolute sound" listeners because of the way that these virtues combine to enhance realism.

Beyond categories, the Constellation Audio Performance Series electronics are simply a delight to listen to. Just put on "Lover, Lover, Lover" from the wonderful Leonard Cohen LP *Songs From The Road* [Columbia], and feel those goosebumps along your arms as the Constellations reproduce Cohen's craggy voice and that inimitable *Sprechstimme*-like delivery, those sweet-as-sugar backup singers across the stage to his right so beautifully miked that there is not a hint of edginess in their pearl-drop-perfect voices, the musicians surrounding him (particularly Javier Mas on the chiming, plum-colored, mandolin-like Spanish instrument, the *bandurria*), and in the distance behind them, stretching from wall to wall in my listening room, the huge happy Tel Aviv Stadium audience (the cuts on this album were recorded live throughout Cohen's 2009-2010 world tour) clapping, not-always-quite-in rhythm because of the delay, and roaring approval at song's end. It's like being there.

Since I've only had the gear in my system for a relatively short period at this writing, there are a few questions that will require more time and play to answer. First, there is the matter of bass. Personally, I find the Performers' bottom octaves, like Goldilocks' porridge, to be neither too warm (all right a little dark and warm) nor too cool but just right—phenomenally articulate, rich in color, and lifelike on classical music, from the LSO going all-out on *Venice* to the Juilliard Quartet going all-out on the Bartók Third Quartet, and equally impressive on powerful deep-reaching Fender bass licks, such as Tina Weymouth's thrilling *ostinato* at the start of "Take Me to the River," or the floor-rattling synth pulses of Blue Tofu's "A Battle Between." However, I can see where some of you may (repeat "may") prefer "bigger" bass (more volume and slam—resolution and color will not be issues) than the Performers offer. Let me put it this way: If the Performance Series components were

Using the Performance Series Electronics

Like their far costlier big brothers, the Constellation Virgo, Centaur, and Perseus come in thick, gorgeous, and gorgeously finished aluminum chassis (designed by Alex Rasmussen of the Neil Feay Company and fabricated by the Feay Company). Both the amp and the phonostage have outboard power supplies that link to each of the preamps via two supplied Hypertronics cables. Why two cables per preamp? Because both the outboard supplies actually house two separate supplies—one a linear R-Core transformer for the analog circuitry, the other to power the control circuitry. The non-directional Hypertronics cables have locking connectors at either end that plug into inputs on the supplies and the preamps. Happily the cables are long enough to keep the power supplies at a fair distance from the preamplifiers.

In addition to balanced and RCA and Constellation Link inputs and outputs, all three components have IEC power inlets on the backs of their chassis, and I would advise using the best power cords you can, as the Performance Series deserves them. Both of the preamplifiers have 432 x 230 pixel touchscreens on their front panels, which allow you to set them up and optimize their functionality.

With the Perseus phonostage you will want to select the input (there are three, any two of which can be configured for moving magnet or moving coil), and then adjust loading via the two knobs on the back of the chassis, which vary impedance in each channel separately and continuously from zero to 1000 ohms for moving coils; moving magnets can be loaded via the front-panel touchscreen at one of four settings from 10k ohms to 100k ohms for both channels, while capacitance can be set at one of five options from 100 to 400 picofarads.

Unfortunately the loading that you set for any given input on the Perseus (be it moving-coil or moving-magnet) will automatically be applied to other inputs of the same type. Unlike the marvelous Audio Research Corporation Reference Phono 2SE phonostage, which allows you to adjust the loading of its two inputs individually (and has a far wider range of loading options for moving coils than the Perseus), the Constellation unit forces you to use the same parameters universally. Speaking purely as an analog hound, if there is one thing I would change on this marvelous phonostage it would be to allow individual loading of each phono input. (Of course, as Peter Madnick pointed out when he visited me, not many listeners are going to be listening to three different world-class turntables equipped with three different world-class cartridges, as I do.)

I guess I should also note that the Perseus, unlike the ARC Reference Phono 2SE, does not have different equalization curves for RIAA, Decca, and Columbia LPs. It is an RIAA-only preamp. As far as I'm concerned this is no great loss, for, as I explained in my ARC Reference Phono 2 review, there is no persuasive evidence that different eq curves were being used by different recording outfits in the stereo era (though they were used throughout the 78 era and probably the first part of the mono era). However, there are true believers out there who simply cannot be convinced that Decca FFSS and Columbia Six-Eye stereos don't sound better using Decca and Columbia curves from the early 1950s. Let them believe what they want, and just listen to the Perseus.

With the Virgo linestage, you will again want to select the input (there are four pairs of them on both XLR and RCA connectors) via the touchscreen front panel. And if you are using the Virgo with the Centaur stereo amp, you will want to come out of the preamp to the amp via the Constellation Direct output and input, which, as noted in the review, allows you to bypass the amp's input stage.

The Centaur amplifier has a horizontal bar on its front chassis that, when pressed and held until you hear a click, takes the amp out of standby and puts it in operational mode. You can tell what mode the amp is in by the color of an LED built into the press-bar: Red indicates standby; green indicates power-up; solid blue indicates that the amp has detected an active source from the preamp and is ready to play, flashing blue indicates muted. (The amp's mute can be accessed by simply pressing the bar lightly after powering up.)

Although none of the Performance Series electronics came with a User Manual (an omission that I hope will be corrected in production models), the touchscreen menus were so intuitive, the choice of inputs and outputs so obvious that I had no problem figuring out how to hook things up and get them going (although the advantages of the Constellation Direct I/Os came as news to me).

loudspeakers they would be Magicos rather than, oh, Focals or Wilsons, so be advised.

At this point I'm also not sure how the Performers will fare with speakers that don't benefit as clearly or felicitously as the beryllium-tweetered Magico Q5s and ribbon-tweetered Raidho C1.1s do from their sweet, soft, edgeless treble and upper mids, although, frankly, I can't imagine any speaker that wouldn't sound great with these solid-state marvels.

There is one thing I *am* completely sure about (and was from the first notes I heard played back): These are truly superb electronics, competitive with and in many regards superior to anything I've yet heard at *any* price, tube or solid-state. For the money that is being asked for them, they are also incredibly good deals. Which is precisely why I'm going into print about them so quickly and enthusiastically. Naturally, Constellation Audio's Virgo, Centaur, and Perseus get my highest recommendation. Until and unless you hear differently, they are my new reference electronics. tas

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Pass Labs XP-30 Reference Line Preamplifier

Transcending the tube/solid-state divide

Dick Olsher

To confess, when RH suggested this review I felt a pang of hesitation. As I've spent much of my audio life in the company of tube preamps, the prospect of auditioning a solid-state design made me a bit nervous. However, RH thought it would be a good thing to nudge me out of my comfort zone, and since I was more than a bit curious, I said yes. In retrospect, it turned out to be a most wise decision.

The progression of the XP preamp line, from the single-chassis XP-10, to the dual-chassis XP-20, has reached a glorious apex in the triple-chassis XP-30. Essentially what you have here are two monaural line preamps sharing a single power-supply chassis, though even the power supply is laid out in dual-mono configuration. The gain modules connect to the power supply/control chassis using DIN-25 cables. These cables only communicate power and control commands to the gain stages. At no time does an audio signal cross these umbilicals. Relative to the XP-20, says designer Wayne Colburn, "we started with a larger external power supply big enough for a small power amplifier." There are two low-noise Plitron power transformers, a beefed-up CRC filter network with substantially more capacitance, and electronic capacitance multipliers. The available power from the new supply is sufficient to drive up to six gain channels in order to accommodate the needs of a multichannel surround-sound system.

There are a total of seven line-level inputs (both balanced and unbalanced sets) on each linestage chassis, the sixth being a pass-through for home-theater use and the seventh a tape loop that can only be operated from the remote control. The unit is shipped with shorting plugs on the XLR input connectors and is ready to accept RCA-type inputs. Flexibility is at the core of this design. The XP-30 is able to drive a pair of power amplifiers with two different gain settings. Each gain module features two pairs of outputs (RCA and XLR). In each pair, one is a master and the other a slave that is tied to the master via a volume pot. Thus the slave output can be tweaked, as needed, to drive an active subwoofer or a bi-amplified speaker configuration.

The voltage gain stages are differential in nature. The first stage uses high-transconductance Toshiba JFETs (2SK170 and 2SJ74) as matched complementary pairs in a cascode topology that is responsible for the preamp's exceptionally low distortion levels. Secondary gain and high-current follower output buffers are implemented using Toshiba MOSFETs. The buffers result in exceptionally low output-impedance and the ability to drive long cable runs with the greatest of ease. There is some global feedback.As Wayne points out, the XP linestage is configured much like an instrumentation amp with a high input impedance and one gain-setting resistor. The Toshiba parts are currently out of production, but not to worry, Nelson Pass had anticipated this, and Pass Labs made large purchases of discontinued Toshiba JFETs and MOSFETs to support production of this gain stage for the next ten years.

Something that Nelson wished for was the ability to drive an amplifier output stage by itself. That requires a preamp to deliver a fraction of a volt to the power amp or peaks in excess of 50V to a balanced no-feedback follower output stage. The XP-30 is up to both tasks. The internal gain of each stage can be boosted up to 24dB via internal jumpers so that the XP-30 can serve as the low-source-impedance front end for Class A power amps.

Note that the XP-30 uses the same new gain modules as the XP-10 and XP-20 but in an enhanced configuration that incorporates several new semiconductors with superior sonic and technical characteristics, a few custom capacitors, and a few other minor design tweaks. In addition, the internal onboard power regulation was improved through the use of select new parts. The consensus at Pass Labs is that all of these advances, while making for small differences in measured performance, appear to have resulted in far greater sonic benefits and a closer approach to the real thing.

