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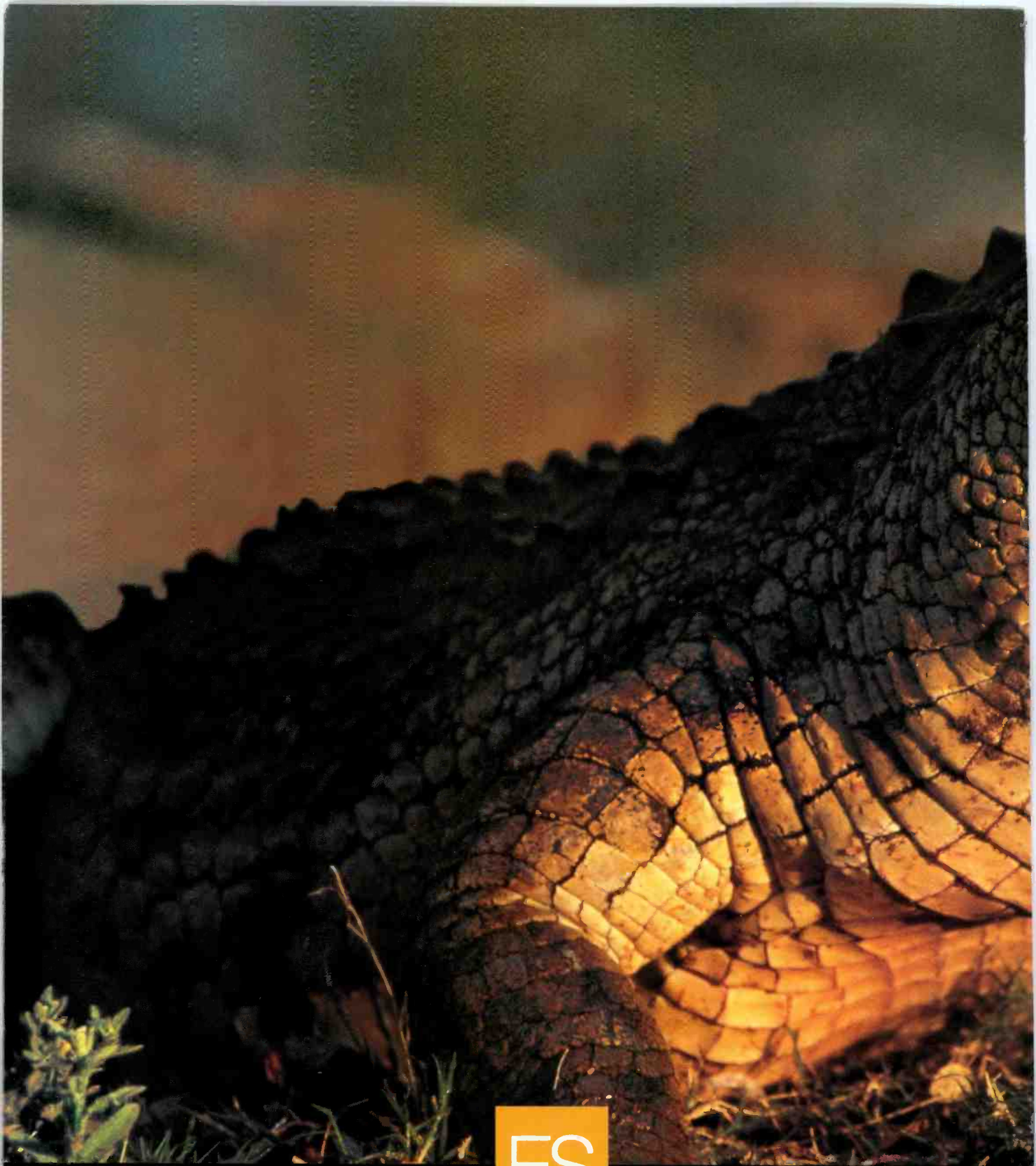
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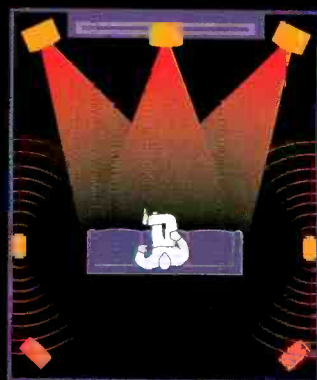
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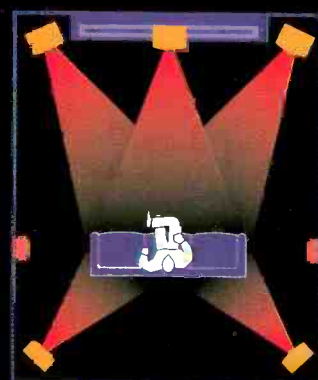
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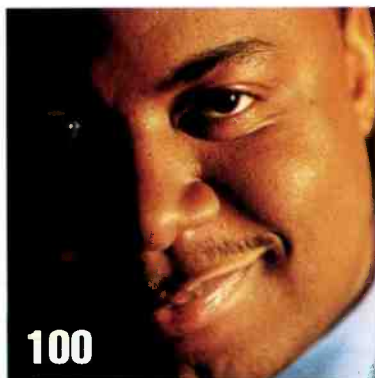
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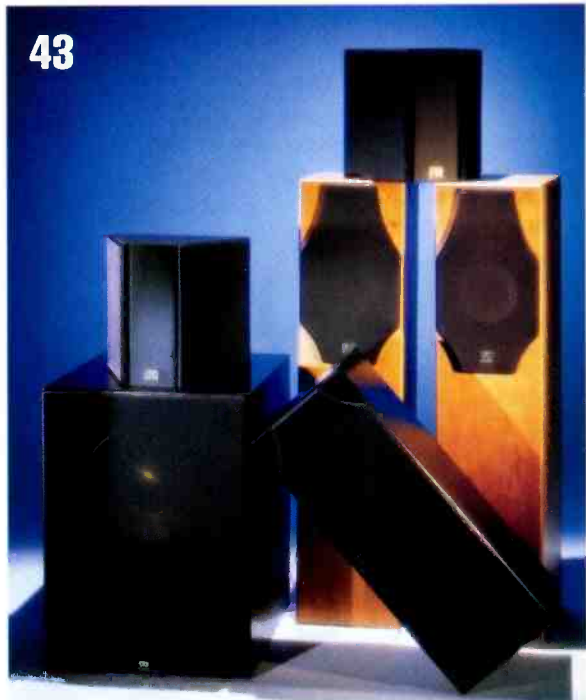
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ABOUT OUR CONTRIBUTORS

ANTHONY H. CORDESMAN has been involved in audio since the 1950s. He first worked in the industry as a salesman for audio stores in Chicago, a sound engineer for theaters and nightclubs, and a recordist for radio. He has since been employed by the U.S. government and as a university professor in a number of different fields, including operations research and systems analysis. Cordesman has been an audio reviewer for nearly 20 years, writing for *The Absolute Sound*, *Stereophile*, and, currently, *Audio*. A classical fan, Cordesman is forcibly kept in touch with contemporary popular music by two audiophile sons and a daughter.

JOE HAGEMAN comes to *Audio* from *Home Theater*, where, as Assistant Editor, he specialized in reviewing multichannel audio components and systems. A New York transplant from Southern California, Hageman always knew that his dream job was lurking in the pages of the A/V magazines that cluttered his coffee table. His sworn testimony that he will never test equipment using Jennifer Warnes CDs is considered by some to be the main reason *Audio* brought him on board.

STUART M. ROBINSON is a U.K.-based hardware reviewer and technology writer for the British home theater magazines *What*

Video & TV, *What Home Cinema*, and *Home Cinema Choice*. He has written educational literature for dealer training and for a number of European cinema chains and participated in the design, production, and evaluation of high-end home theater processors. In recent years, Robinson has been involved in the evaluation of digital transmission and distribution networks for European television broadcasters, and he sits on the Technical Advisory Committee of the Academy Advancing High Performance Audio & Video, where he is responsible for the design of the Academy Web site and for Internet consumer relations.

DARRYL WILKINSON has worked in the consumer electronics industry for more than 15 years, the majority of that time spent in sales and purchasing at one of the nation's premier independent retailers, Bjorn's Audio Video in San Antonio, Texas. In addition to spending countless hours evaluating new concepts and products, he was actively involved in regional and national introductions of technologies ranging from early audio DSP products to Dolby Digital, DVD, and SACD. With A/V retail behind him, Wilkinson now spends his time avoiding work as much as possible, writing TV commercials for a variety of clients, and pounding out the occasional hi-fi review.

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Golly Gee, We're Good

You've done it! *Audio's* November 1999 issue was terrific! I am delighted to see that almost all equipment reviews now carry measurements and that the graphs are legible. The expanded number of equipment reviews hits the nail right on the head, the "Spectrum" item on new microphone technology and Ed Foster's piece on Super Audio CD are interesting and quite educational, the DVD reviews are welcome, and Michael Riggs' "Post-Production" column is right on the mark. What's more, even Corey Greenberg's review returns to adulthood after the first few paragraphs! (Greenberg's a creative and talented guy, but golly gee, when is he gonna grow up?)

Fellows who know their stuff—like Foster, D. B. Keele, and Joseph Giovanelli—place your magazine head and shoulders above the populist and "golden ear mythology" publications. Please make sure these writers continue to have a prominent place in *Audio*.

In short, this is exactly what *Audio* should have been from the beginning. The content is far and away the best of any A/V publication I've ever read. Congratulations on a job exceedingly well done!

Prentice Geddie
Aurora, Colo.

Do You Hear What I Hear?

Angel Romero may know the physics of human hearing ("Crosstalk," October 1999), but he sure doesn't know the difference between digital and analog when it comes to the basics of audio reproduction.

Anyone who has been around high fidelity for any length of time will remember when all reproduction, tube or solid-state, was analog. We have had good, functional transistor amplifiers since the '60s, but my earliest recollection of digital recording for audio playback is from the '70s (and, boy, did everyone make a big deal about that). Yes, it's true that development was probably going on in the '60s, but recording studios were still using analog from the mastering stage to the final LP. That meant whether you used a transistor or tube amp/preamp (or any combination), you were dealing completely with analog reproduction.

In other words, transistor does not automatically correlate with digital any more

than tube correlates with analog. Anyone who pays attention to the ads in *Audio*—or any other high-end audio magazine—can find tube-based CD players. I can't imagine how the signal chain with a tube CD player can start out analog. The transistorized first-stage preamp circuit for a turntable has been around for a very long time, but it's not digital.

Romero should take time to understand what he's talking about.

Mike Richardson
Capitola, Cal.

Mirage Barrage

I totally disagree with Paul Tatar's review of the Mirage MRM-1 (November 1999). I own a pair of these speakers and find that they sound very warm. Perhaps Tatar did not follow the instructions in the owner's manual, but I did and couldn't be happier with the MRM-1s.

I was so bewildered by the review that I contacted the product manager at Audio Products International, Jason Zidle, and asked him about it. Zidle said that the room Tatar used for his auditioning was completely unsuitable and would brighten the sound of any pair of speakers. I agree. A square room with a glass cathedral ceiling really isn't very typical.

This review seems to lack a certain amount of objectivity. The next time Tatar reviews something, I hope he is less biased and pays more attention to his listening environment before offering an opinion.

Denis Doring
via e-mail

Paul Tatar gave the Mirage MRM-1 speakers the proverbial thumbs-down in the November issue. When I spoke to a Mirage rep, Jason Zidle, he said that the room used to test the speakers was described as "typical" by your Editor, Corey Greenberg. Well, how can an 11 x 11-foot room with a glass cathedral ceiling be considered typical? Is this the reviewer's normal setup, or is his whole house made up of these audio "telephone booths"?

I would imagine that my entire system would sound worthless if it were tested in Tatar's room. My current rig—a Yamaha receiver, the Mirage MRM-1s, a PSB 100c center-channel speaker, a Mirage PS-12 powered subwoofer, and Mirage MBS bipo-

lar surrounds—is in a 15 x 22-foot room. The MRM-1s sit about 8½ feet away from each other, and the couch is about 13½ feet away from the receiver and front speakers. These distances all conform to the guidelines included with the speakers.

I am extremely pleased with the performance of the MRM-1 speakers and suggest that your reviewers test products in more realistic rooms and not in the usual audio store's demonstration setups.

Dennis Pare
via e-mail

Why did Paul Tatar give the Mirage MRM-1 such a bad review? I own that particular speaker, which I set up following Mirage's instructions with MIT cables, and have had superior sound since. Shouldn't a review mention the conditions under which the product was tested? Perhaps Tatar's cables were below recommended minimums, or perhaps the MRM-1s were tested in a church!

Name withheld
via e-mail

Don't Go Changin'

I was disheartened to read your plan to reduce *Audio* to 10 issues per year. Of the "original generation" of audio publications in the United States (*Audio*, 1947; *High Fidelity*, 1951; and *Stereo Review*, 1958), only yours survives—and now truncated and less often seen. The "new generation" of audio magazines has gained prominence (unintentionally) by seducing consumers to spend unconscionable amounts of money for products of dubious merit.

Further, only *Audio* has maintained its original mandate to invite technically qualified experts to review products strictly on the basis of sound engineering (in both senses of the term) and to follow objective as well as subjective testing procedures. It is sad to see a great touchstone diminished, especially when its sensibility is needed more than ever.

I hope you will rethink this change in the interest of your readers and for the good of the audio industry.

Ron Levine
via e-mail

Foster's a Saint?

In "Audio Gets the Green Light" (September 1999) Edward J. Foster echoes what I

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CROSSTALK

have been saying for the last two years, ever since this 96-kHz/24-bit nonsense started: The noise floor of a sound system—when it's optimal—is about 25 to 40 dB. The ambient noise level in a dead-quiet country house, with no air conditioning or refrigerator running, is about 30 to 40 dB at best.

Foster should be canonized; okay, canonized is a little strong, but he should at least receive a Reality Award from the masses. If, and it's a big if, you could quiet the ambient noise down to, say, 15 dB, you'd still have a usable dynamic range of only about 100 dB, between there and the loudest sound you could tolerate. Most of what we hear in the home comprises about a 50-dB dynamic range (unless your family has children—then all bets are off).

Major thanks to Foster and those who support him at *Audio*. Much more needs to be said about the reality of audio, not people's prejudices. Of course, with the massive advertising campaign promoting 96/24 as the sonic equivalent of the Second Coming, I doubt many will listen. *Name withheld*
Hollywood, Fla.

Clearing Up Distortion on Cable

I know there are many music lovers and audiophiles who share a desire to “stop the cable insanity,” as Mark Wait described it in “Crosstalk” in the October 1999 issue. I speak to many such people daily about every aspect of their cables and their systems. That's why I'm responding to the following statement Wait made: “If you think the last 10 feet of Silver Garden Hose is going to magically restore whatever you think may have been lost through the pro cable, you're very naive.”

It is a common misconception that cables (exotic or otherwise) somehow “restore” lost information. Nothing could be further from the truth. All cables (yes, even those made by my company) harm the signal and introduce distortion into a system. Better cables do less harm to the signal and introduce less distortion, and less distortion, in turn, means better sound. It really is as simple as that! No cable, at least in the analog world, can ever improve the signal it's carrying, despite any claims a manufacturer might make.

It doesn't matter what cables or components were used in the recording or mastering of a recording—it doesn't even matter if the internal wiring in a speaker (or preamp, amp, or CD player) is the cheapest thing available; installing better cables in your system simply means less distortion and therefore better sound. You don't have to take my word for it! Any AudioQuest dealer can prove that you can get “exotic” cable performance for a “pro” cable price.

Now that you know how to get the best performance for your hard-earned dollar, you can enjoy the music!

Alasdair Patrick, Assistant Sales Director
AudioQuest
San Clemente, Cal.

Bully Pulpit for Interconnects

I'm upset that you didn't include listings for audio interconnects in your Annual Equipment Directory (October 1999). Please include them in the 2000 edition of the Directory, as interconnects are not an option on anything except a boombox.

John Humphries
Mobile, Ala.

Editor's Reply: Regrettably, we don't have unlimited space, which means choices must be made. We didn't include cables at all until a few years ago.—M.R.

Choice Words for Corey

I laughed out loud after reading Cal Jonstone's derisive comments regarding Corey Greenberg in November's “Crosstalk.” Well, I'd like to add a few choice words myself: He's interesting, refreshing, provocative, knowledgeable, informative, entertaining, quick-witted, colorful (to say the least), and sometimes unpredictable. He's even downright hysterical at times. Greenberg's obviously not afraid to take risks, which is why I look forward to his reviews.

Greenberg's also very persuasive and convincing; I never thought I'd see the day when I would run, not walk, to the nearest audio retailer to buy a pair of speakers based solely on his review. Now I just grin and thank him every time I fire up my beautiful JBL HLS 610s—they're great speakers at a great price!

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- Cary Greenberg, Audio, on the Paradigm Mini Monitor

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CROSSTALK

Tell you what: If you keep Greenberg, I won't complain about the two fewer issues per year. Just kidding.

Barry Buster
Panama, Nebr.

Irritated Beyond Words

I read with delight the letter "Everybody Loves Corey" in the November 1999 issue's "Crosstalk." I applaud Cal Jonstone's observations and *Audio* for publishing them. Greenberg has irritated me, more than I can relate in a simple letter, for several years as he's drifted from one publication to the next.

Rolf Hawkins
via e-mail

Newness Doesn't Require Lewdness

I am quite pleased with the changes made to *Audio*. After reading the description of the changes in Michael Riggs' "Post-Production" (September 1999), I pumped my fist like Tiger Woods after hitting a critical putt and said, "YESSS!!!!!!" I think you have done exactly the right thing.

However, I do have one small complaint. You do not need to use words like "dick-head" (as in the November review of Denon's AVR-3300 A/V receiver) to make things fun to read. Don't get me wrong; I like the new personal style. Just don't get too carried away.

Greg Dawson
via e-mail

Watershed Moment

The music industry may ultimately have to decide which is more important: thwarting unauthorized MP3 Web sites (and unauthorized downloading) or keeping the music industry's existing customers (owners of the world's 600 million CD players).

The "threat" to the music industry posed by MP3 is highly exaggerated. There is no indication that the majority of computer owners will want to go through the tedious process of downloading MP3 files, only to obtain thin, data-compressed music with sound quality akin to that of MiniDisc. And despite the computer industry's attempts to brainwash the public, penetration of com-

puters into American homes may never get much beyond the 40% to 45% level that it's now reached. Many of us will never warm to, understand, or want a computer. It's a question of temperament. Some folks do not have the methodical, patient nature required of a computer enthusiast.

Half the public shows no interest in computers; half the public, therefore, will not be potential MP3 pirates. So the music industry's intent to taint the sound quality of CDs by digital watermarking hurts far too many people just for the sake of stopping the unauthorized MP3 copying of a comparative few. I don't know if watermarking will manifest itself as background hiss, as white noise, as a high-pitched background whine, or as an occasional cluster of crackles or dropouts—and I don't want to know. It would have been better to outlaw MP3 altogether rather than diminish the quality of music heard on today's CD players.

The music industry's latest greedy anti-copying scam will backfire. I can foresee a day when pre-SDMI CDs and CD-R ma-

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The Mercury Series provides rich, powerful bass, dynamic, clear and accurate sound quality, ensuring Mercury provides not merely hype, but good, old-fashioned value. Mercury is at home in any application, providing the dynamic delivery of home theater presentations as well as punchy and accurate stereo playback. It's a demanding world out there, so choose the line of loudspeakers that are as versatile as your requirements are demanding.



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chines will change hands at a premium price. I've been collecting recorded music for 36 years (and CDs for 15 years). Now, at 43, I'm mainly collecting vintage "classic rock" outtakes on domestic and imported CDs; I now have acquired thousands of untainted pre-SDMI CDs. But when the record companies start compromising the sound quality of CDs, I'll say good-bye to CD collecting and enjoy what I've already got.

If enough people refuse to buy watermarked CDs, the music moguls may have to back down. Digital watermarking is an odious throwback to the ill-conceived CBS Copy-Code system.

*Phil Cohen
Bay Harbor, Fla.*

Wiring Worries

In his September 1999 review of the Meridian M33 speakers, Corey Greenberg repeats a mistake that has often—by necessity—been made by professionals and amateurs alike: using gray "cheater plugs" to eliminate ground hum. (I call these devices "defibrillators.")

This is an unsafe practice, one that potentially creates shock and fire hazard. It defeats a product's UL listing, which requires that it be grounded by a wire equal in gauge to the power cord wiring. Any qualified electrical engineer experienced in having power supplies UL-rated would attest to this. Cheater plugs should be used only when the green tab or wire is connected to an alternative ground, usually the screw in the center of a wall plate.

Unfortunately, this solution may be the best one available for most people. There are alternatives, such as using isolation transformers for the signal wires; Radio Shack sells them as ground-loop eliminators for cars, and Jensen Transformers (www.jensentransformers.com) makes an excellent line of isolation products. These are more expensive, however, and the perception is that even the best transformers will somehow ruin sound quality.

Audio should ask manufacturers to take steps to eliminate this problem in their own equipment by keeping the signal grounds

isolated from the chassis ground or through some other means. I further encourage *Audio* to publish articles on troubleshooting and eliminating ground loops in the safest manner. At \$3,000 a pair for the M33s, Meridian can afford to find a better method to resolve ground loops.

*Erik Squires
via e-mail*

Trash Talk

Doug Newcomb's predilection for "women with big eyes and big..." is totally out of place in *Audio* (Vandersteen 2Ce Signature speaker review, September 1999). Nor do I appreciate Corey Greenberg's "stable of fine, foxy Fenders that give it to me night after night no matter how hard I beat them" (Meridian M33 speakers and M1500 subwoofer review, September). Responsible journalists have long since given up this male chauvinist trash. Apparently, you've just discovered it. It's time to grow up and hire reviewers whose brains and ears don't hang between their legs.

*Iona Stille
Westport, Conn.*

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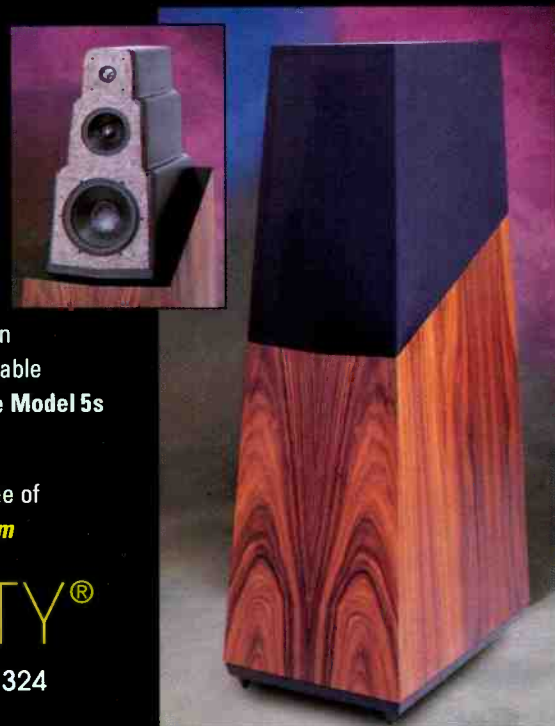
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Cambridge SoundWorks Powered Speaker System

The FPS2000 uses a four-channel digital input and a proprietary DIN connector to accept the S/P DIF output from a SoundBlaster Live! sound card. This is said to yield "three-dimensional" four-channel digital audio for PC game buffs. Separate front- and rear-channel analog inputs let you connect the speakers to other four-channel sound cards. The four tiny, magnetically shielded satellite speakers are driven by 7 watts per channel; the woofer has a 5½-inch driver fed by a 25-watt amp. The speakers' small size and rear tripod stands ease placement in cramped locations. Price: \$199.99.

(Cambridge SoundWorks, c/o Creative Labs, 800/998-5227)



Sennheiser Wireless Headphones

The RS60's radio-frequency technology lets it transmit through walls and ceilings, affording listening unencumbered by wires or the line-of-sight restrictions of infrared cordless headphones. Moreover, its internal SRS Labs processor is said to banish the between-the-ears effect of conventional headphone listening, replacing it with a realistic and spacious "three-dimensional" soundstage. The RS60's battery automatically recharges when the headset

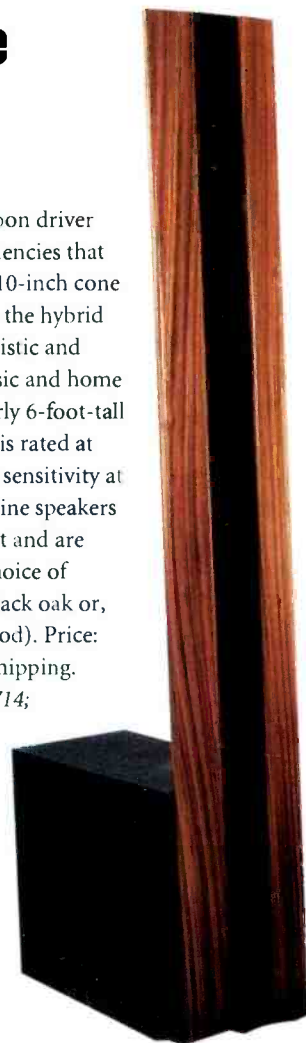
is on its transmitter base. Rated frequency range is 20 Hz to 20 kHz, with a maximum output of 100 dB SPL. Price: \$249. (Sennheiser, 847/998-0600)



Soundline Audio Speaker

Using a 52-inch dipole ribbon driver for midrange and treble frequencies that crosses over (at 250 Hz) to a 10-inch cone woofer in a ported enclosure, the hybrid SL2 is said to yield highly realistic and accurate reproduction of music and home theater soundtracks. The nearly 6-foot-tall speaker's frequency response is rated at 38 Hz to 20 kHz, ±3 dB, with sensitivity at 88 dB/1 watt/1 meter. Soundline speakers are sold only over the Internet and are custom-manufactured in a choice of hardwoods (maple, oak, or black oak or, for a 10% premium, zebrawood). Price: \$2,595 per pair plus \$89 for shipping.

(Soundline Audio, 909/789-5714; www.soundlineaudio.com)





JBL Digital EQ

THX Ultra certified, the Synthesis SDEC2500 uses 83-band parametric digital equalization and DSP technologies to compensate for room resonances and to correct audible room-induced response irregularities of JBL

Synthesis Two and Synthesis Three multichannel audio systems. Because filter frequencies can be adjusted with 1-Hz resolution and bandwidth is variable from 0.1 to 1 octave, corrections can be very precise. The processing algorithm has the intelligence to focus on room problems that are fixable and ignore those that cannot be corrected. Price: \$9,000. (JBL, 516/496-3400)

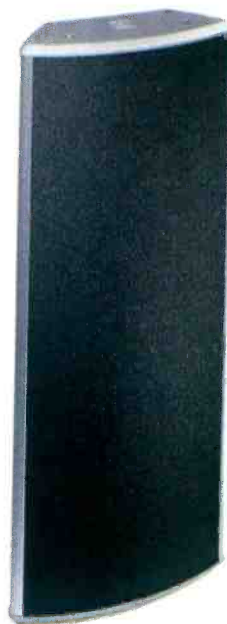
Sony Earphones

Because it has tiny 9-millimeter drivers and soft silicone earpieces intended to be inserted into the ear canal, the MDR-EX70LP is said to be capable of rich, extended bass response. This closed-type 'phone, which forms a seal in the ear canal to suppress ambient noise, has a specified frequency range of 6 Hz to 23 kHz and sensitivity of 100 dB SPL (measured at 1 milliwatt). Supplied with two sizes of earbuds, the EX70LP weighs 0.1 ounce without its cord. The supplied case can help eliminate cord tangles. Price: \$49.95. (Sony, 800/222-7669)

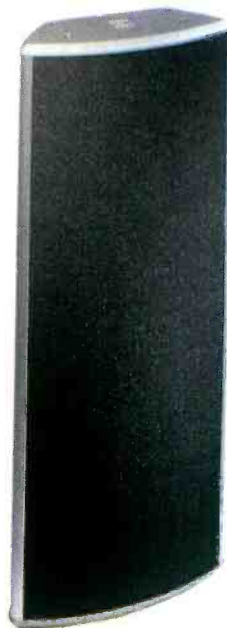


AR On-Wall Speaker

Using an ultra-shallow woofer with a neodymium magnet mounted inside its 8-inch carbon-fiber cone, the Phantom 8.3, at 3 inches deep, is said to be half the depth of traditional on-wall speakers yet still



capable of yielding audiophile sound quality. The three-way speaker's extruded-aluminum enclosure also houses a 2-inch, anodized aluminum/magnesium-alloy dome midrange and a 1-inch plasma-hardened titanium-dome tweeter. The 8.3's rated frequency range is 45 Hz to 20 kHz. Besides wall-mounting, matching optional MS1 extruded-aluminum stands with die-cast bases are available. Price: \$1,250 per pair; stands, \$300 per pair. (Acoustic Research, c/o Recoton Home Audio, 800/732-6866)



Arcam Integrated Amp

Thanks to its heavy-gauge aluminum cover and machined-aluminum extrusions, the FMJ A22 is said to resist the influence of feedback and magnetic fields. Output power is rated at 100 watts per

channel into 8 ohms, and the amp is said to be capable of delivering 20-ampere peak current if required. For future upgrading to home theater, an optional home cinema module can be installed, or a \$999 Multi Area Remote Control multiroom module, which converts the A22 into the control center for a five-zone system, can be added. Price: \$1,995. (Arcam, c/o Audiophile Systems, 888/272-2658)

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Aiwa Noise-Cancelling Headphones

By generating sound waves that are the inverse of the signals in most background sounds, the HP-CN5 open-air headphones are said to electronically cancel up to 70% of ambient noise. The noise-cancellation circuit is switchable and powered by a single AA battery that should last about 60 hours, according to the company. Each earpiece houses a 38-millimeter driver. The lightweight headphones, which fold up for easy storage, have a gold-plated stereo mini-jack and a plug compatible with the connectors used in most commercial aircraft. Price: \$60. (Aiwa, 800/289-2492)



Proceed DVD Player

A high-end design, the PMDT is said to push the limits of the DVD format. When you engage its Electronically Saved Preferences mode, the player automatically recalls the settings you used for a particular DVD when you last played it. You can program the PMDT to permanently record settings for individual

DVDs; additionally, it will, on command, navigate a DVD and choose your usual audio/video preferences—for example, widescreen, Dolby Digital, English soundtrack, and the like. The Proceed PMDT is compatible with Dolby Digital, DTS, PCM, and 24-bit/96-kHz digital audio formats. It has composite RCA and BNC, S-, and component-video outputs. Price: \$5,995. (Proceed, c/o Madrigal Audio Laboratories, 860/346-0896)

Onkyo DVD/CD Changer

Along with the ability to change and play back a mix of up to six DVDs and CDs, the carousel-style DV-C600 has



selectable black-level modes (standard and enhanced). Onkyo says a 10-bit video DAC,

combined with 27-MHz resampling, quadruples the accuracy of digital video

decoding, yielding images free of artifacts in all playback modes. The DV-C600 has 96-kHz/24-bit audio DACs and a seven-speed video search mode. In addition to optical digital and coaxial digital outputs, it has S-, composite-, and component-video outputs. Price: \$579.95. (Onkyo, 201/825-7950)



NHT Home Theater System

The VT-3 Home Theater Reference System comprises a pair of VT-3 tower speakers, each with front- and rear-firing tweeters and 5½-inch midranges, two 6½-inch woofers, and two side-firing 10-inch subs powered by a Sunfire amp. The rear-firing ambient drivers, normally active for home theater, can be turned off. The VC-3 center channel and VR-3 surround speakers each have four drivers identical to the VT-3's front-firing quartet. A component-sized controller, commanded by an infrared remote, communicates with the VT-3 towers. System price: \$9,000. (NHT, c/o Recoton, 800/732-6866)

sum·mit (sum´it) *n.* [*< L. summus, highest*]

1. the highest point; top
2. the highest degree or state

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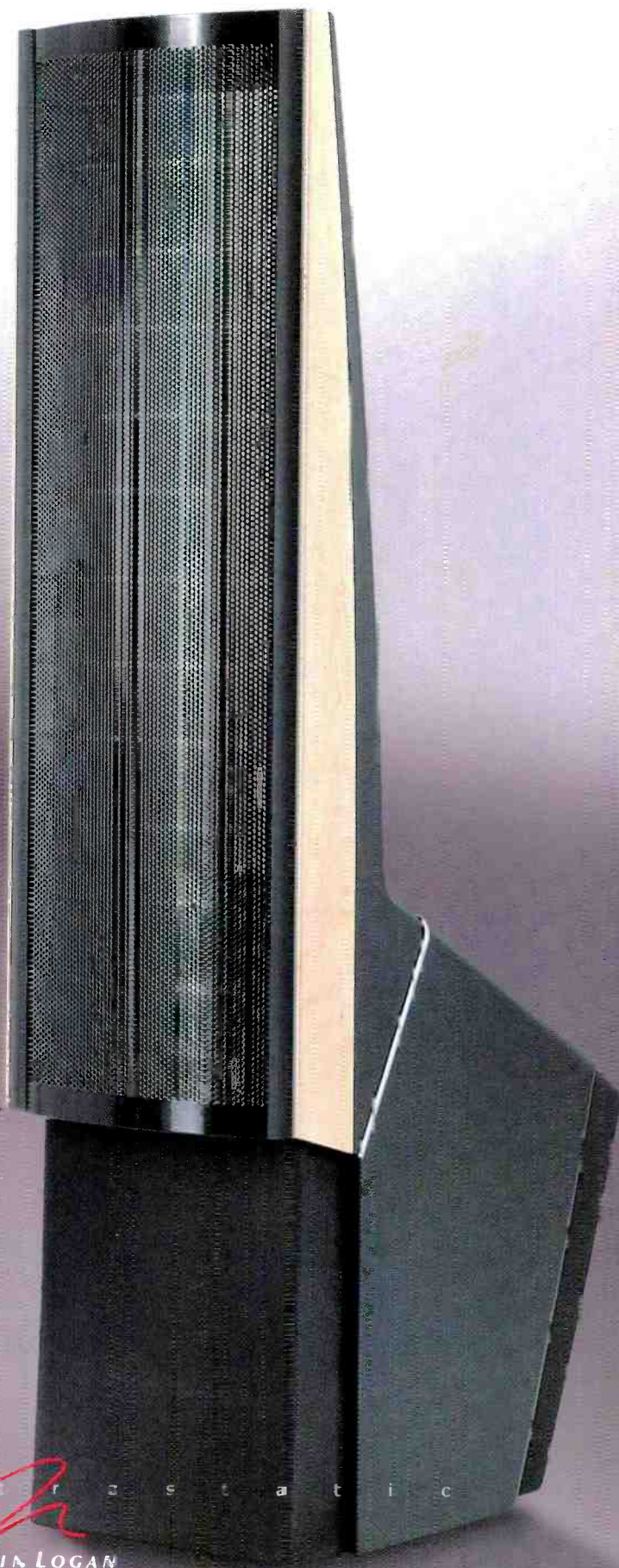
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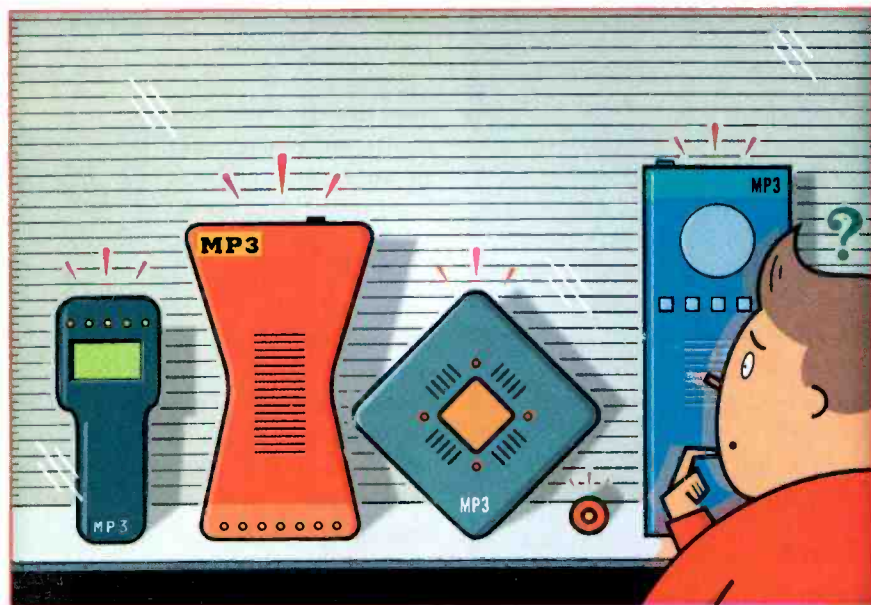
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PORTABLE PLURALISM

Sometimes a new product type emerges so fully developed that it becomes a paradigm for all similar products that follow. Sony's Walkman is a good example; today's kazillion personal cassette portables all follow its functional outline pretty faithfully. The variations lie only in the details: built-in tuners, digital meters, noise reduction, auto reverse, power-supply inputs. Big deal. But then, the Walkman called for no new technology, just the omission of a portable recorder's speaker and recording circuits. The thinking was novel, but the hardware was not.

