

THE WORLD'S #1 A/V MAGAZINE

# Stereo Review

## HOME THEATER STARS

### Center Speakers

Shopping for the best performance

### Subwoofers

Six little bass cubes and how they play



### Showstoppers

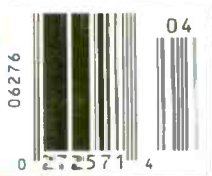
Hot new products from the Consumer Electronics Show

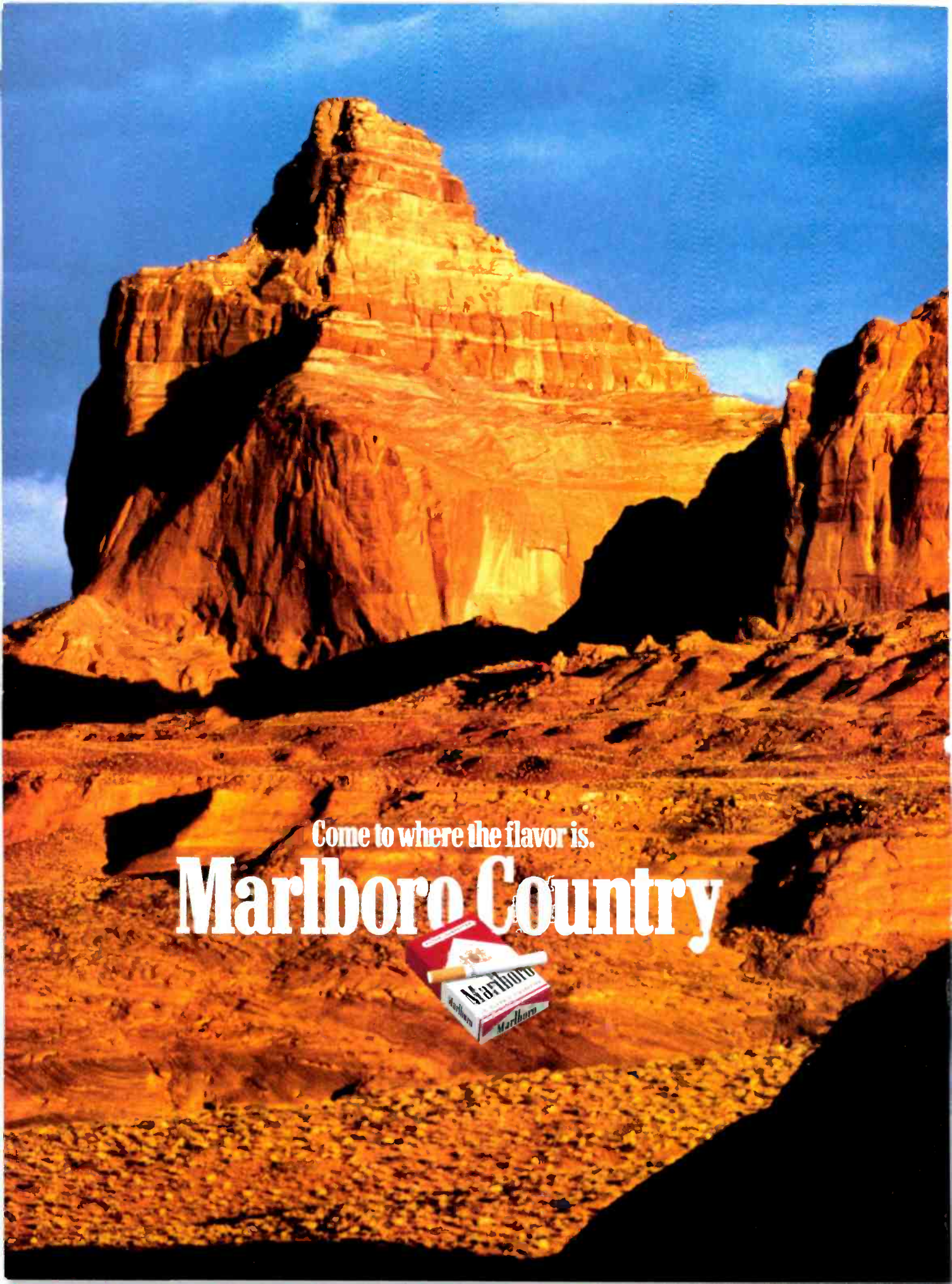
### Test Reports

Listening  
processor,  
Lexicon Dolby Digital preamp, more

MR DAVID S BUCHANAN  
1100 OXMOOR PKY #1906  
LOUISVILLE KY 40222-5569  
MAY 97  
VDO6  
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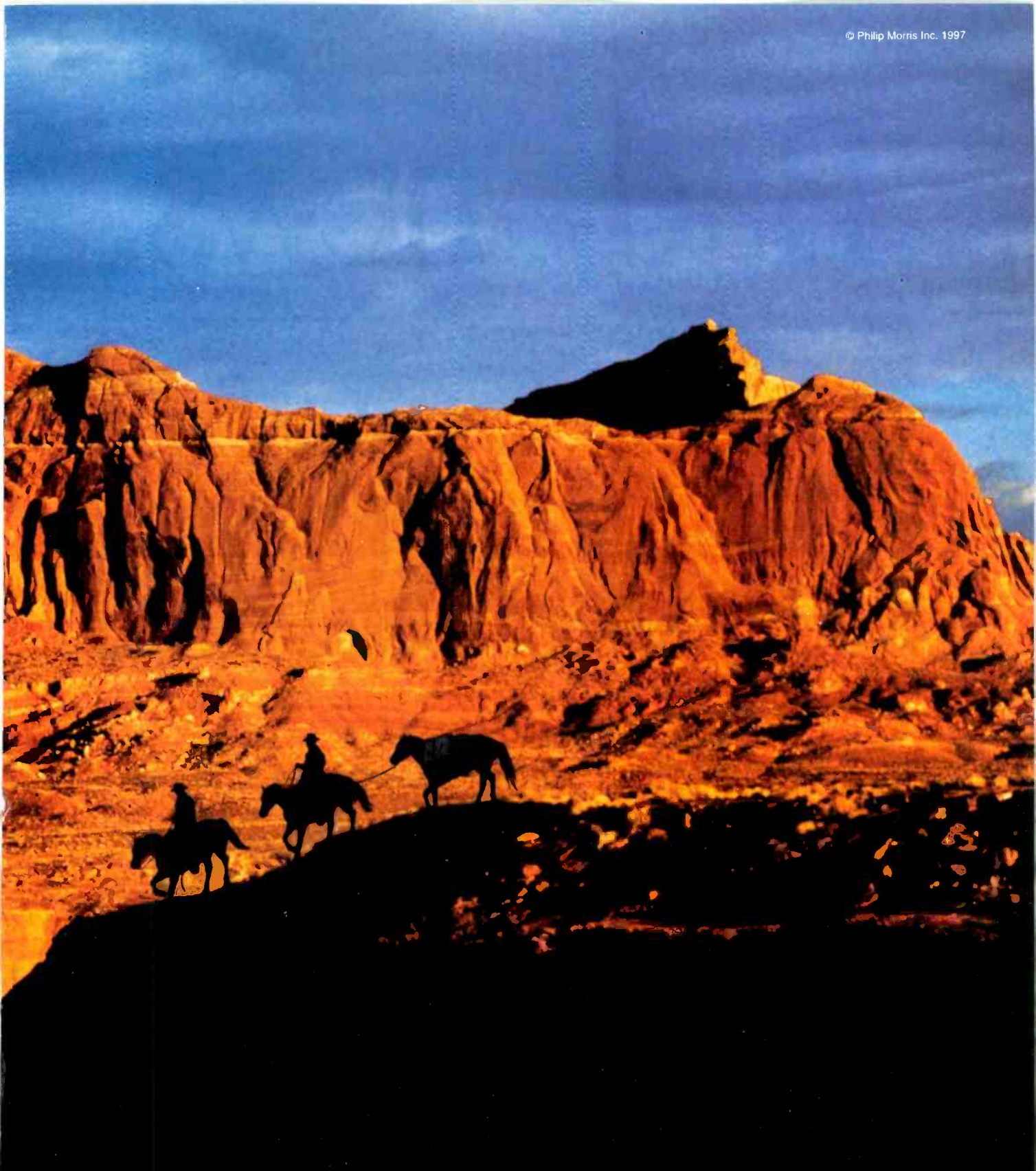




Come to where the flavor is.

# Marlboro Country





16 mg "tar," 1.1 mg nicotine av. per cigarette by FTC method.

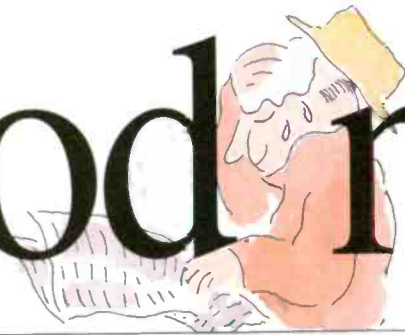
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# Bad news.



Adcom's GFA-555II is no longer made.

# Good news.



Adcom's new GFA-5500 continues the legend.

The Adcom GFA-555II power amplifier has been legendary among audiophiles and serious music listeners. It set the standard for high end sound at reasonable cost, consistently being compared to amplifiers costing two and three times as much. Now, after years of evolutionary development, its successor is available.

The new GFA-5500 provides 200 watts-per-channel continuous at any frequency from 20 Hz to 20 kHz at 8 ohms. It continues the Adcom tradition of delivering high current into low impedance loads that results in extraordinarily pure, clean, musical sound reproduction. But the big news is its use of the newest hybrid MOSFET transistors, HEXFETS. These all-new devices permit a more efficient circuit board design that leads to shorter power paths

for improved sound. And the really good news is that while providing all the punch and muscle of MOSFETS, they have a remarkable ability to sound as sweet as tubes.