One of the basic tasks facing any preamp is volume control. The pecking order as far as sound quality has traditionally spanned the range from the lowly conductive plastic pot to a high-quality resistor-based stepped-attenuator. But recent developments in electronic volume control have upset the status quo. The XP-30 uses the new NJR Muses 72320 IC, a two-channel electronic volume control with an internal resistance-ladder, optimized for low noise and sound quality. Apparently, a few resident audiophiles at New Japan Radio Co. lobbied successfully for some high-end parts, and the result was the Muses series of op-amps, including the 72320 volume control. Pass Labs evaluated the new volume control and liked what it measured and heard. Only then was the 72320 adopted for use in the XP-30. The bottom line is that the Muses control gives an unprecedented low-noise floor and a dynamic range of 100dB in 1dB steps, but, according to Wayne, it performs nicely and consistently only if used properly. It should be noted that Pass Labs is only using part of the IC and avoids any of its op-amps.

EQUIPMENT REVIEW - PASS LABS XP-30 Reference Line Preamplifier

My own listening tests confirmed that the Muses volume control, at least as implemented by Pass Labs, is top-notch. It went up against my reference, the Experience Music Passive-Aggressive autoformer volume control, which is based on Dave Slagle's silver autoformer modules and is perfect for a digital front end. It's a tough test for an active linestage. Consider that line-level output is a nominal 2V for a CD player or DAC—a signal level sufficient to red-line typical power amps with an input sensitivity between 1 and 2V. Therefore, the signal needs to be attenuated by an active linestage before it is amplified again—not an ideal situation. The XP-30 is one of the few linestages that could hold its own in such a head-to-head competition.

If the truth be known, I own two solid-state preamps—the SAE Mark I and the Threshold NS10. The former, an early solid-state design circa 1970, sounds a bit raspy, grainy, and deficient in tonal color. The latter, interestingly enough a Nelson Pass design, comes much closer to the real thing. The critical point is that every solid-state preamp I have auditioned in the past displayed a fairly obvious sonic tell. Needless to say, my auditory antennae were finely tuned when I settled in for the first listening session. Much to my surprise there weren't any tells. That's not to say that the XP-30 sounded overtly tubey. It is well known that triodes operated single-ended produce primarily second-order distortion, which is not only consonant with the music, being an octave higher than the fundamental, but also adds weight and body to the sound. Taken to the extreme, the end result is a fat and harmonically lush presentation, symptomatic of a severe case of tube euphonics. In contrast, the XP-30 sounded texturally pure, adding nothing and subtracting nothing from the musical tapestry. Tonal colors were right on, and (program material permitting) the mids sounded mighty sweet. Paired with the Swedish Q-tron PA12 OTL, the soundstage was wide and deep. Image focus was highly localized with sufficient spatial separation to allow a truck to drive between image outlines. Images, though, were not quite as well-fleshed-out as they are with a world-class tube linestage. Tube attributes, brought to the table by the PA12, were in no way diminished by the addition of the XP-30 to the chain. In particular, the PA12's warm harmonic textures and vivid tonal colors were clearly discernible.

Bass control and resolution transcended anything I had previously experienced. Sure, lots of linestages are competent bass-range performers, but bass is about more than just definition. It's about laying down an orchestral foundation with big tone conviction and dynamic integrity. It's about resolving low-level nuances that ordinary linestages gloss over. The XP-30 did a brilliant job of sweeping away midbass and upper-bass mud, honing in cleanly on bass guitar or acoustic bass lines. Much has been said about the power amp/speaker interface, and specifically its importance in damping woofers. There's an argument to be made that the preamp/power amp interface is a significant contributor to bass-range fidelity, and that much was clear with the XP-30 in the chain. I should add that the XP-30 did not interfere with the intrinsic sound character of any of the power amps it was auditioned with, whether tube or solid-state. Thus, an amplifier in search of a romantic partner will find no satisfaction. This preamp is faithful to the recording and refuses to dish out the euphonic camouflage some solid-state amps may desire.

The XP-30 is built for action. Transient attack was a model of speed and clarity, while decay was well-controlled. The treble range was open and extended, with satisfying levels of finesse. Brushed cymbals and struck bells shimmered just right. The brightness of closely miked piano was clearly elucidated. In general, low-level detail was retrieved without calling attention to the process, in the way that say beryllium-coned drivers appear to do. (I find these drivers impressive for sure, but too much in my face for long-term comfort.) In contrast, the XP-30's detail retrieval was more like ripples in a pond. It allowed me to take in the big picture (i.e., the pond) without distraction, and if I focused, the detail was there for the picking.

Microdynamics—essential for capturing music's expressiveness and rhythmic drive, and long the trump cards of tube preamps—were reproduced with great conviction. And the drama and intensity inherent in scaling music's full dynamic range was given full scope. The preamp showed no hesitation when expanding the sonic envelope from loud to very loud.

In the year of the Dragon, enter the XP-30, a supremely musical line preamp that may well prove to be all things to music lovers and audiophiles alike. It transcends shallow characterizations as either solid-state or tube sound. At its core, it is simply about musical values; music flows naturally through its circuits. I'm jumping for joy over the first solid-state preamp that makes it happen for me. A five-star recommendation! tas

SPECS & PRICING

Inputs: Seven balanced on XLR jacks, seven unbalanced on RCA jacks
Gain: 10, 16, or 24dB
Volume control: 100 individual 1dB steps
Frequency response: 20Hz–20kHz +/- 0.05 dB
Distortion: <0.001% THD @ 1V RMS
Output impedance: Main balanced, 120 ohms total; slave balanced, 200 ohms total; main and slave unbalanced, 120 ohms
Input impedance: 42k ohms
Common-mode rejection ratio: –65dB, 1kHz
Crosstalk: –100 dB, 1kHz
Signal-to-noise ratio: –110dB, ref 5V
Power consumption: 45W
Dimensions: 17" x 4" x 12" (each chassis)
Weight: 74 lbs. (three chassis–packed)
Price: $16,500

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Preamplifiers, Power Amplifiers, and Integrated Amplifiers

The Absolute Sound's Golden Ear Awards is the annual feature in which our staff and freelance writers choose those components that stand out from the competition. Some of these components are long-time references that have withstood the test of time. Others are newfound favorites destined to become classics. In either case, the products selected for a Golden Ear Award are special, indeed. Unlike our Editors' Choice Awards—a compendium of every product we recommend, chosen by consensus of the senior editorial staff—Golden Ear Awards allow each writer to express his individual views on which components he thinks are truly great—and why. The diversity of products selected here reflects not just the industry at large, but also each writer's quest for the absolute sound. —Robert Harley

Neil Gader

Vitus Audio SIA-025
Integrated Amplifier
$25,000

In my wildest imagination I never thought a mega-expensive 25Wpc integrated amplifier would stir anything in me other than incredulity. Was I wrong! Exemplifying the best of separates in a single, trim, and seriously hyper-massaged chassis, the SIA-25 is the pinnacle of a breed never again to be underestimated. The sonic results speak for themselves—a liquid presence, a three-dimensional soundstage, and the finest gradations of detail and dynamic contrast. If all other elements in the system chain are strong you'll hear less system and more space—each component seems to achieve a wider expression, greater intimacy, and richer vibrancy at even the lowest levels. With watts more precious than gold, calling the SIA-025 a bargain is a stretch, but after a few minutes of listening I began to think maybe it was. (218)

Wayne Garcia

Rogue Audio Cronus Magnum
Integrated Amplifier
$2199

Rogue's Cronus Magnum integrated proved to be one of those semi-mind-blowing discoveries of the past year. A KT90-driven version of the company's standard 55Wpc Cronus, which uses the EL34 output tube, the Magnum-edition generates 90Wpc (and proved to be striking sonic match, as well as price match, with the abovementioned Maggies. But the Cronus Magnum should prove to be a fairly lovely partner to a wide range of speakers. The design strikes a sweet balance between elegance and power, with nicely nuanced dynamic gradation. It can swagger with rock, yet shows delicacy and lyricism with chamber, folk music, and the like. And though its bottom-end has decent weight and very fine definition, don't expect the hammer of Thor to come crashing into your listening room. For that you should look to far more muscular solid-state designs. I am also most impressed with this amp's transparency to the recorded event, as it does a terrific job of making us feel like we're listening in to a concert. (Reviewed in Issue 209)

Robert Harley

Lamm ML2.2 SET Power Amplifiers
$40,000

These 18W single-ended triode monoblocks are so magical (with a load-appropriate loudspeaker) that they made me question the paradigm of high-powered solid-state amplification. The directness of expression, the palpability of images, and the purity of timbres are simply sensational through the ML2.2. These amplifiers make it sound as though the musicians are speaking through time and space directly to you. It's an uncanny quality that must be experienced to be appreciated. The ML2.2's achieves this level of sonics not through a euphonic or tubey sound, but by conveying the virtues of SET amplification without SET colorations. With the right loudspeaker (a big caveat), the ML2.2s don't sound like tubes, SET, solid-state, or any other technology. Rather, they sound like music. (review pending) Robert Harley

Constellation Audio Altair Preamplifier and Hercules Power Amplifiers
$65,000 (Altair preamplifier); $140,000 per pair (Hercules power amplifiers)

The Altair preamplifier and Hercules power amplifiers from Constellation Audio are part of one of the most ambitious line of electronics yet produced. Founded by the folks who brought you the Continuum turntable, Constellation represents a cost-no-object design project that united a team of the world's great solid-state designers including John Curl, Bascom King, and Demian Martin. The development effort was led by Peter Madnick, a behind-the-scenes designers of many high-profile products from other companies.