Portable MP3 players, all pocket-sized devices with only headphone output, are obviously Walkman descendants. (One of the new players, I hear, shows its heritage by including a cassette transport.) Beyond that you'll find little uniformity among them, because they're based on newer, less mature, technology. There's more variation among the 30 or more MP3 players announced so far than among the hundreds of Walkman descendants. Just don't expect that wild variety to last.

Take storage, for example. The amount of memory built in varies a bit—a minor factor, since you can supplement virtually every MP3 player's memory with plug-in cards. What cards? So far, you have your choice of SmartMedia, MultiMedia, CompactFlash, and Sony's Memory Stick as well as Iomega's 40-megabyte Clik subminiature disk drive in the Varo Vision VaroMan Plus. Having so many options lessens the odds of quickly finding the memory card that fits your player when you need it. With technology this new, it will take player makers a

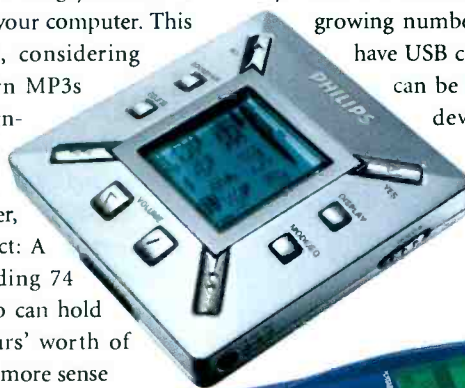


while to converge on a single standard. A few players use yet another form of storage, CD-ROM drives, presuming you'll burn MP3 files onto disk in your computer. This may seem a bit odd, considering there's software to turn MP3s into PCM audio for burning CD-Rs for use on regular CD players. Raw MP3 files, however, are a lot more compact: A CD-R capable of holding 74 minutes of PCM audio can hold far more than 10 hours' worth of MP3. (To me, it makes more sense to add this capability to ordinary portable CD players, as Casio has just done, and maybe add a memory-card slot.)

Interfaces also vary. MP3 players that can connect directly

to the Internet are coming, but all the portables I know of download their music from home computers. Virtually all PCs and some Macs have parallel ports, so most players use parallel connections for this. That appears smart, on the face of it, but it's dumb in practice, unless the player incorporates a pass-through port so you can use your player *and* your printer without con-

stantly having to switch plugs. (And you're supposed to shut the computer off when you switch, then reboot. Yippee.) A growing number of MP3 players have USB connections, which can be shared with other devices and can be "hot-plugged" without turning



Philips Rush and Sony Memory Stick Walkman

Illustration: Jack Gallagher

NEWS+ NOTES

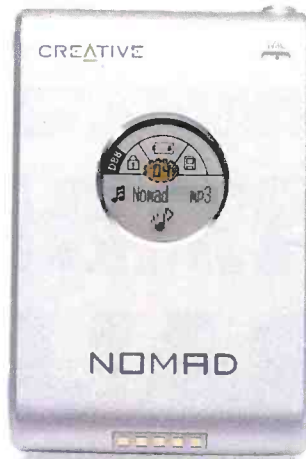
• Composer Alexander Scriabin (1872-1915) was given to spectacular dreams. One of them was partially fulfilled last year, when a team of mountain climbers played recordings of his music atop a 20,500-foot Himalayan peak. Scriabin's real hope had been for a performance of his *Mysterium* in the Himalayas, with a 1,000-member chorus and orchestra and bells suspended from the clouds. He even bought some land there to stage it on. Though Scriabin's plan would still be impractical, even if he had finished *Mysterium*, alpinist Carlos P. Buhler did the next best thing by playing parts of it from a cassette. The selections were John Bell Young's recording of Scriabin's Seventh Sonata, originally conceived as part of the larger work (*Prisms*, Americus Records) and a recording of *Universe*, Alexander Nemtin's "completion" of *Mysterium* (on the Russian Disc label).



Celebrating Scriabin atop Mt. Meleriba (altitude 20,500 feet).

your computer off. If your computer (Mac or PC) supports USB, I'd recommend you pick a player that does. (If your player lacks USB, you can get USB-interface readers for SmartMedia and CompactFlash cards.)

I'm curious to see what extra functions will be built into forthcoming players. Various current models include voice recorders, FM tuners, and phone-number directories—all easy to implement in gadgets that have displays and memory. Add an MP3 codec, and you could record songs off the air; add a delay line, too, and you'd be able to record a whole song even if you were a few seconds late punching the record button. (I came up with that one, but I'd be astounded if I were the first.) With so many product development teams looking at this hot new market, brighter ideas are probably in the pipeline.



Creative Labs Nomad



Sensory Science RaveMP

Samsung, for one, has announced that future versions of its Yepp player will display lyrics, still photos, and brief video clips.

What will happen to this creative variety once manufacturers standardize MP3 players' storage cards and most of the reasonable add-on features are in place? It will survive—in styling. Without the constraints imposed by CD or cassette transports, designers can make MP3 players any damn shape they please. Note the wasp waist of the Sensory Science RaveMP, the sleek simplicity of the Creative Labs Nomad, the long and slender look of Sony's Memory Stick Walkman, and the square-pancake appearance of the Philips Rush. And if you want an MP3 player you'll never look at when you're using it, Texas Instruments has obtained a patent for a player that fits into one earpiece of a headphone. *Ivan Berger*

Submicro CDs and the Nanophonograph

Shorten the wavelength of the lasers that write and read CDs, and you can shrink the discs' data-coding bits, pack them tighter, and cram more of them onto a disc. Hence the worldwide effort to replace today's red and infrared lasers with blue, short-wavelength, lasers. But maybe, says an electrical engineer at Princeton University, the way to really cram more data in is to avoid using lasers at all—and replace them, in part, with technology inspired by the phonograph. Professor Stephen Chou claims his techniques, which he developed with Peter R. Krauss when both were working at the

University of Minnesota, could produce a penny-sized CD that would hold five hours' worth of movies.

Wavelength limits the data-pit size of CDs and DVDs because a beam can't etch or read patterns smaller than its wavelength. To create much smaller bits, Chou carves his molds with an electron beam, then pushes the molds into a polymer blank that's melted only enough to soften it, not liquefy it.

The resulting pits are too small to be read by lasers, so Chou plays them with a vibrating stylus. That may remind you of a phonograph, but the similarity ends there. Chou's stylus is actually the tip of an atomic-force microscope, a research tool used for such tasks as moving individual atoms. The tip hovers a microscopic distance above the disc, with no need to touch it.

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PRODUCTS SHOWN APPROXIMATELY 1/2 SIZE

NEWS+ NOTES

•Peter Newman, inventor of the SafeDisc system for protecting CD-ROMs against copying, is now working on a similar system, AudioLok, to prevent audio CDs from being "ripped" into computer files and sent around the Internet. Ironically, this comes at a time when the record industry has given up that fight (its Secure Digital Music Initiative, SDMI, is an acknowledgment that it's better to limit the spread of music via the Web than go crazy trying to stop it altogether). But the technology is still interesting. AudioLok's codes will render a disc unplayable on the CD-ROM drives used in computers. (Audio CD players, which have less stringent error correction, just ignore these codes.) And if your computer can't read the disc, you can't send its contents over the Web or burn them onto CD-R. AudioLok will also prevent dual-transport home audio CD recorders from copying the discs it protects, because its codes will trigger the safeguards that keep the recorders from copying CD-ROMs.

•Orchestral scores are hardly more static than the music they hold. Conductors rearrange or delete sections and reassign parts to different instruments, musicians scribble notes on how to play certain passages, and someone at each orchestra must ensure that the right parts reach the right musicians at the right time. Recognizing this, Paolo Nesi and coworkers at the University of Florence have developed a computer-based system to handle these tasks. Called the Music Object-Oriented Distributed System (MOODS), it replaces traditional music stands and scores with video-screen lecterns and includes software for distributing the music and tracking changes. (Further information is available at <http://aguirre.dsi.unifi.it/~moods/wwwpag.html>.)

And the player, not the disc, sets the stylus in motion. What the disc does do is change the speed of the vibration. The speed is controlled by atomic forces between the disc and stylus tip; when a data pit passes under the stylus, the space between the recorded surface and the tip increases, lowering the vibration frequency. The player then translates these frequency changes into data bits.

At \$35,000 and up, atomic-force microscopes aren't likely to show up in even the

most high-end home audio systems. But IBM and other research-oriented companies are working on single-chip versions that should cost a *lot* less, Chou says. He predicts wristwatch-sized players for his penny-sized discs. I don't; discs that small would be too hard to label and too easy to lose. I'd vote for slightly larger discs, even if they weren't really full. Not that there's anything to worry about: No matter how much data a medium can hold, someone will find a way to fill it. *I.B.*

Sounds from the Field Museum's Vaults

Displays of musical instruments are usually static and often frustrating. Sure, the instruments look interesting, but how do they sound? Until March 5th, visitors to Chicago's Field Museum will be able to see

and hear 50 of the 6,000 musical instruments in its anthropology collection. The instruments will remain safely in glass display cases, but computer workstations will enable visitors to "play" the instruments, explore their history, and see and hear Chicago musicians demonstrating them. If you can't get to the Field Museum before the exhibit's closing date, log onto www.fnmh.org/sounds, where some of this material will be online. *I.B.*



Visitors to Chicago's Field Museum can "play" strange instruments without touching them.

Minimalism and Miking

In rock, speakers and overdriven amps are as mandatory as violins at the Philharmonic. In folk, the music is primarily acoustic, and amps should be used gingerly, almost guiltily, as a last resort to get sound to the back of the room. (Many coffeehouses, church basements, and other folk venues have awful acoustics.) Folk song societies,

whose sound systems must usually be set up anew for each performance, find it hard to get good sound—harder still if the audio crew is a changing group of volunteers. Yet some folk song societies, such as the Folk Project (www.folkproject.org), which stages its performances in Mendham, N.J., manage to get pretty good sound. So when the Project held an audio training session, I went along to see what I could learn.

Folksinger Mike Agranoff started us out on mike placement. The first steps were to determine what instruments the band was

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NEWS+ NOTES

• In some rooms, it's inconvenient to put speakers at ear level, where they're supposed to be. In cars, it's often impossible. But a circuit intended to solve the problem in cars is now showing up in home equipment. SRS Labs' Focus, originally designed to make floor-mounted car stereo speakers generate ear-level images, is now being used in some Hitachi TVs to raise the image from speakers mounted below the screen. Focus is also available in a packaged home stereo system from Authentic. (I would not, however, expect it in the higher-priced spreads. Anyone likely to shell out for a pair of small NHT or Sonus Faber speakers is likely to buy stands for them rather than leave them on the floor.)

• The prospects for the IEEE-1394 wide-band connection bus, a.k.a. FireWire and i.LINK, got a boost last fall, when Cirrus Logic announced plans to produce low-cost chips for use with it, under its Crystal brand. However, progress is still slowed by worries that 1394 connections could enable us to make unauthorized copies of digital TV and DVD content. To protect digital content, a Digital Transmission Content Protection (DTCP) system has been developed by the "5C" consortium (Hitachi, Intel, Matsushita, Sony, and Toshiba). But although it's been adopted by companies outside the group, such as Philips, and by the Motion Picture Association of America (MPAA), some studios are holding out for further limitations, such as reduced image resolution.

using and to get everyone on stage. "Then put the mike stands in place, but not the mikes, so you can put the cables where they belong," Agranoff commanded. The cables and mixer knobs were color-coded so we could tell what each knob controlled. Next, we had to determine which instruments to mike and which had pickups that fed the sound board via "direct boxes." ("Before

you plug anything in, turn down the slider and the monitor," said Agranoff.) After that, it was time to position the mikes.

For vocals, Agranoff advocated aiming the mike between the singer's mouth and nose while making sure it didn't obscure the singer's face. "A lot of singers eat the mike," he commented. "They get into that habit with big systems that use very low gain on the mike to avoid feedback, which forces them to sing right into the mike to get enough volume." At the Folk Project, this is neither needed nor desirable; system levels are kept as low as possible, to reinforce the natural sounds of the music rather than replace them.

For guitar, we were told that the mike should be about 3 or 4 inches away: "Not by the hole—that's boomy—but above or below the fingerboard." For mandolin, on the other hand, we learned that the mike should be placed by the f-holes. For string bass, Agranoff said to use the same mike placement, with the option of using the instrument's pickup via a direct box in addition to the mike (or instead of it).

Not all of this was cut-and-dried. When Agranoff suggested miking a whistle at its fipple (the square hole below the mouth-piece), Lisa DiSavino, who was playing it, contradicted him: "The sound comes lower down, by the highest open hole." A test confirmed this, and then someone added, "That's true of clarinets, too. The sound can come from the bell or the holes, depending on the note."

Setting levels started with a sound check, to hear if everything was working. "You need *quiet* for a sound check," said Agranoff. "You have to enforce that. Be a hard-ass. But don't worry if the sound seems a bit echoey, because it will sound better when the audience comes in. Put everything up around the zero mark, then get someone to check the microphones, one at a time. Speak into them or scratch them—don't blow into them."

Checking out the house speakers came next. ("Listen to what's in the air. Don't use headphones unless you're going to give them to everyone in the audience.") Then it was time to turn the house speakers off, switch to the on-stage monitors, and ask the musicians if they were hearing what



Photo: Marjorie Wormiser

Mike Agranoff explains the Folk Project's sound board.

they needed. The monitor speakers were fed a different mix from that going to the house speakers, as conditions are different on the stage. The Folk Project runs lower monitor levels than some musicians are used to, because it runs very low house levels. If the monitor speakers get too loud, the audience will hear muddy sound from the backs of the enclosures.

Setting mike levels requires some sensitivity to the music. "When you mix instruments with voice, it gets sticky. Ask yourself, 'Can I hear every word the singer is singing?' If you can't, you have to drop the instrument levels," Agranoff explained. "The crude way is to boost the singer, but it's better to turn the instruments down a lot. If the guitar is playing a simple rhythm strum as backup, you don't need to hear every string. Don't be afraid to shut someone's channel off, if it's appropriate to the mix. And if two singers are harmonizing, the melody should prevail, particularly if there's a high harmony. If a woman is singing harmony, you may have to take her channel way down.

"The most important thing to keep in mind," advised Agranoff, "is that less is more. Do as little as possible. You want the audience to hear the natural sound of the instruments." I.B.

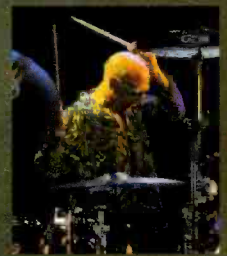
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For audiophiles, part of the excitement of last spring's *Star Wars* installment, *The Phantom Menace*, was the introduction by Dolby and Lucasfilm of a new soundtrack format. Called Surround EX, it built on the now-standard 5.1-channel digital surround format by incorporating a third surround channel, to be reproduced from speakers on the back wall of the movie theater. The immediate question, of course, was when it would be available for home theater.

The answer turns out to be about now. A number of processors have come to market that incorporate the new technology, licensed from Lucasfilm under its THX Ultra program, and films with Surround EX soundtracks are starting to make their way to DVD. With those pieces in hand, plus at least one more speaker, you're ready to enjoy the latest in Hollywood surround sound. Before you take the leap, however, you might want to know what you

stand to gain from the effort, theoretically and practically.

Dolby and Lucasfilm developed Surround EX in response to demand from the people responsible for creating movie soundtracks, who wanted more control of the surround field than the existing digital surround formats (Dolby Digital, DTS, or SDDS) would allow. Strictly speaking, it is not a new format but an enhancement to the standard 5.1-channel scheme. And like the original Dolby Surround, it's both remarkably simple and fully backward-compatible with existing media and reproduction systems.

THE ASTRONAUT'S WIFE



by Stuart M. Robinson

INSIDE Surround EX

DOLBY AND THX TEAM UP TO GIVE
US A THIRD SURROUND CHANNEL

The reason these benefits accrue is that Surround EX employs the techniques of the original Dolby Surround system to matrix-encode the third surround channel, surround back (henceforth SB), into the discrete surround left and surround right (SL and SR) channels, in the same way a center channel is encoded in the two lateral channels of a Dolby Surround mix. And the extraction procedure for the surround back channel is the same as that used in Dolby Pro Logic to extract the center channel: $SL + SR = SB$. Steering logic in the decoder enables adjacent-channel separation of approximately 30 dB. In movie theaters, this process is currently handled by an add-on adaptor that is connected to the surround outputs of the existing 5.1-channel decoder. (This adaptor, called the SA-10, has become the fastest-selling product in cinema history.) The theatrical surround loudspeaker array is rewired so that the speakers on the back wall reproduce SB rather than being split equally between SL and SR, which are now reproduced solely by the speakers on the side walls.

Photo: P. Mountani/©1999, New Line Cinema (Courtesy Kobal)

Although Surround EX is a Dolby/THX technology, it can be delivered by DTS and SDDS; EX information is buried in the master prior to any proprietary encoding and is therefore automatically carried forward. DTS calls its version DTS ES, but the principle is the same and a royalty must be paid to Dolby and Lucasfilm. (Licensing is handled by Dolby on the pro side and by Lucasfilm THX on the home side.) Sound designers are embracing EX in ever-increasing numbers. All forthcoming New Line titles will be Surround EX-encoded, for example, and prominent sound designers such as Gary Rydstrom and Gary Rizzo have thrown their support behind it.

Bringing It All Back Home

The good news for home theater enthusiasts is that Surround EX will carry over into Dolby Digital 5.1 (or DTS) soundtracks on DVD and laserdisc. These soundtracks will play back normally on non-EX systems. But on a system with an EX-enabled decoder and rear speakers, the third surround channel will be detected and automatically reproduced separately from the

SEVEN



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THE HAUNTING

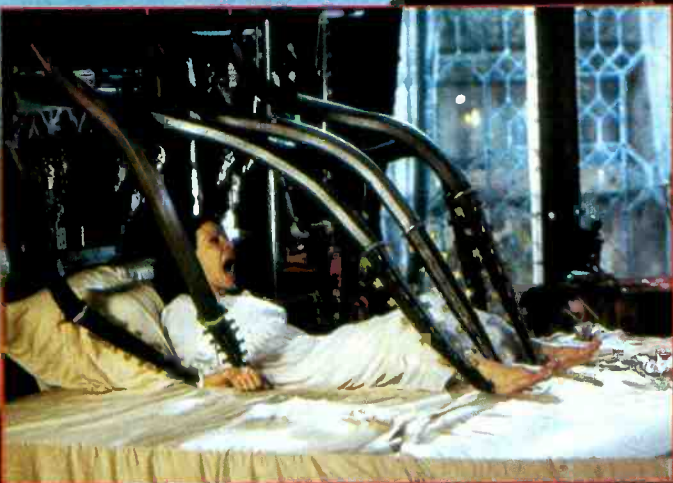


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speakers at the back of the room. (Remember that the left and right surround speakers in a 5.1-channel system are properly situated more to the sides of the listening area than to the rear.) The first Surround EX-encoded DVD titles, *Austin Powers: The Spy Who Shagged Me* and *The Haunting*, were released in November.

So what about the equipment to play these Surround EX soundtracks in their full glory? Not surprisingly, given the system's genesis, the only companies that will be able to market Surround EX decoders will be THX licensees. Processors have already been demonstrated, announced, or introduced by JBL (updated Synthesis SDP-3), Mark Levinson (No. 40 controller), Lexicon (updated DC-1, DC-2, and MC-1), and Onkyo Integra (RDC-7), and EX receivers will follow from Marantz, Pioneer Elite, and Denon. All the aforementioned will be, or are, THX Ultra certified, with EX to be introduced into the lower-tier THX Select program sometime in the middle of this year.

INSIDE Surround EX

ic circuit to the surround outputs of the Dolby Digital decoder. The manufacturer then requires a Surround EX side letter (or equivalent agreement) from Lucasfilm. Specific details as to how the two processors are interconnected also originate exclusively from Lucasfilm.

All THX licensees, from Adcom through to XLO, can develop Surround EX products if they so wish, but that leaves those who have historically distanced themselves from Lucasfilm in favor of proprietary (or purely generic) technology scratching their heads over how to participate in the latest surround format without embracing the rest of the THX agenda. In the case of Yamaha, the most prominent example, the current answer is to release compatible products anyway and await the consequences. A press release issued in

To provide Surround EX decoding, a manufacturer first has to enter into an agreement with Dolby Laboratories. Permission is required to connect a Dolby 3 Stereo Pro Logic

Japan indicates that an updated version of the company's flagship DSP-A1 amplifier, called the DSP-A1X, will include modes such as Dolby Digital/EX and DTS Surround/ES.

Yamaha has not announced the DSP-A1X in the U.S., but it did recently introduce the RX-V1 receiver for March delivery. The RX-V1 incorporates what Yamaha calls Dolby Digital/Matrix 6.1, which the company says can be used with "the newest Dolby Surround technologies and the DTS-ES 6.1-channel surround format." But it uses a proprietary Yamaha matrix rather than Pro Logic, to extract the back surround channel and does not carry the Surround EX logo.

Hardware Requirements

Surround EX hardware is somewhat thin on the ground at the moment, but as with all things THX, there are cut-and-dried criteria to which all products must adhere, the most important and obvious being the addition of two SB outputs. While SB left and right convey the same monaural signal, they can be individually calibrated for level and delay, thus allowing better coverage of asymmetrical rooms. The outputs of two loudspeakers in relatively close proximity producing the signal are likely to suffer some degree of comb filtering, but apparently this is not something Lucasfilm has found to be important or significant. Its recommended EX loudspeaker configuration employs four dipole surrounds, two to

THE SPY WHO SHAGGED ME



the sides of the listening position and two in the rear of the room, orientated so that facing drivers are in phase. A tolerated alternative is to use monopole SB loudspeakers, provided they are approximately 150° from the front axis.

Rather than being used simply to increase ambient envelopment, Surround EX introduces, at least theoretically, a surround channel intended primarily to provide localization, and sound designers are deliberately steering surround effects into it. In theaters, the SL and SR loudspeaker arrays extend forward and aft of the listening position, so dipole surround speakers provide a reasonable approximation at home. Exceptional installations aside, however, the SB speakers are always behind the audience. This raises questions regarding the use of dipole SB speakers in a home installation, since their radiation pattern is not ideal for re-creating a discretely placed event and listeners will not typically be sitting in the nulls of those patterns (as they do for side-mounted dipole main surrounds). I will give you my impressions a bit later, but THX representatives say they arrived at the dual dipole SB recommendation empirically, finding by experimentation that this speaker configuration typically yielded the best results.

Surround EX also brings another iteration to the surround-channel decorrelation element of Home THX processing. Decorrelation was originally conceived to diminish the tendency of Dolby Pro Logic's mono surround output to "bunch up" rather than envelop. (The method Lucasfilm proposed was continuously varying phase shift between the outputs to the two surround speakers, though it has approved

RUSH HOUR

other techniques as well.) When discrete digital 5.1-channel formats arrived, with stereo surrounds, the decorrelation specs were modified to make the system dynamic, kicking in only when it determined that the signals in the left and right surround channels were essentially identical (i.e., mono). In EX, however, anything that is the same in the two main surround channels is routed to the SB outputs, so in this mode decorrelation is turned off altogether.

Straight out of the box, current EX-equipped processors default to EX on, as Lucasfilm feels this alerts consumers to the potential joys of their new toy. Although you will have to toggle EX on and off manually to accommodate the first DVD and LD EX soundtracks, the processors will be able to do this automatically for future releases, after encoder revisions are in place early this year to embed an EX flag in the Dolby Digital bit stream. Those with non-EX decoders need not worry, however, since the EX flag will be transmitted in an unused area of the Dolby Digital syntax originally reserved to convey time-code data and thus will be transparent to encoders that are not equipped to recognize it.

Shut Up and Listen

Those familiar with the Lexicon MC-1 I used for my listening, suitably upgraded with version 4.0EX firmware, will know

THE PHANTOM MENACE



Photo: Bob Marsliak/©1998, New Line Cinema (Courtesy: Kobal)

that it already has a 7.1-channel mode, Logic7, that can be used to enhance 5.1-channel recordings. But for this test I limited myself to comparing THX 5.1 EX with seven main speakers to standard THX 5.1 with just five. The most difficult part of setting up the experiment was deciding what loudspeaker configuration to use, so at first I took the easy option and plumped for a complete set of B&W SCM8 dipole surrounds. Although this speaker array yielded truly enveloping sound, it did not afford the degree of SB localization I have experienced in theaters. And because of the orientation of the rear pair of dipoles, I noticed inconsistencies when moving from one side of my listening area to the other. I think that

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dipole side surrounds in conjunction with conventional monopole rears may prove to be the configuration of choice.

It was immediately clear that the effects of EX processing on non-EX material could be undesirable, and for predictable reasons. In some standard 5.1 soundtracks (*Rush Hour*'s, for example), the musical score is mixed into the surrounds. Turning EX on for such a film collapses the wide, enveloping surround field into a claustrophobic presentation, with the monaural SB channel predominating alongside unpleasant steering artifacts. The finale of *Seven* is another telling evaluation piece, in

INSIDE Surround EX

Spy Who Shagged Me. Although the THX disc is not intended to showcase everything EX can do, there are some startling illustrations of the impact it can have, a re-mixed version of the THX *Textrailer*

being a primary example. In this elongated version of the classic, Tex the repair robot flies from SR, across to SL, and then into SB, where he saws, hammers, and hits his thumb ("ouch!") before flying back through SL and onto the screen. It is a most impressive and dynamic use of the additional surround channel, which in conjunc-

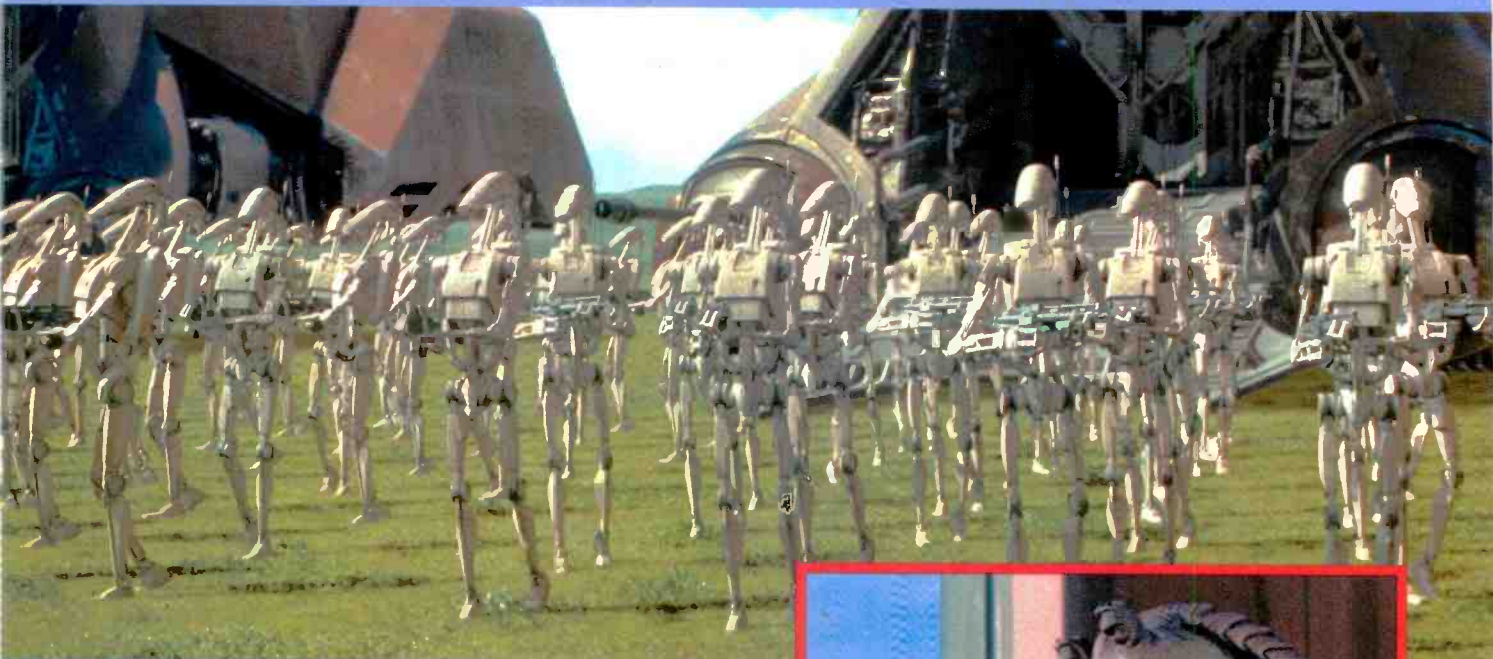
THE PHANTOM MENACE

conventional 5.1 until a deliberate SB event occurs, at which time the channel springs into life, adding that bit more to the whole experience.

So once again, home theater aficionados have an excuse to update their hardware. But for those who have grown (understandably) wary of new formats, there is the option of buying the software now while waiting on the hardware. The presence of EX encoding in a soundtrack will not diminish your enjoyment of it in ordinary 5.1 or even Pro Logic or stereo playback. How much are you giving up by not making the jump to Surround EX decoding? Having listened long and hard to EX, I believe that given EX-encoded material, the not-inconsiderable expense and inconvenience of additional amplification and loudspeakers and the change of processor are worthwhile, although not essential.

A

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which the sound of a helicopter passes from SL to SR. Its path is clear in 5.1, directly from one side of the room to the other. With EX engaged, however, the pilot makes a quick detour through SB channel, and the effect is a little disconcerting. So while there may be 5.1 soundtracks that serendipitously benefit from EX decoding, the general rule should be not to apply EX processing to non-EX encoded material!

Thankfully, THX was able to supply a demonstration DVD containing a number of EX-encoded clips, and I also had a chance to listen to a pre-release copy of *The*

tion with the others conveys a greater sense of spaciousness.

One comforting aspect of the EX-encoded material I listened to was the way in which left and right surrounds maintained a high degree of separation. Sequences from *Austin Powers: The Spy Who Shagged Me* and *The Astronaut's Wife* sound like



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abling you to maneuver it into place by lifting the front a tad and making like a wheelbarrow. Once you get it in position, it rests on three jumbo feet shod in firm but resilient pads. The wheels are a small point, to be sure, but considering the amp's weight, it's a thoughtful, typically Rotel gesture. Unique? No, not really. In fact, Rotel did the same thing a quarter century ago with the RB-5000, a 500-watt-per-channel stereo amplifier.

Rotel tends to stay with the tried and true electronically but implements its designs exceedingly well. Although I have no detailed information on the RMB-1095's circuitry, it seems clear from the test data that it employs the traditional Class-AB approach, probably with a fairly generous amount of bias to eliminate crossover distortion. Rotel simply does a better job executing traditional topologies than many others do, chooses components of superior quality, and doesn't scrimp to save a nickel. The same can be said for a handful of other companies—Bryston and Krell come immediately to mind—but their products sell for considerably more.

The Rotel RMB-1095 is bigger and heavier than many other 5 x 200-watt amps because it needs to be, not because it wants to be. Without noise-inducing switching power supplies or multirail topologies that are efficient but have questionable distortion characteristics, the RMB-1095 needs a pretty potent power source, and that's what it has. Pop the lid and you'll find its capacious chassis chock-full of components, not empty space. Two Rotel-made toroidal power transformers are stacked one atop the other in the center. Only the top one is visible; the other is hidden under the mounting platform for the upper. Heat sinks flank both sides of the chassis and sport multiple Toshiba power transistors for each channel.

The input circuit board runs across the top portion of the rear of the package. Mounted directly to it are gold-plated RCA jacks for unbalanced inputs and XLR connectors for balanced. A DB-25 socket enables single-plug hookup for all five channels to preamps and processors that support this type of connection. Using the DB-25 requires that you insert open plugs (supplied) into the RCA jacks, which en-



There are certain words and phrases that, despite common currency, I won't use, because they just don't make any sense. One example would be "very unique." If something is unique, it is singular; the only one of its kind. There can be no degrees to that, no more or less: It either is or it isn't. Another would be "faultless." Calling a product faultless implies that you are prepared to prove a complete absence of flaws—nonexistence. Can't be done. But much as I hate to use words like "faultless" to describe a hi-fi component, the Rotel RMB-1095 tempts me. It's a wonderful amp! On the test bench and in the listening room, it performed faultlessly, and in at least one respect it is unusual enough that some, less inhibited than I, might call it unique.

Photos: Michael Groet

That particular aspect isn't earthshaking. It doesn't involve circuit design or anything esoteric. In fact, the RMB-1095's circuit topology seems pretty much plain vanilla. What I'm referring to is the pair of casters that support the amplifier's rump end, en-

ROTEL

Rated Power: 200 watts per channel into 8 ohms, 20 to 20 kHz, with less than 0.03% THD.

Dimensions: 17 in. W x 9½ in. H x 15¾ in. D (44 cm x 24 cm x 39.8 cm).