The two-chassis Altair looks and operates like no other preamplifier, from its monolithic, apparently button-less front panel to the Pyxis whole-system touchscreen controller. The Hercules power amplifiers are massive affairs, delivering 1000W each into 8 ohms, with the ability to double the output power as the impedance is halved. Sonically, the combination has an unbelievably black background and resolution of low-level detail that is the state of the art. Although highly resolving, these electronics are anything but etched or clinical. Rather, they transfer to the loudspeakers a rich tapestry of fine musical information. Moreover, the system is amazingly transparent, clean, quick, and dynamic. Expensive, but truly of reference quality. (215)

Jeff Rowland Design Group 725 Monoblock Amplifiers, Corus Preamplifier
$28,000, $12,800

These components are the most beautiful and beautifully made I've ever had in my home. But their beauty isn't merely skin-deep; the 725 monoblock amplifiers and Corus preamplifer are extraordinarily expressive and involving. While other first-rate electronics reveal additional sonic details that may or may not translate to greater musical communication, these Rowland products unfailingly show me nuances of expression and shadings of meaning in familiar music that goes far beyond mere hi-fi "resolution." They have a very sophisticated and refined midrange and treble, coupled with a richness and density of tone color in the bass, that makes for world-class performance. I'll have a lot more to say about these extraordinary components in an upcoming issue. (review pending)

Dick Olsher

Pass Labs XP-30 Reference Line Preamplifier

$16,500

Not only does the XP-30 represents the state of the art when it comes to bass control and resolution, but it also transcends the tube/solid-state divide. Microdynamics essential for capturing music's expressiveness and rhythmic drive, and long the trump cards of tube preamps, are reproduced with great conviction. There is no hesitation in expanding the sonic envelope from loud to very loud, giving full scope to the music's drama and intensity. It is fully capable of laying down an orchestral foundation with big tone conviction and dynamic integrity. The first stage uses high transconductance Toshiba JFETs as matched complimentary pairs in a cascode topology that is responsible for exceptionally low distortion levels. Secondary gain and high-current follower output buffers are implemented using Toshiba MOSFETs. Expect a winning combination of soundstage transparency and low-level detail resolution. Transient attack is a model of speed and clarity, while decay is well controlled. In particular, the treble range blooms with satisfying levels of finesse. Brushed cymbals and struck bells shimmer just right. This is a supremely musical line preamp that may well prove to be all things to music lovers and audiophiles alike. (223)

Audio by Van Alstine Ultravalve Amplifier

$1699

According to Frank Van Alstine, the Ultravalve's lineage is traceable to the Dynaco Stereo 70, arguably the most successful basic power amplifier of all time, which he denotes as its "great grandmother." In essence, the Ultravalve represents the distillation of over 30 years of design experience. Sounding more powerful than its 35Wpc would indicate, it is intended as a thoroughly modern and rationally priced vacuum tube amplifier. While its perspective is not as romantic as that of the original Dynaco, it is far better focused, clearly more dynamic, and in general communicates as a higher-resolution device. A synergistic match for the Salk Sound Songtower loudspeakers. (204)

Berning ZH-230 ZOTL Amplifier

$8360

David Berning's latest refinement of the ZOTL technology offers 30Wpc of pure tube delight. Although the ZOTL technology has been around for over a decade by now and could be considered mature, it still looks and sounds cutting edge. The ZH-230 features a higher RF carrier frequency relative to the older ZH-270. It is intended to work with nominal speaker loads in the range of 4 to 16 ohms, and, ideally, would appreciate a speaker sensitivity of at least 90dB. Superlative transient speed at the point of attack leaves conventional transformer-coupled tube amps in the dust. Control of transient decay is also exemplary. Treble nuances are silky smooth and delicate. Harmonic textures flow in a relaxed, effortless manner, with richness of tone. Its considerable gift lies in blending the best of tube and transistor sound, reaching a Goldilocks zone where harmonic textures are neither too hard nor too soft—just natural sounding. (210)

Paul Seydor

Croft Acoustics Micro 25 Preamplifier and Series 7 Power Amplifier
$1395 each

Although this all-tube preamplifier and hybrid MOSFET power amp, designed in the UK by the near-legendary Glenn Croft, can be used separately, they constitute both stylistically and sonically so beautiful a synergism that it would be a shame to separate them. Plain Jane and retro in looks and features (no remote handset, minimal controls), the Crofts evoked to my ears classic tube sound brought wholly up to date: a pretty, liquid, dimensionally rounded presentation that I'd broadly characterize as a little more beautiful than what I hear on systems I know to be more literally source accurate. Subjectively, the pair has either a slightly downward-sloping extreme top or a slightly softened one; a lovely, refined, and beautifully open midrange; and a full, well-defined bottom end that suggests natural bass as opposed to hi-fi "punch" or "slam." Indeed, "natural" recurred in my notes more than any other adjective, and next comes "romantic." An ace up the Crofts' collective sleeve is an ability to establish a three-dimensional soundstage unsurpassed by any electronics I've used regardless of cost or complexity for sheer spatial integrity and solidity in the literal sense of stereophonic.

Quad 909 Stereo Power Amplifier
$1550

Just days before writing this came the announcement that Quad's 909 amplifier will be discontinued once existing stock runs out, to be replaced by a newer model. Incorporating Peter Walker's famous "current dumping" technology, the 909 is one of the most natural-sounding, tonally neutral, yet musically involving and lifelike pieces of electronics you can by at any price. Compact in size and light in physical weight only, it's very dynamic (140Wpc, 11 amps peak current), one of the most reliable amplifiers ever made (they just don't break down and appear to be unconditionally stable into any sort of load), and one of my references ever since I first reviewed it for TAS in 1999. Why a Golden Ear—the second, actually—if it's discontinued? Because it's already well on its way to becoming a bona-fide audio classic. Not many of them turn up on the used market because its discriminating owners know a great thing when they've got it. If you've ever been tempted, now's the time. (203)

Spread Spectrum Technologies Ampzilla 2000 Monoblock Amplifier and Ambrosia Preamplifier
$7500 each

As with the Crofts, I'm cheating by including a *set* of electronics here, but these monoblocks and stereo preamplifier, authored by James Bongiorno, one of high-end audio's authentic legends and truly great designers, boasts surpassing neutrality, vitality, naturalness, lifelikeness, dynamic range, and freedom from electronic artifacts, with tube-like body and dimensionality. The Ambrosia is a gauntlet flung at an increasingly minimalist world: a two-channel preamplifier complete with *two* phonostages (mm and mc, both dead-quiet single-gain circuits), unusually effective tone controls and filtering, headphone amplifier, and as much flexibility as anyone is likely to need. Sonics match those of the Ampzilla 2000. These are true reference-caliber components that cannot be bettered anywhere near the price or, frankly, many multiples of it. (219)

Jonathan Valin

Audio Research Reference 5 SE Linestage Preamplifier/Reference Phono 2 SE Preamplifier/Reference 250 Monoblock Power Amplifier

$??,???/$??,???/$??.???

ARC's new Reference 5 SE preamp sounds like a Reference 5 on steroids—the energy level has gone up several notches, as has resolution. When you couple these improvements with exceptionally neutral balance, superior presence and focus, and what may be the most capacious soundstaging I've yet heard from *any* ARC preamplifier, you get a preamp that is considerably better than its predecessor. Ditto for the Reference 250 monoblocks, which simply sound like much more ferocious beasts than the pussycat Ref 200s they replace. Where the 200s always seemed to run out of steam long before they'd come close to using up all their watts, the 250s just seem to keep going and going, and they do this with much better bass, resolution, transient response, dynamic range, imaging, and staging than their wimpy forbear. Top this off with the Ref Phono 2 SE, IMO one of the two highest-fidelity phonostages that money can buy (the other being the Golden Ear-award-winning Constellation Perseus), and you get the most neutral, highest-energy, most lifelike-sounding ARC electronics I've yet heard, which is saying a mouthful. (Review pending)

conrad-johnson GAT Preamplifier and ART Monoblock Power Amplifier

$25,000 and $35,000

C-j's statement preamp and amp are astonishingly alive-sounding—and because of their incredible width and depth of field, depth of color, depth of image, and unusually grainless liquidity, they do that most marvelous of things any piece of electronics can do: Disappear in most ways as a sound source leaving the music hanging there in space as if conjured out of thin air. But the GAT and ART do something more than this, as well. Let's face it: Tubes still have an inherent tonal and textural magic. At their best they can reproduce strings, winds, brass, and vocals with the diaphanous transparency of the very best contemporary transistor gear, without sacrificing the natural warmth of timbre that makes a violin sound like a violin rather than a glass box with cellophane strings. (218)

Constellation Audio Performance Series Centaur Stereo Amplifier, Virgo Linestage, Perseus Phonostage

$24,000, $19,000, $19,000

Engineering by committee (even a committee as stellar as Constellation's Bascom King, John Curl, Demian Martin, and Peter Madnick) isn't always a great idea. Here, the results are uniformly sensational. All three of these Performance Series components—amp, linestage, and phonostage—are incredibly high in resolution, top to bottom, and (because of this) in transparency to the sources ahead of them. All three of them are (once again with the right sources) exceptionally beautiful in tone color—and yet, magically, that rich timbre doesn't seem to get in the way of the clear reproduction of fine textures or small-scale dynamics or, for that matter, large-scale dynamics. It's like getting a Class A triode amp and preamp with the bandwidth, low distortion, and speed of attack of the very best solid-state. (223)

2012 the absolute sound Editors' Choice Awards

Welcome to *The Absolute Sound*'s Editors' Choice Awards, our annual Recommended Products List. For this Buyer's Guide we've excerpted those preamplifiers, power amplifiers, and integrated amplifiers that are most worthy of your attention. These are the components we ourselves would buy—or recommend to friends and family. Each product category is divided into price ranges, with components listed in order of ascending cost.