Weight: 75 lbs. (34 kg).

Price: \$1,999.

Company Address: 54 Concord St., North Reading, Mass. 01864; 800/370-3741; www.rotel.com.

TEST RESULTS

I have more than a passing acquaintance with power amps. I hate to admit how long ago it was that I designed my first one or how many have passed through my lab since. Power-amp design, like most things electronic, comes down to a delicate balance of conflicting requirements. You want low distortion? No problem! In theory, feedback can make distortion as low as you want, but you've got to trade something to counter distortion that way. Feedback brings its own bag of conflicts. What will you trade? Bandwidth? Stability? Output impedance characteristics? A little from Column A and some from Column B? Or are you willing to spend extra for transistors that produce less distortion and don't need so much feedback to Band-Aid the wound? A superior power amp is one

MEASURED DATA

Output at Clipping (1% THD at 1 kHz): 8-ohm loads, 285 watts (24.5 dBW)/channel; 4-ohm loads, 500 watts (27 dBW)/channel.

Dynamic Power: 8-ohm loads, 315 watts (25 dBW)/channel; 4-ohm loads, 575 watts (27.6 dBW)/channel; 2-ohm loads, 1,060 watts (30.3 dBW)/channel.

Damping Factor re 8-Ohm Loads: 415 at 50 Hz.

Output Impedance: 20 milliohms at 1 kHz, 25 milliohms at 5 kHz, 35 milliohms at 10 kHz, and 49 milliohms at 20 kHz.

Sensitivity for 0-dBW (1-Watt) Output: Unbalanced inputs, 120 mV; balanced inputs, 230 mV.

Noise (A-Weighted): Unbalanced inputs, -95 dBW; balanced inputs, -91.5 dBW.

Input Impedance: Unbalanced, 31.9 kilohms.

Channel Separation, 100 Hz to 10 kHz: Unbalanced inputs, greater than 73.2 dB; balanced inputs, greater than 64.7 dB.

Channel Balance: ± 0.03 dB.

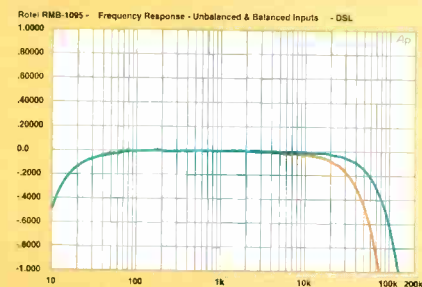


Fig. 1—Frequency response. Unbalanced input, aqua; balanced input, orange.

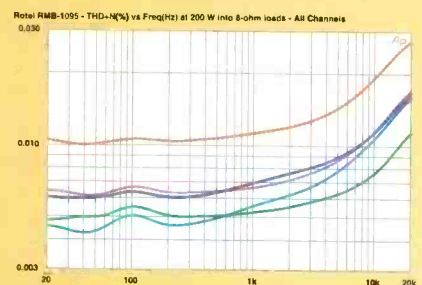


Fig. 2—THD + N vs. frequency at rated power, 8-ohm load. Left front, blue; right front, red; center, green; left surround, cyan; right surround, magenta.

in which those choices have been thoughtfully made, and in this respect, few compare to the Rotel RMB-1095. It's one mighty well designed amplifier!

Its frequency response is superb, especially in the treble—so good that Fig. 1 has an extremely sensitive vertical scale to emphasize how flat the response really is. The RMB-1095 is one of relatively few power amps whose high-frequency -3-dB point lies beyond 200 kHz—when using the unbalanced inputs, as I did for all basic tests. As usual, the bandwidth through the balanced inputs moves in a bit, but even then the -3-dB point is beyond 140 kHz, which is remarkably good. Bass response is the same using either input: down a negligible 0.13 dB at 20 Hz, with a -3-dB point below 10 Hz.

Distortion is exceedingly low. Into 8-ohm loads, Rotel rates the RMB-1095 at 200 watts per channel with less than 0.03% total harmonic distortion plus noise (THD + N) from 20 Hz to 20 kHz. In my tests, only the right front channel approached

that level of imperfection (if 0.03% distortion can be considered imperfection), while the other four proved notably better and quite similar to each other. I hasten to point out, however, that every channel betters Rotel's specification (and THX Ultra certification requirements) for distortion.

You can see the whole story in Fig. 2, which plots THD + N versus frequency for each channel at rated output into 8-ohm loads. The surround and left front channels top out at pretty much the same point at 20 kHz—approximately 0.015% distortion (half the rated amount)—while distortion in the center channel barely exceeds 0.01% at 20 kHz. On the whole, distortion is less than 0.01% at rated power over the most important frequency range, and that's great performance!

Figure 3A shows THD + N versus frequency for the left and right front channels at three power levels into 8 ohms: 10, 100,

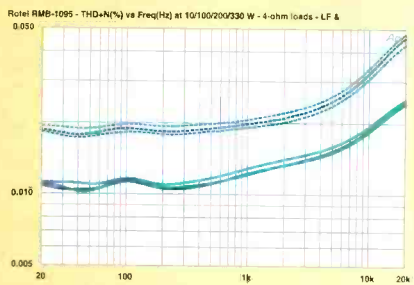
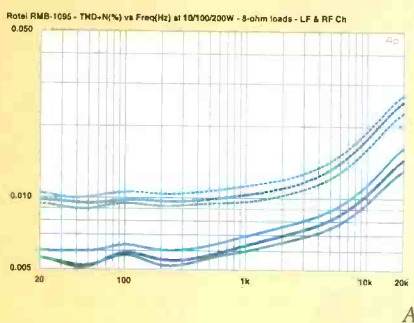
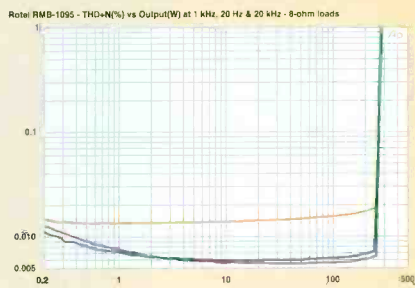
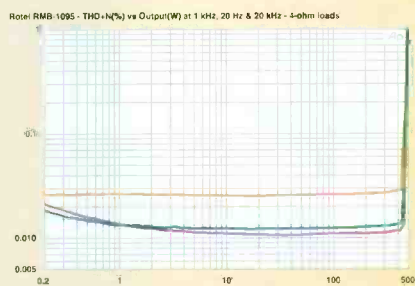


Fig. 3—THD + N vs. frequency at 10 watts (aqua), 100 watts (purple), and rated power (cyan) into 8 ohms (A) and 4 ohms (B). Rated power is taken as 200 watts into 8 ohms and 330 watts into 4 ohms. Solid curves are for left front channel, dashed for right front.

TEST RESULTS



A



B

Fig. 4—THD + N vs. output at 20 Hz (green), 1 kHz (magenta), and 20 kHz (orange) into 8-ohm loads (A) and 4-ohm loads (B).

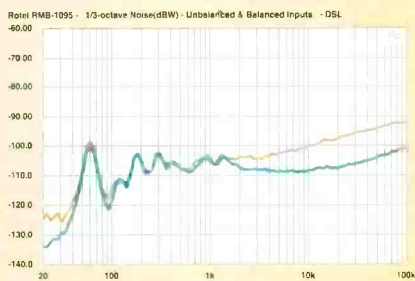


Fig. 5—Noise analysis. Unbalanced input, aqua; balanced input, orange.

and 200 watts. The left can be considered representative of the other channels, while the right is the worst case. What's impressive about these curves is how parallel they are to each other and how negligibly distortion rises from 10 watts to rated power. It's as if the RMB-1095 doesn't care how much power you ask it to deliver. It just hangs loose.

Figure 3B is similar except that the data was taken using 4-ohm loads and the "rated-power" curve was taken at 330 watts. I put in the quotes because Rotel doesn't

give an FTC power rating for 4-ohm loads, just a DIN spec of 330 watts at 1 kHz with less than 0.03% THD. I don't know why the company is so conservative; the RM-1095 certainly has no difficulty driving 4-ohm loads anywhere in the audio band and could easily claim a rating of 330 watts, 20 Hz to 20 kHz, with less than 0.05% THD (the poorest reading in the poorest channel). Perhaps the amp will not pass FTC preconditioning with 4-ohm loads, although it ran cool on my bench considering its power rating. (Since I've found that preconditioning can obscure more problems than it uncovers, I don't precondition before measuring.) In any event, although distortion is slightly greater when the RMB-1095 is driving 4 ohms than 8, it remains essentially unaffected by output level, which is amazing performance.

Figure 4 shows THD + N versus output into 8- and 4-ohm loads at three test frequencies: 20 Hz, 1 kHz, and 20 kHz. The results are remarkable in several respects. For one thing, the curves reveal that the RMB-1095 can deliver essentially the same maximum output power independent of frequency, which is rare. All the curves in Fig. 4A head up at 250 watts and cross the 1% line at 285 watts. All 4-ohm curves (Fig. 4B) head skyward around 440 watts, and two of the three cross 1% at 500 watts. The amp's protection circuit kicked in at 460 watts at 20 kHz, so that curve ends there. Since I can't say I know of a tweeter that can take 460 continuous watts at 20 kHz, I'd say that's a non-issue.

The relative flatness of these curves, together with their very low lie, indicate that the noise is exceedingly low. A-weighted noise of -95 dBW is great for any amp and in this case reflects an A-weighted S/N figure of 118 dB relative to rated output, several decibels better than Lucasfilm requires

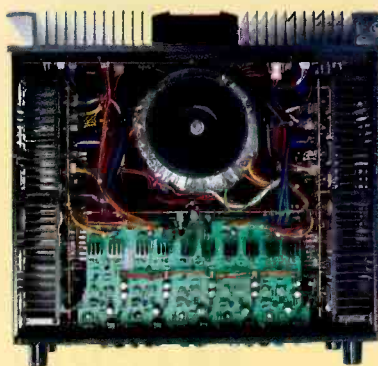
for THX Ultra certification. (Through the balanced inputs, noise is about 3.5 dB greater, which is to be expected.) Noise-spectrum analyses taken using the unbalanced and balanced inputs are shown in Fig. 5. There's a suggestion of magnetically induced hum at 60 Hz and its odd harmonics (180 Hz and 300 Hz) but almost no power-supply ripple at 120 Hz. No hum component is excessive (-100 dBW, worst case, at 60 Hz), all are far lower in level than the maximum allowed for Lucasfilm THX certification, and they are totally inaudible.

The Rotel RMB-1095 can deliver awesome amounts of dynamic power into just about any load. When I terminated the front channels in 2 ohms and cranked up the IHF tone burst, the

amp pumped out more than a kilowatt a side, repetitively, with no sign of fatigue! Into 4-ohm loads, it put out 575 watts a side on the burst, and with 8-ohm loads it cranked out 315 watts. That's a dynamic headroom of +2 dB relative to rated power, eight times better than required for THX Ultra certification.

Damping factor exceeded 400 at 50 Hz, and output impedance remained very low across the audio band. Even at 20 kHz, it was less than 50 milliohms, worst case, one-fourth of what's permitted for THX Ultra certification! (It is difficult to measure output impedance when it's that low, and the reading often depends on the test method. I actually got figures well under 50 milliohms at 20 kHz when I did the test a different way.)

Sensitivity is virtually spot on the THX targets for both the unbalanced and balanced inputs, and input impedance is three times greater than Lucasfilm requires. This amp not only meets THX Ultra certification requirements, it leaves them in the dust!—E.J.F.





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John Atkinson, *Stereophile*, Vol.20 No.10



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gage switches that toggle the input lines to the DB-25 and adjust the input impedance appropriately.

The input circuits use 5534A op-amps that, despite golden-ear protests to the contrary, do a fine job if you know how to handle them. Rotel says eight British-made, Dennis Moorcroft-designed capacitors serve as power-supply filters. Presumably they're tucked under the shield that supports the input board, because they're not readily visible. Component quality seems excellent, and the layout and construction are neat, which testifies to care in manufacture. Some call this "build quality," but a good-looking layout doesn't ensure quality any more than a sloppy one precludes it. The best that can be said is that care in manufacture never hurts! Frankly, I'm just as impressed by the rubber dampers affixed to the chassis under the sheet-metal cover as I am by neat wire routing. Covers that vibrate in sympathy with the power transformer are one of my pet peeves, and I can't see the wire routing when the cover is in place.

In addition to the two internal heat sinks, most of the front panel serves as a third, external heat dissipater. The center of the panel is smooth and bears the power pushbutton, power indicator, and five LEDs that illuminate when a protection circuit has triggered. Each channel's protection circuit minds its own business unless tragedy is imminent, in which case it doesn't muck around with current limiting, which can have disturbingly audible side effects; it simply disconnects the works and turns on the LED. It resets itself when the fault is cleared.

In use, the RMB-1095 never got more than moderately warm, so I guess its convection cooling is more than adequate. I'll happily accept the extra weight in the heat sinks in exchange for the freedom from fan noise. Power comes in through a removable, heavy-duty, three-wire IEC line cord, which brings up one feature that's missing on the RMB-1095: remote power switching. The only way to turn the amp on and off is with the front-panel button. If I owned the RMB-1095, I'd get a remote-controlled power strip of adequate capability, plug the amplifier into that, and leave the amp's own power switch on. Rotel says that the RMB-

1095 has a built-in surge attenuator to prevent circuit breakers from tripping at turn-on; I presume that the surge attenuator works whether or not you use the amp's power switch.

Including the front-panel heat sink and the bumpers that protect the rear-panel connectors, the RMB-1095 needs at least 16 inches of shelf depth and 17 inches of width. Figure on using a sturdy shelf (the amp weighs 75 pounds) with a vertical spacing of at least 13 to 14 inches to permit adequate airflow. Rotel suggests a minimum clearance of 4 inches all the way around.

Outputs are color-coded, multiway binding posts that accommodate spade lugs and single or dual banana plugs. The posts aren't drilled to accept bare wire or pins, but that's only a minor inconvenience; you're better



In the listening room and on the test bench, the RMB-1095 performed faultlessly.

off using lugs or plugs anyway. I've annoyed some companies by asking why they don't mount their amplifiers' output binding posts on 3/4-inch centers so they can accept dual (GR) banana plugs. I'm aware that 3/4-inch spacing is illegal in Europe, but I don't live there. Neither do most of my readers, and North America is not exactly the world's smallest market. If a company the size of Rotel can provide different products to meet the individual needs of the European and U.S. markets, why can't others?

Clearly, the Rotel RMB-1095 is built like the proverbial brick pagoda. Because it is, and because Rotel doesn't scrimp when it

comes to components and ratings, the RMB-1095 doesn't just meet spec and THX Ultra certification requirements, it blows them away! That's apparent from the test data, where the RMB-1095 cleared every hurdle by a huge margin—and from its effortless character in the listening room.

"Effortless" is the word of choice. No matter what music I handed it, no matter what movie soundtrack, the RMB-1095 refused to cry uncle. In stereo in my music listening room, it held its own against my reference Bryston 4B-ST so well that I could not tell them apart with any degree of surety, on any music, despite the Bryston's slightly higher power rating. True, I wasn't driving either amp to its limits, and it's also true that the powered woofer in the Mirage OM-8s I use for music listening reduces the strain on the main amp. But I also tried passive speakers and couldn't reliably tell the amps apart then, either.

That's high praise for the Rotel, because the Bryston is an excellent amplifier. Technically, I attribute this performance to the RMB-1095's remarkable bandwidth, distortion that is not only low but virtually independent of the power being drawn, the amp's ability to drive high currents into low-impedance loads without batting an eye, and its low and uniform output impedance. It is a most remarkable amplifier.

In my home theater, the RMB-1095 wiped out the amp I had been using. For the sake of decency, I'll not reveal the identity of the vanquished, since it was less powerful than the RMB-1095 and the contest was less than fair. Suffice it to say that I found no soundtrack that taxed the RMB-1095, even when I dropped the subwoofer out of the system and redirected bass into the main front speakers (Paradigm 9se MK 3s, which are, fortunately, big enough to take the gaff).

I would be most happy to install the Rotel RMB-1095 as the reference amp in my home theater. It's musical, it's powerful, and it got the most out of my speakers. From the test results, I dare say it will get the most out of your speakers, too, because it really doesn't seem to give a damn about what kind of load it's driving. It's that kind of amplifier—the best kind. I recommend it with enthusiasm. **A**

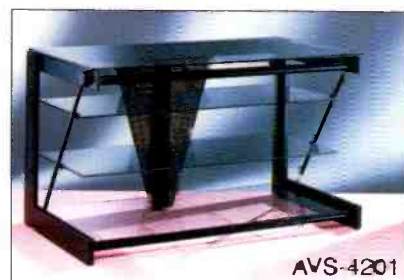


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JOE HAGEMAN

Monitor Audio Silver Cinema Speakers



Photos: Michael Groen

More. More. More. We all want more, don't we? When you buy a computer, don't you look for the one that has the most stuff in it—even if that hinders its performance? If it has more stuff, it must be better, right? I have seen many first-time buyers of A/V equipment become awestruck at a speaker that has four

or more drivers and immediately conclude it must be better.

For those of us who know better, there are companies like Monitor Audio. Instead of stuffing a cabinet with all the drivers it can hold, Monitor populates its speakers with only as many drivers as they need. Take, for example, the Silver 7i ("i" for improved), a classic two-way design. Its driv-

ers, both of which have ceramic-coated aluminum/magnesium (C-CAM) diaphragms, are a 6½-inch woofer (vented through a 2-inch port on the back of the cabinet) and Monitor's legendary 1-inch dome tweeter.

Unlike some classic two-ways, the 7i has a second-order (12-dB/octave) crossover (at 3.1 kHz) instead of a first-order (6-dB/octave) network. A second-order crossover cuts the lower frequencies off more sharply, increasing the available output from the tweeter and thus dynamic range. Many people, me included, would argue that speakers with first-order crossovers just don't sound right for home theater.

Monitor Audio's Silver Cinema Series speakers sounded phenomenal.

They are more prone to lobing, which occurs when the drivers' outputs cancel each other at certain angles. Lobing causes tonal balance to change noticeably with listening angle, which makes a speaker's sound very sensitive to placement and installation fairly tricky.

Monitor Audio's Silver Centre 12i center-channel speaker has almost the same driver complement as the 7i; it uses the same tweeter but has two woofers instead of one. The 12i also uses essentially the same crossover as the 7i. The woofers share two 1-inch ports on the 12i's front panel, which makes it easier to place in a cabinet or against a wall.

The 7i and 12i can be bi-wired by removing the Z-shaped, gold-plated jumpers that connect their gold-plated, five-way binding posts. Dave Solomon of Monitor Audio tipped me off that I'd get better sound if I replaced the jumpers with decent speaker wire. I'm wary of such audiophile tweaks, but I'll be damned if this one didn't actually work! The 7i's midrange performance, already great, got even better when I used 16-gauge Radio Shack speaker wire.

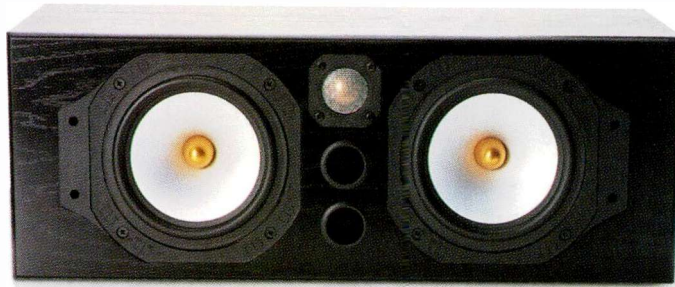
The Silver FXi surround speakers have two 5½-inch C-CAM woofers and two of

the same 1-inch C-CAM tweeters as the 7i and 12i. Each woofer-and-tweeter pair fires diagonally into the room, one toward the front and the other toward the back. There are binding posts for each of these pairs, connected to each other by silver speaker cables. (The FXi can't be bi-wired.) If you wire the two pairs of posts together in the same polarity, the FXi operates as a bipole, with all drivers operating in phase; if you invert the wiring to one pair of posts, the speaker becomes a dipole, for more diffuse-sounding surround. This is a very cool design, but it has one drawback: Because the drivers in a dipole speaker are out of phase with one another, you get bass cancellation. Many manufacturers of dipole surrounds compensate by incorporating an all-pass filter that allows the speaker to operate in bipole (in-phase) mode below 500 Hz or by using a low crossover to a single woofer. Monitor chose not to go that route, so the FXi has practically no bass response when it's used as a dipole.

I'm not entirely sure the FXi's bass limitation is a problem. Dolby Labs says that surround channels should be able to reproduce the full audio spectrum, but the bass management in any Dolby Digital processor or receiver will let you redirect any low-frequency energy in the surround channels to the front speakers or a subwoofer. I'd suggest you count on your subwoofer to reproduce bass and be done with it.

The subwoofer I auditioned with the Silver Cinema Series was Monitor Audio's ASW-210, a powered sub that has two 10-inch drivers (one firing forward and the other firing down), vented through two 3-inch ports. There are controls on the back for gain, phase (0° to 180°), and low-pass filter frequency (40 to 140 Hz), together with a switch to boost the level by 3 dB for movie soundtracks. The low-pass filter's 24-dB/octave slope should be steep enough to keep vocals or other midrange material out of the sub. Also on the rear are the inputs and outputs, RCA jacks for line level and multiway binding posts for speaker level.

As usual for Monitor Audio, all of these speakers were very well built. A quick rap



I was wrong to fear that the Monitors' laid-back sound would take the thrill out of DVD movies.

of the knuckles on their cabinets revealed them to be constructed from thick, non-resonant MDF. The Silver 7i is available in black, cherry, or rose mahogany (all for

the same price, mind you). The Silver Centre 12i, Silver FXi, and ASW-210 subwoofer are available only in black at present.

So how did the speakers sound? In a word, phenomenal. I hooked them up to B&K electronics, a Reference 20 preamp/processor and a brand-new Reference 7250 five-channel amplifier (reviewed in this issue). At first, I used the Silver 7i towers by themselves, running them full-range. It took me a day to get used to their sound, because they blended vocals perfectly into the music rather than, as many speakers do, thrusting them forward so they stand out.

Within the first 10 minutes, it was obvious that midrange performance was the name of the game with the 7i. Male vocals had a clarity and rightness I've seldom experienced with such relatively inexpensive speakers. Mel Torme's voice on *Mel Torme*

MONITOR AUDIO

SILVER 7i TOWER

Rated Frequency Response: 35 Hz to 25 kHz, ±3 dB.

Rated Sensitivity: 89 dB SPL/1 watt/1 meter.

Rated Nominal Impedance: 8 ohms.

Recommended Amplifier Power: 30 to 250 watts.

Dimensions: 33¼ in. H x 7¼ in. W x 9¼ in. D. (85.7 cm x 19.7 cm x 24.8 cm).

Weight: 26.4 lbs. (12 kg) each.

Price: \$1,399 per pair.

SILVER CENTRE 12i

Rated Frequency Response: 44 Hz to 25 kHz, ±3 dB.

Rated Sensitivity: 90 dB SPL/1 watt/1 meter.

Rated Nominal Impedance: 8 ohms.

Recommended Amplifier Power: 30 to 150 watts.

Dimensions: 8 in. H x 22 in. W x 8 in. D (20.3 cm x 55.9 cm x 20.3 cm).

Weight: 15.4 lbs. (7 kg) each.

Price: \$799 each.

SILVER FXi SURROUND

Rated Frequency Response: 55 Hz to 25 kHz, ±3 dB.

Rated Sensitivity: 90 dB SPL/1 watt/1 meter.

Rated Nominal Impedance: 8 ohms.

Recommended Amplifier Power: 15 to 200 watts.

Dimensions: 9¼ in. H x 10 in. W x 6 in. D (24.8 cm x 25.4 cm x 15.2 cm).

Weight: 7.7 lbs. (3.5 kg) each.

Price: \$899 per pair.

ASW-210 POWERED SUBWOOFER

Rated Frequency Response: 25 to 140 Hz, ±3 dB.

Dimensions: 20¼ in. H x 14¼ in. W x 14¼ in. D (51.4 cm x 37.5 cm x 37.5 cm).

Weight: 22 lbs. (48.4 kg) each.

Price: \$999.99 each.

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SCIENCE

Swings Shubert Alley (on Verve) sounded hauntingly natural and lush, while the accompanying instruments extended far into the room, with surreal dynamics and detail. Running the 7i towers full-range seemed to overtax their woofers a bit, so I switched the preamp/processor to "Small" speaker mode

and added the ASW-210 subwoofer. The 7i towers did a fantastic job of reproducing upper bass (80 Hz and up) while the ASW-210 belted out well-defined, punchy mid and lower bass.

During that first day of listening, I could tell that the 7i's tweeter needed more break-

in, because it sounded a little metallic at high volume. But it improved over the next two days of listening, until the C-CAM tweeter took on the quality of an expensive soft-dome driver. The ASW-210 sub also needed a little breaking in. On day one it sounded a touch too punchy, but soon its

TEST RESULTS

The frequency responses of the Monitor Audio Silver 7i towers, Silver Centre 12i, and Silver FXi surrounds (Fig. 1A) match each other well, a highly desirable trait for home theater. The 7i main speakers have the flattest response. Without their grilles, response is pretty much within ± 2 dB except for a peak at 4.5 kHz. When True Technologies tested the 7i with its grille on (not shown), this peak was attenuated, although overall response was rougher. Few listeners remove surround speakers' grilles, so the FXi's response is presented only with grille on.

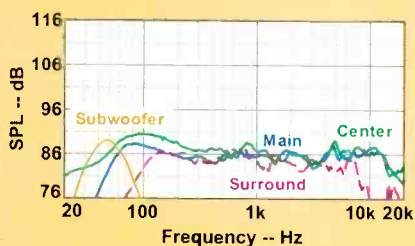
The subwoofer curve in Fig. 1A gives just a rough idea of how the ASW-210 can fill in the Silver Cinema speakers' bass response, as the test signal's level and frequency were not chosen to complement the other speakers' responses. Figure 1B is of the sub's output at four crossover settings in "Audio" mode and at the 180-Hz setting in video mode. Switching to the "Video" mode increased output by 3.8 to 5.7 dB, depending on the crossover setting.

The 7i tower's horizontal off-axis responses (Fig. 2A) cluster reasonably closely, which means response shouldn't change much as you move across the room. The 4.5-kHz peak diminishes slightly off axis, but other irregularities take its place. For the 12i center speaker, 45° and 90° off-axis responses are presented (Fig. 2B) so you can see the lobing caused by its dual woofers. It's hard to define what "on axis" means for a dual-baffle surround speaker like the FXi; 0° , straight out from the wall, is actually well off either tweeter's axis, which accounts for the rapid rolloff of the 0° curve in Fig.

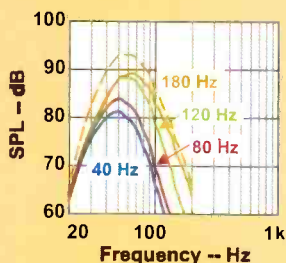
2C. Response is actually flattest 10° off one baffle's axis, where the "Surround" curve in Fig. 1A was taken.

Above axis, the 7i tower's response changes relatively little up to 15° , but note the dips at larger angles near the crossover frequency (Fig. 3A). Although the center speaker is not absolutely symmetrical in the vertical plane (its tweeter is above its

two ports rather than between them), its response is essentially the same above and below axis (Fig. 3B). Surround speakers are usually mounted high, so Fig. 3C includes more of the FXi's response below axis than above. More than 15° above axis, there is severe lobing, which causes a dip of about 20 dB at around 3 kHz; if you have to place this surround speaker below

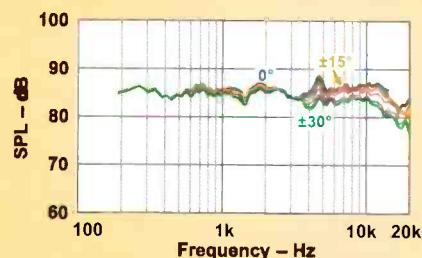


A

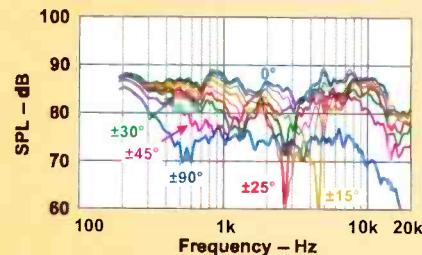


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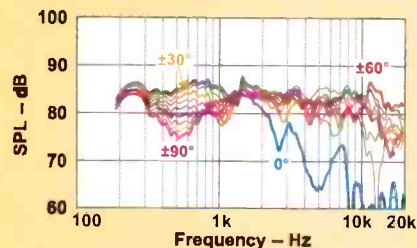
Fig. 1—Frequency response of Monitor Audio Silver Cinema 7i (main channels), Silver Centre 12i, and ASW-210 subwoofer without their grilles and of Silver FXi (surround channels) with its grille (A). Frequency response of subwoofer in "Audio" mode for four crossover settings and in "Video" mode (dashed curve) for the 180-Hz setting (B).



A



B



C

Fig. 2—Horizontal off-axis responses of 7i tower (A), Centre 12i (B), and FXi surround speaker (C).

drivers loosened up a little and bass notes began to sound a lot more natural.

After listening to the Monitors in stereo, I was concerned that their laid-back, easy-listening character would fail to thrill me on DVD movies. Boy, was I wrong! When asked to re-create the dynamics of a Dolby

Digital soundtrack, the Monitor Audio system answered with a resounding "bring it on!" In the blow-'em-up scenes in *Tomorrow Never Dies* and *Saving Private Ryan*, the Monitor system never so much as hiccupped, and the ASW-210 subwoofer revealed its true power potential.

I placed the Silver Centre 12i on top of my TV at first, but it sounded way too boxy up there. Only when I placed it on some cinder blocks on the floor did I realize just how good it was. Dialog intelligibility was outstanding, remaining clean and natural even during the most raucous of scenes. The 12i did not exaggerate sibilants at all, and it delivered a decent amount of bass. But if you can't put your center speaker anywhere except on top of your TV and it sounds boxy, I suggest using your surround processor's "Small" center setting to filter out the bass.

When I used the FXi surround speakers in their bipole mode, they were dynamic enough to keep me entertained but tended to be way too directional. When I changed the rear-panel connections and switched them to dipole mode, I preferred the less localized sound that resulted but missed the

Male vocals had a rare clarity and rightness, hauntingly natural and lush.

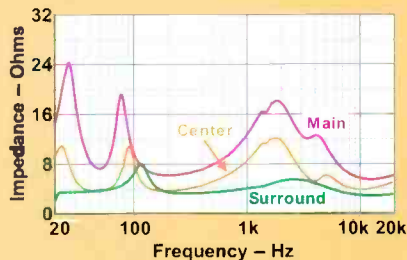
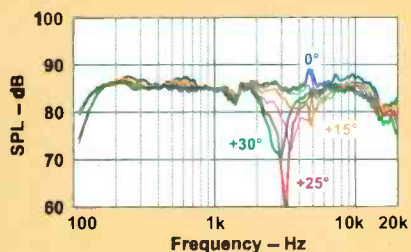
bass. I would probably prefer direct-radiating surround speakers (such as Monitor Audio's Silver 3); I listen much more to surround music than to surround films and don't mind the compromise of more localization when I watch a movie on DVD. But I have to hand it to Monitor for designing a well-built, flexible surround speaker, even if it is a little pricey.

While evaluating these speakers, I had the opportunity to compare the 7i tower to the Silver 9 tower, the most expensive model (\$2,000/pair) in the Silver Cinema Series. The 9 is a three-way system that uses the same tweeter and two of the same 6½-inch drivers as the 7i. Though I preferred the quantity and definition of the 9's bass (I wouldn't feel the need for a subwoofer with it), I found the 7i's midrange a bit more accurate. Now that I've heard both of these Silver Cinema Series towers, I'd probably stick with the 7i and use a subwoofer with it—that lush, detailed midrange is just too good to pass up. **A**

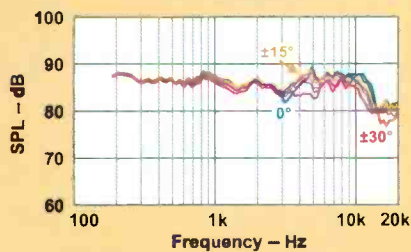
ear level, you'd be best advised to turn it upside down.

You can tell from the impedance curves in Fig. 4 that the surround-channel speaker has a sealed enclosure, as opposed to the vented enclosures (note the two bass peaks) of the main-channel and center-channel speakers. The surround should be an exceptionally easy load, because its im-

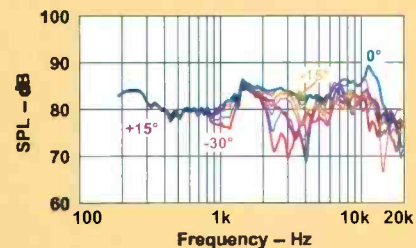
pedance is quite close to 4 ohms at most frequencies, never drops below 2.8 ohms, and is constant within a 2.8:1 ratio. The center speaker's impedance varies a bit more (3.5 to 12.1 ohms over the audio range, a 3.5:1 ratio), but its minimum impedance is higher. The main speakers' 5.5-ohm minimum should give no amplifier pause.



A Fig. 4—Impedance of 7i main speakers, Centre 12i, and FXi surround speakers.



B Distortion at 100 dB SPL was moderate in the midrange for the main, center, and surround speakers but rose in the bass, pretty common behavior. For the 7i towers, things didn't get anywhere near out of hand until below about 70 or 60 Hz. (Like many ported speakers, the 7i will sound cleaner when driven via a high-pass filter, such as in the crossover of a home theater preamp or processor, to limit bass excursion.) The 12i center speaker's dual woofers kept its distortion lower than the 7i's, with individual harmonics rarely exceeding 1% at frequencies down to 80 Hz. Distortion was highest in the FXi surround speaker (where it will probably be least bothersome) yet was respectably low from about 250 Hz on up. The ASW-210 sub's distortion was commendably low, mostly around the 1% level and with no harmonic exceeding 10%, even at 20 Hz.—Ivan Berger



C Fig. 3—Vertical off-axis responses of 7i tower (A), Centre 12i (B), and FXi surround speaker (C).

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ANTHONY H. CORDESMAN

Pass Labs XO Preamp



Pass Labs' XO meets all the criteria of a great preamp. I have spent months enjoying the XO, and it is the equal of any in resolving power and musicality. It simply does everything as well as, or better than, any other line-level preamp I have heard, and it should give you years of sonic enjoyment. It may not exactly meet your needs, but I assure you that it will provide sheer listening pleasure.

The XO was engineered by Wayne Colburn of Pass Laboratories and sells for \$8,000. It's a three-chassis affair made entirely of machined aluminum. Two chassis contain the left and right gain stages, and the third houses the power supply and analog and digital control circuitry. All three are relatively slim and weigh about 30

pounds each. Because they are the same size, you can stack them or place them on different shelves, connecting the two gain stages to the power supply/controller with two sets of computer-style cables. The XO has a remote that duplicates front-panel functions.