POWER AMPLIFIERS

Under $1000

Odyssey Audio Khartago
$895
www.odysseyaudio.com
Shockingly similar in tonal balance to certain high-priced solid-state amps, this 130Wpc stereo amp has no discernible grain, high resolution, and a deep, wide soundstage. Positively, the best budget amp JV has heard. JV, 195

Parasound Halo A23
$950
www.parasound.com
Parasound's A23 isn't the last word in low-end authority, and it's a bit cool in the midrange, but what it lacks in oomph it makes up for in finesse and pitch definition. Moreover, this reasonably priced amp is musically quite involving. SB, 138

Belles Soloist 5
$995
www.belles.com
A paradigm of minimalism and musicality, this small, cool-running sixty-five-watter is stuffed with sonic virtues: a forgiving tonal balance, good soundstage dimensionality, and naturalistic depth. Paired with its companion preamp, the Soloist 5 is a great way to get into separates at an integrated-amp price. NG, 174

$1000–$3000

PrimaLuna ProLogue 5
$1599
www.primaluna-usa.com
The 36Wpc vacuum-tube-powered ProLogue 5 is more authoritative than its rating would lead you to expect, and offers a warm, rich presentation, yet really does not sound "tubey" in any traditional sense, producing clean, deep, tight bass and grand soundstaging. A synergistic match with the companion ProLogue 3 preamp. SR, 156

Odyssey Khartago
$1800/pr.
www.odysseyaudio.com
These monoblocks may not be fully twice as good as the Khartago stereo amp (see above), but they're mighty good, improving on the Khartagos in every area (particularly in stereo separation and lower noise). Once again, champagne sound on a beer pocketbook. Forthcoming

Audio by Van Alstine Ultravalve
$1999
www.avahifi.com
Sounding more powerful than its 35Wpc would indicate, the Ultravalve is a thoroughly modern and rationally priced vacuum-tube amplifier. While its perspective is not as romantic as that of its "godmother," the Dynaco Stereo 70, it is far better focused, clearly more dynamic, and in general a higher-resolution device. DO, 204

Parasound Halo A21
$2300
www.parasound.com
An excellent Class AB stereo transistor amp, designed by the redoubtable John Curl, capable of 250Wpc into 8 ohms (400 into 4 ohms). Though not the last word in solid-state amplification, the A21 offers a lot of power at an affordable price. JV, 168

Wyred4Sound SX-1000
$2398
www.wyred4sound.com
While many amplifiers use Bang & Olufsen's ICE output device, the SX-1000 combines it with its own direct-coupled, balanced, dual-FET input stage designed by Bascom King. A powerful amplifier capable of effortlessly delivering copious amounts of power and detail. SS, 193

Rogue Audio Stereo 90
$2495
www.rogueaudio.com
This tube monoblock combines a rich treble and midrange with a gutsy bass and a clarity unusual in its class. Its one shortcoming is a tendency to push the midrange a bit forward. Even with this, it makes all types of music sound right. SR, 171

Vincent Audio SP-331 MK
$2500
www.wsdistributing.com
The hybrid SP-331MK delivers 150Wpc into 8 ohms and 300Wpc into 4 ohms, and operates in pure Class A for its first 10 watts. This makes the amplifier somewhat dual-natured, in that at moderate levels it sounds spacious, naturally balanced (if a tad dark), with good dynamic scaling and fine rhythm and pace. Pushed harder, it sounds more ragged. Overall, a terrific design that seems happiest when not played at its power limit. WG, 208

PrimaLuna ProLogue Six
$2599/pr.
www.primaluna-usa.com
These beautifully built, affordable, and "hassle-free" 70Wpc monoblocks will alter your preconceptions about tube gear. Indeed, their transient quickness and ability to drive difficult loads may fool you into thinking you're listening to a very good hybrid. Yet they still have that wonderful tube magic. JH, 169

Cambridge Audio 840W
$2699
www.audioplusservices.com
The key to the 200Wpc 840W is its proprietary XD topology, which allows Class A operation at low levels and transitions to "enhanced" Class B without the crossover distortion of Class AB designs. The result is a wide soundstage, excellent micro-dynamics, and near limitless power—plus that familiar, buttery, pure Class A vibe. NG, 186

$3000–$6000

Balanced Audio Technology VK-55
$3995

www.balanced.com

A remarkable amp and terrific value, BAT's 55-watt tube model may not be as revealing as some, but it offers a high degree of harmonic, textural, rhythmic, and ambient information. Tonally, a bit warm, with a gorgeous, well-balanced midrange, an easy, natural top end, and quite respectable weight in the bass. A 3-D soundstage and tight focus round out the virtues of this highly musical design. SK with WG comment, 153

conrad-johnson LP66S Series 2
$4500

www.conradjohnson.com

Have your sights set on a romantic tube stereo power amplifier? This 60Wpc design is it! Tonal emphasis is squarely on the lower midrange. Timbres and textures are slightly liquid and warm. The treble range is laid-back. Count on a mellow, relaxed presentation with an exceptionally low listener-fatigue factor and plenty of imaging magic. DO, 193

Krell S-150m
$5000/pr.

www.krellonline.com

Krell's compact, narrow-profile, cool-running 150W monoblock's tight, musically convincing bass and superb treble openness place it on a par with Krell's best. Further, it displays a dynamic liveliness and dexterity that verge on the uncanny. In the midrange, it is as grainless as any amp in SS's experience, perhaps faltering just a bit in the way of three-dimensionality and harmonic juiciness. SS, 205

NuForce Reference 9 Special Edition (SE) V3
$5000/pr.

www.nuforce.com

NuForce's best Class D amp yet, the Ref 9 SE V.2 monoblock delivers the expected virtues (articulate, well-defined mids and deep tightly controlled bass), plus noticeably sweeter, more grain-free highs than previous NuForce designs. The SE V.2's clarity, definition, and control can bring certain speaker systems alive, but can also make some speakers sound slightly "clinical." Forthcoming

Sanders Magtech
$5000

www.sanderssoundsystems.com

This no-nonsense amplifier was designed to drive any loudspeaker impedance, particularly full-range electrostatics, which can have an impedance of less than an ohm in the top octave. The Magtech "sounds as if it had infinite power into anything with total stability," said REG. The fully regulated power supply is unusual. The rated power output of 500Wpc into 8 ohms and 900Wpc into 4, coupled with its stability driving capacitive loads, makes it the perfect choice for electrostatics. REG, 211

Vincent Audio SP-T800
$5000/pr.

www.wsdistributing.com

This 200W hybrid monoblock is a remarkable performer. Its tube signature shines through clearly in the midrange, albeit slightly diluted by the solid-state output stage. Soundstage dimensionality is superior to that of conventional solid-state designs. It closely fulfils the promise of a hybrid design: Tube magic with plenty of bass crunch and drive. DO, 188

PrimaLuna Dialogue Seven
$5500/pr.

www.primaluna-usa.com

The 70W (40W in triode mode) PrimaLuna Dialogue Seven monoblock employs a unique output stage—two discrete amplifier channels are paralleled at the loudspeaker terminals. This technique preserves the purity of a low-powered design while imbuing the amplifier with higher current capability. "No tube amplifier I've auditioned comes close to its performance for anywhere near its modest price," said Jim Hannon. JH, 199

Cary Audio CAD 120 S II
$5500

www.caryaudio.com

This 120Wpc Class AB tube amp offers a sound that emphasizes the natural warmth of the midrange and upper bass, and produces musically natural upper-octave energy without losing the highs you hear in live music. Detail is natural, centerfill is excellent, and imaging is realistic in size. AHC, 208

Bel Canto REF1000M
$5990/pr.

www.belcantodesign.com

If you're looking for a component that is compact, efficient, powerful, transparent, musical, and extremely reliable, the Bel Canto REF1000M monoblock could be the last amplifier you'll ever need. While it may not warm up an overly sterile-sounding system like a classic tube amplifier, it certainly won't subtract any harmonic warmth. SS, 193

Modwright KWA150
$5995

www.modwright.com

"To my ears," said reviewer Dick Olsher, "the KWA 150 represents a smashing success, combining the musicality of tubes with the punch, power delivery, and bass reach of transistors. Factor in the performance and looks of this amp relative to its asking price and the result is a fantastic value." DO, 199

$6000–$10,000

Atma-Sphere M-60 MK3.1 OTL
$7100

www.atma-sphere.com

Atma-Sphere's uniquely simple, 60Wpc, Class A, all-tube OTL (output transformer-less) design offers a rare and exhilarating glimpse into the music few others can duplicate. This triode-based classic also possesses outstanding neutrality, clarity, definition, soundstaging, and dynamics. Relatively high-impedance, high-sensitivity speakers are recommended for best bass performance. SK, 184

Spread Spectrum Technologies Ampzilla 2000
$7500/pr.

www.ampzilla2000.com

Authored by James Bongiorno, one of high-end audio's authentic legends, this latest incarnation of the 300W monoblock Ampzilla 2000 boasts surpassing neutrality, vitality, and naturalness, with tube-like body and dimensionality. Rock-solid in stability and effortless in dynamics, it also evinces rare finesse, nuance, and delicacy. Mated with Bongiorno's Ambrosia preamplifier, it forms the nucleus of a system that cannot be bettered at anywhere near the price. PS, 219

NuForce Reference 18
$7600/pr.

www.nuforce.com

Though still a class D design, the Reference 18 is twice the size of any previous NuForce amp, thus making room for the elaborate "Cross-Matix Array" of capacitors contained within. The array doesn't affect measured power output, but it makes the amp sound dramatically more detailed, dynamically expressive, three-dimensional, and revealing. This amp is for those who prize unvarnished sonic honesty over a more forgiving but less truthful presentation. CM, 218

Chord SPM 1050
$7695

www.bluebirdmusic.com

The compact SPM 1050 delivers 200Wpc and is all but unflappable when pushed hard. Indeed, it likes it that way. It has terrific control and grip over speakers, delivers explosive dynamics as well as nuance, and is coherent across the band. Cool under fire, the 1050 never sounds forced or exaggerated. WG, 196

Aesthetix Atlas
$8000/pr.

www.musicalsurroundings.com

Aesthetix' first foray into power amps is an unqualified success. This monoblock has great resolution and reflexes, making it a snap to follow interwoven melodic and rhythmic

lines. The Atlas creates a cloud of air around each instrument, and a deep, convincing sense of space. Tonally, the amp is on the sweet side in a way that is consonant with real music. Slightly less dynamically incisive than AT's reference amp, the Atlas is a sheer joy—both sonically and musically. AT, 196

Berning ZH-230 ZOTL
$8360

www.davidberning.com

David Berning's latest refinement of the ZOTL technology offers 30Wpc of pure tube delight. It is intended to work with nominal loads in the range of 4 to 16 ohms, and ideally, would appreciate a speaker sensitivity of at least 90dB. Superlative transient speed at the point of attack leaves conventional transformer-coupled tube amps in the dust. Control of transient decay is also exemplary. Its considerable gift lies in blending the best of tube and transistor sound. DO, 210

Parasound Halo JC 1
$9000/pr.

www.parasound.com

The latest collaboration between legendary designer John Curl and Parasound has resulted in the Halo JC 1 monoblock, which SK called "silky-smooth, crystal clear, and abundantly detailed. An amp to listen to all day." SK, 141