The Pass has five sets of input connectors, two pairs of output connectors, and a tape loop. All inputs and outputs have balanced and unbalanced connectors, and it is possible to convert from one to the other without switches or adaptors. The unbalanced input impedance of the preamp is rated as (worst case) 10 kilohms. In balanced mode, the specified input impedance is higher, with a differential impedance of at least 20 kilohms. The preamp's control software allows one input to be set to unity

gain, facilitating using your primary audio system with a surround processor in a home theater system.

Initially, I found operating the Pass XO to be a bit unusual, but it soon proved to be simple and straightforward. A two-button mode switch on the controller lets you choose from among eight different functions: volume, input selection, muting, tape, balance, display, mono, and unity gain. Then, using the two-button "Select" switch, you can control the chosen function, toggling between choices (e.g., mono and stereo), although the knob on the right is always a volume control. The remote uses the same four-button system.

The controller's fluorescent display shows you settings and gives a numerical readout of each channel's gain, a nicety that lets you easily reproduce preferred volume and balance settings for a particular recording or program source. Because the numerical display lets you adjust levels so precisely, it would be a pleasure to use the XO for comparative reviewing.

You can also set the balance control to any level rather than having to adjust it in audible steps. On far too many preamps, you can set balance only in 1- or 0.5-dB increments. Unfortunately, this can result in an unbalanced soundstage with some recordings and with program sources whose left- and right-channel gains are unequal. The XO's balance control makes it easy to lock in the correct soundstage.

The XO uses a new type of volume control. Controlled by a microprocessor and with a range of more than 70 dB, it reads an optical encoder activated by the front-panel knob or the "Select" buttons on the front

PASS LABS

Rated Frequency Response: 10 Hz to 100 kHz, +0, -3 dB.

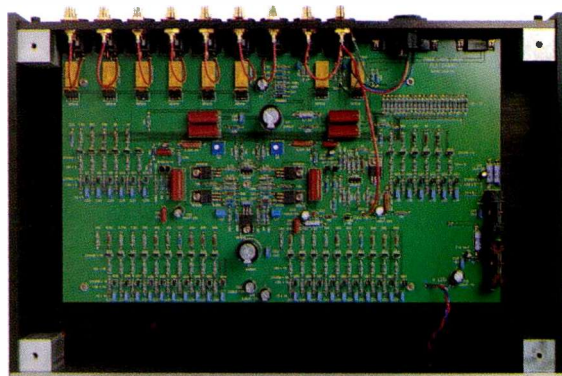
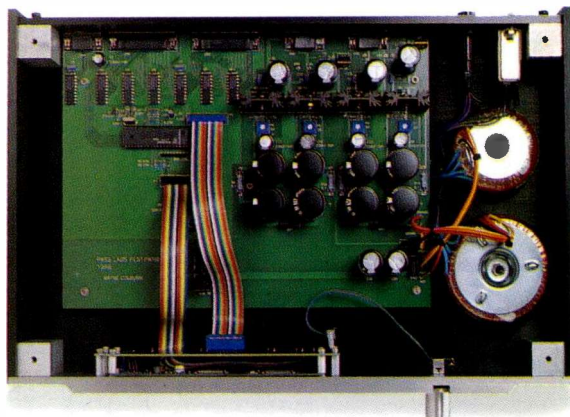
Rated Distortion: Better than 0.1% THD; typically 0.003% THD at 1 kHz.

Dimensions: 19 in. W x 3 in. H x 11½ in. D (48.3 cm x 7.6 cm x 29.2 cm).

Weight: 90 lbs. (41 kg).

Price: \$8,000.

Company Address: P.O. Box 12878, Reno, Nev. 89510; 530/367-3690; www.passlabs.com.



panel or remote. This system is said to maintain interchannel tracking much more accurately than conventional volume controls. It is also said to ensure precise level steps and a high common-mode rejection of about -60 dB. Further, Pass Labs claims that distortion and noise are reduced and that dynamic range (in an electrical sense) is dramatically increased.

The Pass XO has independent power supplies for the digital and analog circuits, which are shielded from digital noise and radio-frequency interference. The supplies use toroidal power transformers to deliver an unregulated ± 45 volts, which is then actively regulated for each channel before feeding passive filtering and the constant-current sources that bias the gain stages. Noise from the power supply that actually reaches the circuit is, says Pass, about 1 microvolt, and even that is differentially rejected at the output in a balanced system.

Muting relays delay connection of the circuitry during turn-on and shut down the preamp's output when the power supply is insufficient to maintain regulation. The XO is intended to be left on all the time, and

Pass Labs claims that it will reach optimum performance after about 10 hours of operation.

Each of the XO's gain stages operates in Class-A mode, using a dual monolithic FET feeding power MOS-FETs in what Pass says is as simple a configuration as possible. The XO's "Supersymmetry" topology is said to improve performance by precisely matching the characteristics of the two halves of the balanced circuit and connecting them in such a way that noise and distortion largely cancel at the output. Pass claims that the benefit far exceeds what can be achieved with ordinary matching techniques without requiring large amounts of feedback.

These are impressive claims, and Pass Labs has so

far had an excellent track record in producing outstanding products. But because I have heard so many different tube and solid-state preamps that use different circuit topologies yet still deliver excellent sound, I

This Pass preamp is the equal of any in resolving power and musicality.

believe that quality of execution counts more than design and that the test of any preamp lies in the listening.

And the XO definitely passed the listening test. I simply couldn't find *anything* to fault! I initially thought its deep bass a touch lean, but after burn-in it improved. Subsequently, when I used Dunlavy SC-Vs, Thiel CS7.2s, Polk SRTs, and a REL subwoofer, it sounded superb. With the Dunlavy speakers, I was able to get massive amounts of 25-Hz (and lower) output in

my listening room. The XO certainly delivered with test tones, and with music it furnished clean, deep, and dynamic bass—of the sort you can really feel. Only top-of-the-line Krell preamps can compete with the Pass here.

In other respects, the XO was outstanding right out of the box. Its low-level resolution was state of the art. With some tube preamps, you can listen through the noise floor and get excellent low-level information. With competitive transistor preamps, there is less apparent noise but also slightly less resolution.

One of the XO's most striking characteristics is that it may sound less detailed than some other solid-state preamps until you seriously contemplate live music. Then you realize that the XO actually yields *more* musical information but in a less etched and "hi-fi" form. This was one of the small pleasures that kept drawing my attention even when I was making no attempt at serious listening. I'd pause and suddenly realize that I had never heard a particular instrument sound quite so natural on a certain recording. This happened again and again with a variety of familiar recordings, a sure sign that a preamp is nudging greatness.

The XO's dynamics and transient response were good at all frequencies and at all levels of musical energy. Some tube enthusiasts may judge the XO slightly lacking in apparent life, probably because many tube preamps sound relatively warm and have more apparent life in the midrange and less in the deep bass. The XO's dynamics were lifelike and neutral, and though with some recordings this may yield a less romantic sound, this Pass preamp remained more convincing with a broad range of high-quality records and CDs.

The soundstage had a similar neutrality. The XO may have lacked the extra depth that some tube preamps contribute, but it extracted as much from a recording as the miking and production values permitted. I was struck by how the Pass resolved image depth and width and by its ability to handle solo instruments and full orchestra with ease. These soundstage characteristics interacted with an unusually neutral timbre to ensure that the XO did not shift the apparent listening position by either warming

or thinning the sound. I have heard similar performance from only the finest Audio Research preamps (although they sound quite different in many other ways).

In fact, reporting on the Pass XO's tonal colorations is an exercise in futility. Any I thought I heard were not a product of the XO but of the sources feeding it, which the preamp quite transparently revealed. The only caution I pass on to you is that you should be careful about using the XO in a system that previously relied on a euphonic preamp to compensate for other system colorations. Because the XO is a completely neutral device, it has no colorations that will mask problems in other components.

The Pass merits the finest cables and careful attention to system grounding and other potential sources of noise and coloration. (The preamp's low noise floor means that any traces of transformer hum or of fan and motor noise elsewhere become more audible.) I had no problems using Kimber Select or cables from Audio-Quest, Discovery, or Wireworld; the XO actually did an exceptionally good job of resolving the sonic differences between them. I did find, however, that cables with annoying colorations or minor ground problems deprived the Pass XO of some of its magic. This preamp also revealed the benefits of using balanced interconnects; if possible, you should use them.

If you are looking for the finest stereo preamp—one you can invest in and keep for years—the Pass XO is a “must” audition. It is *competitive* in sound quality with any reference preamp I know of. And let me be clear about why I use that word. There are great preamps, like the original Marantz, that become classics, maintaining audiophile interest and respect decades after they were made. And over the last year, I have heard other superb contemporary preamps from Audio Research, Conrad-Johnson, Krell, Mark Levinson, Jeff Rowland Design, and VAC. Trying to find the world's greatest preamp is as pointless as searching for the world's best wine, most desirable car, or finest painting.

The Pass Labs XO is not this month's “world's best.” Rather, it is a preamp that's simply too good to overlook if you want to set up a state-of-the-art audio system. **A**

TEST RESULTS

True Technologies made all of its measurements on the Pass XO via the preamp's unbalanced inputs and outputs. Frequency response (Fig. 1) is good, with just a quarter-decibel droop at the frequency extremes. And channel balance, as claimed, is outstanding—essentially perfect.

As is apparent from Fig. 2, the XO is capable of prodigious output. The distortion curves, taken with the preamp's volume control turned all the way up, don't start to take off until the output reaches about 17 volts (in response to a 2-volt input). Measurements of total harmonic distortion plus noise (THD + N) versus frequency (Fig. 3) reveal astonishing consistency, both with frequency and between channels. Again, this bears out Pass's claim of exceptionally close matching. Although not the absolute lowest distortion we've seen from a preamp, it is certainly well below the threshold of audibility.

The noise component alone is plotted in Fig. 4. The XO is a very quiet preamp; there's not even a trace of hum in the output. Total noise is an excellent -83 dB, A-weighted, relative to a 0.5-volt output. Interchannel crosstalk (Fig. 5) was the same for all inputs and amazingly low, especially at high frequencies, where it usually increases (often dramatically).

All in all, the Pass Labs XO delivers textbook performance: clean, quiet, and quirk-free.—*Michael Riggs*

The Pass remote uses the same four-button system as on the preamp's front panel.

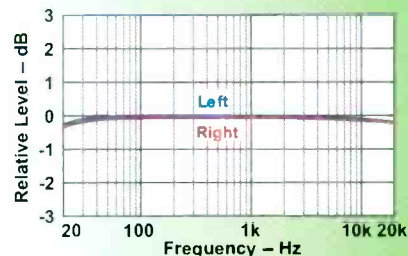
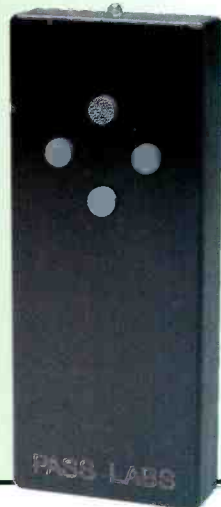


Fig. 1—Frequency response.

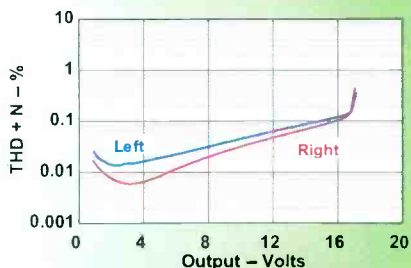


Fig. 2—THD + N vs. level.

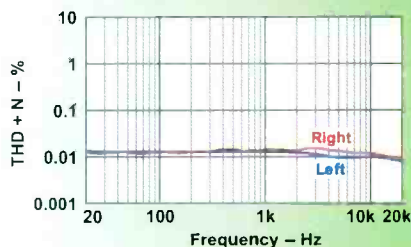


Fig. 3—THD + N vs. frequency.

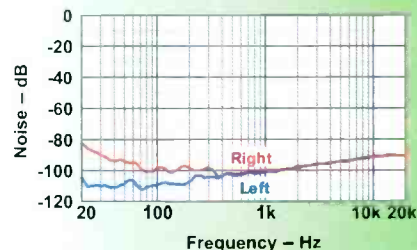


Fig. 4—Noise analysis.

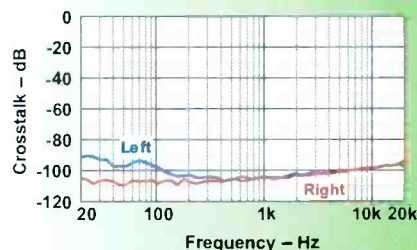


Fig. 5—Crosstalk vs. frequency.

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Photos: Michael Groen

Remember when “Made in the U.S.A.” was a big deal? Actors in TV commercials extolled the virtues of products made here, in a campaign that extended to T-shirts, bumper stickers, and newspaper and magazine ads. But like so many trends, this one came and went. The American public simply stopped buying products *just* because they were home-grown. (Why do you think the Ford Taurus is no longer the number-one car here, besides the fact that it’s hideous?) The “Made in the U.S.A.” slogan quickly became a memory as consumers returned to less expensive and, in many cases, better-quality Japanese products.

Not only have the Japanese been a significant presence in our automotive market

for quite a while, they’ve also had a strong hold on the consumer electronics market. I can’t remember the last time I was in someone else’s home that *didn’t* have at least one Sony product in it. Why is this? Because the Japanese understood that what consumers really wanted was something they could afford, sounded pretty good, and was easy to use. While the Japanese were busy churning out receivers like crazy and gearing up for the digital era, many American brands were left behind in the dust because of their relentless quest to obtain the best possible sound, no matter what the price or ergonomic sacrifice.

Now that more American electronics manufacturers have caught on to this fact, however, “Made in the U.S.A.” seems to be

making a comeback of sorts. Take B & K Components, for instance. All of its products are engineered and manufactured by B & K right here in the good ol’ U.S. of A. Despite deep-pocketed competition, the company has managed to survive, even flourish, by designing and building high-quality, great-sounding, affordable, easy-to-use audio equipment. B & K also has persevered by aligning itself with the right people. Its facility in Buffalo, N.Y., happens to be an alpha test site for Motorola, and its products were among the first to undergo and pass Lucasfilm’s THX certification process.

I’ve been a pretty big fan of B & K amps for a while now and happen to use its outstanding AV-5000 five-channel amplifier in my test system. Needless to say, I was pretty jazzed when I saw the Reference 7250, the new incarnation of the 5000, at the CEDIA show in Indianapolis last September. (B & K also unveiled another monstrous home theater amplifier, the Reference 7260, which is a six-channel version of the 7250.) At first sight, it was easy to tell that B & K wasn’t messing around when it built this behemoth: The 7250 weighs in at a whopping 70 pounds. Part of this is attributable to the aluminum-extruded heat sinks B & K uses to keep the amp’s high-current, Class-AB, MOS-FET output stages running cool and to the 25-pound

B & K

Rated Power: 200 watts per channel into 8 ohms or 375 watts per channel into 4 ohms, all channels driven.

Rated Bandwidth: 5 Hz to 45 kHz at full output.

Rated Distortion: 0.09% THD at 1 kHz.

Dimensions: 17 in. W x 7¼ in. H x 19¼ in. D (43.2 cm x 18.4 cm x 48.9 cm).

Weight: 70 lbs. (31.8 kg).

Price: \$2,498; champagne finish, \$100 extra.

Company Address: 2100 Old Union Rd., Buffalo, N.Y. 14227; 800/543-5252; www.bkcomp.com.

TEST RESULTS

The B & K Reference 7250's frequency response (Fig. 1), measured by True Technologies at 1-watt output with all five channels driven, is textbook linear. In fact, it's hard to believe there are five channels represented in the graph. The channel-to-channel variation is less than 0.1 dB from 20 Hz to 20 kHz—absolutely first-class performance.



As you can tell from Fig. 2, how much power you get out of the 7250 hinges on how many channels you choose to drive full-tilt. Into 8 ohms (Fig. 2A) and with four channels driven, the amp meets its rated power

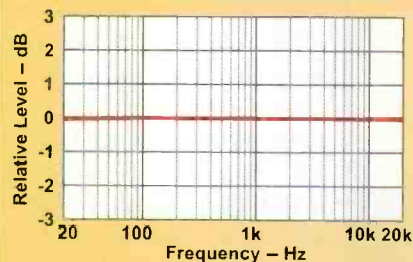
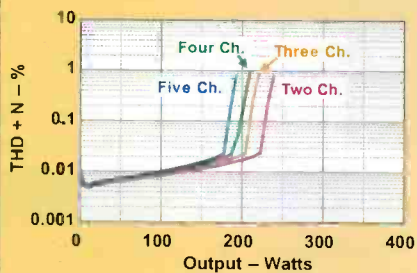
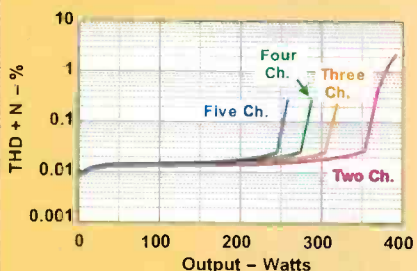


Fig. 1—Frequency response.



A



B

Fig. 2—THD + N vs. output at 1 kHz, for 8-ohm load (A) and 4-ohm load (B).

output, producing 200 watts per channel at 0.1% THD. It's almost inconceivable you'd ever push the 7250 to full output in all five channels in your home (unless you're a headbanger for deafening sound levels); if you were so inclined, however, you'd get about 175 watts per channel at 0.02% THD. Driving just two channels, this amp cranks out a generous 225 watts into 8 ohms and 350 into 4 ohms (Fig. 2B). With five channels driven into 4 ohms, the 7250 still manages a comfortable 245 watts per channel at 0.03% THD.

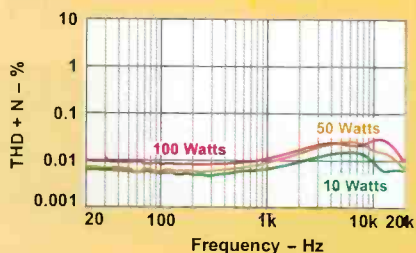
The Reference 7250's total harmonic distortion plus noise (THD + N), for its worst channel and measured across the spectrum into 8 and 4 ohms (Figs. 3A and 3B, respectively), is thoroughly respectable. Into 8 ohms, THD + N stays around 0.01% until the upper frequencies; even then, it never exceeds 0.03%. Into 4 ohms, the curves rise a tad in the upper octaves, climbing to 0.07% at 6 kHz. These levels would be inaudible.

No question that the 7250 is a very quiet amp: Fig. 4 shows the two worst channels' noise measured across the spectrum, and it is 90 dB down (or better) at all frequencies (would that my upstairs neighbor were that quiet!). For the record, you can see a tiny AC line blip at 60 Hz in channel 1 and its second harmonic, at 120 Hz, in channel 5.

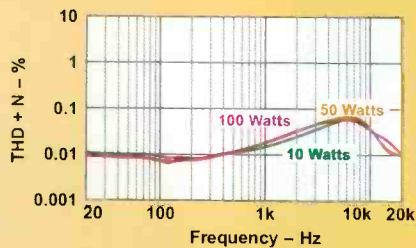
Crosstalk versus frequency (Fig. 5) tracks the 7250's signal leakage into channel 5 (worst case) when channel 2 was driven with a test signal from 20 Hz to 20 kHz. The crosstalk is -80 dB or better in the low bass; as is typical, it increases at higher frequencies. From -70 dB in the midrange, crosstalk increases to about -50 dB between 10 and 20 kHz—not as impressive as at lower frequencies but certainly nothing to worry about.

Indeed, "nothing to worry about" is as admirable a trait as one might expect in a

multichannel amp: lots of gain applied equally to every audible frequency, in every channel, at benign distortion levels, and with no audible background noise. The B & K Reference 7250 handily meets these criteria. What else do you need?—Alan Lofft



A



B

Fig. 3—THD + N vs. frequency, for 8-ohm load (A) and 4-ohm load (B), of worst channel.

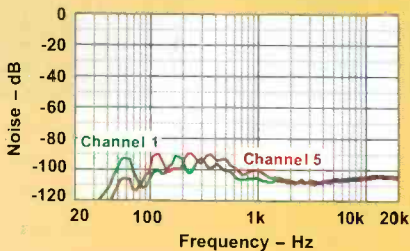


Fig. 4—Noise spectra of two worst channels.

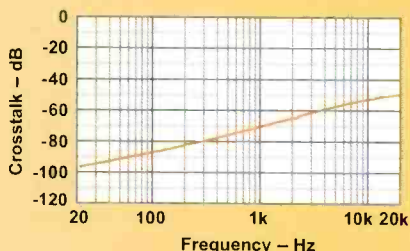


Fig. 5—Crosstalk, worst case.

B E T T E R S O U N D T H R O U G H R E S E A R C H .

BOSE

*With enough knowledge,
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When Bose® began building factory-installed music systems for cars, conventional wisdom believed the automobile environment was much too hostile for true high-fidelity sound. But we embraced the research challenge of developing smaller, lighter, more efficient equipment. Automatic functions. And through it all, far better sound. That knowledge creates better systems for your home, too. Today, the single piece of Bose equipment shown on the left, about the size of a laptop computer, replaces a shelf full of conventional components. Knowledge. It's the foundation of every Bose product.

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1-BIT AMPLIFICATION

1-BIT, THE HEART AND SOUL OF THE NEXT GENERATION AUDIO SYSTEM

The history of audio recording media is over a century old. The analog vinyl disc format passed through several transition stages: extending playing time, reducing noise and distortion, and improving sound quality through expanding the reproduction range. The jump from vinyl disc to CD brought digital technologies for the first time to consumer audio equipment. These technologies further reduced noise and sound distortion while allowing audio systems to become compact and lightweight. With these benefits, CDs quickly gained dominance as the preferred audio format.

In the 17 years since the debut of the Compact Disc (CD), rapid progress in digital and recording techniques has resulted in vast improvements in CD mastering. These improvements have made possible the invention of new high-quality audio package media, SACD and DVD-Audio, which have already begun to be warmly embraced in the market.

STRIVING FOR PERFECTION

To enable the amplification of this next generation of digital audio formats as well as existing analog and digital sources, (and to satisfy the desires of music lovers and audiophiles who wish to listen to natural sound at its original quality,) Sharp has introduced a standard-setting technology known as

OUTSTANDING SOUND QUALITY

The first product to incorporate 1-bit technology is the Sharp SM-SX100, a 100 watt/channel stereo integrated amplifier. Conventional analog amplifiers rely on the linearity between input and output. Class-A and class-AB systems with good linearity are adopted in analog amplifiers but they are highly inefficient and consume a lot of energy for high power output. This is not ideal from an environmental viewpoint. 1-bit digital amplifiers on the other hand, when compared to conventional amplifiers, reduce heat radiation by four-fifths and use approximately half the power consumption due to their simple ON/OFF switching operation. This simple switching operation as well as other digital technologies not only allow for high energy-efficiency but space-saving size

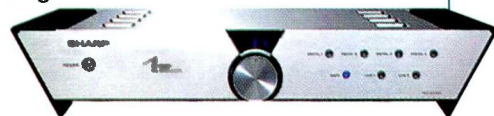
Extremely stable amplification of music signal faithful to the original analog signal is made possible by Delta-Sigma Dynamic Feedback circuit which feeds back fluctuations of the voltage power to the 7th-order Delta-Sigma modulation LSI and corrects the 1-bit control signal in real time. The SM-SX100 obtains a 1-bit signal stream faithful to the input data by high-speed (64 fs, 2.8224 MHz) sampling Delta-Sigma modulation.

The newly developed 1 chip 7th-order Delta-Sigma modulation LSI plays a key part in this process to shift quantization noise to higher frequency and maintain a wide dynamic range in the audible band. At the

ADVANTAGES OF 1-BIT AMPLIFICATION

Purity of sound is achieved by a simple sound transmission circuit that does not degrade, add or remove anything from the original signal. The result is a new concept for digital audio systems, offering:

- ◆ Excellent Transient Response (Ultra-high 2.8224 MHz Sampling Rate)
- ◆ Frequency Response (5 Hz to 100 kHz)
- ◆ Superior Dynamic Range (105 dB at audible range)
- ◆ Extraordinary Efficiency (half the power consumption of analog amp at normal listening levels)
- ◆ Cool Running (80% less heat dissipation than an analog amp of comparable rating)
- ◆ Compact size (1/3 the size of traditional analog amplifiers)



SPECIFICATIONS

Amplification System:
64fs 1-Bit Switching (fs = 44.1 kHz)

Frequency Response:
5 Hz - 100 kHz (+1 dB, -3 dB)

Dynamic Range: 105 dB (5 Hz - 20 kHz)

THD: 0.02% (at 1 kHz, 1 W)

Rated Power Output:
100W+ 100W (8 ohms)
(10 - 20 kHz, Both Channels Driven)

100W+ 100W (4 ohms)
(10 - 20 kHz, Both Channels Driven)

5 Hz - 20 kHz (+1 dB, -1 dB)

Dimensions: (W x H x D)
472 x 89 x 462 mm
8-9/16" x 3" x 18-3/16"

Weight (Approx.): 18.5 kg (40.7 lbs.)

1-Bit Audio Amplification. This extraordinarily advanced system uses sophisticated 7th-order Delta-Sigma modulation coding, with an incredibly high-speed 2.8224 MHz sampling rate.

Sharp first exhibited this new technology with a prototype 1-bit amplifier and SACD player at Audio Expo (Oct. '98 in Japan). Its performance was showered with praise: "instantaneous response of sound," "dramatic high-speed atmosphere," "the original sound produced through high fidelity," "surprising energy-efficiency and space-saving size." The 1-bit amplifier's benefits stunned manufacturing partners, other audio-related companies, specialists and audiophiles.

Since then, Sharp has made further improvements to its 1-bit amplifier technology. Its instantaneous transient response, wide frequency range and wide dynamic range make it possible to reproduce original sound without compromise regardless of the source, new generation digital audio media, existing CDs or vinyl discs.

final stage, the amplified switching signal is converted into an analog signal used to drive the speakers by a low pass filter network.

By inputting 1-bit signals recorded on SACDs, the next generation format, directly to the 7th-order Delta-Sigma modulation LSI through the amplifier's exclusive 1-bit SACD input terminal, it is possible to digitally convey music signals without loss.

The SM-SX100 achieves pure sound transmission as sound that passes through the microphone is transmitted digitally to the speakers.

Sharp's initial introduction, the SM-SX100 integrated amp, will give the listener the best sound quality reproduction of SACD and all other music sources. In addition, Sharp plans to incorporate this new technology into future products that will establish 1-bit as the new audio standard.

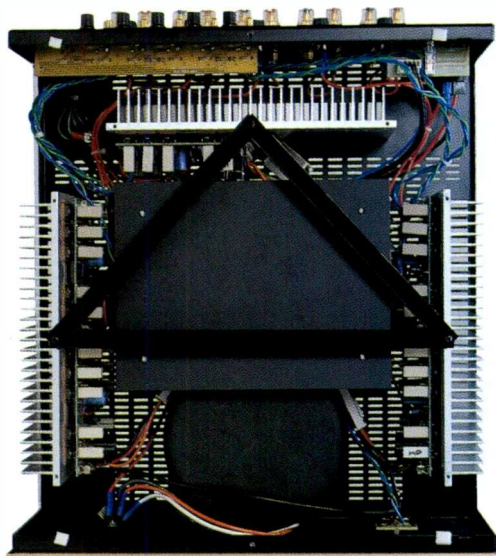
SHARP

For more information call 1-800-BE-SHARP or visit WWW.SHARP-USA.COM

toroidal power transformer. Also under the 7250's hood are high-quality supporting parts, such as 1% metal-film resistors and high-current, computer-grade electrolytic capacitors.

B & K decided to go pretty high-end on the outside of the Reference 7250 as well. On the back are sturdy, plastic-encased, five-way binding posts for speaker connection and surface-mounted "Tiffany"-style RCA input jacks. There are input level controls for all five channels, a removable IEC-type AC cord, and DIN-type inputs and outputs so the 7250 can be powered up remotely or daisy-chained to another amp. The B & K can be ordered with a champagne faceplate for a \$100 premium. (I highly recommend you spend the extra C-note. As you can see in the photos, this amp is beautiful.) Its price of \$2,498 breaks down to almost 500 bucks per channel, which may seem like a lot—but wait until you hear this amp.

During the time I spent evaluating the Reference 7250, its sound got better and better every day. On day one, the 7250 sounded pretty good: It reproduced a clean midrange and had plenty of punch but wasn't really all that special. On day two, although the midrange was even cleaner and the amp seemed to have more punch, I was still hoping for more. The next day was a complete revelation. I played the same music I had listened to on the previous days, CDs ranging from Dave Matthews to Sara K., and the 7250's top end totally opened up. Whereas the amp had previously seemed to hold back on high-frequency extension, now there was tons of detail and a clarity that rivaled that of some of the best tube amps I've heard. The midrange pretty much stayed the same—which is to say, dead accurate: Female and male vocals were very natural and displayed no excess sibilance or grating characteristics at all. However, as detailed and extended as the top end was, it never became strident. On bright recordings (such as Hole's *Celebrity Skin*, on DGC), I never winced or felt the need to scramble for the volume control. On day three, the 7250's bass response also improved dramatically. Some B & K amps have tended to be a little an-



**I was awestruck
by the clarity
and detail
the 7250 extracted
from DVD.**

mic in the low end, but this one had no problem giving the woofers in my Monitor Audio Silver 9s a real workout. I always knew these Monitor speakers had deep bass extension; the 7250 helped me realize just how low they could go.

The Blockbuster around the corner from me finally began renting DVDs (I've now seen almost every title it has in stock), so I took the opportunity to watch a few movies using the Reference 7250. I can confidently say this is an amp I could easily live with. I watched movies in my evaluating mode, at high volume levels, and at real-world levels. The 7250's clarity and detail in the mid-

range was a big asset with dialog-heavy movies. Its ability to reproduce intelligible dialog over the most raucous backgrounds (e.g., when the ship sinks in *Titanic*) was extraordinary. The 7250 also had an uncanny ability to seem dynamic and laid-back simultaneously. Overly bright Dolby Digital mixes (*Tomorrow Never Dies*, for one) were much easier to take at high volume when played through the 7250. Although some sound effects, such as shattering glass, were much tamer, stuff blowing up and gunshots were anything but tame. The 200-watt/channel 7250 responded quickly to changes in action sequences. I won't say that surround effects were that much better because of the amp, largely because I think this is more a function of the processor. Nevertheless, the B & K did reproduce Foley effects as accurately and dynamically as could be expected.

As much as I enjoy watching movies, I spend the bulk of my time listening to music, especially surround-encoded CDs and DVDs or two-channel music played back in surround mode. I was curious to hear what the Reference 7250 would do, because frankly, I have heard many an amp perform well in stereo and with 5.1-channel movies on DVD, only to fall apart with multichannel music. The 7250 did not disappoint. Listening to *The Best of Sessions at West 54th, Vol. 1* (Sony DVD Video), I was in awe of the clarity and detail the amp was able to extract from the disc. Centered vocals were completely natural and blended perfectly with the rest of the music. Even DTS-encoded music (which I feel is mostly too bright in the center channel) was pleasing to listen to.

In one sentence, the Reference 7250's sound is dynamic but in an accurate and exciting way, not in an overly brash or fatiguing way. It's a real-life product at a real-world price. In a market where A/V receivers are sounding so much better, thereby blurring the distinction between high-end and mass-market gear, this B & K amplifier clearly stands out. It gives you a real reason to stick with separate components. Like so many other B & K products, the 7250 makes the phrase "Made in the U.S.A." mean something again. **A**

LOOK NO FURTHER.



The new Sunfire Theater Grand tuner/preamp/processor is the latest innovation from Bob Carver. It is easy to set up, simple to operate, and delivers superb performance. Features include Dolby Digital® and DTS® decoding, Holographic Imaging, automatic signal sensing, and a versatile LCD remote. The Sunfire Theater Grand is state-of-the-art now and fully upgradable, so it is poised for the future.

It is no wonder that Home Theater magazine concluded: "If you're in the market for a full-featured controller for your system, look no further than the amazing value you get with the Theater Grand." — Jeff Cherun, Home Theater, February, 1999

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KEN KESSLER

Dynaudio Contour 1.3 SE Speaker

When you leave the airport in Denmark to visit Dynaudio, the first thing you see is a stack of gigantic Lego blocks. Dynaudio's factory is in the same neck of the woods, and Lego is the region's most famous concern, so you gotta figure that this particular strain of Dane will be, uh, quirky. The region—pure end-of-the-millennium, politically correct, CE-approved Northern Europe—certainly beats the hell out of belching smokestacks or the congestion of Southeast Asia. We're talking clean and green, a Scandinavian idyll that just happens to be the home of one of the most sophisticated speaker manufacturers on the planet.

Huh? Dynaudio? Doesn't it make drivers for other speaker brands? You've just nailed the company's identity crisis, as most people think of Dynaudio only for the drivers it has supplied to makers as admired as Wilson Audio Specialties (woofers) or Sonus Faber (which once used Dynaudio's Esotar tweeter). But at least three times during my visit, I was reminded that raw drivers account for as little as 5% to 10% of the company's sales. It's not that they're bitter; the guys at Dynaudio simply want the world to realize that they're one of the world's dozen or so largest makers of complete speaker systems and that the company has been around for more than 25 years.

Given that its speaker line ranges from \$700/pair compact two-ways to the \$85,000/pair Evidence, Dynaudio certainly isn't missing any market niches; it even manufactures some serious studio monitors that compete with Genelecs. I recently auditioned its Contour 1.3 SE ("Special



Edition"), a new speaker that's sort of a statement in a series launched in 1986 with the Contours 1 and 2. Taking a page from the British speaker designers' handbook, Dynaudio positioned the Contours in the middle of the classic two-way box market—too refined and therefore too expensive to be entry-level speakers but affordable enough to compete in the real world. Dynaudio is one of a diminishing number of speaker companies making everything from

its drivers to its cabinets (okay, so maybe it doesn't weave its own grille cloth), and the Contours have always oozed quality and solidity and had a frisson of individuality—qualities that you rarely get from speakers assembled from other companies' ingredients.

Following the DNA chain back to the moment of arousal, I remember a project from the early 1990s, when Dynaudio engineers hot-rodged a Contour 1 by incorporating then-cutting-edge technologies to produce a speaker devoid of compromises in materials, build, or performance. Planned as a severely limited edition, it went on to sell more than 5,000 units. In 1993, the Contour 1 was replaced by the Contour 1.3, which acquired MK II status in 1998. And that's where the Contour 1.3 SE enters the picture.

First, the carcass. The Contour 1.3SE's cabinet measures a tidy 15 x 8 x 11½ inches but weighs a chunky 22 pounds, attesting to its solidity. I saw the regular Contour's enclosure under construction and noted its extensive internal bracing, the girth of the woofer magnets, and the complex crossover, so I can't attribute that weight to, say,

Photos: Michael Groen

DYNAUDIO

Rated Frequency Response: 37 Hz to 27 kHz, ±3 dB.