Plinius SB-301
$9045

www.eliteavdist.com

Big and heat-sinked to beat the band, the Plinius outputs 310Wpc of the sweetest Class AB NG has heard. A model of silken control and neutrality, it doesn't sound like tubes, transistors, or any combination of either. Rich in tone color, with wide-open dynamics and sweet embraceable highs, it never failed to improve any set of speakers that it hooked up with. NG, 169

Electrocompaniet AW180
$9600/pr.

www.electrocompaniet.com/usa

The AW180 is a "tube-like" solid-state monoblock amp offering 180W into 8 ohms (considerably more into lower impedances). It provides very natural timbre and exceptionally realistic upper bass and lower midrange. Both low- and high-level dynamic contrasts are excellent. AHC, 198

$10,000–$20,000

Air Tight ATM 300
$10,500

www.axissaudio.com

The Air Tight ATM 300 is one of the handful of 300B SET amplifiers that lays claim to magical sound extending beyond the midrange. This amp's airy highs, natural tonality, and low-bass extension defy common perceptions of 300B SETs. Scot Markwell, 128

Pass Labs X350.5
$11,550

www.passlabs.com

A 350Wpc solid-state stereo amp that has what Pass amps always seem to have in abundance: remarkable midrange presence and immediacy. A shade darker-sounding and less bloomy than something like an Edge 10.2, it is exceptionally lively from top to bottom, with remarkable deep bass and fast sweet treble. JV

conrad-johnson LP125M SE
$12,000

www.conradjohnson.com

The Signature Edition features New Sensor's Russian Tung-Sol KT120. It is not a particularly tubey-sounding amp, being neither particularly warm nor romantic in character. Harmonic textures, while comfortably tube-like, avoid taking a warm bath. As a consequence, the presentation is transparent and detailed to a degree that has traditionally been difficult to access with push-pull amplification The overall sound is regal and suave, coupled with solid image outlines and excellent soundstaging. Its sound is reminiscent of the iconic Harman Kardon Citation II. Both share a thunderous bass range and a correct presentation, free of tube excess. Forthcoming

Jeff Rowland Stereo 625
$13,000

www.jeffrowlandgroup.com

Jeff Rowland is back at the top of his form with this solid-state beauty, which is, as near as HP can tell, devoid of a solid-state signature. Not a Class D circuit, as are the less expensive electronics in Rowland's line, this gorgeous 300Wpc (into 8 ohms, 550Wpc into 4 ohms) Class AB stereo amp has wideband response with very low distortion, and a purity and sweetness rare in electronics of any kind. HP, 215

Classé Audio CA-M600
$14,000/pr.

www.classeaudio.com

Thanks to a highly sophisticated passive cooling system, the Classé monoblocks don't run hot; nevertheless, their sheer dynamism and alacrity are stunning. Blinding speed is coupled to a spookily low noise floor. So linear and revealing are these amplifiers that in some systems they may best be coupled with tubes elsewhere in the audio chain. You can search far and wide for a better amplifier at double the price. JHb, 210

Simaudio Moon W-8
$15,000

www.simaudio.com

This 80-pound, dual-mono, bridgeable amplifier is Simaudio's premier stereo unit, boasting 250Wpc into 8 ohms (an even thousand when bridged). Like its companion preamplifier the P-8, the W-8 is tonally neutral, has iron control yet exquisite finesse, and appears to do nothing but amplify the signal fed to it. PS, 185

Pass Labs XA100.5
$16,500/pr.

www.passlabs.com

These masterpieces from Nelson Pass bring the virtues of Class A to a more efficient package. The XA100.5 monoblocks have a purity and transparency that are jaw-dropping. Timbres are also well served, with a warmth and ease reminiscent of tubes but without "tubey" colorations. RH, 186

Edge NL 10.2
$17,388

www.edgeamps.com

Always a contender in the solid-state arena, Edge has spent the last few years improving both its circuitry and parts selection. The results, as heard in the new 10.2 power amp, are a much lower noise floor and greater freedom from any sense of low-level dynamic constriction, jaggedness, or smearing. And though the 10.2 is first-rate at layering harmonics, it is not a warmly colored device but rather a solid-state design that holds as closely to the ideal of "neutral" as WG's experienced. WG, 219

$20,000 and above

Cary Audio 211 FE
$20,000/pr.

www.caryaudio.com

A zero-feedback design, the all-triode 211 FE monoblock updates the classic 211 that Cary has produced for 17 years. Though it may lack the ultimate wallop of a powerful transistor unit, and may—if you're into large-scale classical or hard rock—run out of juice before you want it to, this is one gorgeous-sounding amplifier—pure, exciting, and expressive. WG, 205

Spectral DMA-360 MKII
$20,000/pr.

www.spectralaudio.com

The DMA-360 monoblock combines high output current with lightning-fast audio circuits, producing an unparalleled portrayal of music's dynamic expression. It also delivers what is, in RH's experience, the largest, best-defined, and most accurate spatial presentation of any amplifier. Timbral realism is also a DMA-360s' strong suit, as is amazing resolution of fine inner detail. Reference-grade amplifiers at a rational price. RH, 190

Air Tight ATM-3
$21,000/pr.

www.axissaudio.com

This beautifully made, metered, push-pull, 100Wpc, 6CA7-based

monoblock combines the rich textures and timbres of an SET amplifier (though it is not an SET) with the fine resolution, more extended bandwidth, more neutral balance, and superior transient speed of Class A solid-state (though it is not solid-state). A little marvel of fidelity, it mates wonderfully well with fast loudspeakers like Quad 2905s. JV, 188

Pass Labs XA160.5
$22,000/pr.

www.passlabs.com

"An amplifier with soul," the XA160.5 monoblock is the most "tube-like" transistor amp AHC has heard. Its sound is warmer than most, and the music emerges from a deep black silence. Moreover, its soundstage depth matches its width, dynamics are musically natural and slightly "soft," and the amp has terrific harmonic integrity. AHC, 192

Lamm M1.2 Reference
$23,890/pr.

www.lammindustries.com

Another winner from the fertile mind of Vladimir Lamm. Combining brawn and finesse, the M1.2 drives even challenging loads with ease. Its siren song of suave harmonic textures, tight bass control, articulate transients, kinetic drive, and essential tonal neutrality is musically most persuasive. DO, 188

Burmester 911 Mk III
$29,995

www.burmester.de

Burmester components are unquestionably expensive, but also uncommonly versatile and aesthetically exquisite. The sound of this stereo amplifier is on the same plane, with hold-your-breath dynamics, uncanny timbral realism, and a remarkable sense of "inevitable" pace. AT, 212

Classé Audio Omega
$35,000/pr.

www.classeaudio.com

Classé's statement monoblocks possess Stygian bass slam, whiplash speed, and power galore. The abundant power on tap means that the soundstage is utterly holographic, allowing the listener to pinpoint each instrument. A superbly liquid midrange and refulgent sound make it one of the most commanding monoblocks around. JHb, 203

conrad-johnson ART
$35,000/pr.

www.conradjohnson.com

The 275W ART monoblocks are far and away the lowest noise, highest resolution, highest transparency c-j amplifiers JV has heard, with wonderfully expansive soundstaging, robust midbass and lower mids, slightly sweet upper mids and treble, and excellent grip and extension in the bass. One of JV's references. JV, 218

Ayon Vulcan II
$40,000/pr.

www.ayonaudio.com

If you value huge panoramic soundstaging with velvety black backgrounds and eye-popping detail, the Ayon Vulcan II monoblock is for you. A rare do-it-all design, it marries the drive of solid-state with the magic of SET. One of the most holographic amplifier ever, it is not as tonally pure as the Lamm ML3; nonetheless, it is reference-quality due to its outstanding spatial presentation. PB, 211

Boulder 1050
$44,000/pr.

www.boulderamp.com

A truly superb monoblock that offers the very best in bass, power, transients, and low-level detail. It's slightly warmer and more tube-like than many competing solid-state designs, but this adds—rather than subtracts—from musical realism. If you want the real-world sound of acoustic instruments, this may be the amplifier for you. AHC, 188

Soulution 710
$50,000

www.axissaudio.com

Jaw-dropping resolution and transparency-to-sources sets this 120Wpc into 8 ohms (240Wpc into 4) solid-state stereo amp apart. It is preternaturally "not there," making inherently neutral speakers, in turn, sound more "not there," and music (and the engineering and mastering that went into putting that music on LP or disc) "more there." If you truly want to know what's on your records, this supremely honest amplifier must be heard. JV, 199

Krell Evolution One
$65,000/pr.

www.krellonline.com

While the Evolution One mono amp is not a radical sonic breakthrough—the best aspects of Krell "voicing" have been preserved—the Krell virtues of deep-bass power and rich natural timbre have been enhanced, while air, life, microdynamics, depth, detail, and the upper octaves have improved to contenders for the state-of-the-art. A true sonic benchmark. AHC, 158

Octave Jubilee
$67,500/pr.

www.octave.de

An assault on the state of the art by the German firm Octave and its lead designer, Andreas Hoffman, the Jubilee monoblock is a tall, superbly styled tube amplifier that that can easily put out some 280W. Our reviewer AHC "struggled to find something to criticize." Oh, he said that the Jubilee could use just a touch more warmth, but freely admitted that this was a matter of taste and that other listeners didn't feel this way. One of the two or three best amps AHC has auditioned. AHC, 212

BALabo BP-1 MK-II
$88,500

www.balabo.com

This exquisitely made, extremely powerful (500Wpc) solid-state stereo power amp from Japanese master-designer Fumio Ohashi is as lovely to listen to as it is to behold. If ravishing gorgeousness of tone color, outstanding resolution of detail, quick natural transient response, huge reserves of power, and superb bass grip are your cup of Saki, you will have to look long and hard to find an amp that sounds this lovely and this lifelike. JV, 201

Soulution 700
$130,000/pr.

www.axissaudio.com

Capable of 860W (into 4 ohms) these huge, Bauhaus-handsome, solid-state monoblock amplifiers are, like their littler brother the 710, paragons of neutrality and transparency. Just a touch warmer and more *gemütlich* in tonal balance than the utterly colorless 710, the 700s bring nearly the same astonishing resolution to the table, reproducing sources with standard-setting high fidelity.
JV, 199

Lamm ML3 Signature
$139,290/pr.

www.lammindustries.com

This two-chassis, 32Wpc SET monoblock sets new standards in sound reproduction. The ML3 delivers amazing speed plus captures the full harmonic envelope of each instrument. The result is unparalleled tonal neutrality. Surprising, for an SET design, the Lamm can be used with a wide range of loudspeakers, though care must be exercised in impedance and sensitivity matching. PB, 208

Constellation Audio Hercules
$140,000/pr.

www.constellationaudio.com

A monumental product in every sense of the word, from the audacious design effort, to the sheer size and weight (270 pounds, 12" x 29" x 20" chassis), to the stellar sound quality. With a whopping 64 output transistors per monoblock, the Hercules lives up to its name by delivering 1000W into 8 ohms. Many mega-powered amplifiers lack the delicacy, refinement, and ease of lower-wattage designs, but not the Hercules. Its sound is reminiscent of an SET amplifier in its palpability. Throw in a complete absence of grain, colorless rendering of timbre, a super-black background, phenomenal resolution, and seemingly limitless dynamic reserves, and you have a stunning amp. RH, 215

PREAMPLIFIERS

Under $1000

Vincent Audio SA-31
$650
www.wsdistributing.com
The SA-31 is a well-made entry-level vacuum-tube preamp that provides tone controls and a loudness contour switch. The preamp's sound is characterized by a rich, seductive midrange and solid bass. Though not quite the equal of today's best $1k preamps in resolution, definition, or high-frequency "air," the SA-31 offers terrific bang for buck. CM, 208

$1000–$2000

Rogue Audio Metis
$1095
www.rogueaudio.com
Rogue Audio's Metis is a USA-made, vacuum-tube-powered (6SN7-based) preamplifier. The dynamic liveliness and harmonic richness we expect in any good tube design are present here, at levels that remind us of the sound of $2500 tube preamps. But unlike tube designs that sound focused in the midrange and soft at the frequency extremes, the Metis remains evenly balanced and finely resolved from top to bottom. CM, 160

Van Alstine Transcendence 8+
$1299
www.avahifi.com
Configured as a linestage (the optional phonostage fared less well), the T8 is one of those rare products that genuinely transcends its price. Its sound is not particularly smooth or euphonic. But it won praise based on its stable imaging and killer dynamics. It benefits from being mated with a romantic tube amp. DO, 173

Vincent SA-31MK
$1500
www.wsdistributing.com
An upgrade to its SA-31 linestage, Vincent's SA-31MK features a new output circuit with shorter signal paths and improved component parts, including a second set of 6N16 vacuum tubes. A little dark and finely grained, it brings an extra bit of texture to a violin, cello, or bluesy vocal. Staging and focus are strengths, though it could benefit from a bit more air and bloom. WG, 208

PrimaLuna ProLogue 3
$1599
www.primaluna-usa.com
The vacuum-tube-powered ProLogue 3 preamp makes an ideal companion to PrimaLuna's ProLogue 5 tube power amp. Like the power amp, the preamp combines tube warmth and richness with a clear, crisp, precise presentation reminiscent of the best solid-state designs. Bass, too, is taut and clear. SR, 156

Cambridge Audio 840E
$1799
www.audioplusservices.com
The preamp companion to the 840W amp, the 840E is highly configurable, with excellent connectivity and a wonderful premium-resistor-ladder volume control. Musicality and neutrality are top-class. It's almost unsettling how quiet this preamp is. The 840E/840W tandem is one of the most satisfying debuts in recent years. NG, 186

$2000–$5000

Mystère CA21
$2195
www.mystere-usa.com
Built like a tank, the CA21 is a fine example of the minimalist approach: a line preamp with an input selector and a volume control, but no balance control. A giant killer in clarity, soundstage transparency, and detail resolution, its slightly closed-in treble highlights the midrange. Tonally, the center of gravity is the lower midrange, enabling a big-tone portrayal of cello and upright bass. DO, 208

ModWright SWL 9.0SE/SWL 9.0 Signature Edition
$2495/$2995
www.modwright.com
These two all-tubed linestages (the Signature Edition offers a number of design upgrades) offer particularly wide and deep soundstaging, coupled with an extended bottom-end and a sweet treble. "Addictive, seductive, beautiful, exciting," is how SR summed up the SWL 9.0 Signature Edition. SR, 181

Vincent Audio SA-T8
$2500
www.wsdistributing.com
This tube line preamplifier is about bass precision, spacious soundstaging, speedy transients, pure midrange textures, and rhythmic drive. The lower treble is a bit coarser than the midrange. Microdynamic nuances are reproduced with commendable conviction. A rare musical blossom at this price point, and an absolute steal considering its twin virtues of crystalline clarity and ample boogie factor. DO, 188

PrimaLuna DiaLogue 3
$2699
www.primaluna-usa.com
With its massive toroidal power transformers, this true dual-mono, point-to-point-wired preamplifier is unflappable, reproducing music effortlessly and with wonderful dimensionality even through complex, dynamically challenging musical passages. While it may make many recordings sound better than they should, you can listen to it for hours without any aural fatigue. JH, 219

Cary Audio SLP-03
$3000
www.caryaudio.com
Like the Cary 120 S II, with which it is intended to mate, this tube linestage produces a sound that emphasizes the natural warmth of the midrange and upper bass. It sets a soundstage that slightly emphasizes depth over width. Detail is natural. Flute, clarinet, and piano have transients and peaks that sound musically realistic; brass has bite without being hard, and female voice does not lose its warmth or emphasize sibilants and breathing sounds. AHC, 208

Triode Corporation TRX-1
$3000
www.twinaudiovideo.com
This all-tubed linestage boogies along with plenty of dynamic conviction, generating an infectious enthusiasm for the music. It may not excel in audiophile terms, but is a standout in its faithfulness to musical values. In particular, it captures the interplay between musicians to an extent that is rare or even exceeds that of preamps costing much more. The caveat is that you'll have to invest in replacement tubes, preferably 5751s. Consider it a must-audition if your priority is to simply enjoy the music. DO, 219

Electrocompaniet EC 4.7
$3495
www.electrocompaniet.com/usa
The Electrocompaniet EC 4.7 solid-state preamp from the Land of the Vikings produces a natural mix of lifelike imaging and soundstaging that gives large complex orchestral music about as much realism as you can achieve in a home stereo. Clean, transparent, and exceptionally quiet, it also has significantly more extended bass and high-frequency response than many competing units. A very good preamp by any standard. AHC, 198

conrad-johnson ET3SE
$4000 ($1500 for phono option)
www.conradjohnson.com
Despite its entry-level status, the ET3SE is a low-distortion, high-resolution line preamplifier that delivers timbral accuracy and phenomenal bass control. The overall presentation is clean, smooth, slightly laid-back, yet highly detailed, with an emphasis on harmonic accuracy. It can certainly hold its own in elitist company. DO, 193

Parasound Halo JC 2
$4000
www.parasound.com
The JC 2 is that extreme rarity—a near-reference-quality product that many of us can actually afford. Neutral and natural, transparent-

to-sources, quick and delicately detailed (though not as hard-hitting and detailed as the higher-priced spreads), here is one solid-state preamp that doesn't trade away key parts of the baby (air, bloom, color, three-dimensionality) for the bathwater of razor-cut imaging and iron-fisted control. JV, 182

$5000–$10,000

Aesthetix Calypso/Calypso Signature
$5000/$7000

www.musicalsurroundings.com

The all-tube Calypso delivers most of the performance of Aesthetix' two-box $13,000 Callisto linestage for about a third the price. Sonically, the Calypso is characterized by extremely good dynamics and dynamic nuance. Although the treble is smooth and somewhat laid-back, transparency and resolution are first-rate. Noise floor is highly dependent on tube quality, which has been variable. Competes with the megabuck preamps. RH, 151

The Signature version improves on the Calypso's already terrific performance with an expanded soundstage, richer portfolio of instrumental textures, more air, longer decays, and better-defined bass. AT found that the Signature version imparted a warmer cast to timbres. AT, 196

Edge G2
$5800

www.edgeamps.com

Like its amps, Edge's preamps are a different kind of solid-state—grain-free, open, neutral but not cold, and not at all dark or grainy. The sound described is with the G2 powered by its internal gel batteries. When the G2 is driven by AC, the sound is noticeably drier, hashier, and less magical. WG, 149

Lamm LL2.1
$5990

www.lammindustries.com

This all-tube linestage preamp (with tube rectification) captures 80% of price-no-object preamps for a fraction of their cost, said our reviewer DO. Never in-your-face analytical, the LL2.1 frames details organically within the fabric of the music. Treble, bass, and transparency can be improved by using the right after-market tubes. DO, 198

BAT VK-42SE
$6995-$8245 (depending on options)

www.balanced.com

BAT designer Victor Khomenko is rightly proud of the numerous programming features on the 42SE preamplifier. But that's only the start of the story. A great value, this exemplary solid-state design is most notable for its smooth, silky sound and superbly low noise floor. Where it falls short of more elaborate designs is in resolution and dynamics. JHb, 179

Aesthetix Janus/Janus Signature
$7000/$10,000

www.musicalsurroundings.com

The Janus combines Aesthetix' Calypso linestage with a scaled-down Rhea phonostage in a single chassis. The Signature version features upgraded parts in the identical circuit. The units share numerous qualities: speed and detail; a low noise floor; precise rhythms; dynamics that are almost reference-caliber; and a laid-back perspective. The quiet background and smooth highs add up to long hours of glorious, fatigue-free listening. AT, 196

Spread Spectrum Technologies Ambrosia
$7500

www.ampzilla2000.com

James Bongiorno's new preamplifier is a gauntlet flung at an increasingly minimalist world: a two-channel preamplifier complete with *two* phonostages (mm and mc), unusually effective tone controls and filtering, headphone amplifier, and as much flexibility as anyone is likely to need. Sonics match those of the Ampzilla 2000: vitality, life, and lifelikeness with no sacrifice of neutrality. As with the companion amps, the Ambrosia easily withstands comparisons from much more expensive rivals. PS, 219