Rated Nominal Impedance: 6 ohms.

Rated Sensitivity: 85 dB SPL/1 watt/1 meter.

Dimensions: 15 in. H x 8 in. W x 11½ in. D (38.1 cm x 20.3 cm x 29.2 cm).

Weight: 22.2 lbs. (10.1 kg) each.

Price: \$3,499 per pair.

Company Address: 1144 Tower Lane, Bensonville, Ill. 60106; 847/283-1853; www.dynaudio.com.

TEST RESULTS

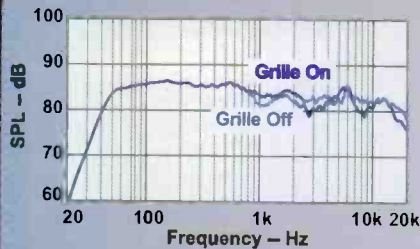


Fig. 1—On-axis frequency response.

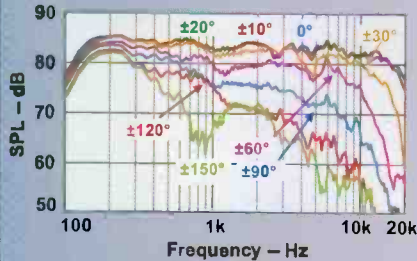


Fig. 2—Horizontal off-axis frequency responses.

Measured by True Technologies with its grille on and off, the Contour 1.3 SE's on-axis frequency response (Fig. 1) is admirably smooth and free of anomalies from 50 Hz to almost 1 kHz. With its grille off, a fairly pronounced dip of 5 dB appears at 1 kHz; interestingly, the dip's severity is significantly reduced—the opposite of what usually happens—by leaving the grille in place. On the other hand, leaving the grille on produces a large sag at 3 kHz and a slightly tamer one at 8 kHz. What to do? In terms of potential audibility, the 1-kHz dip, because it falls in the critical center of the midrange, is the riskier proposition. The dips at 3 and 8 kHz, because they're higher up, are unlikely to be as audible. Still, upper-midrange and high-octave response is unquestionably much smoother with the Dynaudio's grille off. Me, I say when in doubt, try it both ways. Place the Dynaudio speakers, one with its grille on and the other sans grille, in the middle of your room, with perhaps a foot or so between them. Play wideband vocal and instrumental music, in mono, and use your preamp's balance control to

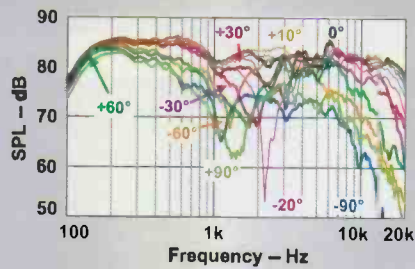


Fig. 3—Vertical off-axis frequency responses.

switch back and forth between the two speakers. Listen carefully to see which one sounds smoother and more natural.

The 1.3 SE's horizontal dispersion (Fig. 2) holds up very well to frequencies as high as 15 kHz over lateral angles as great as 30°; this should help the Dynaudio create a wide, spacious, and three-dimensional soundstage. In the vertical plane (Fig. 3), the effects of driver cancellation create a somewhat chaotic picture, with midrange output somewhat reduced relative to bass output. However, it's the horizontal dispersion that really counts, and the Dynaudio excels there.

**The Dynaudio's
wide dispersion
should help it create
a broad, spacious
soundstage.**

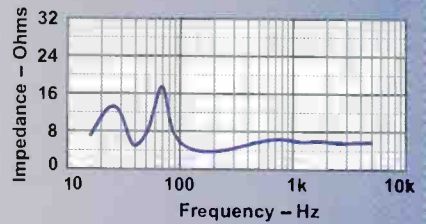


Fig. 4—Impedance magnitude.

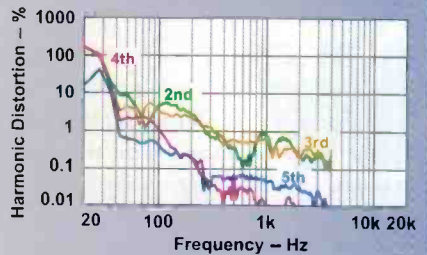


Fig. 5—Harmonic distortion.

Remarkably, the 1.3 SEs impedance (Fig. 4), at least above 300 Hz, adheres almost exactly to its nominal 6-ohm rating and is unusually linear. Impedance dips slightly below 4 ohms at 200 Hz and then climbs to a peak at 70 Hz and a lesser one at 25 Hz. In any case, the 1.3 SEs should prove a gracious load for any amplifier, although running them in parallel with a second pair of speakers would be somewhat imprudent.

As you can see from Fig. 5, the 1.3 SE keeps all harmonic distortion components below 1% down to 300 Hz; the fourth and fifth, for example, are less than 0.1% to 250 Hz. At lower frequencies, because of greater mechanical excursion of the Dynaudio's woofer, second and third harmonic distortion gradually climb to around 7% but then stabilize and remain under excellent control to 40 Hz, where a sudden upsurge of all distortion components signals the speaker's effective lower response limit. Although the 1.3 SE is not a large speaker, its very good control of distortion indicates it's capable of realistic, clean, high-level dynamic reproduction of all but the lowest frequencies.—Alan Lofft

Home Theater

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Cobalt CC20
600\$

Cobalt SW27a
1000\$



FIT AND FINISH



No fancy styling: Dynaudio's designers let fine materials speak for themselves.

lead ballast. This baby is intrinsically heavy. (Don't laugh; I know of one manufacturer who *did* fit ballast to make his speakers heavier.) Although it lacks styling fillips in the Italian manner (except for a slight chamfer around the 20-millimeter-thick MDF baffle), the 1.3 SE earns a "handsome" tag because its finish is so classy. The enclosure is veneered in gorgeous, light bird's-eye maple with a satin surface, set off by the black grille. You don't have to be a carpenter or a furniture expert to appreciate this element of the "SE" appellation.

Still, it's what's behind the grille that counts. Compared to the standard Contour 1.3, the SE version is actually an entirely new loudspeaker that just happens to be based on the cabinet, as described above, of the regular model. Since Dynaudio develops and produces all of the drivers in-house, it was hardly a major effort to manufacture special ones for limited editions. The front plates of both drivers are coated with an aluminum-metallic lacquer, in contrast to the black of the standard versions. The 6¾-inch long-throw woofer employs a Neodymium double-magnet system and a 3-inch aluminum-wire voice coil on a Kapton former, to improve bass transient response. These refinements are said to make the voice coil's movement much more linear and give the speaker deeper, more dynamic bass reproduction. The woofer crosses over at 2.6 kHz (at 6 dB per octave) to a 1½-inch soft-dome tweeter that has fer-

rofluid cooling and damping, a pure aluminum voice coil, a double-magnet system with its own rear chamber, and a 4-millimeter-thick die-cast aluminum front. The crossover network is a sight to behold, two circuit boards—not one—bearing more than 20 components. Dynaudio says it uses individual boards for the woofer and tweeter sections so it can separate them enough to prevent interactions.

I heard rolling bass and layered space, all from a box the size of a microwave oven.

In keeping with European regulations, the Contour 1.3 SE features overkill, CE-approved WBT terminals, but they accept banana plugs, spades, bare wire—you name it. Dynaudio skipped bi-wiring, which seems to be going out of fashion. The terminals are fitted to a handsome cast metal plug to insert into it if you place the speakers too close to a wall and suffer a surfeit of bass. I found it best to follow the instructions to the letter, using the SEs on sturdy stands and positioning them well into the room, some 5 feet from any walls.

Setup was surprisingly noncritical, once I got the 1.3 SEs away from boundaries. Toe-in wasn't as fussy as with Wilson Audio WATTs or most Sonus Fabers, and I found the Dynaudios gave their best when firing straight ahead, if I was seated more than 6 to 8 feet from the speaker line. By virtue of their benign impedance and middling sensitivity, I was able to use the 1.3 SEs with a wide range of amplifiers, from low-to-medium-power amps (such as the Roksan Caspian integrated), to Unison Research's single-ended triode Smart 845, to serious powerhouses (like Musical Fidelity's NuVista 300 and two of the 200-watt channels on the three-channel Acurus A200X3). Sources included the wild new SME 10 turntable and arm with a Lyra Lydian cartridge, a Pioneer DV-414 DVD player, and a Musical Fidelity XRAY CD player.

Admitting to prejudice, I expected the Contour 1.3 SE might have an over-etched, hyperanalytical sound, maybe a bit bass-shy but with exceptional imaging. Why? Because I'm as guilty as the next guy of judging Dynaudio by the way its drivers are used in other companies' speakers. I was only partly right, and I didn't realize quite how deceptive Dynaudio's reputation could be until I pulled out Tom Waits' latest album. Don't read too much into this. I'm not a big fan, but I find Waits somehow reassuring after seeing a film noir or reading a novel set in urban squalor in the '50s; he has that effect on me. Anyway, Waits' *Mule Variations* (on Epitaph) is full of lower-octave activity, his trademark growling and gravel, some stupendous piano figures, and the kind of atmosphere you could cut with a knife. Above all, though, it is *warm*, almost close and muggy. You can almost smell the Sterno.

In track 8, the bizarre "What's He Building," there's *Blair Witch*-y clanking and buzzing, and the narrative never lets you forget Waits played Renfield in *Bram Stoker's Dracula*. From a purist's viewpoint, I suppose that this track is a sonic nightmare (it's certainly a nightmare as far as the lyrics go) because you know it was assembled in a studio, all percussion and sound effects and spatial trickery. But the Contour 1.3 SEs did two things that made me sit back and rethink my prejudice about Dynaudio sound.

For one thing, they untangled that sub-300-Hz stew with the facility of big, fat circa-1978 BBC studio monitors. And they gave me a sense of scale that's hard to better for less than the price of Wilson Audio WATT/Puppies. I heard churning, roiling bass—a veritable flood of industrial noises—with such clarifying three-dimensionality that I had to try the Dynaudios with three different amplifiers to see if it was repeatable. It was.

With something as atmospheric but more musical—live Taj Mahal on *An Evening of Acoustic Music* (Ruf)—it was the same story: lots of air and plenty of room but clearly defined boundaries. Taj Mahal's rich vocals (only slightly less gravelly than Waits'), in front of banjo and tinkly, metallic guitar, vied for space with audience sounds. The clapping during "Blues with a Feeling" enjoyed its own spatial layer, complementing rather than competing. And all from a box no bigger than a microwave oven.

Spatial concerns and bottom-octave activity are only part of the deal. What forced me to alter my response to the Dynaudios was the way the Contour 1.3 SEs handled vocals, and not just the growls of Waits and Taj. How far away from them is Cilla Black? Try 35 years and 6,000 miles. Yet her work in EMI's Abbey Road studios—with a roster of tunes from Lennon/McCartney, Bacharach/David, and the like—exhibited an equal level of coherence, competence, and naturalness. I felt the same about the 1.3 SEs' handling of material in a whole 'nuther sonic spectrum: mono-era Louis Prima; Dolly Parton's bluegrass homage, *The Grass Is Blue* (Sugar Hill); Overmars' stunning punky/poppy debut, *Highlife* (WEA/Lightyear); and the newly remastered James Bond themes. This is not a genre-sensitive speaker but a deceptive little gem.

No, make that a mini-masterpiece. Dynaudio's Contour 1.3 SE is a real slice of high-end sensation, in a small package and with a price tag that's high but not obscene. Then factor in that it's also an import and a piece of fine furniture that should blend into almost any decor. Besides, there ain't nuthin' you can't make from a box of Legos if you put your mind to it. **A**



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"I was losing all my friends!"

Matt Polk, Speaker Specialist

Friends in the market for an audio system would often turn to me for advice. I was happy to help, because nothing thrills me more than helping someone discover the joy of great sound. But (I admit) I'm an audiophile. I would steer friends to the highest performance components they could afford. Then I would give them some quick set-up advice, and everybody was happy. Of course, that was 'stereo.'



Matt Polk,
Speaker Specialist

Things got complicated when digital home theater came along.

The phone calls would come just as we were sitting down to dinner. 'Hey Matt, what the %\$#&! is bass management and how do I turn it on?' Or, 'Matt you creep, I need an electronics degree to hook this contraption up!' Creep? Me? *Ouch!*

Obviously things aren't as simple as they used to be.

Don't get me wrong; I love digital surround technology. I just got tired of making after-dinner house calls to hook up, set up, and explain how to use complicated home theater systems. But I couldn't bring myself to recommend one of those 'home theater-in-a-box' systems. They're easy to operate, but they fall far short of 'spine-tingling' in the performance department.

I got to thinking, 'It doesn't have to be this way. There's no reason why you can't have an easy-to-use *high performance* home theater system.'

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So I designed a system that's easy to choose, easy to set up, and easy to use—and *still* delivers no-compromise performance. It's something entirely new: the RM Digital Solution. It features award-winning satellite/subwoofer speakers, a Dolby® Digital preamp/processor, and a 500 watt multi-channel amplifier—integrated into a *single system*. I engineered the 'high-end' component electronics to work specifically with the speakers. By optimizing the complete system—from input to speakers—I not only made it easy, I made it sound spectacular.

"\$2,699 for a complete system this good is not just a 'good value,' it's an outright steal!"

-Wayne Garcia, Etown.Com

Needless to say, now my friends get the simplicity and high performance they want, and I don't miss dinner.

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The industry is buzzing about my new RMDS-1. It's the first, best, and *only* high-end integrated home theater audio system. If it sounds like something you'd be interested in, call (800) 377-7655 ext. 161 and I'll send you a free brochure and tell you where you can hear an RMDS-1 near you."



The RMDS-1 was chosen by the editors of etown.com as the 1999 Product of the Year in the Packaged Home Theater System category.



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EDWARD J. FOSTER

Citation 5.0 A/V Preamp

darned good, I was sure that the digital add-on promised for it would produce the best Dolby Digital sound around. So I waited. And I waited. And I waited. But the add-on was never introduced. So much time passed that DSPs grew more powerful, the sound of digitally decoded Pro Logic improved noticeably, and the 7.0 now had serious competition for the best sound on the block. Ultimately, I gave up waiting for the add-on.

Meanwhile, the Citation 5.0 appeared, originally with Dolby Digital decoding and then with DTS decoding as well. It costs less than the 7.0 did but has fewer video inputs—six, two of them with S-video. (To me, two S-video inputs just ain't enough for an upscale controller; these days, I expect a stand-alone to support S-video on every input and ideally handle a couple of component-video sources, to boot.) It's okay that the 5.0 has only six analog audio inputs, because it also sports six digital audio connectors (four coax, two optical).

Audio outputs are provided for the three front channels, for side and back surround channels, and for stereo and mono sub-

woofers. There are stereo feeds for one recorder and a second room. On the video side, the 5.0 has composite- and S-video outputs for your TV, the second room, a video recorder, and a second TV. (You could also use that auxiliary video output for a second video recorder. However, there's no companion audio output, so you'll need a Y connector to feed sound along with the picture and you'll have to be careful not to record on-screen menus.) The 5.0 converts S-video signals to composite but not the other way about.

There's an input for an infrared sensor on the back panel, so you can control the Citation 5.0 from another room or if it's inside a cabinet (which would be a pity, as it's rather attractive). Two programmable trig-

I considered the Citation 7.0 A/V pre-amp/processor, which I reviewed in the April 1996 issue, to be in a class by itself. It handled eight audio channels and eight video sources. And four (count 'em, four!) of those sources had S-video jacks even though S-video was the new guy on the block and few people were likely to need all of them. In my opinion, it was the most flexible controller on the market and the best-sounding. Nothing deciphered Pro Logic in the analog domain as well as Jim Fosgate's super-fast steering logic in the 7.0. And this box had some of the finest analog-derived simulated surround you could shake a stick at—again thanks to Fosgate, who was a wiz at circuits to dig ambience out of recordings.

Though the 7.0 became my reference (and served the same function for several other reviewers), it was a straight analog box at a time when Dolby Digital was lurking in the wings. For a while I patched the 7.0 through a Sony SDP-EP9ES Dolby Digital processor. But the 7.0 sounded so

CITATION

Dimensions: 17½ in. H x 4 in. H x 15½ in. D (44.5 cm x 10.2 cm x 39.4 cm).
Weight: 21 lbs. (9.5 kg).
Price: \$3,650.
Company Address: c/o Madrigal Audio Laboratories, P.O. Box 781, Middletown, Conn. 06457; 860/346-0896; www.citation-audio.com.



Photos: Michael Groen

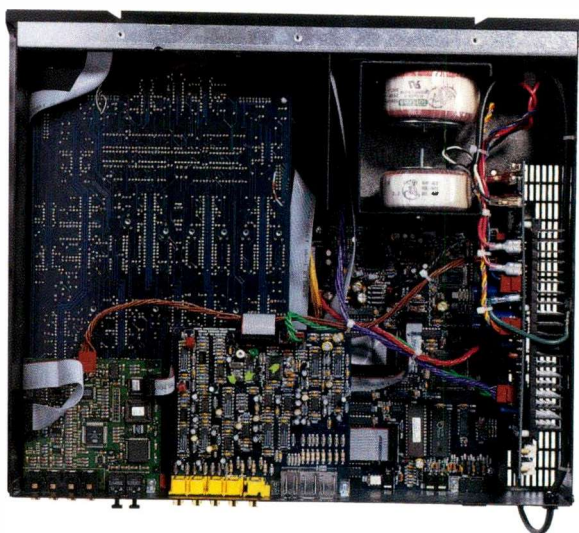
ger outputs can activate power amps, a projection screen, and what have you. And a serial port is provided for control by computers, "optional wired remote controls," or home automation systems; it requires optional software, and dealer assistance in setup is strongly recommended.

You can do a few things from the 5.0's front panel, but, like most A/V preamps, it's best operated from its remote, a rather typical, smallish affair. Although the controls aren't illuminated and most are relatively small and similarly shaped, it does give you one-button access to many functions that other remotes do not. Some buttons are out in the open, others behind a sliding panel. You can vary bass boost, kick in "Hi-EQ" to simulate Home THX re-equalization, choose "Panorama" to spread the sound along the side walls (if that's permitted in the mode you're using), toggle the triggers and center speaker on and off, select wide or normal center spread ("Wide" bleeds the center into the left and right front to diffuse the center soundstage), and boost the center channel's level by a few dB to narrow the soundstage—all without wading through endless nested menus. I like that. Four buttons access fairly standard sound processing modes ("Dolby," "6 Axis," "Stereo," and "Party"), and three more call up custom modes (preprogrammed to generate "Rock," "70mm," and "Classical" sound fields but modifiable to suit your whim). Also behind the remote's sliding panel are buttons to access the six analog and six digital audio inputs individually. Other buttons select a program source (analog only) to be fed to the second zone, turn that feed off, and mute or adjust the volume in that zone. You can use the audio source selectors to turn the 5.0 on and select the main program source, but it's more convenient to use the "Watch" and "Listen" keys. Pressing either will turn the 5.0 on, present a list of video or audio program sources, and default to the last source you used.

You can select each source's video and audio input, surround decoder, and sound-field enhancement (if desired) during setup

or use the 5.0's preassigned combinations. The "LD ANLG" program, for example, ties the first composite-video input to the first analog audio input, chooses "6 Axis" presentation with "Auto-Balance" on, and sets input level to automatic.

Unlike most current A/V controllers, the Citation 5.0 processes analog signals in the analog domain. Today's controllers usually digitize analog signals as soon as they come in, processing everything in the digital domain and converting back to analog on the



The Citation 5.0 retains some of the 7.0's features, adds Dolby Digital and DTS, and costs less.

way out. Digital processing imposes a hard upper limit on frequency response (nothing beyond 20 or 21 kHz gets through) and exposes the signal to artifacts like quantization noise, converter nonlinearity, and truncation error. On the other hand, once in the digital domain, signals are not subject to additional random noise or the nonlinearities in analog circuits that cause distortion. Furthermore, many operations can be performed more readily and precisely in the digital domain. On the whole, these advantages lead to better performance, although I'm not saying digital signal processing is a panacea or that it is guaranteed

to be distortion-free. It invariably increases word length, and some nasty and harsh-sounding distortion can occur if the long data words are not handled properly in the processing chips or are not dithered properly when word length is reduced to fit the DAC. Back when some audio manufacturers cut corners because they didn't know how to do things right or found it too expensive, a good analog processor (like the Citation 7.0) could easily beat the pants off a crappy digital box. But now, with the cost of super-powerful DSPs having rapidly fallen, digital problems can be overcome at reasonable cost.

When it comes to movie soundtracks, the Citation 5.0's analog processing makes it a buggy whip in the days of the Lexus. The 60-kHz bandwidth that the 5.0's analog processing makes possible is really wasted on movie soundtracks, which don't extend past 20 kHz. And as a Pro Logic processor, the 5.0 is no match for my EAD TheaterMaster Ovation, which is at least equally clean (maybe even more so) and produces a more stable image. The Citation's image-stability deficiencies may have resulted, at least in part, from the erratic action of its automatic balancing circuit (see "Test Results"), which can't be defeated in Pro Logic.

Sad to say, the Citation 5.0's performance in Dolby Digital surround was even worse. Its bass management was totally screwed up, with low-frequency effects signals appearing where they shouldn't have (again, see "Test Results"). You have to set your system up to use "Small" speakers all around if you expect their cones to survive after Godzilla tromps through. How Citation could take so long to come up with a Dolby Digital processor and then get it wrong is beyond me.

What the Citation 5.0 does best is Jim Fosgate's hallmark, the extraction of natural-sounding ambience from naturally recorded material. I imagine this can be done in the digital domain at least as well, but when you give engineers too much DSP power, few seem to resist the temptation to concoct weirdo effects. I prefer the less contrived Fosgate approach that just milks the

TEST RESULTS

Sad to say, the Citation 5.0 was a disappointment on the bench. Take stereo frequency response with an analog source, for example (Fig. 1). Sure, the 5.0 clears the 20-kHz barrier common among today's "digital preamps" (the -3 dB point is out beyond 60 kHz), but the right channel had a weird, step-like response that changed from one test run to the next. I beat my head against this wall for some time until I tried defeating the automatic balancing; lo and behold, the right channel's response shaped up and looked very much like the left's. Apparently the 5.0's analog auto-balance circuit shifts gain with frequency, inducing the response anomaly. My test signals are perfectly balanced to start with, so the auto-

balance circuit should have left well enough alone. Who needs auto balancing in stereo, anyway? Why not default to manual balancing in stereo? Based on the results in Fig. 1, what would you choose? Figure 2 reveals that with digital signals, which are unaffected by the auto-balance system, response may not get out beyond 20 kHz (note the change in frequency scale from Fig. 1), but it's perfectly balanced and essentially flat in both channels. I'll take that any day, thank you.

As you can see in "Measured Data," analog input overload was more than adequate. Gain topped out at just over 2 dB with the input level control at 0, its midpoint. Therefore, I couldn't run curves of total harmonic distortion plus noise (THD + N) versus frequency with an analog input and still follow IHF standards, which specify 12-dB gain. The best I could do was to crank the volume control up all the way and let the chips fall where they might. (Raising the input level setting would have done the trick, but I didn't want to introduce another variable.)

Figure 3 compares THD + N versus frequency in stereo mode for analog and digital signals. Although the flatness of the curves taken with analog input might lead you to suspect the THD + N is noise, it's true harmonic distortion, predominantly second-order. Still and all, the distortion is quite low (less than 0.053%) even though performance from a digital input is far better. Interchannel crosstalk, too, was better for digital signals than for analog. The latter was hardly punko, however, with worst-case figures of about -47 dB at the highest frequencies (versus -68 dB or so for digital) and about -62 dB (versus -75 dB) at 1 kHz.

It's not really cricket to combine spectrum analyses taken using digital and analog inputs in the same graph because they use different references and the gain settings are different. However, it does save space. For Fig. 4, I referenced the analog curve to 2.208 volts rather than the usual 1 volt so it could be plotted on the same

MEASURED DATA

Maximum Output Level, Analog

Signals: Left and right front channels, 9 V; center channel, 6.4 V (9 V with boost); surround channels, 2.5 V.

Maximum Gain: Input level at "0," +2.2 dB; input level at "-32" (min.), -14 dB; input level at "+31" (max.), +12.1 dB.

Analog Input Overload: Input level at "0," 7.2 V; input level at "-32" (min.), 9.5 V; input level at "+31" (max.), 2.2 V.

Analog Input Impedance: 10.9 kilohms.

Analog Output Impedance: 300 ohms at main or recording outputs.

Channel Balance: Analog input, ± 0.06 dB; Dolby Digital, ± 0.15 dB.

S/N, Stereo Mode: Analog input, 88.1 dB A-weighted and 80.9 dB CCIR-weighted, both re 1 V; digital input, 98.5 dB A-weighted and 89.7 dB CCIR-weighted, both re 0 dBFS.

Quantization Noise, Stereo Mode: -90.8 dBFS.

Dynamic Range, Stereo Mode, Digital Input: Unweighted, 94.4 dB; A-weighted, 97.2 dB; CCIR-weighted, 88.3 dB.

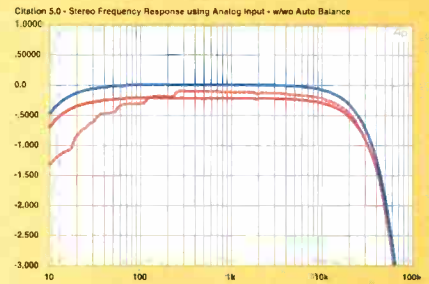


Fig. 1—Frequency response, stereo mode, analog input. Left, blue; right, red; with auto-balance, dashed.

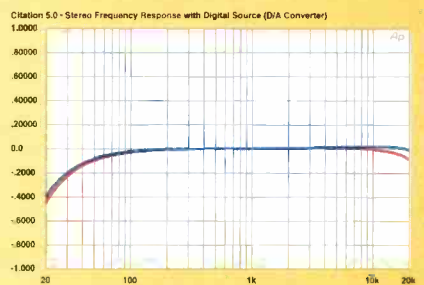


Fig. 2—Frequency response, stereo mode, digital input. Left, blue; right, red.

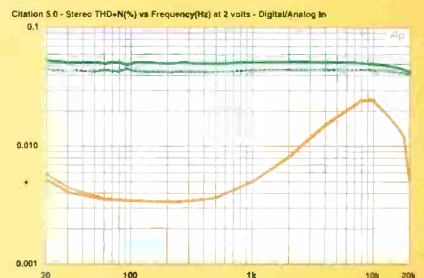


Fig. 3—THD + N vs. frequency for analog input (green) and digital input (orange). Left, solid curves; right, dashed curves.

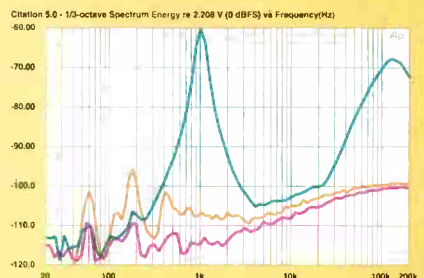


Fig. 4—Noise spectra. For -60-dBFS, 1-kHz digital input, aqua; for "silent" input, analog is orange and digital is magenta.

TEST RESULTS

vertical scale as the digital curves (which are referenced, as usual, to 0 dBFS). It's apparent that the Citation's DACs mute on digital silence, as most do, and use high-order noise shaping to move quantization noise out beyond 20 kHz. (Look how steeply the -60 -dBFS/1-kHz curve rises above 20 kHz.) Furthermore, although the 5.0 is reasonably quiet with analog or digital signals, there's a good bit more hum via the analog inputs. I expect it is caused by flux leakage from the power transformer, since the components are at 60 Hz and at the odd harmonics of that frequency (predominantly the third and seventh).

Figure 5 shows the response of the Citation 5.0's high- and low-pass crossover, its "Bass Boost" circuit (which peaks at 80 Hz), and its "Hi-EQ" (a treble roll-off that emulates THX re-equalization). "Bass Boost" can be adjusted in 2-dB in-

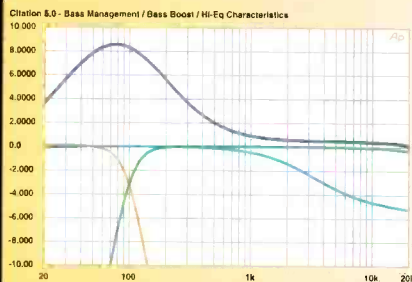


Fig. 5—Response with "Bass Boost" (purple), "Hi-EQ" (aqua), high-pass crossover filter (green), and low-pass crossover filter (orange).

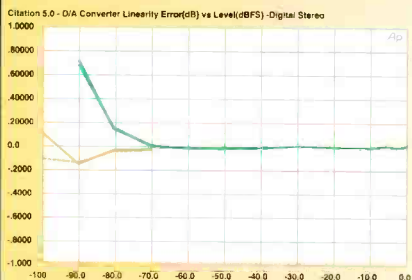


Fig. 6—Linearity error. Undithered signal, green; dithered signal, orange; left, solid curves; right, dashed curves.

crements; the results here are for the maximum setting. The 5.0's bass management is somewhat unusual in that it uses identical 18-dB/octave slopes for both high- and low-pass. (Electrical crossover occurs just below 100 Hz, where each filter is down about 3.5 dB.) It's more common for the low-pass rolloff to be sharper than the high-pass, on the assumption that it's more important to keep the lower mid-range and its directional cues out of the sub than it is to keep bass out of the other speakers. Small speakers usually roll off smoothly and naturally in the low bass anyway, which increases the slope of the acoustic crossover. Apparently the 5.0's designers don't see it that way. To each his own.

The Citation's analog input impedance was reasonably decent in stereo but could have been higher. The output impedance of both the main and recording outputs was low (terrific!), and there was more than adequate output capability to drive any power amp berserk.

Let's turn now to the D/A converters, whose THD + N and linearity were both excellent. At -6 dBFS, THD + N dropped below -91 dBFS, which is quite impressive, and was about -92 dBFS for signals from -20 to -90 dBFS. Linearity error (Fig. 6) is nonexistent to -70 dBFS and negligible to -100 dBFS with dithered material. No complaints here. No complaints about dynamic range and quantization noise, either (see "Measured Data"). Although the maximum output to the center and surround channels in Dolby Pro Logic operation was lower than to the left and right fronts, it was adequate. And over the bandwidth appropriate for Pro Logic measurements, THD + N at 2 volts for all channels was nearly as low as it was for the pair in stereo operation.

The frequency response of the right front channel in Pro Logic mode (Fig. 7) has the same anomaly I found in stereo. You can even see the effect in the center channel and, very slightly, in the surround. (Automatic balancing can't be de-



With the 5.0's remote, you can operate many features without wading through endless menus.

ambience that's already in a recording rather than generating synthetic stuff. The downside is that what you get depends entirely on the recording.

I've been recording digitally for almost 20 years, using a number of microphone techniques, mainly simple ones: spaced omnis, cardioids in ORTF and similar arrays, and occasionally one-point cardioids or M-S mikes. The Citation 5.0's "Classical" mode (which shuts the center speaker off, increases surround delay, and slows the steering logic) made many of my recordings sound fuller and better. I had to shorten the surround-channel delay and drop the surround level below the 5.0's default settings to keep the main sound from getting too fat and wandery. But once I did, my recordings had more of a natural, you-are-there presence than they usually do without processing. The operative word here is "natural"; when ambience strikes me as contrived, I soon tire of it.

With commercial recordings, too, the simpler the mike setup, the more realistic the results were likely to be. In the classical world, this included Jack Renner's recordings on Telarc, Craig Dory's on Dorian, and John Eargle's on Delos. John, for example,

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Robert Deutsch on the Velodyne HGS10
Stereophile Guide to Home Theater,
September 1998



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TEST RESULTS

Citation 5.0 - Dolby ProLogic Frequency Response - Front LCR and Surround

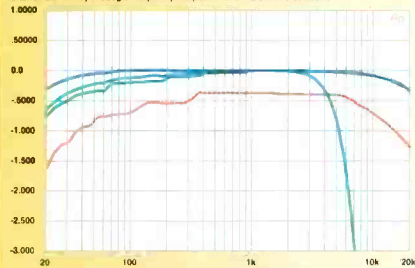


Fig. 7—Frequency response, Dolby Pro Logic mode. Center channel, green; left front, blue; right front, red; left surround, aqua.

Citation 5.0 - Dolby Digital Frequency Response - Front / Surround / LFE

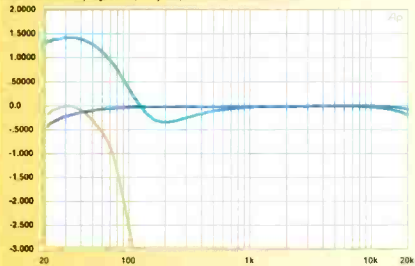


Fig. 8—Frequency response, Dolby Digital mode. Left front channel, blue; left surround channel, aqua; LFE channel, orange.

feated in Pro Logic mode; you have to live with it.) That weirdness aside, the Pro Logic response curves are quite respectable in extent and uniformity, and the surround-channel response falls rapidly above 7 kHz, as it should. A-weighted noise was substantially higher in Pro Logic mode than in stereo (especially in the important left and right front channels). Channel separation, on the other hand, was excellent, considering that this is an analog decoder.

The Citation 5.0's Dolby Digital performance was sub-par in several respects.

Separation in the bass and lower mid-range was surprisingly poor between the surround and front channels—not a good place to have such a problem. Below 100 Hz, separation between any front channel and either of the surrounds was only about 15 dB; it increased to 50 dB from about 700 Hz up. I've never seen such numbers for a Dolby Digital decoder, not even in the early days.

As you can see in Fig. 8, the three front channels' frequency response in Dolby Digital mode is fine—basically, +0, -0.5 dB across the audio band. However, the surround-channel response has a weird bump of nearly 1.5 dB at 35 Hz.

These anomalies may be related to the Citation 5.0's improper handling of the Dolby Digital low-frequency effects (LFE) channel, although I can't be sure. With the exception of the LFE response curve in Fig. 8, my tests were made with signals that did not contain LFE information. When I did try to use recordings that contained an LFE signal, it appeared at full level in every channel set up to use "Large" speakers, whether the subwoofer output was set to "Mono," "Stereo," or "LFE Only." No Dolby Labs-approved bass-management system that I know of permits the LFE to be redirected to the center or surround channels. Even redirection to the left and right front speakers should not occur if there's a subwoofer in the system. Beats me how the Citation 5.0 got Dolby certified!

At least distortion in Dolby Digital mode was reasonably low. For the most part, it was less than 0.08% in the worst (center) channel. I guess one shouldn't complain about that.—E.J.F.

is fond of using an ORTF array as the main stereo mike setup, "sweetening" only where needed (and then in moderation). His Delos recording of a *A Brahms/Schumann Soirée*, played by Carol Rosenberger and David Shifrin, responded well to the Citation 5.0's processing. So did the Delos recording of guitarist Paul Galbraith playing Bach's Six Sonatas & Partitas, for which John set up the mikes. Galbraith's eight-string instrument has an endpin like a cello; he holds it like a cello, too, with the endpin resting on a wooden resonator. The result is a very warm, full sound with, for guitar, an unusually robust bottom end.