Cary Audio SLP-05
$8000

www.caryaudio.com

Sporting eight 6SN7 vacuum tubes in its main chassis and a 5AR4 rectifier tube in its outboard power supply, this zero-feedback, balanced linestage ranks among the best. Highly transparent, it transports you to the recorded event, combining tonal naturalness, a lifelike sense of instrumental body and weight, air, and dimensionality in a way that brings recordings to startling life. WG, 205

Pass Labs Model XP20
$8600

www.passlabs.com

Very quiet, with no trace of solid-state hardness, excellent musical life, and the best low-level detail AHC has encountered. Sound-staging is as real in imaging, width, and depth as the recording permits. Excellent deep bass, and clean, detailed upper midrange and treble that get the most out of flute, clarinet, strings, piano, and the full range of male and female voice. AHC's new reference preamp. AHC, 192

conrad-johnson ET5 Preamplifier
$9500

www.conradjohnson.com

The latest addition to conrad-johnson's enhanced triode preamplifier lineup offers world-class soundstaging replete with 3-D image outlines. Bass lines are tightly defined, while the upper resisters are open and free of gratuitous brightness. Tonal colors approach the vividness of the real thing without euphonic adulteration. Expect no sonic editorializing from this preamp! It refuses to stray from neutrality and maintains an even-handed perspective top to bottom. Forthcoming

$10,000 and above

Apex Pinnacle
$10,000

www.ttvjaudio.com

Functionally, the Pinnacle performs double-duty as both a headphone amp and a linestage preamp. A convincing design on a technical level that happens to deliver plenty of tube magic. Harmonic textures are sweet, velvety, and pure. Its overall soundstage exhibits considerable grandeur, though it slightly congests space between instruments. There is a romantic blush about the lower midrange. Low-level detail is plentiful and the treble range is gorgeously nuanced with firm transient control. DO, 214

Mark Levinson No. 326S
$10,000 (optional phonoboard, $1200)

www.marklevinson.com

The No. 326 possesses greater transparency and fidelity to the source than previous ML preamps, with less of the characteristic ML house sound. Astonishingly focused and detailed, yet smooth, suave, and sophisticated. Superb features and ergonomics make the No. 326S a pleasure to use on a daily basis. RH, 161

Purity Audio Silver Statement
$10,000

www.purityaudiodesign.com

In an audio world circumscribed by copper, the Silver Statement makes a massive investment in silver technology. The result is cost-no-object performance but at a price point kilobucks removed from the hyper end of high-end audio. Tonal colors are vivid, pure, accurate, and without euphonic emphasis. The preamp is without peer in fleshing out individual image outlines with realistic space between them. DO, 215

Jeff Rowland Corus
$12,800

www.jeffrowlandgroup.com

Precision machined from aluminum, this solid-state linestage preamp has an imposingly high-design look, and a presentation that is perfectly

matched to that of the Rowland 625 amp—one devoid of a solid-state signature. The Corus is also priced more than fairly. When you audition it, "I can promise you'll be listening to the music again and not the electronics," said HP. HP, 215

Spectral DMC-30SS
$10,000

www.spectralaudio.com

Spectral's DMC-30SS is a *tour de force* of preamplifier design, with its ultra-fast circuits, heroic volume control, and meticulous attention to detail. Its sound is hard to describe because it imposes so little signature. Putting the DMC-30SS into the system is like washing months of winter off a picture window. Timbres are richly saturated, soundstages huge and defined, and resolution of transient detail is unmatched, provided that these qualities exist in the recording. RH, 190

Boulder 1010
$14,000

www.boulderamp.com

A preamp that complements all of the sonic virtues of the Boulder 1050 power amp, and does so with exceptional resolving power and detail. An excellent phonostage. The ability to adjust the level of each input to match. Excellent remote control features. Superb Boulder construction. AHC, 188 and 208

Simaudio Moon P-8
$15,000

www.simaudio.com

If it weren't for the absence of a stereo/mono switch, PS would find this two-channel, dual-chassis, dual-mono preamplifier literally perfect in function. Like any superior modern solid-state unit, it's tonally neutral and pretty much characterless. Additionally, its dynamic response is hair-trigger and detail amazing, with that paradoxical combination of iron grip and utter ease. Drawbacks? Well, it does cost $15,000. PS, 165

VAC Signature IIa
$15,000/$19,500 with phono option

www.vac-amps.com

Kevin Hayes has outdone himself with the new Signature IIa preamp. Transformer-coupled, completely balanced, hand-wired, and using no coupling capacitors or negative feedback, the full-function model has four line inputs, a tubed phonostage with mm/mc inputs, a completely separate power transformer, dedicated filter circuitry, and variable impedance loading. And the sound is gorgeous—capable of handling rock, jazz, or classical music equally well. Forthcoming

Balanced Audio Technology Rex
$20,000

www.balanced.com

This massive, two-chassis, all-tubed preamplifier sets a reference standard in midrange liquidity, palpability, and lack of electronic artifacts. The Rex is supremely seductive and engaging, making the listener forget he's listening through the electronics to the music. The only caveat is that the Rex runs hot, even in standby mode. If you can handle the cost, heat, and rack-space requirements, RH knows of no sweeter-sounding preamplifier. RH, 182

conrad-johnson GAT
$20,000

www.conradjohnson.com

Building upon its superb ART design of about a decade past, c-j's newest statement preamp takes the ART's virtues several large steps forward. Gone is any vestige of the ART's overly warm, slightly opaque sound, replaced by a brook-clear neutrality and transparency and a transient speed and low-level resolution that are new to JV's experience of c-j electronics. The GAT and the c-j ART amp have less background/foreground hash and noise than any piece of electronics, solid-state or tube, JV has yet auditioned. JV, 218

VTL 7.5 Series III
$20,000

www. vtl.com

VTL's new linestage is the best one it has produced. Its transient fidelity, dynamic power, enormous soundstage, and sheer grip are mesmerizing. Like its predecessors, the 7.5 features an ingenious "clean" and "dirty" box to prevent the signal from becoming contaminated by noisy parts. But there the similarities end. The Series III version of the 7.5, which features a host of upgraded parts and improved circuit design, has conquered the slight bit of electronic grain that the Series 2 version displayed. Forthcoming

mbl 6010 D
$26,500

www.mbl-northamerica.com

One of the three best solid-state preamps JV has auditioned. Its noise floor is so incredibly low that it consistently resolves fine harmonic and dynamic details that simply aren't audible through other great preamps. At the same time its transient speed and authority are superbly realistic. To ice the cake, it is absolutely neutral in tonal balance, with excellent imaging and soundstaging, and superb ambience retrieval. JV, 164

Ayon Polaris III
$28,629

www.ayonaudio.com

This full-function preamplifier's highlights include outstanding three-dimensional imaging and endless layering coupled with non-fatiguing, reference-quality transient delivery. Instruments seem to "pop up" from nowhere. The phonostage dazzles with liquidity and detail, plus it offers the ability to play low-output moving coils with absolutely no noise. PB, 211

Burmester 088
$28,995

www.burmester.de

This preamp delivers musical details and lines that are easily delineated and never trip over each other. Overall, it fully lives up to its builder's claim of achieving the ability to capture the power, variety, and surprise of music. AT, 212

Octave Jubilee
$35,000

www.octave.de

The Octave Jubilee preamplifier has all of the excellent build-quality, detail, and life, and unique design features of the Octave Jubilee power amplifier. Although it is a bit on the lean side (and lacks a remote and balance control), AHC found it was sonically well suited for use in any high-end system, if its leaner balance agrees with your taste. AHC, 212

Soulution 720
$45,000

www.axissaudio.com

The second of the three best solid-state preamps JV has heard. Dead neutral in balance (though sweet enough in the mids and treble not to sound clinical), the 720, like Soulution's amplifiers, is killer-transparent to sources. It's not *more* detailed than the ultra-high-resolution mbl 61010 D, but it's not less. Like the 700 and 710 amps, this is a component that just "disappears" as a sound source, allowing other components ahead of and behind it to more completely show their true colors (or their lack of same). JV, 194

Krell Evolution Two
$55,000

www.krellonline.com

The Krell Evolution series puts the third dimension back in music by providing exceptional depth. It also provides exceptional reproduction of hall sounds and musical mechanics—bowing sounds, score rustling, etc. This effect is enhanced by the imaging qualities of the Evolution Two. When the imaging on a recording is natural and detailed, the Evolution preserves the size, the place, the stability, and the layers of imaging. The result is a more open soundstage, better reproduction of life and air, and a greater ability to lose yourself in the music. AHC, 158

Constellation Audio Altair
$60,000

www.constellationaudio.com

Created by a consortium of the world's best electronics designers, the Constellation Altair explores

uncharted territory in circuit design and construction methods to deliver nothing less than state-of-the-art performance and state-of-the-art functionality and user interface. In the listening room the Altair delivers the blackest background, the lowest noise, and the finest resolution of detail RH has heard. The Altair's singular achievement is sounding massively high in resolution while simultaneously delivering a tremendous sense of ease, warmth, and listener involvement. RH, 215

BAlabo BC-1 MK-II
$67,500

www.balabo.com

The third of JV's "Top Three Solid-State Preamps." Like its companion power amp, the BP-1, the BC-1 "control amp" (linestage preamplifier) is among the most beautiful pieces of electronics JV has seen or heard. A little dark in overall balance, the BAlabo is simply exquisite on tone colors, turning everything into a shade of gorgeous without sacrificing any of the speed or low-level detail of the real thing. Wonderful grip and definition in the low bass, too. Breathtakingly lovely and extremely high in resolution. JV, 201

INTEGRATED AMPLIFIERS

Under $1000

NAD C 316/C 326 BEE
$349/$550

www.nadelectronics.com

The entry-level C 316 is still the go-to amp for audiophile newbies who crave sonic neutrality, good power output, nice tactile feel, and NAD's characteristic quality-control. Looking for a little more oomph? The 50Wpc C 326 will make BEElievers of even the most jaded audiophiles. WG, 140

NAD C 356 BEE
$800

www.nadelectronics.com

The 80Wpc C 356 BEE borrows technologies from NAD's Master Series M3 dual-mono integrated. Its tonal balance leans slightly to the darker side, bringing a bit of extra wood to strings and burnish to brass. The soundstage is large, with a good sense of air around instruments, and a nice sense of depth. WG, 210

Marantz PM8004
$999

www.us.marantz.com

With 70Wpc, the PM8004 is tonally neutral, clean, clear, transparent, and dynamic into low-efficiency speakers. The preamp section features an excellent moving-magnet phonostage and headphone amplifier, and the circuit has an unusually high number of discrete parts (rather than ICs). High value. PS, 220

Rotel RA-1520
$999

www.rotel.com

Part of the newly revamped and restyled 15 Series, the RA-1520 is a superb 60Wpc solid-stater that includes a moving-magnet phonostage and a robust power supply. Its sonics are trademark Rotel—a rich chunky midrange with solid extension at either extreme. In two words, it is "scary good." NG, 196

$1000–$2000

PrimaLuna ProLogue One
$1375

www.primaluna-usa.com

The sweet and affordable ProLogue One features a 12AX7, 12AU7, and a pair of EL-34s per channel in a very simple circuit. In classic EL-34 style, the ProLogue throws a very wide and deep soundstage, and has a wonderful midrange. Jeff Dorgay, 151

Naim Nait 5*i*
$1645

www.soundorg.com

One of the great bargains in high-end audio, this latest version of the Nait 5*i* brings more than a taste of expensive separates to a mid-priced integrated amplifier. The Nait is sweet without sounding rolled-off, presents a huge sense of space, tremendous separation of images, and, most importantly, sounds like music. RH, 183

Cambridge Audio Azur 840A
$1799

www.audioplusservices.com

The 120Wpc Azur 840A solid-state integrated amplifier features Cambridge's innovative "Class XD" circuit. Apart from its substantial power output, the 840A's greatest strengths are its articulate, well-defined sound and its lifelike dynamics. CM, 167

Simaudio Moon 250i
$1800

www.simaudio.com

The entry-level Moon 250i (formerly the iL) is a fine example of why integrated amplifiers offer such superb value. Rated at a moderate 50Wpc, the 250i nevertheless delivers impressive large-scale dynamics, rhythmic liveliness, transient speed, and top-to-bottom balance. One of the purest-sounding integrated amps in its class. WG, 185

$2000–$3000

Exposure 3010S
$2195

www.bluebirdmusic.com

Exposure's electronics deliver the goods by balancing detail with warmth, rhythmic precision with lyricism, and delicacy with power. With an optional phono card, the 3010S morphs with the music as each recording demands; it can be either sweet and mellow, lean and mean, or a combination of the above depending on the disc. WG, 181

Rogue Audio Cronus Magnum
$2195

www.rogueaudio.com

Rogue's 90Wpc Cronus Magnum features a new Electro Harmonix KT90 tube. Striking a balance between elegance and power, its dynamic scaling is very fine—lilting with chamber music, muscular with rock and orchestral. The Magnum is also remarkably transparent to sources in a way that is highly unusual in this price class. WG, 209

Prima Luna ProLogue Premium
$2299

www.primaluna-usa.com

Sonically, the 35Wpc ProLogue Premium does not have the rosy colorations of traditional triode or SET tube varietals. True, there is a glimmer of romance and softness, but tonally it's a thoroughly contemporary tube amp that walks a mostly neutral line yet still seasons the lowest level details of music with delicacy and resolution. NG, 212

Perreaux Audiant 80i
$2995

www.fidelisav.com

A new breed of "hub" integrated amplifier with inputs to support several generations of formats—specifically a phonostage and an upsampling USB DAC. With 80Wpc the Audiant 80i reproduces music with ease, honesty, and impressive midrange timbre. Transients aren't filed to a hard gleaming edge and distinct from the overall presentation. A refreshing mix of Old School cred and contemporary cool. NG, 213

Rega Elicit
$2995 (add $145 for mm and $175 for mc phono boards)

www.soundorg.com

Rated at 80Wpc, Rega's Elicit is a cleverly named integrated amplifier. The sound is dynamically fleet of foot, and conveys both the heart of the music and the details in the recording. Although it does have a few minor operating quirks, and does not have sledgehammer-like power or weight, the Elicit nevertheless delivers high levels of musical satisfaction. WG, 198

PrimaLuna DiaLogue 2
$2999

www.primaluna-usa.com

The first product in PrimaLuna's higher-performance line of tube units is a real honey, surpassing the ProLogue Two across the board. Rated at only 38 watts in Ultralinear mode, it sounds much more powerful due to its outstanding transformers, but requires speakers that are at least moderately efficient. JH, 195

$3000 and above

Hegel H100
$3000

www.hegel.com

Hegel (made in Norway) uses unique engineering solutions to offer high performance at relatively modest prices. The H100's understatedly elegant looks are in keeping with its sophisticated, musically rewarding sound, drawing you in through its non-fatiguing portrayal of musical performances. The soundstage is a tad narrower and images are somewhat smaller than some amplifiers can produce. On the whole, a good value that includes an on-board USB DAC. KM, 206

April Music Stello Ai500
$3695

www.aprilmusic.com

The April Music Stello Ai500 can deliver a completely satisfying one-box solution for a high-end system. The Ai500's analog preamp stage's transparency is near reference-quality. For audiophiles who require the ultimate in resolution from their digital music files, the Ai500 needs to be mated with a top-echelon USB signal-converter or DAC. SS, 202

Hegel H200
$4400

www.hegel.com

The more powerful and more accomplished big brother to the H100, the H200 is a beautiful-sounding integrated amplifier whose emphasis is on optimal sonic performance and power reserves rather than on a variety of inputs and features. It lacks the on-board DAC of the H100 but more than makes up for that by offering a larger soundstage, clearer details, and greater listener involvement. A great value. KM, 211

Music Culture MC701
$4495

www.music-culture.us

This 120W integrated amp from Germany oozes elegance in its appearance and sound. Edging to the warm and inviting side of neutral, it also conveys ample rhythmic snap and detail and has enough power to drive a relatively wide range of speakers. Not the last word in a spacious, airy soundstage, the MC701 makes up for this by blending visual, tactile, and sonic appeal in a compelling package. KM, 215

Simaudio Moon 340i
$4500 fully equipped

www.simaudio.com

Simaudio sees the future with this elegant 100Wpc cross-generational design. Formerly known as the i3.3, the 340i linestage integrated epitomizes Simaudio sonics—a sensation of pomp and pace to the reproduced signal. The 340i launches rhythmic volleys, percussive accents, and transient cues with the speed and smoothness of Usain Bolt bursting from the starting blocks. You can add an optional DAC package, or internal phono preamplifier or balanced set of inputs at any point. NG, 198

Plinius 9200
$5100

www.eliteavdist.com

The 9200 is a thorough and timely re-imagining of the brilliant but aging 8150/8200. Still compact in size, it pumps out a healthy 200Wpc and, thanks to its strong Class A bias, is sweeter and richer than ever. Even the all-new phonostage is quieter and more dynamic. Bass doesn't sound as darkly ominous or as extended as in years past, but control and definition are strikingly improved. NG, 156

NAD M2
$6000

www.nadelectronics.com

Five years in development, the innovative M2 is a "digital" amplifier in the true sense of that word. It takes in PCM data (up to 192kHz/24-bit) and converts it to a pulse-width-modulated signal that turns the output transistors on and off. The signal path has no digital filter, no DAC, no analog gain stages, no analog volume control, no preamplifier, and no interconnects. The M2, which functions like an integrated amplifier in practice, sounds remarkable, with tremendous dynamics, extremely low noise, richly textured and defined bass, and three-dimensional soundstaging. RH, 198

Vincent V-60
$6000

www.wsdistributing.com

The V-60 is one of Vincent's new flagship offerings and it's an effort that's as beautiful to listen to as it is to behold. From its silken midrange transparency to its airy top-end, this conservatively rated sixty-watter is pure high end. It's also thoroughly modern, sporting full-automated bias-voltage-and-current control. To extract its full sonic measure speaker sensitivity is an important consideration. NG, 194

Pass Labs INT-150
$7150

www.passlabs.com

Powerful, subtle, effortless, Pass Labs' first foray into the ultra-competitive integrated amplifier market is a complete success. This control amplifier doubles its prodigious 150Wpc output into 4 ohms making it a good candidate for less-sensitive loudspeakers. Its sound is tempered with pleasing warmth—an ease and fluidity characteristic of solid-state with a strong Class A bias. NG, 184

Simaudio 600i
$8000

www.simaudio.com

Building on a long tradition of great-sounding integrated amplifiers, Simaudio has hit one out of the park with the 600i. This dual-mono, fully differential integrated delivers the sound quality of expensive separates with the convenience of a single chassis. The 600i's presentation is rock-solid in the bass, unbelievably dynamic, with a slight forwardness in the midrange that increases lifelike presence. RH, 210

Rega Osiris
$8995

www.soundorg.com

Rega's brilliant Osiris is a deceptively compact, 162Wpc beast of an integrated amplifier. Rega describes the amplifier's topology as a "minimalist high-gain power amplifier and passive preamplifier circuit." The less-is-more approach yields an integrated amp that delivers almost mind-bending levels of dynamic agility, subtlety, and clout. The Osiris is an eerily effective and three-dimensional soundstager, too. CM, 213

Plinius Hiato
$9100

www.eliteavdist.com

This 300Wpc solid-state amp is a bull—a big gun reserved for the large-caliber jobs of bringing unwieldy speakers into line. It virtually redefines low-frequency control and extension, as well as overall dynamics, in this segment. When mated to a full-range speaker it will elicit inner detail and resolution that very few integrated amps can touch. Available with an excellent full-featured phonostage. NG, 201

Vitus Audio SIA-025
$25,000

www.vitusaudio.com

Conventional wisdom states that integrated amps are hopelessly compromised at birth. Vitus Audio obviously didn't get the memo when it created the SIA-25. Built to the same Olympian standards as its preamps and amps, this 25Wpc Class A (on-the-fly switching to 100Wpc Class AB) integrated gives you the best of separates in a single chassis—liquid presence, a 3-D soundstage, and the finest gradations of micro-information and dynamic contrasts. It may not fill a cathedral (unless horns are your thing), but the SIA-25 is the pinnacle of a breed never again to be underestimated. NG, 218