The Citation 5.0's "6-Axis" setting, which generates three-channel stereo surround from Pro Logic's mono surround signal, often sounded good, but I preferred the "Classical" mode, especially as it is more amenable to user modification. "Party," which sends a stereo signal to the

The Citation 5.0 made my own recordings sound fuller, with a more natural presence.

main and surround speakers, seemed pretty useless except to pump out full-level sound all around. "Rock," with fast steering logic and minimal surround delay, seemed to bounce things around a lot. I didn't care for the results, but I ain't into hip-hop. Nor am I much into jazz, but I did rather like the "Jazz" mode on my buddy Tom Jung's small-band recordings on the dmp label. Though Tom typically uses multiple mikes, he has a knack for mixing realistic sound.

Despite the Citation 5.0's real virtues, I can't recommend it. It's out of date and has too many technical problems. To me, it seems that Citation, the once-proud premium brand from Harman Kardon, has fallen on hard times. If the Harman empire no longer is willing to support Citation with the engineering wherewithal it needs to survive in today's world, it owes the brand a decent burial.

A



Plenty of jacks populate the Citation 5.0's rear panel.



Disintegrated.

The performance of integrated amplifiers is compromised for all-in-one convenience. Integrated amplifiers are not equipped with the heavy-duty, high current, high voltage power supplies available in the best separate power and preamplifiers. First of all, there just isn't enough space. More importantly, there are technical limitations. In an integrated amplifier, such supplies would generate unacceptable levels of heat and hum. And the high signal levels found in the power output stages create a source of noise, crosstalk, and preamplifier instability. Obviously, heat and noise-generating elements shouldn't be operating in close proximity to the preamplifier circuits. However, this is exactly where such elements, scaled down-to be sure, are found in integrated amplifiers.

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channel uses eight carefully matched pairs to produce 300 watts per channel into 8 ohms and 450 watts per channel into 4 ohms. The GFA-5802 also includes switchable balanced (XLR) and unbalanced (RCA) inputs and dual sets of heavy duty, gold plated, five way binding posts ideal for biwiring.

The GFP-750 is a purely passive attenuator/switcher or, at your option, an active preamplifier. In passive mode, the signal sees only input switching and the high resolution attenuator. In typical Adcom fashion, the GFP-750's massive high current power supply features a large toroid transformer with multiple secondary windings for each channel. Specially chosen storage capacitors insure responsive voltage supply to all active elements. For active gain functions, it offers true differential balanced audio signal paths, with MOSFET devices. The GFP-750 features remote control, balanced (XLR) and single ended (RCA) inputs for CD as well as single ended inputs for four additional line level analog sources. Independent balanced and single ended outputs allow easy interface with almost any amplifier.

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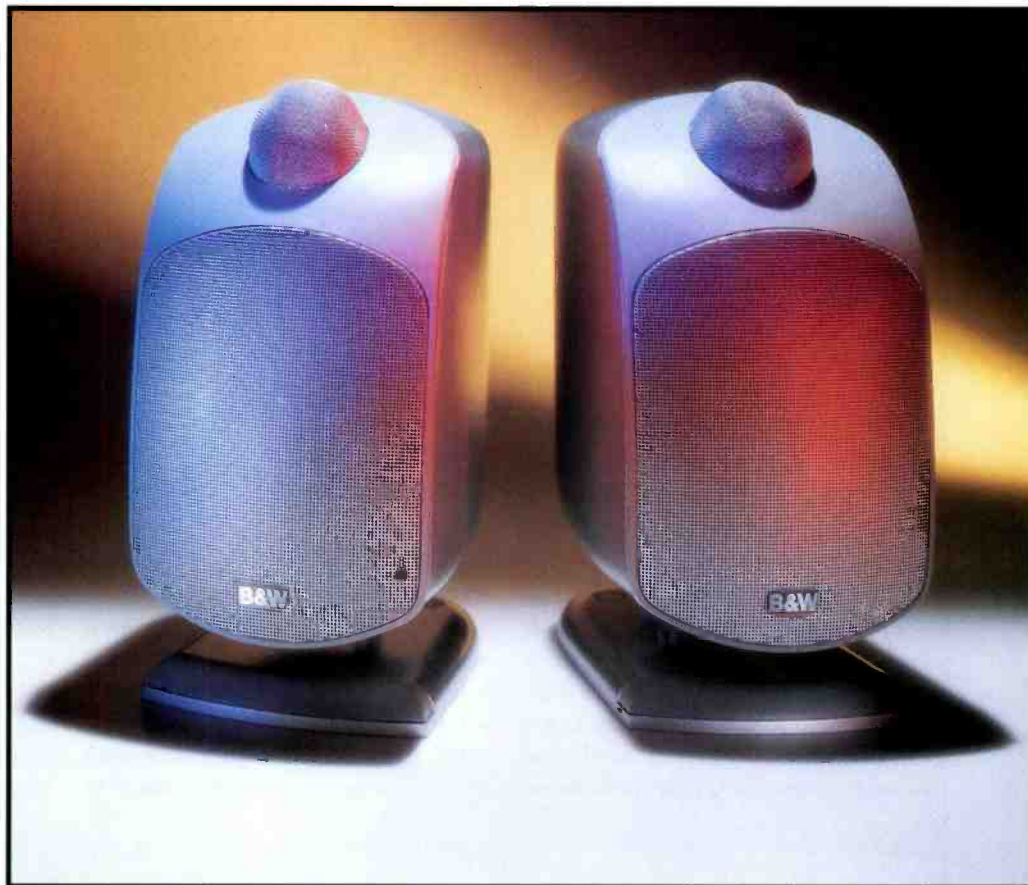
B&W LM-1 Speaker

The term “audiophile” rightfully carries with it some negative connotations, in the same way that the signifiers “Trekkie,” “Dittohead,” and “Manson family” can make sensible human beings recoil in horror. It’s one thing to love music and want to hear it in the most precise, evocative manner possible. Some folks, however, are two steps away from marrying their audio equipment; they’d be dragging it up the aisle right now if it weren’t for the electronically dangerous proposition of man/speaker love.

Luckily, it’s possible to be a hi-fi fanatic without taking it too far, price or otherwise. In speakers, as in the mating ritual, size often does matter, but you can still derive pleasure from a system that doesn’t take up a lot of space or cost a whole lot of money.

B&W’s new \$350/pair LM-1 “Leisure Monitors” are a good example. They’re only 11 inches high, 5½ inches wide, and 7½ inches deep. A 5-inch polypropylene woofer is crossed over at 3.5 kHz to a 1-inch dome tweeter, in a vented box system that’s rated as 6 dB down at 65 Hz. Because the LM-1s are magnetically shielded, you can place them next to a television or computer monitor without distorting the screen image. A neat feature is that you can mount them on a wall via a built-in bracket that also serves as the base if you opt to place these speakers on a shelf or on stands. There’s an Allen key thoughtfully hidden beneath each base to adjust the LM-1’s angle, and B&W includes a template to mark the exact location of the screws. The cable connectors are good-quality, five-way binding posts.

The LM-1s are a bit wacky-looking, but they complement the other components in



my living room while giving it a smooth-edged, Expo ’70 feel. Obviously borrowing a page from Apple’s wildly successful iMac, B&W offers the LM-1s in a variety of colors—black, pearlescent white, burgundy red, silver, and, yes, teal/turquoise. The nonremovable woofer grille is finely perforated metal; the same material bubbles up over the tweeter. This speaker looks like something you’d see on the spaceship in *2001: A Space Odyssey*, although I don’t think it’s capable of killing you and the other crew members when you aren’t paying attention.

I placed the B&W Leisure Monitors on rigid, 22-inch-high stands and drove them with an Acurus DIA150 integrated amplifier. A Yamaha DVD-C900 DVD/CD player was the program source, and I hooked things up with Kimber cables. My main

source of comparison for the B&Ws was a pair of NHT SuperTwo floor-standing speakers, which cost more than twice what the LM-1s do. Still, I find that if you let the little kids play with the big kids every once in a while, you might find out that you’ve

got a star halfback on your hands. So now, here comes the kickoff.

Duke Ellington may well be the most fully documented musician in American history, and *Blues in Orbit* (Columbia) is as el-

B & W

Rated Frequency Response: 75 Hz to 20 kHz, ±3 dB.

Rated Nominal Impedance: 8 ohms.

Recommended Amp Power: 25 to 100 watts.

Dimensions: 11 in. H x 5½ in. W x 7½ in. D (28 cm x 14 cm x 19.1 cm).

Weight: 5½ lbs. (2.4 kg) each.

Price: \$350 per pair.

Company Address: 54 Concord St., North Reading, Mass. 01864; 800/370-3740; www.bwspeakers.com.

TEST RESULTS

Smack in the middle of the B&W LM-1's on-axis frequency response (Fig. 1), as measured quasi-anechoically by True Technologies, is a big, fat, 5-dB hump just above 1 kHz: It's the speaker's most conspicuous departure from otherwise smooth response between 100 Hz and 3 kHz. Because the hump at 1.3 kHz is also obvious in all the horizontal (Fig. 2) and vertical (Fig. 3) off-axis curves, it's likely the B&W will sound somewhat up-front, or in-your-face, on some vocals and instrumentals. Above 3 kHz, the on-axis response gets a bit choppy, with a modest peak at 4 kHz, a dip at 8.5 kHz, and a substantial hump centered around 14 kHz. Although these anomalies are echoed in the horizontal and vertical off-axis curves, it's the 1-kHz hump—and its prominence in the midrange—that will have the most audible effect.

By contrast, the LM-1's upper- and lower-bass response, from 800 to 100 Hz, is commendably smooth. And it doesn't have the 150-Hz boost that's often engineered into small speakers to give listeners the impression of big bass but usually imparts a fat coloration to male vocals. Below

The LM-1's recessed cable connectors are good-quality, five-way binding posts.



100 Hz, bass response rolls off smoothly; it's -5 dB at 60 Hz and -10 dB at 40 Hz, quite respectable performance from a small woofer. In many rooms, the effects of boundary reinforcement should help support the LM-1's bass output.

Off axis, the LM-1's lateral dispersion (Fig. 2) is nicely maintained to about 10

degrees, stays below 4 ohms (except for a peak at 140 Hz) up to 1 kHz—a bit peculiar, because B&W rates the LM-1 nominally at 8 ohms. Strictly speaking, it might have been better to call this a 4-ohm speaker. Above 1 kHz, the impedance slopes gently up to about 9 ohms at 6 kHz and then gradually declines. The curve itself is fairly smooth—apart from the usual artifacts of vented-box tuning at 45 and 140 Hz. Nevertheless, any amp or receiver that drives the LM-1 should definitely have low-impedance load capability.

The second through fifth harmonics (Fig. 5) indicate that the LM-1's overall distortion is mostly well controlled (about 1% or less) above 100 Hz. Thus, the B&W should play adequately loud without starting to sound congested and awful. True, second-harmonic distortion climbs to about 8% at 300 Hz, and, with distortion running from 10% to 50%, the little woofer is pumping real hard below 100 Hz. Still, the LM-1 acquitted itself better than some much more expensive speakers, and it should be reasonably persuasive reproducing moderately loud listening levels.—Alan Lofft

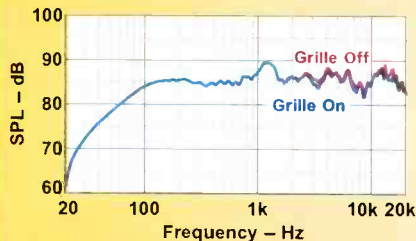


Fig. 1—On-axis frequency response.

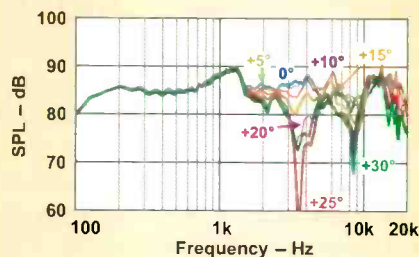


Fig. 3—Vertical off-axis frequency responses.

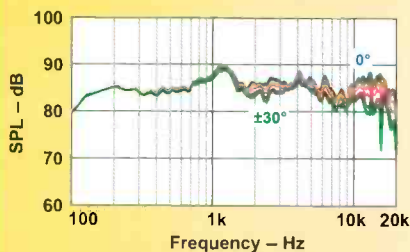


Fig. 2—Horizontal off-axis frequency responses.

kHz, which augurs well for a reasonably spacious soundstage. Its vertical dispersion (Fig. 3) evidences the usual untidy interaction between drivers in the crossover region. In most rooms, however, it's a speaker's horizontal dispersion that plays the greater role in shaping tonal balance.

The LM-1's impedance curve (Fig. 4) touches a low 3 ohms below 100 Hz, dips even lower between 200 and 700 Hz, and

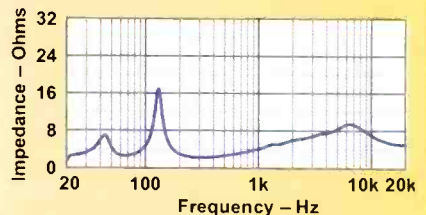


Fig. 4—Impedance magnitude.

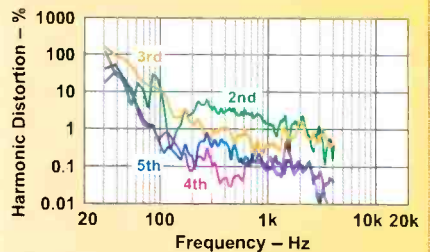


Fig. 5—Harmonic distortion.



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egant as anything in his catalog. The strolling title track features Duke tickling the ivories in a manner that suggests Count Basie's famous minimalism. Though not remastered, this is a cleanly engineered session from the late 1950s.

The LM-1s didn't handle Ellington's piano as well as the bigger NHTs. Through the NHTs, there was an almost buttery sound to the orchestra, with the low end spreading out behind the horns while the cymbals faded away without overstaying their welcome. Through the B&Ws, the sound wasn't as precisely tempered; there was a little harshness when Ellington struck the keys hard. However, though they didn't sound as humanly breathy as they did on the larger speakers, the horns had a full, earthy tone on the LM-1s. I could distinctly pick up the voicings of the various reeds, bringing Ellington's textured arranging skills to life. And the bass, though a bit light overall, established a solid backdrop. Each plunk of the strings died away without losing its coherent shape, and it wasn't the least bit muddy. The B&Ws did a superb job with the sound throughout the album. The horn section suddenly kicking in never overtaxed them, and I didn't hear any distortion at high volume levels. This kind of spacious jazz is ideal for the LM-1s' range; Johnny Hodges' alto, in particular, sounded especially robust.

I absolutely despised Fleetwood Mac when I was growing up. You just couldn't turn on a radio without hearing *Rumours* (Warner Bros.), and Stevie Nicks' forevertwirling California witch persona was painfully embarrassing to watch, even for a 15-year-old. Now that I'm an adult and know how foolish perfectly decent people can get, I'm able to look past the depraved bacchanal stylishness and appreciate the group for the tight, smooth-rocking unit that it was.

The hit single "Dreams," with its clean, thumping bass line and Nicks' sandpaper voice mixed up front, is well suited to the B&Ws. This is a fastidiously produced recording, and the LM-1s did a remarkable job with it. The cymbal clashes rang loud and true, and, even more so than on the

Ellington album, the image faded away distinctly. The cymbals didn't suddenly appear and then get lost in the rest of the music. The bass was deep and rich, a surprisingly ample sound. It didn't flatten out into mush in the lower register or just envelop



B&W's LM-1s are adept at detailing a broad range of sounds.

the whole song with a sort of dull, bottom-heavy roar. It sounded rounded-out, giving the tune an appreciable amount of bounce. I could crank the B&Ws up without the slightest loss in clarity, and the feisty low end on this track was close to spectacular. I can't imagine anyone being disappointed with how they handle this kind of music.

I'm not what you would call a classical music buff, but I've always been a fan of Holst's *The Planets*. Even if you've never heard it before, you've heard it. (John Williams robbed Holst blind when he wrote the score for *Star Wars*.) I'm especially partial to "Jupiter, the Bringer of Jollity," which moves through a variety of inspiring, string- and horn-laden passages that can give any system a workout.

On the Holst opus (Charles Dutoit and the Montreal Symphony Orchestra, London Records), the NHTs were better suited to conveying the vastness of an orchestra. When the brass played in the lower register, it boomed forth magnificently, and the clear imaging conveyed the location of var-

ious instruments. Things got temperamental, however, when the horns were played in higher tones. They started to screech a little and lose their definition.

I certainly couldn't expect the LM-1s to remedy that, and they didn't. But they didn't completely embarrass themselves, either. There was a slightly hollow sound to the proceedings; the timpani, for instance, wasn't gone, it just didn't emit as much rumble as on the bigger NHT speakers. Some of the inherent power of the music was lost in the process; the bass wafted rather lightly behind the other instruments when the music called for something more forbidding. Things sounded much better when I played the Holst disc at medium volume. If you're not looking to blast symphonies at levels that can shatter a chandelier, the B&Ws get the job done.

Being very small speakers with a 5-inch woofer, the LM-1s don't always generate a significant amount of low end (they're not likely to split your skull open when Ringo hits a tom-tom)—but that sort of limitation is to be expected. What I look for in a small monitor is the ability to blast at loud volume levels without the music rasping or fraying around the edges. And they should display a certain precision in sound separation. Each instrument should have a distinct identity in whatever you listen to. The LM-1s do all of these things very well.

The LM-1s are adept at detailing a broad range of sounds. The high end isn't too bright, and the bass, though gentle, is still warm enough to supply the music with a foundation. A lot of small monitors give you one or the other—a booming, muffled bottom end that covers the rest of the music like an old blanket or an overwhelming tinniness that turns every song into an unpleasant metallic clatter. The LM-1s are hospitable musical hosts. For the most part, everyone gets to be heard, and that's what makes any conversation more interesting.

B&W has designed a multipurpose monitor that sounds good and has a civilized price tag, to boot. If you're just getting into high-end speakers, this would be an ideal place to start. **A**

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DARRYL WILKINSON

Sunfire Cinema Grand Signature Five-Channel Amp

expensive in the grand scheme of things. There are amplifiers that cost a lot more, like the \$5,000 Krell KAV-500 multichannel amp (I've been using one lately as therapy for my sad compulsion to buy cheap). But when the Sunfire arrived, I had my doubts whether I'd spend *my* money on it.

The Cinema Grand Signature looks like the other Sunfire amps. (They all have the same chassis, which helps keep costs down.) A meter with mellow, adjustable lighting is the sole embellishment on an otherwise minimalist front panel. A glass-plate base lifts the amplifier off the shelf, making it seem as if it's hovering in space. I liked the clean, Spartan look; it says, "no frills, just performance."

The only visible difference between this Signature version of the Cinema Grand and the original model is Bob Carver's signature in gold on the front panel. There's more to differentiate it, however, than penmanship. In addition to a detachable power cord and better binding posts, the Cinema Grand Signature has twice as many output devices, a larger transformer, a more robust power supply, and the latest incarnation of Carver's Tracking Downconverter power supply.

One of the reasons Carver is proud enough to sign the Signature Cinema Grand is that he thinks it may be his best amplifier ever. At 375 watts per channel into 8 ohms, it's certainly one of the most powerful multichannel amps you can find today. And my free promo calculator shows me that its total of 1,875 watts comes out to about \$1.86 a watt. Now, that's a number I



I admit it. I'm a receiver kind of guy. It's not that I don't believe separates sound better. I do. It's not that I don't believe that, for the most part, they're worth the money. They are. I could say it's because I'm "frugal," "value-oriented," or even "economically minded," but the dirty truth is I'm just cheap. Though I've heard lots of great-sounding equipment during 15 years working in A/V stores, I'm embarrassed to admit that when it came to spending my own money, I always wound up with something cheap. Don't get me wrong: I like expensive things. I like owning them. I just don't like to pay for them. And when I do, I need to be overwhelmingly convinced that I'm getting more than what I paid for. Much more.

So when Sunfire sent me its latest amplifier, the Cinema Grand Signature, to review, I felt a little trepidation. I've met Bob Carver. He's a nice guy. More than that, he's dreamily passionate—you could even say fanatical—about what he does. I once saw him tear apart a prototype of Sunfire's True Subwoofer in an attempt to find and fix a mysterious minor rattle before a consumer demo. (After an hour, he finally tracked down the problem—a pipe in the demo room's wall.) When someone puts that much passion and energy into something, I'm impressed.

I kept thinking, though, that at \$3,495, this amp better pack a wallop (it would be nice if it made me more attractive to the opposite sex, too). I know \$3,500 is not really

SUNFIRE

Rated Power: 375 watts per channel into 8 ohms or 750 watts per channel into 4 ohms.

Rated Distortion: 0.5% THD.

Dimensions: 19 in. W x 6½ in. H x 15¼ in. D (48.3 cm x 16.5 cm x 40 cm).

Weight: 47 lbs. (21.4 kg); with glass base, 54 lbs. (24.5 kg).

Price: \$3,495, including glass base.

Company Address: P.O. Box 1589, Snohomish, Wash. 98291; 425/335-4748; www.sunfire.com.

can get behind. (Of course, if price were all that mattered, we'd all be eating ramen noodles for dinner.)

With all that wattage in one box, you'd think we'd be in for another round of global warming and crazy El Niño weather patterns. To my great surprise, even after hours of use, the Cinema Grand Signature remained downright cool to the touch. My old Dolby Digital receiver, barely mustering less than a fourth the Sunfire's total power, gets a lot hotter.

The amp's coolness (in more senses than one) comes from the Tracking Downconverter. Most amplifiers maintain the highest power-supply voltage they can at all times. When the signal calls for it, fine; when it doesn't, the excess energy shows up in the output transistors as heat. The Tracking Downconverter monitors the output signal and varies the supply voltage so it's always just 6 volts above the signal. This super-efficient design wastes much less of its energy as heat. (Simple as this brief description sounds, it took Carver more than 20 years to develop the idea and make it work properly.) Less heat should mean a longer useful life, so the amplifier's cost per year goes down. And smaller, less expensive heat sinks help trim the initial cost. Greater efficiency is also good for your electric bill. In theory, then, the Tracking Downconverter should give you more power for less money. I can dig that.

Like other Sunfire amps, the Cinema Grand Signature has two kinds of outputs



and gives you three ways to hook up speakers. For the three front speakers, you have your choice of standard voltage-source outputs, with near zero-impedance (which Carver says can be used for "all typical applications"), and higher-impedance, "current-source," outputs. The latter (recom-

mended for electrostatic, planar-magnetic, and ribbon speakers) are supposed to yield more of a classic tube amp sound. If your speakers are bi-wirable, you can connect the amp's voltage-source outputs to the woofers and its current-source outputs to the high-frequency drivers.

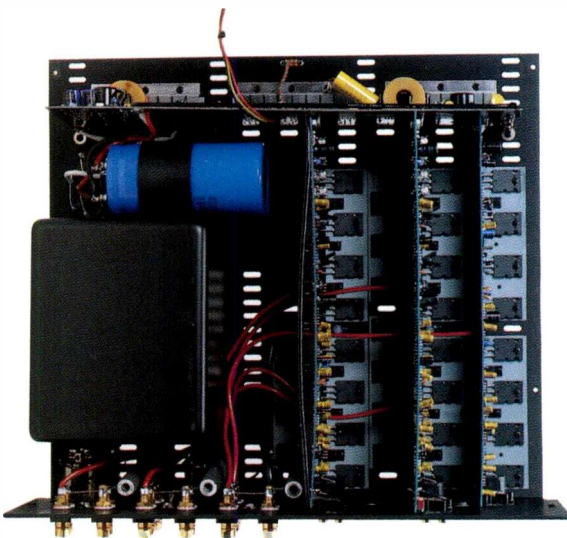
Now that I've told you everything you need to know about the dollars per donuts, the watts per pound, and the temperature per inch, how did the Cinema Grand Signature amp sound? To find out, I used it with Parasound's super-slick AVC-2500 tuner/preamp/processor, a Pioneer DV-414 DVD player, Kimber Kable interconnects, and Monster Cable speaker wire. Initially, and also for my 5.1-channel listening, I used Definitive Technology's Pro Tower 400 speakers for the front left and right channels, a Pro Center C2 for the center channel, and BP-1Xs for the surrounds.

I started out by watching a lot of scenes on DVD—among them, the time travel sequence in *Star Trek IV*, the early action in *GoldenEye* and *Tomorrow Never Dies*, the diva/Leeloo/Mangalore scene of *The Fifth Element*, and the launch in *Apollo 13*. These were all great and pretty much told me that my misguided love affair with cheap receivers had gone on way too long. But if I had any lingering doubts about that amplifier, they were dispelled when I loaded *Saving Private Ryan* into the DVD player.

At the movie theater, I had seen *Private Ryan* from the front row (not because of some masochistic desire to inflict punishment on myself; there were no other seats available). The experience was pretty intense. But when I watched the 24 minutes of the D-day landing on Omaha beach at home, using the Cinema Grand Signature, "intense" was not the word for it: The energy and realism were near terrifying! This is as close to combat as I ever want to come. Through all the explosions and rapid transients, the Sunfire never missed a beat, playing as cleanly and coolly as if it were reproducing a 1-kHz test tone.

No receiver of mine ever accomplished this feat.

Fully convinced of the Sunfire's home theater *cojones*, and wanting to calm my nerves, I decided to see what it would do with some good old-fashioned two-channel music. After lots of discs and switching back and forth between the current- and the voltage-source outputs, I found the



current-source outputs to have a sweeter, smoother, more ethereal character that I liked a lot. The voltage-source outputs seemed almost clinically clean—not unpleasant, just not as emotionally satisfying.

I expected to notice a difference in the bass characteristics of the two output types, but I knew I'd never find out while using powered woofers like the ones in the Pro Tower 400s. So I called Jack Rodgers, a buddy at my old employer, Bjorn's Audio Video in San Antonio. He was kind enough to lend me a pair of B&W Nautilus 804s. Aside from being more than three times the price of the Pro Tower 400s, they've got some of the sexiest-looking tweeters known to man.

With the B&W speakers, my reactions to the Sunfire's current- and voltage-source outputs depended on the music. The bass on Jennifer Warnes' "Way Down Deep" (on *The Hunter*, a BMG/Private disc) had more authority on the voltage-source outputs, while Emmylou Harris's voice on the title track of *Wrecking Ball* (Elektra) wasn't quite so edgy when I used the current-source terminals. The St. Petersburg Chamber Choir opening on Loreena McKennitt's "Dante's Prayer" (from *The Book of Secrets*,

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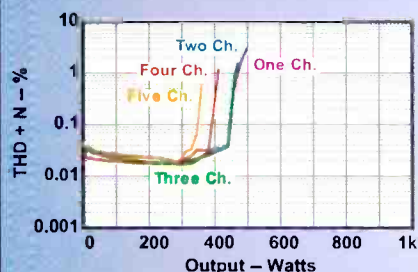
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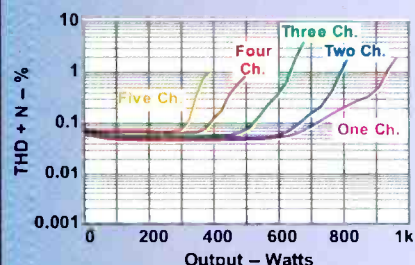
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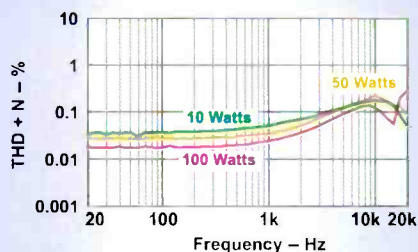


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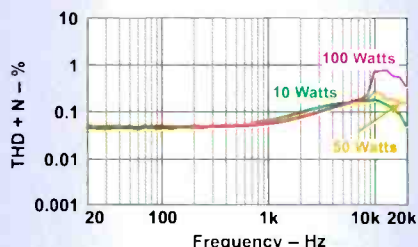


B

Fig. 1—THD + N vs. level into 8-ohm loads (A) and 4-ohm loads (B).



A



B

Fig. 2—THD + N vs. frequency into 8-ohm loads (A) and 4-ohm loads (B).

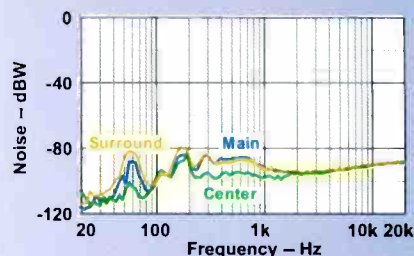


Fig. 3—Noise analysis.

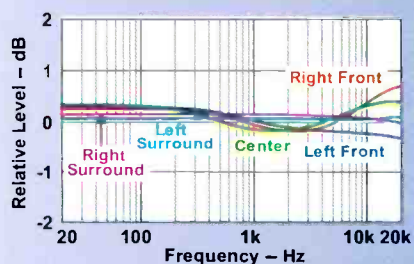


Fig. 4—Frequency response.

When you're this good, you can exaggerate a bit. The Sunfire Cinema Grand Signature amp does not *quite* meet all its specs—and will still blow you away with its performance.

For example, True Technologies found that its continuous power, with all five channels driven, is about 360 watts per channel into 8 ohms (Fig. 1A) or 4 ohms (Fig. 1B), a mere 0.15 dB below its 8-ohm rating but 6.4 dB below the 4-ohm spec. However, that "shortfall" doesn't occur until you have all channels (and your neighbors) screaming. In practice, you'll never get every channel running continuously at full blast, and power per channel increases significantly as the number of driven channels drops. For stereo listening, the amp's available power at rated distortion rises to about 460 watts/channel into 8 ohms and about 710 watts/channel into 4. And that's just continuous power. With all five channels driven, the Sunfire's dynamic power was 480 watts/channel into 8 ohms, 849 watts/channel into 4 ohms, and 1.25 kilo-

watts/channel into 2 ohms. That should rock any home theater!

When the Sunfire amp was driven to high output levels in these distortion tests, magnetostriction flexed the coils in its Tracking Downconverter power supply. But this was audible only when the amp drove load resistors in the lab; in a listening room, the sound of all that power pouring from the speakers would more than mask any such mechanical noise from the Cinema Grand Signature.

The Tracking Downconverter may also have affected the amp's measured distortion at high output levels, which increases in the region around 10 kHz. Bob Carver says this anomaly is caused by the way the power supply tracks swept steady-state test tones and will not occur when playing music. In any case, total harmonic distortion plus noise (THD + N) is within Sunfire's 0.5% spec at all frequencies for power levels up to 100 watts into 8 ohms (Fig. 2A) and rises to, at most, 0.72% for 100 watts into 4 ohms (Fig. 2B). "Not the cleanest amp," comments True Technologies, "but pretty good."

The Cinema Grand Signature's noise spectrum (Fig. 3) shows impressively quiet performance on every channel; the hum peaks at 60 and 180 Hz should, at less than -80 dBW, be inaudible. Unfortunately, switching noise from the Tracking Downconverter resulted in spikes at around 34 and 38 kHz—totally inaudible, but they raised the A-weighted noise measurement to -90 dBW. Without those spikes, A-weighted noise would probably have matched the -100 dB that Sunfire specifies. Crosstalk was a reasonable -70 dB or so at low frequencies but climbed to almost -30 dB at 20 kHz for the worst-case channel.

Frequency response (Fig. 4) was within about ± 0.2 dB for all but the right front channel, whose response was off by +0.7, -0.2 dB. Channel imbalance never exceeded 1.3 dB, and that was at 20 kHz.

The results reported here were all taken at the amplifier's voltage-source output terminals; sample measurements taken at the current-source outputs differed only slightly into the resistive loads used for the tests.—Ivan Berger

on Warner Bros.) had more depth and space with the current-source connection but a tighter bottom end with the voltage-source.

Because I couldn't decide which I liked better, I did the only thing appropriate in the situation. I biamped the 804s, driving their woofers from the voltage-source terminals and using the current-source outputs to drive the midrange and treble. Suddenly, I had my cake and was eating it, too! The sweetness and delicacy of the current-source outputs was there, right on top of

**Even with 1,875 watts
in one box,
the Sunfire amp
ran cooler
than my receiver.**

the guts and glory of the voltage-source. It's the audio equivalent of the love child you'd get from a sumo wrestler and a ballerina.

I started grabbing at discs to listen to. Keb' Mo's voice and the instruments around him locked solidly into place on the title track of *Just Like You* (Sony/Columbia). The "Explosions Polka" on *Ein Straussfest* (Telarc) proved no problem even at levels that bordered on the uncomfortable. (Actually, I consider the whole disc uncomfortable at any volume, but that's from years of hearing it used on the sales floor.) The Jim Keltner drum improvisation on a PARA/Sheffield demo disc simply stunned me with its fat-sounding kick drum and high-impact snare.

So how can I sum all this up? I have a real love/hate relationship with the Cinema Grand Signature. I love the way it sounds. For the money, it's one of the best all-around values in a multichannel amplifier. Lots of power, beautiful sound, and just as good for music as it is for home theater. But I hate the way it has ended my sleazy, sordid, 15-year relationship with cheap receivers. There's just no way I can go back. Would I spend your money on this amplifier? Without a doubt. More important, would I spend *my* money on the Sunfire Cinema Grand Signature? You bet! **A**

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COREY GREENBERG

Infinity Prelude MTS Speaker System



Photos: Michael Groen

With all the different cooks stirring the broth at Infinity over the years, it's no wonder Harman's high-end speaker brand has had its share of ups and downs.

Founder Arnie Nudell made the company's name on the backs of gigantic, woolly mammoth-like speakers whose bass-heavy sound always struck me as being tailor-

made for the testosterone-challenged. Post-Nudell, other designers came and went, leaving behind a trail of tears culminating in the infamous, unlistenable Compositions system of several years back, which finally prompted Harman to clean house and start from scratch.

Today, Infinity's chief speaker designer is a young Canadian engineer named Allan Devantier, a protégé of Dr. Floyd E. Toole,

INFINITY

PRELUDE MTS TOWER

Rated Frequency Response: 80 Hz to 22 kHz, ± 3 dB.

Rated Nominal Impedance: 4 ohms.

Rated Sensitivity: 90 dB/1 watt/1 meter.

Recommended Amp Power: 25 to 500 watts.

Dimensions: 37 in. H x 6½ in. W x 7½ in. D (94 cm x 16.5 cm x 19.1 cm).

Weight: 60 lbs. (27.3 kg) each.

Price: \$3,200 per pair; \$8,000 per pair with two MTS Subwoofers.

PRELUDE MTS CENTER CHANNEL

Rated Frequency Response: 80 Hz to 22 kHz, ± 3 dB.

Rated Nominal Impedance: 4 ohms.

Rated Sensitivity: 89 dB/1 watt/1 meter.

Recommended Amp Power: 25 to 500 watts.

Dimensions: 6½ in. H x 23 in. W x 7½ in. D (16.5 cm x 58.4 cm x 19.4 cm).

Weight: 30 lbs. (13.6 kg) each.

Price: \$1,000.

PRELUDE MTS POWERED SUBWOOFER

Rated Frequency Response: 23 to 80 Hz, ± 3 dB.

Crossover Frequency: 80 Hz.

Maximum Amplifier Output: 850 watts into 8 ohms, 20 to 100 Hz, 0.1% THD.

Dimensions: 20 in. H x 20½ in. W x 9½ in. D (50.8 cm x 52.1 cm x 24.1 cm).

Weight: 100 lbs. (45.5 kg) each.

Price: \$2,400 each.

System Price: \$12,000 for four towers, center-channel speaker, and two subwoofers.

Company Address: 250 Crossways Park Dr., Woodbury, N.Y. 11797; 800/553-3332;

www.infinitysystems.com.

TEST RESULTS

Figure 1A blends quasi-anechoic frequency response measurements taken by True Technologies of the Infinity Prelude MTS Subwoofer (with its low-pass filter off), Prelude MTS Center Channel, and Prelude MTS Tower main speaker (grille on and grille off). These curves are strikingly smooth and free of anomalies, especially the Tower's grille-off curve (it's obvious this speaker should be listened to that way). The curves in Fig. 1A indicate that the MTS Prelude system should be capable of wide-bandwidth, natural, uncolored sound reproduction from the low bass to the high treble. (In their linearity, these curves remind me of some of the best response curves I saw emerge from the anechoic chamber at Canada's National Research Council when I was taking measurements of speakers there and conducting blind listening tests for a Canadian audio magazine.)

Frequency response of the sealed-box Prelude MTS Subwoofer (Fig. 1B) is smooth and extended. At 50 Hz, the sub's response begins to gradually roll off and is 5 dB down at 30 Hz and only 8 dB down at 20 Hz. With normal boundary reinforcement in a listening room, the MTS subs should provide usable output down to almost subterranean frequencies. As you can tell from the curve taken with parametric equalization, the R.A.B.O.S. circuitry inserts a very sharp, deep notch with maximum "Q" at, in this case, 60 Hz (the frequency, width, and depth are all selectable). With the sub's low-pass filter engaged, response begins to decline steeply at about 60 Hz and is 10 dB down at 100 Hz.

The MTS Tower's horizontal off-axis dispersion (Fig. 2A) is superb; within the $\pm 15^\circ$ listening window, upper-octave response extends well beyond 15 kHz and is as smooth as the on-axis curve. Even at greater off-axis angles, response diminishes by only a few dB. No question that the Towers should throw a spacious and three-dimensional soundstage. The speaker's vertical off-axis dispersion (Fig. 2B) isn't quite as consistent as its lateral radiation. You can see effects of driver cancellation

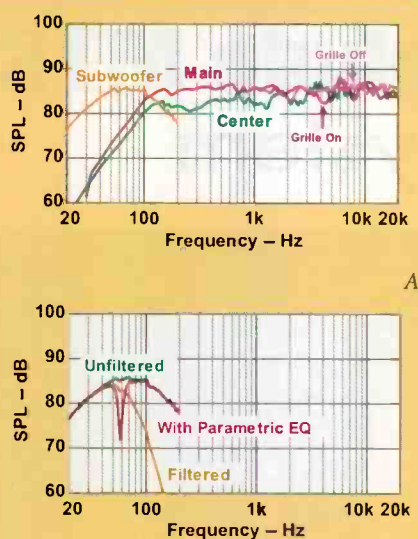


Fig. 1—On-axis frequency responses of subwoofer, center-channel speaker, and main-channel speakers (A) and of subwoofer alone (B).

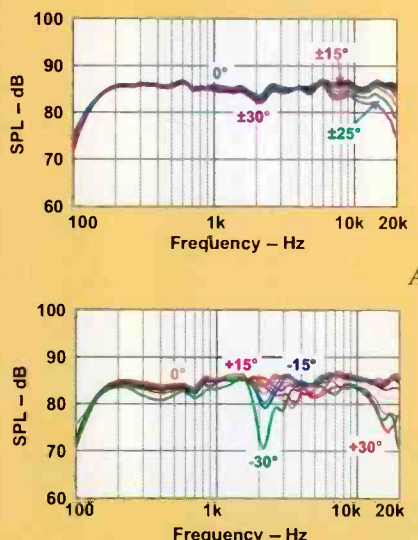


Fig. 2—Horizontal (A) and vertical (B) off-axis frequency responses of MTS Tower (main-channel) speaker.

between 1.8 and 4 kHz, although things smooth out again at higher frequencies, with excellent dispersion to about 12 kHz.

The MTS Center speaker's horizontal off-axis dispersion (Fig. 3A) isn't quite as smooth or as uniform as the Tower's. Nevertheless, it holds up well to a bit past 10

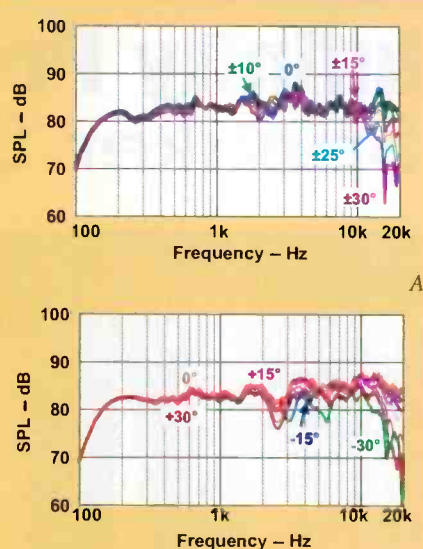


Fig. 3—Horizontal (A) and vertical (B) off-axis frequency responses of MTS Center speaker.

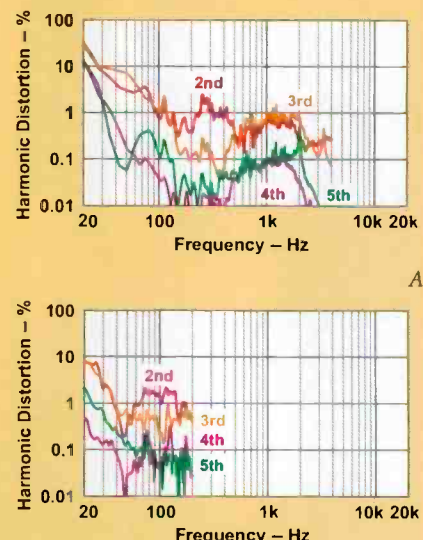


Fig. 4—Harmonic distortion at 100 dB SPL for MTS Tower (A) and MTS Subwoofer (B).

kHz. You can see a few small irregularities between 1.5 and 2 kHz and a rising response that reaches a minor peak at 4 kHz. In the vertical domain (Fig. 3B), the bump at 1.8 kHz remains, as does the one at 4 kHz. Still, if you compare the overall shape of these off-axis responses to those of many

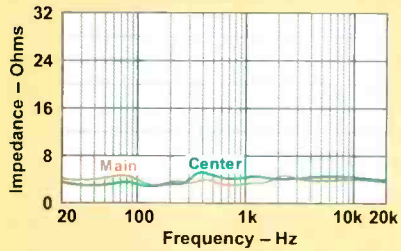


Fig. 5—Impedance magnitude.

other speakers, the Prelude MTS Center and Tower speakers emerge as winners.

Living up to Infinity's goal of keeping all harmonic distortion components to 1% or less at a very loud 100 dB SPL is a tall order. As you can tell from Fig. 4A, however, the Prelude MTS Tower meets that heady criterion with only one minor excursion, at 250 Hz, to about 3% second-harmonic distortion. You can ignore the Tower's distortion below 80 Hz because that's where the MTS Subwoofer takes over; its distortion components (Fig. 4B) are, apart from the second harmonic at about 4%, exceptional. Third, fourth, and fifth harmonics average about 0.8% or less down to 30 Hz; even at 20 Hz, second and third harmonic distortion are less than 10%, with fourth and fifth components barely cracking the 1% level. All this points to the potential for wonderfully clean, deep bass at concert-hall levels—which, of course, is an essential ingredient of true high-fidelity music reproduction.

The MTS Tower and Center Channel impedance curves (Fig. 5) are so smooth and uniform that they leave me with almost nothing to say, except that I can recall only one other speaker in recent years that even approached this ideal of a perfectly linear 4-ohm impedance across the entire audio spectrum. Splendid!

On the basis of these lab results, it's indisputable that Infinity devoted an enormous engineering effort in designing its Prelude MTS system. Seldom would I be moved to call speakers "beautifully engineered" (given the intrinsic liabilities of most transducers), but in this case the mix of science and art has yielded a system of the highest caliber.—Alan Lofft

Harman's V.P. of engineering. Devantier has wiped Infinity's slate clean and instituted the same kind of rigorous, science-minded approach to loudspeaker design spearheaded by Toole at Canada's National Research Council. Devantier's first all-out assault on a cost-no-object, state-of-the-art system is the subject of this review, the \$12,000 Prelude MTS.

The heart of this system is the Prelude MTS Tower, a three-way, six-driver speaker. For stereo-only systems or the main front speakers in a surround setup, the MTS Towers are configured as full-range speakers with the addition of a pair of Prelude MTS

"Even, clear, and amazingly fast" is my thumbnail sketch of the Prelude MTS system's sound.

Powered Subwoofers, each of which houses a heavy-duty, 12-inch driver with a high-temperature, 3-inch voice coil. The driver is side-mounted in a deceptively slim, curved-wood sealed enclosure that also houses an 850-watt BASH amplifier. The sub can take its feed from the incoming speaker-level signal or via a separate, line-level subwoofer output from your preamp or receiver.

The Prelude MTS Tower, which handles frequencies above 80 Hz, is solid, anodized aluminum and screws down tightly to the front of the MTS Subwoofer. (The Tower is available separately, without the sub, for surround-channel duty. It can be swivel-mounted to the wall or bolted to optional, sand-fillable floor stands, which I used.) The Tower houses six drivers in a vertical array: a quartet of 5¼-inch woofers, a 3½-inch midrange, and a 1-inch dome tweeter sunk behind a shallow, horn-like waveguide designed to match its low-end dispersion with the mid-range's for flatter off-

axis response (one of the cornerstones of the NRC school of design, shared by such illustrious grads as Paradigm and PSB). Except for the MTS Center Channel, the Preludes come supplied with spikes to anchor the speakers in place.

All of the drivers in the Prelude MTS system, including those in the subwoofers, are new designs custom-manufactured by Harman. They feature a new material, C.M.M.D. (Ceramic Metal Matrix Diaphragm), which consists of a deep-anodized ceramic coating on both sides of an aluminum cone or dome. Infinity claims the C.M.M.D. process endows the matte silver-colored drivers with ultra-low mass and ultra-high rigidity. (The company's distortion measurements are some of the lowest I've seen for real-world speakers, more akin to amplifier specs).

The timbre-matched and magnetically shielded Prelude MTS Center Channel looks like a smaller version of the MTS Tower tipped on its side. The 3½-inch midrange is on top of the 1-inch tweeter; they are flanked by a pair of 5¼-inch woofers. This speaker comes with a pretty trick metal stand that lets you tilt it up or down and adds another layer of magnetic shielding to help prevent screen purpling on direct-view TVs (such as Sony's high-end WEGA monitors, which are more sensitive than most to speaker-magnet interference).

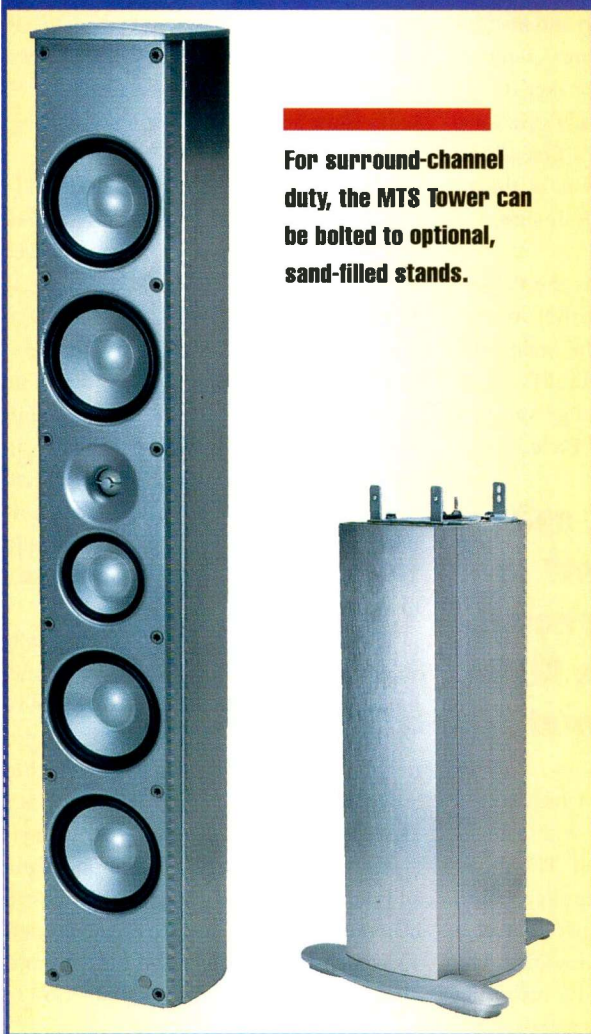
The silvery Prelude Towers have rather flimsy plastic-frame grilles covered with a silver-colored woven fabric; even Infinity doesn't take the grilles too seriously, recommending they be left off for the most accurate sound. I mean, look at these things; it's not as if they're going to fade into the background if you stick the grilles on! And, yes, they definitely muffle the sound enough to be left in the packing boxes for good unless you've got ceramic-licking monkeys for pets.

The Prelude MTS system is full of innovative, cutting-edge technology,



An SPL meter, to adjust bass EQ, comes with the Prelude system.

STAND & DELIVER



For surround-channel duty, the MTS Tower can be bolted to optional, sand-filled stands.

but by far its most interesting feature is R.A.B.O.S. bass equalization. Basically an adjustable parametric equalizer operating at 100 Hz and below, R.A.B.O.S. (Room Adaptive Bass Optimization System) nulls out the main low-frequency room mode, or "love hump," that prevents truly accurate bass response in every real-world listening room. With this system, Infinity bundles a custom-designed SPL meter (the popular \$30 Radio Shack meter doesn't have flat enough low-end response, just in case—like me—you were wondering) and a test CD with bass warble tones. This lets you find the optimum settings for frequency, notch width, and bass cut to dial in on the Towers' recessed front-panel trimpots. A word of caution: The supplied SPL meter sucks 9-volt batteries like Ron Jeremy's fluffer. Devantier says it's a necessary trade-off in or-

der to get a high degree of accuracy from the meter. I can tell you that a brand-new alkaline lasted only 40 minutes or so in this thing, so be sure to have a spare or two on hand when you set up these speakers.

I listened to the Prelude MTS system in my He-Man reference rig. The speakers were driven by a Bryston 9B-ST 120-watt, five-channel amplifier. I used Meridian's 861 A/V preamp and 800 DVD/CD player, along with a Sony SCD-777ES SACD player. (I bypassed the all-digital Meridian preamp for SACD listening by using a passive preamp jacked directly into the Bryston amp.) Canare 75-ohm digital/video cabling and L-2B2AT analog interconnect and Kimber Kable 8TC speaker wire hitched everything together, and all electronics—including the amps of the two Prelude MTS Subwoofers, were plugged into API Power-Pack noise filters.

Even, clear, and amazingly fast—that's my thumbnail description of the Prelude MTS system's sound. Even though the main-channel Tower/Subwoofer combos are four-way designs with a whopping seven drivers per side, they sound instead like really, *really* good two-way mini-monitors, except with killer bass. Lots of tower speakers distort image size, lending everything the same "Big Tex" character—"Howdy, pod'ner, git a load of mah 10-foot-tall maracas!" Not the Preludes. Music sounds like it's coming from a pair of point sources at about ear height, and the only fleshing-out the speakers provide is in bass extension, which is frightening in both ferocity and precision. Voices, in particular, sound totally realistic in terms of size and shape. My workhorse vocal demo CD, The Fairfield Four's *Standing in the Safety Zone*

(Warner Bros.) sounded so natural and lifelike on the Infinities I wound up listening to the whole CD all the way through, something I haven't done in years. While most big multidriver towers sound like mutant P.A. systems, the Prelude MTS keeps it real.

The MTS Towers are definitely at their best when firing straight ahead rather than toed-in toward you. Devantier says he designed them that way on purpose, because they'd look awkward tilted in, with their woofer-asses jutting out to each side like a couple of splayed clown feet. Me, I would've put up with the awkward-looking arrangement if the sound were better, but it wasn't: The best-looking arrangement was also the best-sounding. The Prelude Towers were clearly designed to be listened to slightly off axis, and that's where I heard the most clearly focused imaging, the smoothest response, and the closest timbre match with the Prelude Center Channel.

The Prelude MTS system's tonal balance was extremely smooth and even. The speak-

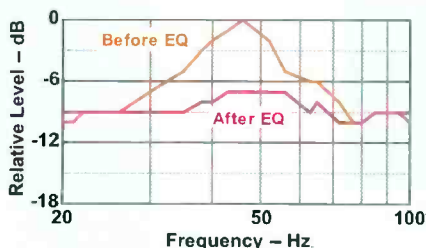
The Prelude subs served up the deepest bass I'd ever heard in my living room.

ers tended to sound very different from disc to disc, always a good sign that a speaker is fundamentally accurate and not imposing its own character on the music. In direct comparison with my NHT 3.3s (\$4,300/pair), the Preludes' midrange was a bit less forward, and their low treble was more apparent, pushing even the tiniest recorded detail to the forefront. Whether it was differences in tonal balance or the ultra-low-distortion C.M.M.D. drivers, I heard details in familiar CDs and DVDs that I'm just not used to hearing quite so easily. My own guitar work on Archer Prewitt's *White Sky* (Carrot Top Records) was so clearly rendered that I could hear all the little guitar-pick inflections, string scrapes, and other slop that's thankfully obscured by most speakers I hear this CD on. (You can download MP3 samples of this disc, in-

cluding a bit of my solo on the song "Motorcycle," from www.cdnw.com.)

The Prelude Towers' clear and present character almost works against them when they're used in the surround channels. The sound field that the subwooferless Towers created in their surround-channel role was much crisper and more distinctly defined than I'm used to hearing from the NHT 3.3s I usually stow there, and I have to admit it was a little distracting at first. The Infinity speakers tended to sound almost *too* discrete, so I had to tinker with placement to get them to gel with the rest of the system. I finally found that spacing them far apart, a few feet behind the couch, and aiming them directly at each other was best. It made for the best trade-off between surround presence and integration with the front sound field. The surrounds then presented a seamless, hyper-focused bubble of sound from every DVD I threw at them.

And the bass? Oh, mammy! The Prelude MTS Subwoofers served up the deepest, tightest, scariest bass I've ever heard in my living room, bar none. I've had some monster subs through these parts, and my reference NHTs have built-in, 12-inch subs that go toe-to-toe with the best of them. But I'm telling you, all bets were off when I fired up the Preludes. Even before I used R.A.B.O.S. to flatten the response, the deceptively slim Infinity subs redefined my expectations of how deep and supremely tight the low end can sound in my loft.



Dialing in R.A.B.O.S. quelled a huge, 46-Hz peak in the author's home.

But it was after going through the R.A.B.O.S. optimization process that the MTS Prelude system's low end went from hugely impressive to utterly astonishing. From start to finish, measuring the bass response in my room with the supplied SPL meter and then adjusting the three controls on the front of the subs took all of 20 min-

utes. And it made all the difference in transforming the bass performance of the Prelude subs from great to insane. (Look at the graph to see my in-room bass response, before and after R.A.B.O.S.)

It's one thing to go down to 20 Hz with all kinds of love humps and peaks in the response muddying things up across the bass range; it's something else entirely to hear this kind of extension and power with truly flat response from 100 to 20 Hz. Thanks to R.A.B.O.S., electric-bass lines, such as Willie Weeks' epic Fender flash on the classic *Donny Hathaway Live* CD (Sony Japan) suddenly sounded much more even all the way up and down the scale, and I heard all kinds of subtleties in the playing that don't usually present themselves on most subs. And Paul McCartney's fattened-up bass lines on the *Yellow Submarine* DVD had never before sounded so clearly defined and pulsing; for the very first time in my listening room, every note was at the same volume as the next.

The MTS Prelude system's low end was just as fast and nut-tight as those of the most overdamped "music" subs (e.g., the Meridian and REL jobs) I've had through here, but when it came time to rock the house with the sub-bass wallops during the 'Nam re-creation scene at the end of *Rushmore*, the sheer unrestrained power unleashed by the Prelude subs literally and physically took the room like no other sub I've ever tried. When I originally eyeballed these arty-looking, curved-wood subs, I thought I'd need four of them to do any real damage, not just the lone pair that Infinity sent. But, ye gods, was I wrong. The combination of the custom, 12-inch C.M.M.D. drivers and the 850-watt BASH amplifiers are a bass freak's wettest, woolliest dream.

Infinity's Devantier described his goal for the Prelude MTS system as being "Bang & Olufsen looks with high-end sound quality." I would say he's succeeded mightily on both counts. Visually as well as sonically, these speakers make as bold a statement as I've seen audio's high end produce in quite a few years. The Prelude MTS is far and away the finest-sounding loudspeaker system ever to wear the Infinity badge—highly recommended. **A**

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ANTHONY H. CORDESMAN

Vantas DPA-S50 Surround Processor/Amp

My initial reaction to the DPA-S50 was not favorable. I sat there reading the letter from Vantas describing a device that adds Dolby Pro Logic (including Dolby 3 Stereo), Dolby Digital, and MPEG decoding and a three-channel amplifier to a stereo system. There's even a mode called "Dolby Digital Karaoke." But the list price was \$649, it did not include DTS, and the brochure talked about using it with existing receivers. My reaction was, "overpriced kluge. Forget about it."

Well, I was wrong. The Vantas DPA-S50 surround processor/amplifier has proven itself to be a well-designed unit that is anything but a kluge. And for anyone who wants to transform his high-quality stereo

system into a home theater, it may be just the ticket.

The DPA-S50's construction seems to be very good, and it has high-quality components and heat sinks. The processor section uses a Zoran ZR38600 DSP and 20-bit delta-sigma D/A converters on all 5.1 channels.

The DPA-S50 incorporates many of the features of a full home theater processor. You can select the delay to the surround and center channels and select "Small" or "Large" speaker configurations for those channels (or do without a center channel). You can make adjustments to trim level, limit dynamic range, and set the subwoofer crossover frequency (to 80, 100, or 120 Hz).

The DPA-S50 has four RCA stereo analog inputs, a stereo tape input, and three digital

inputs (two coaxial and one Toslink optical). There are also speaker-level inputs for the outputs of your stereo amp or receiver and the usual speaker outputs for center channel, left and right front channels (fed from the outputs of the main amp or receiver), and left and right surround channels. (The Vantas also has line-level outputs for all 5.1 channels so that it can be used as a stand-alone processor.) All told, this can mean a hell of a lot of wires, but the S50's rear panel is well laid out and clearly labeled, and connections are easy to make.

Vantas rates the DPA-S50's amplifier at 100 watts, continuous, for each of its three channels, with less than 0.05% total harmonic distortion. I gather power is substantially lower than 100 watts with all three channels driven but is still rated as above 80 watts. (The owner's manual simply says it's 85 watts per channel with two channels driven.) The manual says the S50 should be used only with speakers having a nominal impedance of at least 6 ohms and says nothing about current capacity. This concerned me, since such warnings often mean a component can have problems with low-impedance or otherwise demanding loads. The Vantas had no trouble with any of the speakers I tried, however, including an old Spondor BC-1 that has taxed some other amplifiers. The power supply is impressive for the price: a 9-pound, solid-core toroidal transformer and twin 12,000-microfarad capacitors. The processing section has its own power supply.

What keeps the DPA-S50 from being a nightmare in terms of gain settings is that after you've trimmed levels to establish proper channel balance, it uses the signals from your stereo or Dolby Pro Logic pre-amp or receiver to automatically set the levels of the center channel, the surround channels, and the subwoofer. Vantas calls

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Dimensions: 17 in. (43.2 cm) W x 14½ in. (36.8 cm) D x 4¾ in. (10.5 cm) H.

Weight: 25 lbs. (11.4 kg).

Price: \$649.

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TEST RESULTS

T rue Technologies found that the Vantas DPA-S50's V-Track automatic volume-matching system does its job well. Once relative main- and surround-channel levels had been adjusted in setup mode, V-Track maintained that balance within ± 0.5 dB until the front left and right amplifiers were delivering more than about 90 watts per channel. Then, as it is designed to, V-track began to limit the output from the S50's amps so as not to overload them.

Figure 1 is a plot of the Vantas's frequency response. The signal fed from the DPA-S50's main-channel output is essentially flat, save for the rolloffs imposed by the crossover. But the amplifiers produce some odd (though probably not audible) anomalies. The center channel's minor response ripples below crossover and the dip around 9 kHz also occur in the surround channels, though the center channel's small peaks at about 450 Hz, 850 Hz, and 3 kHz do not.

Power output into 8-ohm loads can be read from Fig. 2, a plot of total harmonic distortion plus noise (THD + N) versus output. The DPA-S50's THD + N stays below 0.3% until about 92 watts per channel, a bit above the 85 watts per channel Vantas specifies for operation with two channels driven. Dynamic power per channel with all channels driven was 99 watts into 8 ohms and 163 watts into 4 ohms.

The measurements in Fig. 2 were made at 1 kHz, using the DPA-S50's digital input. As Fig. 3 discloses, THD + N via this input stays below 0.1% for frequencies below 13 kHz and rises only to 0.15% at

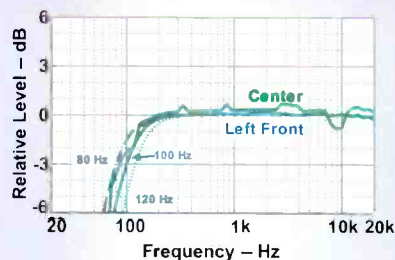


Fig. 1—Frequency response of one main-channel output with three crossover settings and of DPA-S50 center channel with crossover at 100 Hz.

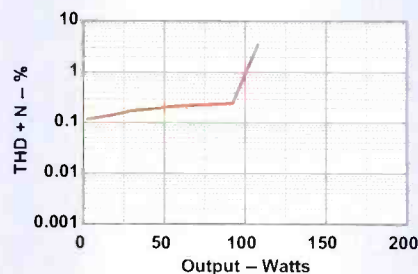


Fig. 2—THD + N vs. level, 8-ohm loads.

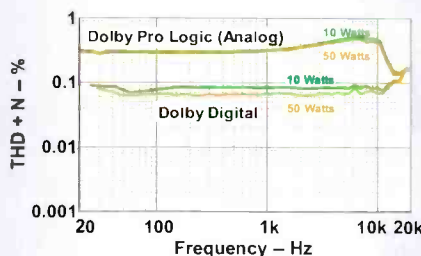


Fig. 3—THD + N vs. frequency.

higher frequencies. Via the analog inputs, THD + N is significantly higher, about 0.3% out to 2 kHz and as much as 0.5% at higher frequencies.

I suspect much of that THD + N may be just noise. The readings are higher at 10

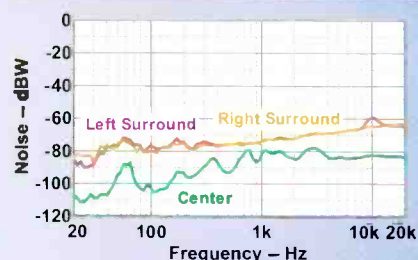


Fig. 4—Noise analysis.

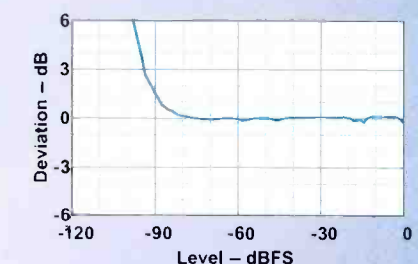


Fig. 5—DAC linearity.

watts than at 50 watts per channel, and this difference is more pronounced for results taken via the digital input, which has less noise-producing circuitry of its own. Further, the DPA-S50 is fairly noisy, especially in its surround channels (Fig. 4). Worst-case A-weighted noise is -55.9 dBW, in the left surround channel. Noise also accounts for the rounded "knee" of the curve for DAC linearity (Fig. 5), but the DAC's performance is still good for un-dithered signals down to -90 dBFS.

Crosstalk was rather better. Worst-case crosstalk between the Vantas's amplifier channels was below -68 dB across the audio range and closer to -75 dB at most frequencies. Crosstalk between these channels and the main-channel outputs was a good 10 dB lower.—Ivan Berger

this gain monitoring "V-Track technology" and says it eliminates the need for dual volume controls, complex source switching, and constant fiddling with level adjustments. It also turns the S50 on automatically when it senses a signal.

Setup is fairly easy, the instruction manual is a good one, and the front-panel display is well designed. The DPA-S50 has no remote control of its own, but it does automatically detect the active source (analog or

digital) and switch to it automatically. And it will automatically switch to Dolby Digital or MPEG decoding if it detects such a signal and revert to stereo or Pro Logic when it detects PCM or two-channel Dolby Digital. The only drawback is that you have to go to the DPA-S50's front panel if you want to adjust channel balance to suit a particular recording or soundtrack. Getting up and doing this every couple of hours should pose no hardship for most people, however.

I still have deep reservations using the Vantas as an add-on to a stereo receiver, but they are based largely on price. I can't believe any audiophile would find the sound of an old stereo or Dolby Pro Logic receiver particularly attractive. (In fact, if you are deeply in love with your old receiver, you have gone from audiophile to fetishist. What you need is a therapist, not a Vantas DPA-S50.) It doesn't make sense to keep an old receiver, one that wasn't designed to be



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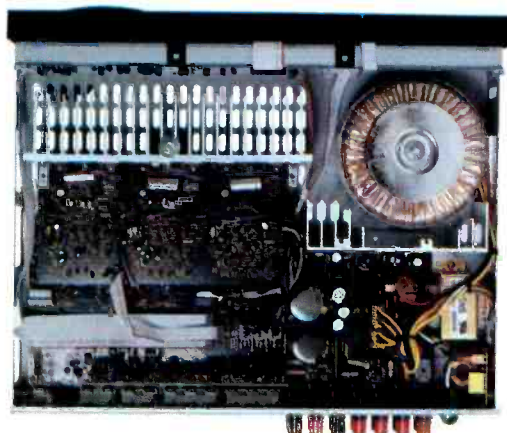
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a home theater product and that has several years of wear, when good Dolby Digital 5.1-channel receivers cost the same as the S50 and really good THX-certified and other high-performance home theater receivers sell for \$1,000. The convenience of a single home theater component that offers video switching and remote control is undeniable. (As for current "Dolby Digital-ready" receivers, these seem mostly mediocre to crappy in quality, with prices of \$300 or less, and it makes no sense at all to buy a \$649 add-on for such a product.)

For example, the Onkyo TX-DS777 is a THX-certified receiver whose rated power is 105 watts per channel, with all five channels driven from 20 Hz to 20 kHz. It has better-sounding bass and midrange than the Vantas, more power, and better dynamics. Further, it has far more features, and its suggested list price is \$999. Sony's STR-DA555ES, in its ES line, has 24-bit processing, is rated at 120 watts on all five channels, and has a \$1,000 list price. In a brief listening session, I found its overall sound to be very good and its touchpanel LCD remote exceptionally user-friendly. The Yamaha R-V1105 is a pleasant-sounding receiver whose price is close to the DPA-S50's, but the Yamaha provides 85 watts on all of its five main channels and gives you a remarkable range of signal processing options. I found it slightly warmer and more natural-sounding than the Vantas.

The situation is different if you have a high-end stereo system you want to keep but you want to add home theater features without disturbing the rest of your system. Here, the DPA-S50 may make sense. Though it is not of reference quality, it does well enough. You can use the S50 to rig up a reasonably good sound field in the center and surround channels, and it will drive an effects-channel powered subwoofer quite well. The S50 will give you perfectly acceptable reproduction of most movie soundtracks, although it cannot create a sound field with the coherence of a really good A/V preamp or get the best out of the few

soundtracks that go beyond spectacular explosions and contain a great deal of theatrical information. Incidentally, the Vantas may interfere slightly with the damping fac-



tor of your stereo amplifier and the sound quality from your speaker cables, since you must have an additional cable linking your main stereo amp and the S50.

The Vantas DPA-S50 does have a slightly bright sound, and it does not provide the ultimate in dynamics or low bass performance. Call it a good center- and surround-channel amplifier, not a very good or great one. The processing lacks an adjustment to tame the upper-octave brightness of movie soundtracks, so you may notice the odd touch of hardness. However, its resolution of low-level detail, its imaging, and its soundstage depth and width are perfectly adequate. (But bear in mind that much of the important information in these areas will come from the left and right channels in the main stereo system.)

I have developed considerable respect for the Vantas DPA-S50 as a supplement for a system built mainly for stereo music. It is intelligently engineered and is good enough for most home theater listening. If you want to add surround sound and other home theater features to an existing component system and are willing to accept some compromises in sound quality, it may be just the right choice. **A**

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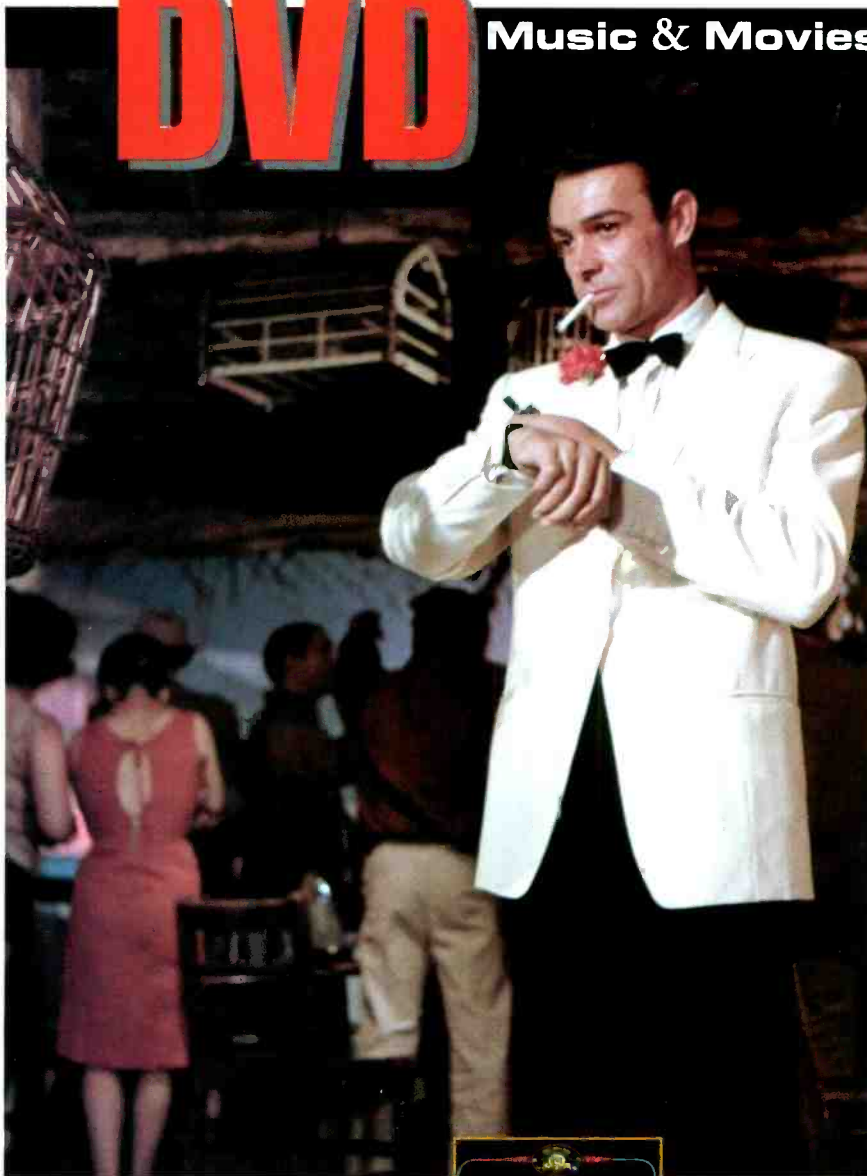


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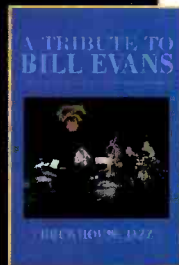
him is Gert Frobe as Auric Goldfinger, the best Bond villain ever—a clever and vicious criminal who plans to nuke all the gold in Fort Knox. Honor Blackman, who had been discovered on *The Avengers* TV series, plays the most memorable Bond woman of all time: Pussy Galore. And one must not forget the dramatic score by John Barry and the title song belted out by Shirley Bassey, a tune known the world over.

Fans have watched this movie dozens of times yet still get turned on. But not since

SOLID SOIREE

A Tribute to Bill Evans Gordon Beck, piano; Kenny Wheeler, trumpet and flügelhorn; Tony Oxley, drums; Stan Sulzmann, saxophone and flute; Dieter Ilg, bass. 1991; no ratings; one-sided (1.33:1 aspect ratio); in PCM stereo. EAGLE ROCK/IMAGE ENTERTAINMENT, 53 minutes, \$19.98

This concert DVD features some of the late Bill Evans' most well-known tunes, including "Not the Last Waltz," "Blue in Green," and "Waltz for Debbie." *Tribute's* auditorium setting might explain the businesslike manner of the quintet, which plays the spots off the notes but doesn't seem to be having much fun doing it. The bravura style is more extroverted than the low-key Evans would have produced himself. Close-in camera work, which zooms in on fingerings and drum work, adds excitement to the proceedings, while the sound is clean, clear, and robust, with excellent presence. This is a solid, competent concert, if not a totally memorable one. But the bass solo by Dieter Ilg just might be the best in a decade. This guy seems to have four hands and 20 fingers, popping off all sorts of harmonics and special effects in perfect tune. This DVD is worth it for those 5 extraordinary minutes. **R.B.**



WORTH ITS WEIGHT

Goldfinger 1964; PG rating; one-sided, dual-layer (1.77:1 aspect ratio and anamorphic widescreen); English and French Dolby Digital two-channel mono; English and French subtitles; closed-captioned; includes two commentary tracks, two documentaries, still-frame gallery, publicity featurette, trailers, and TV and radio spots. MGM, 110 minutes (feature), \$34.98



formula for future 007 movies. It was the first one whose opening minutes were like a mini-feature and the first to have a gadget that everyone wanted to own—the Aston Martin DB5 sports car, equipped with a few extras, such as machine guns and a passenger-ejector seat. As stated in the supplement section of this special-edition DVD, guys came out of the theater wanting to "be" Bond; women came out wanting him, period.

Goldfinger still holds up as superb action/adventure entertainment. Sean Connery, in his prime as the ultimate Bond, is suave, sexy, and dangerous. Playing against

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Star Trek: The Original Series, Vol. 1 ("Where No Man Has Gone Before" and "The Carbonite Maneuver") and *Vol. 2* ("Mudd's Women" and "The Enemy Within") 1966; no rating; one-sided (1.33:1 aspect ratio); digitally enhanced; Dolby Digital 5.1; subtitles. PARAMOUNT, 100 minutes each, \$19.98 each

It is hard to believe more than 33 years have passed since *Star Trek* first aired, in the fall of 1966. A show that presented intelligent human drama in a futuristic setting, *Star Trek* eventually gave birth to several spinoff programs and a series of movies. It was way ahead of its time, with a multiracial cast and many important female char-

acters. *Star Trek* added such phrases as "beam me up, Scotty" to our lexicon, and its Spock rivaled the fame of the baby doctor of the same name.

Paramount is releasing the original shows again, this time on meticulously processed DVDs. The game plan is to have two episodes per disc, in order of broadcast. The project will ultimately take up 40 DVDs! Six were released in 1999, while the rest are "coming to DVD in the new millennium." (Those folks at Paramount are crafty; that statement gives them a thousand years to complete the series.)

The picture is super-sharp without a trace of digital artifacts, and the mono soundtrack has been intelligently re-

mixed into good-sounding 5.1 surround. Spaceship sounds come from the back of the room as atmospheric engine sounds emerge all around. Fans and newcomers alike can get more into the original *Star Trek* than ever before. The few extras include TV promos and one trivia note for each episode, though these shows stand on their own without the trappings.

R.B.



acters. The original have they been able to see it as handsomely as they can here. The picture is impressive, with bright colors and sharp focus, a great improvement over the laserdisc versions. The mono sound has good dynamic range and does justice to the music, dialog, and sound effects. The generous extras offer just about all the information on Bond one could desire.

Thunderball, Live and Let Die, For Your Eyes Only, Licence To Kill, GoldenEye, and Tomorrow Never Dies have been given this same special treatment of new digital transfers and copious extras. MGM has promised six more titles will be released early this year and the remainder in mid-summer. If they are all as good as *Goldfinger, Agent 007* should be properly bonded by the end of 2000!

Rad Bennett

The Blair Witch Project 1999; R rating; color and black-and-white; one-sided, dual-layer (windowboxed, 1.33:1 aspect ratio); Dolby Digital two-channel matrix surround; closed-captioned; includes documentary (Curse of the Blair Witch), director/producer commentary, mythology, theatrical teasers and trailer, trailer for *The Stand*, and DVD-ROM features (including excerpts from the dossier and the comic book). ARTISAN, 87 minutes for feature and 45 minutes for documentary, \$24.98

The town of Burkittsville, Maryland, lies in a beautiful valley right across the river from where I live, in Harpers Ferry, West Virginia. Coming across Burkittsville by accident—as I did some 20 years ago—one has the feeling of entering a Currier & Ives



scene. There are no fast-food joints, no billboards, no signs of commercialism at all. Ironically, the movie was so successful that the town's residents have had to remove quaint welcome signs to keep them from being stolen by crazed fans. Does the movie deserve its mega-success? *Blair Witch* is neither the masterpiece of horror that some people claim nor the ripoff its detractors insist that it is; rather, it's a very clever example of effective, low-budget filmmaking.

Even better than the feature film is the accompanying documentary, originally produced for television. It is not a making-of but a serious, albeit fake, documentary that treats the events of the movie as fact. Why did three student filmmakers disappear while making a film about the Blair Witch? Their parents, friends, and teachers are interviewed, and "historical" evidence is presented. It is so effective that you're liable to start believing it.

This DVD is impeccably produced. The handheld cameras may jerk around a lot, yet they seem in perfect focus except when the images are intentionally blurred. It is obvious that the transfer hasn't introduced additional artifacts.

The Blair Witch Project did not scare the socks off me, but I found it good fun, and the extras provide an even better viewing experience than the movie by itself. R.B.

Cream: Farewell Concert 1968; no rating; one-sided (1.33:1 aspect ratio); PCM stereo. IMAGE ENTERTAINMENT, 48 minutes, \$14.98

Though together barely three years, Cream—Jack Bruce, Eric Clapton, and Ginger Baker—made a mark on rock 'n' roll that is still felt today. Each was a virtuoso musician, and together they more than tripled that talent. This brief film of the fabled final concert, produced by Robert Stigwood, has some obvious flaws. First, the narration drowns



out some of the music. Surely this could have been inserted between numbers. Second, though the box says the disc's in stereo, it sounded mono to me, with everything coming from the center. It's good enough for a location recording of the era, but it lacks bass and space.

On the positive side, the band members reveal influences, techniques, and feelings about the music in interesting interviews. But most important, this is an incredibly exciting performance. These guys play like there is no tomorrow and are seen in such close-up, revealing shots that you'll feel like you can reach out and touch them. At this low an asking price, I'd go for it. R.B.

Short 6: Insanity 1999; no rating; color and black-and-white; one-sided (1.33:1 aspect ratio and some letterboxed, from 1.66:1 to 2.35:1); Dolby Digital 5.1 and two-channel matrix surround; includes directors' commentaries, alternate video track, and commercials. QUICKBAND/WARNER, 120 minutes, \$14.98

Short Cinema's first volume of award-winning films was one of the most original titles to hit the street during the early days of DVD. The company had planned to make it available primarily by subscription as a "video magazine." This did not work out, and another company, QuickBand, is releasing new volumes in stores only, albeit at an attractive lower price. The format of the new volumes is much the same as before: an eclectic mix of the best short films and programs culled from commercial release and festivals. This latest volume includes *Blue City*, a poignant film involving "a boy, his ball, a suicidal man, his chalk, two thieves, and a street in the inner city"; *Billy's Balloon*, a wacky, absurd piece of animation that depicts homicidal balloons attacking babies; and *Midnight Dance*, an evocative supernatural animated short set to Saint-Saëns' "Danse Macabre."

Considering the low price, chances are you'll enjoy enough of these shorts to justify buying other volumes. Video and audio quality are never less than good and often better than that. R.B.



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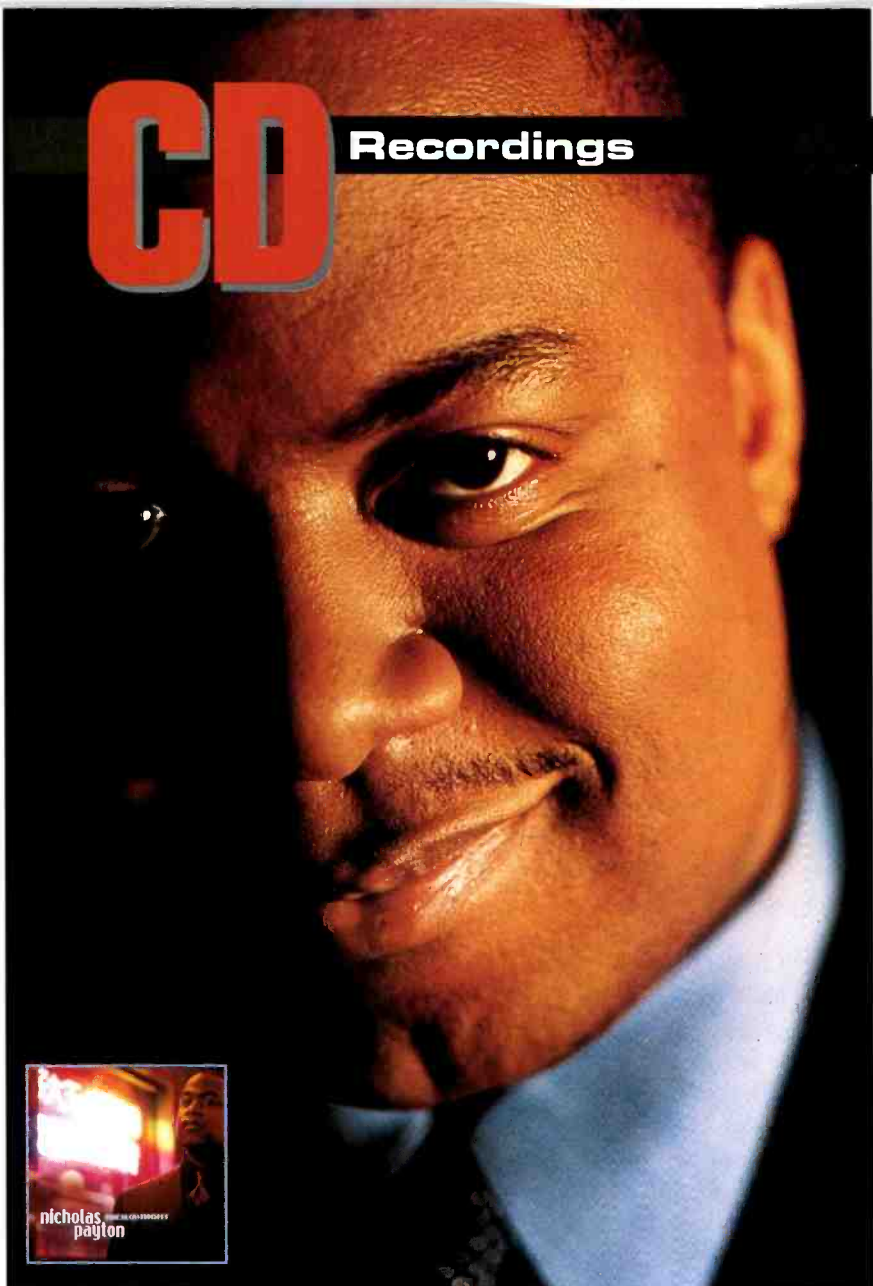


Photo: © Barron Claiborne



PAYTON'S PLACE

Nick@Night, Nicholas Payton
VERVE, 71:44

New Orleans native Nicholas Payton is one of the hottest young trumpeters around. His command of his instrument shows a fluidity heard only from the top trumpeters throughout jazz history. Payton's latest release, *Nick@Night*, highlights the leader's compositional and arranging skills. He wrote 10 of its 13 tunes, intending to foster emotion in both listener and performer. A gamut of grooves—from swing to funk to Latin—succeed in spurring heightened improvisations.

The set's opener, "Beyond the Stars" (featuring the quintet's front line of trumpet and tenor saxophonist Tim Warfield), is typical of Payton's ambitious arrangements. With its unison lines and harmonies written in rhythmic parallel, this ominous waltz also rediscovers the lesser-used technique of counterpoint. Pianist Anthony Wonsey (doubling on harpsichord) and bassist Reuben Rogers dig in with an ostinato that majestically reinforces the song's pulse. A short interlude then announces Payton's freewheeling trumpet improvisation. Following Wonsey's piano solo, it's back to the melody, ending with a lengthy tag showcasing the solid drumming of Adonis Rose.

Payton's complexities are doubly commendable, as they never lose the listener.

The music begins, the compositional techniques kick in, and things flow seamlessly. Optimally exploiting the talents of his gifted quintet of fellow youngbloods, Payton keeps the torch burning for straight-ahead swinging jazz.

James Rozzi

Joe Louis Walker

Silvertone Blues
BLUE THUMB, 50:03

Contemporary blues star Joe Louis Walker takes a trip back in time on *Silvertone Blues*, the guitarist's homage to the blues' rural acoustic roots. It's a gratifying departure for him; at last he's able to explore the many early roots and branches of the original blues idiom he so loves. If the sound of his inimitable electric guitar seems conspicuously absent, it's because he's replaced it with a battery of quainter, more "front-porch" weapons, from acoustic and primitive slide guitars to the Dobro. These excursions would sound misdirected on the bluesman's electrified recordings but sound like a flock of songbirds in a shady knoll here.

Walker is surrounded by a tremendous pool of talent on *Silvertone Blues*, including harp player James Cotton on three tracks, rustic revivalist Alvin Youngblood Hart on guitar, and pianist Kenny Wayne, who pounds the ivories with abandon on the rollicking "Kenny's Barrelhouse." If you harbor suspicions about an electric bluesman going back to his roots, you need only hear Walker's solo original "Talk to Me" to understand that the man is paying sincere tribute to his heroes.

Bob Gulla



Foo Fighters



There Is Nothing Left To Lose
ROSWELL/RCA, 46:21

When you pop in the latest Foo Fighters release, you might be tempted to think that the group is up to the same-ol', same-ol'. As "Stacked Actors" opens, the wall of guitars immediately begins its brick-by-brick ascent. But very quickly a groove worthy of an *Austin Powers* soundtrack takes over, with head Foo Dave Grohl singing in a voice that owes more to Vic Damone than Kurt Cobain. The song swings between post-grunge and pop before settling into an amalgam of both. It's a musical change that's jarring and welcome at the same time.

Grohl has fought the Nirvana tag for years, despite two successful outings as a Foo Fighter and his emergence from behind the drum kit (where many still think

he belongs). But *There Is Nothing Left To Lose* isn't a declaration of independence so much as a showcase for his widening musical scope and a final bow to his past. Hard rock and punk still drive him, but pop often rears its mainstream head.

In fact, toe-tapping is hard to resist when listening to this disc. Many of Grohl's songs have a newer, freer feel, as though he's decided that shaking his groove thang ranks right up there with shaking his fists. The only problem is that *There Is Nothing Left To Lose* doesn't inspire much more than that. The collection is even and well executed, and Grohl—never a slouch as a songwriter—proves his worth once again.

But the edge of his group's debut, *Foo Fighters*, and its follow-up, *The Colour and the Shape*, has disappeared, and that has as much to do with the departure of guitarist and ultimate odd-man-out Pat Smear as with Grohl's musical evolution. Gone are Smear's eccentric solos and energetic, quirky rhythm strokes. In their place are steady, able guitar work and a new cohesiveness. Not that there's anything wrong with that; Grohl & Co. could do much worse than become a better band. But you'll miss "This Is a Call," especially when songs like "Aurora" begin to sound, well, like the same-ol', same-ol'. *Marie Elsie St. Leger*



When the Pawn, Fiona Apple
CLEAN SLATE/EPIC, 42:39

Here's the Good News: *When the Pawn* is similar to *Tidal*, Fiona Apple's debut from '96—only better. Her voluptuous vocals swoop down at you as the piano clears a path. The musical power displayed here parts your hair in the middle. One big reason why it is so good? Apple promoted Jon Brion, Talent Supreme, to producer



this time around. And anybody who's followed his career as producer/musician (Aimee Mann, The Grays, Sam Phillips, Robyn Hitchcock) knows that he's the closest thing we have these days to George Martin and The Beatles rolled into one.

The Bad News: This CD should carry the advisory, "LAME LYRICS—Not Suitable for Adults." I usually cut some slack in this department, but Ms. Apple is trying to be profound here. Alternating between vague and clunky, her words belong on some brain-dead Tori or Alan disc, where the tune sucks, too. Fiona needs to fill the



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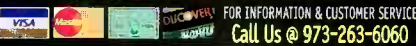
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HANGIN' WITH: STEREO LAB'S TIM GANE

Through its seven-year evolution, Stereolab has taken an eclectic, original approach to mixing jazz, pop, the avant-garde, and many sounds in between. Bandleader Tim Gane describes it as “messing with the concept of high art and low art and what constitutes either, and how you can mix both of them and get some interesting ideas.” Stereolab’s latest album, *Cobra and Phases Group Play Voltage in the Milky Night* (reviewed below), continues the high/low hi-jinks in grand style. Writer Ken Micallef recently talked music and the high end with Gane.

What does the name Stereolab mean?

It comes from the name of an old record label, which was part of Vanguard. Stereolab had Joan Baez and jazz and classical artists. It was the audiophile offshoot of Vanguard. I thought it would

be a good, tongue-in-cheek name for a band. It was very tongue in cheek.

Stereolab has a very unusual musical approach.

We’ve made two records, *Transient Random Noise Bursts* and *Space Age Bachelor Pad Music*, which are specifically concerned with the act of physically listening to music, including the equipment and genres. A lot of what Stereolab is known for are things slightly outside of the music:



That’s unusual for a musician these days. How does it affect the music-making?

I was using a lot of high-quality pro audio stuff. I made the music, then listened to it on a crappy system. It sounded appalling. All the subtle things we

did were lost. You didn’t hear any clarity. So I slowly built this system.

Has that affected mixdown?

I am very fussy. We always mix to tape. We use real reverb, passive EQ, and valve compressors. We keep the signal as pure as possible. What we do is about layering, and the sounds have to be good and clear.

What’s next for Stereolab?

Touring, a new EP, and I might look for some good horn speakers for the studio.

vacancy behind those big, blue eyes of hers and match her musical chops. Heck, she’s only 22, so there’s plenty of time. But for those who say “lyric, schmeeryric,” the choice is easy. Soundwise, *When the Pawn* is a little too dark and the vocals too thick to qualify as a demo disc. *Mal Alcalá*

This Time, Los Lobos
HOLLYWOOD, 38:01

If you thought *Kiko* was a little too Taco Bell and *Colossal Head* a little too graffiti-covered food stand in the heart of East L.A. (where the food promises to burn just as much coming out), then *This Time* is for



you, hombre. For the rest of us who can swing both ways, it’s a welcome addition to the play pile. Los Lobos makes it darn hard for us to take it for granted. First, it’s been a three-year wait between albums. Second, “Viking” is about as good as a nasty riff-driven tune can get. Period. Not much of a ladies’ man? Repeated exposure to this riff will change that. For this song alone, *This Time* is worth getting.

The Cuban-style songs sound earthier to me than most of the modern “real” stuff I’ve heard. Once again His Froomness and

Tchad Blake have done a great job at knob twiddling. When I was young, Los Angeles was lousy with first-rate bands. These days Los Lobos makes that list with a whole lot of elbow room. *Mal Alcalá*

It’s Harder Now, Wilson Pickett
BULLSEYE, 42:47

After more than a decade away from the studio, the pop music scene welcomes back Wilson Pickett, the singer of nearly two dozen Top 40 hits, including such classics as “In the Midnight Hour,” “Land of 1,000 Dances” and “Mustang Sally.” Luckily, *It’s Harder Now*, produced by Jon Tiven, does not update Pickett’s sound with modern bells and whistles. Rather, the new album continues to embrace the bread-and-butter Southern soul music of Muscle Shoals and Memphis that catapulted Pickett into an elite circle of ’60s R&B singers. The rough but poetic “Outskirts of Town,” Dan Penn’s “Soul Survivor,” and the revealing title track sound nearly as crisp and credible as Pickett’s early stuff.



There are a few transgressions. The randy “What’s Under That Dress,” in particular, doesn’t hide well enough behind its double-entendre. Still, 35 years on, Pickett sounds terrific, and whaddaya know? It’s past the midnight hour, and he’s still got a decent album to stand behind. *Bob Gulla*

Cobra and Phases Group Play Voltage in the Milky Night, Stereolab
ELEKTRA, 75:45

As the only contemporary group to successfully merge the Krautrock sounds of Kraftwerk and Neu! with the pastoral tones of Brian Wilson, postmodernist Stereolab has evolved into a distinctive unit capable of sublime Kosmische music moments.

Building on the band’s trademark hypnotic vocal and instrumental repetition, *Cobra* is rife with mad genre-splicing. Free-jazz, Euro-lounge, systems music—it’s all in there. The aromatic samba of “People Do It All the Time” bleeds into the Latin rhythms



of "The Free Design." Vibraphone winds through the lighthearted confection "Blips Drips and Strips," sounding like Steve Reich at Disneyland. Singer Laetitia Sadier's French pop dominates "Italian Shoes Continuum," which conjures up Nino Rota conducting an alien tea party. "Infinity Girl" is a pestered jazz calliope of smashing sounds and murmuring melodies over tumbling rhythms. Then, just as the sound can't get any more bizarre, Stereolab offers "The Emergency Kisses," a breezy swirl of vocals and instruments that is as soothing as skipping stones at the beach.

How Stereolab manages to constantly evolve in this over-referenced, sample-savaged world is anybody's guess. What matters is that it does. *Ken Micallef*

Hot & Cool: Bennett Sings Ellington
RPM/COLUMBIA, 60:58

Though Tony Bennett never said he was a jazz singer, his new, all-swinging, all-Ellington CD offers ample evidence to the contrary. Listen to the way he wraps his still-supple pipes around "Don't Get Around Much Anymore" or to his gentle

caresses of "Azure" and "Sophisticated Lady." His phrasing, his mood, and his tone sound like jazz to me.

Ralph Sharon, Bennett's pianist since the 1950s, anchors the shifting arrangements on *Hot & Cool*, which move from the intimacy of his quartet, through big-band romps, to lush orchestral charts. But it's Bennett's record—or, should I say, it is Bennett's and the Duke's: The man doesn't just sing the tunes, he inhabits them.

Ellington's indelible presence is also heard on the sound of this recording, which is simply gorgeous, in a late-'50s/early-'60s way. The whole affair feels very live, in the moment—you know, like a jazz record. *Steve Guttenberg*

BBC Sessions, Cocteau Twins
RYKODISC, two CDs, 1:51:20

To many adventurous music fans in the '80s and early '90s, the U.K.'s Cocteau Twins were phantoms of a pop opera, mysterious personalities who rarely appeared

in public but created spellbinding music. Led by singer/vocalist Elizabeth Fraser and guitarist/composer Robin Guthrie, the Twins' musical and creative ethos was always impeccably abstract, from their song titling and album art to their bewitching recorded performances, which happened to sound like visitations from some brilliant musical otherworld.

Fraser sings in a combination of languages—including invented words—rendering her voice more a lead instrument than a message conveyer, while Guthrie, one of pop's great underrated guitar stylists, embellishes his arrangements with gilded layers of shimmering textures. The result enchants, especially on the early "Wax and Wane," the dizzying "Dear Heart," and the dissonant, agonizing "Hitherto." This magical set of BBC live recordings includes material never before available in the States and tacks on two tracks never available anywhere, a cover of Billie Holiday's "Strange Fruit" and the beautiful "My Hue and Cry." *Bob Gulla*



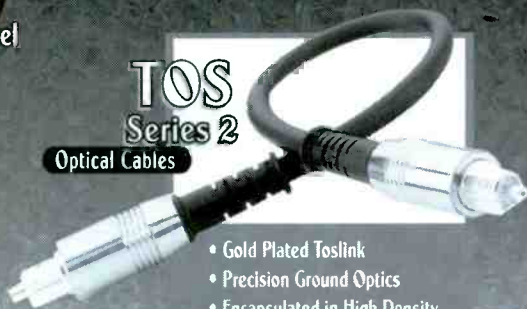
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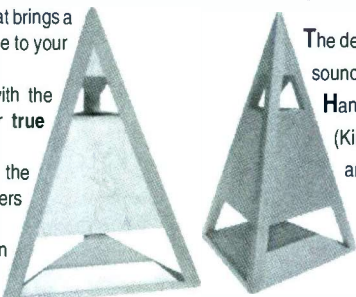
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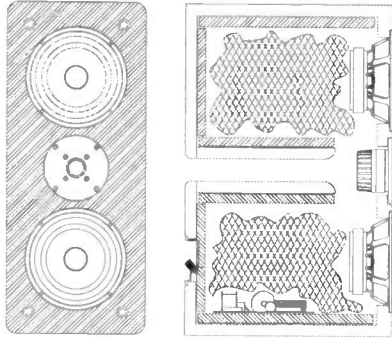
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Seas Odin Millennium

Madisound and Seas of Norway are pleased to introduce the **Odin Millennium Speaker Kit**. This system introduces Seas' new line of premium loudspeakers known as Excel drive units. The Odin delivers strong bass with a wide sound stage. The imaging and accuracy results in a realism that draws the listener into the music.



Woofers: The Odin uses two woofers per cabinet: the Seas Excel W17E 002. This 7" woofer has a specially coated magnesium cone and a solid copper phase plug. The phase plug along with copper shorting rings on the pole piece help reduce distortion by dissipating heat and minimizing the inductance. This combination of materials also results in a design that is a visual work of art.

Tweeter: The Seas Excel Millennium T25CF-002 tweeter is a 25mm Sonotex fabric dome, Hexadym magnet system (6 radially arranged neodymium magnets), a machined aluminum face plate with decorative copper ring and a rear chamber to eliminate unwanted reflections. Described by some as the "most transparent tweeter they have listened to".

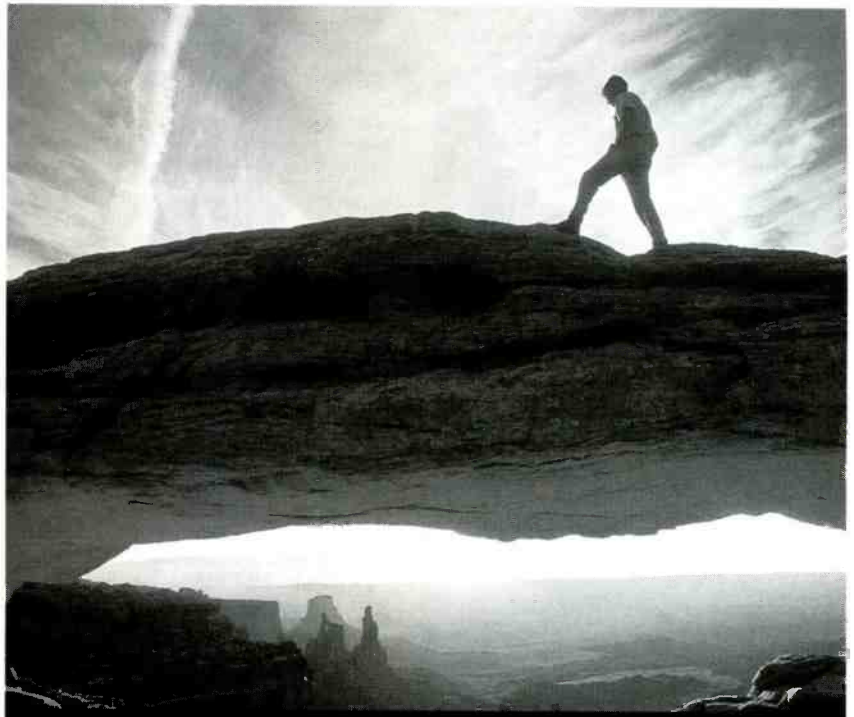
Cabinets: The cabinets are oak veneer with a slot loaded rear vent and full black textile grills. Cabinets are available with a clear finish or ebony finish. Cabinets are 22" high, 9 1/2" wide and 14 1/2" deep. The cabinets, grills and crossovers are fully finished and assembled. You receive all parts necessary to construct the kit.

Conclusion: The Odin speaker is the result of a combined effort of Seas and Madisound. The Odin was subjected to extensive listening tests and all involved agree that the combination of high quality parts, design experience and listening has created a memorable musical experience.

Price: Kit with cabinets are \$1089 per pair. Kit without cabinets are \$869 per pair.



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Ends and Beginnings

RIP, Mobile Fidelity I am sad to report that the longest running of the audiophile reissue houses has had to close its doors. Perhaps the most dispiriting element of the story is that this occurred through no fault of the company's own. One of its biggest distributors folded while holding so much inventory and owing so much money that MoFi got crumpled in a chain reaction. A dismal way to go.

For me, the irony is that I had expected all such labels to vanish pretty quickly after the introduction of the Compact Disc, more than 15 years ago. And just about all of them did. How could they survive when the primary rationale for their existence had been better LP cutting and pressing than the big labels were providing?

It turned out they actually had a couple of things going for them, which Mobile Fidelity seized hold of and most of the others missed. Particularly important was the slipshod manner in which many of the majors transferred their back catalog to CD.

Everything should have sounded better—or at least the way the artists intended—on CD, but too often the original (or remastered) LP releases remained the best available. More insidiously, because nobody realized it, not all of the equipment used for moving digital audio around in studios and mastering houses was (or is) truly bit-accurate. In other words, sometimes data is changed unintentionally, just by passing it through some piece of electronics. I was amazed when Tom Holman told me this a few months ago, but he says that it's true (and that he was just as surprised when he discovered it). The result, he says, is that many recording engineers don't quite trust digital audio today. Yet there's nothing wrong with the theory; there's just more sloppy implementation than anyone would have imagined.

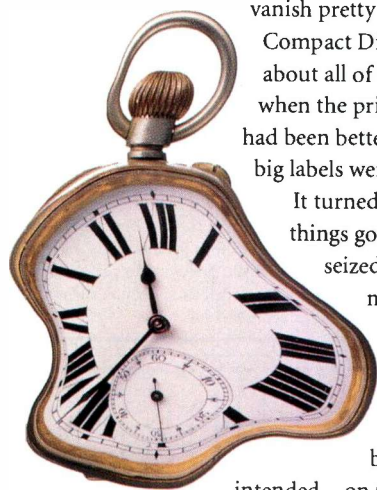
So Mobile Fidelity did continue to have a reason to exist and continued to the end to push the limits of the best media available. I will miss the company and the personable, dedicated people who made it go.

DVD-Audio Delay Shortly after we went to press with last issue's preview of the Technics DVD-A10 DVD-Audio player, word came that the format's launch would be delayed six months. The reason? The successful

hacking of the DVD-Video encryption scheme, which prompted nervous record company execs to demand a fresh look at DVD-Audio security. (Maybe timing really is everything.) This is hardly surprising, given that what the labels want more than anything else out of the next-generation delivery systems is better copy protection. Anyhow, rest assured that DVD-Audio will happen, just not as soon as we had hoped.

Pioneer, by the way, announced in early December that it would begin shipping DVD-Audio players in Japan (nowhere else) by the end of that month, even though there might be no DVD-Audio titles available for almost a year. The company says it will upgrade all players sold to support whatever enhanced encryption system is adopted after it is finalized. If you want commitment, there it is.

Recordable DVD "But it won't record." This is what I kept hearing from naysayers when DVD was launched. And as I expected, people mostly didn't care. Still, once you have a DVD player, you start to think about how nice it would be to make your own recordings now and then, whether off the air or from home videos. Pioneer (again) has already introduced a stand-alone (as opposed to computer-based) DVD recorder in Japan and plans to release one in the United States late this year, using the DVD-RW format. DVD-RW is one of three rewritable DVD recording formats competing for the market. The other two are the official DVD Forum system, DVD-RAM, and a dark horse, DVD+RW, supported primarily by Sony and Hewlett-Packard. DVD-RW's biggest current selling point is that the discs should be playable on many, though not all, existing DVD players. DVD-RAM, on the other hand, will require some minor changes in players to accommodate it. It probably will take a couple of years for this particular intramural slugfest to sort itself out. Meanwhile, however, if you're among those eager to record your own DVDs, you can console yourself in the knowledge that you won't have to wait too much longer.



**An exit
untimely
and an
entrance
delayed**

A handwritten signature in black ink, appearing to read "Michael". The signature is fluid and cursive, with a large initial 'M'.

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The advertisement features a close-up of several Everest speaker cables against a background of a car's speaker grille. The cables are braided and have blue plastic connectors with the Everest logo. One cable is labeled 'MID/TREBLE' and another 'BASS'. The Everest logo and 'EXTREME SPEAKER CABLE' are embossed on the grille. The audioquest logo is also visible.

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