So while audiophiles the world over may be sad to see the end of the legendary GFA-555II, music lovers everywhere can look forward to hearing the sweet power of the GFA-5500. Visit your Adcom dealer and listen. You will hear the details that make a difference.

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CIRCLE NO. 1 ON READER SERVICE CARD

It's not a ball game. Or movie-of-the-week. But, AR's CS 25 HO (High Output) Center / Surround Speaker is the most dramatic improvement in home entertainment you'll ever see - or hear.



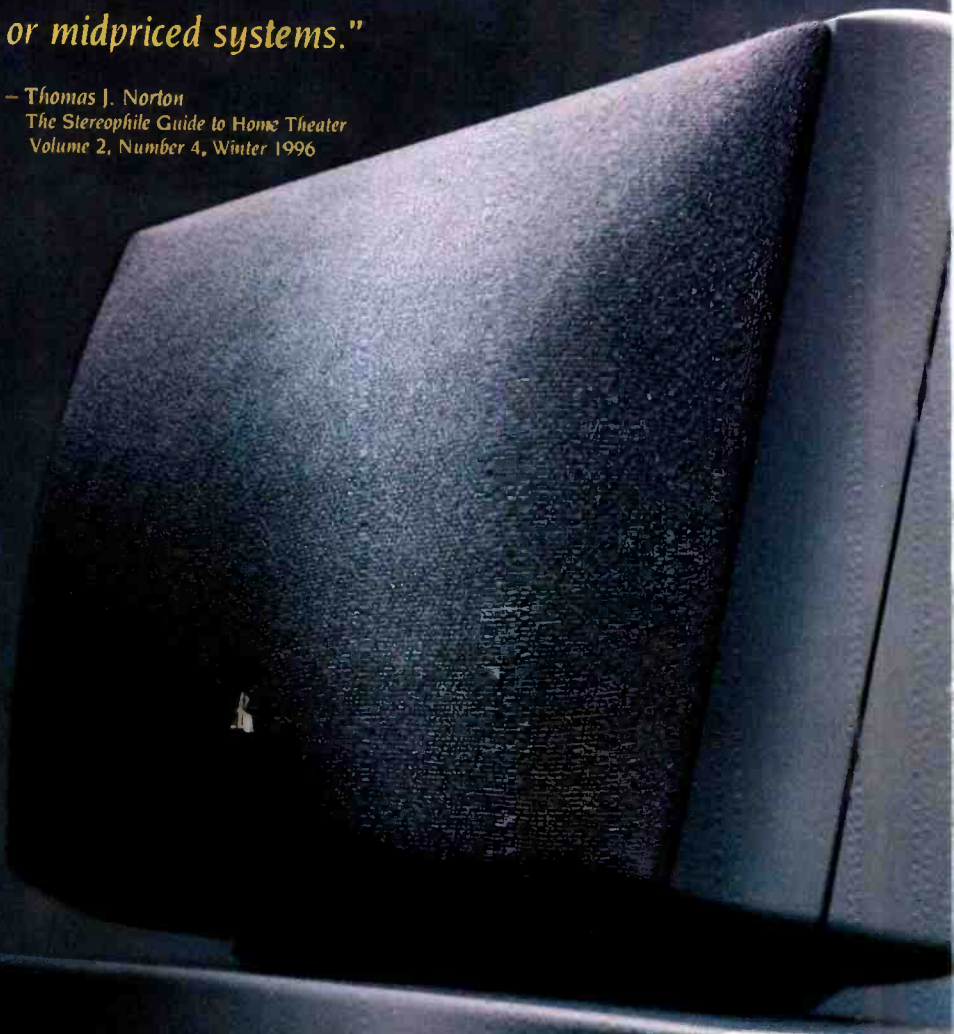
For starters, the CS 25 HO has a compact, soft-grip base that fits comfortably atop any TV and doubles as a wall mount bracket with built-in swivel

adjustment. The magnetically shielded Focused Array Driver Configuration delivers spacious sound, crisp dialog, and dynamic musical reproduction at any position, with no interference to your system's video signal. Best of all, thanks to AR's commitment to value, you'll enjoy audiophile performance and the ultra high efficiency that the CS 25 HO stats of 94dB @ 2.82 volts / meter will deliver...and still have money left over for the popcorn.

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*"The sound had dynamics and punch to spare, but also an ease that is uncommon with low - or midpriced systems."*

*- Thomas J. Norton  
The Stereophile Guide to Home Theater  
Volume 2, Number 4, Winter 1996*



# THE BEST THING ON TELEVISION

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# Stereo Review

INCORPORATING HIGH FIDELITY

April 1997

Cover. Our up-to-the-minute home theater includes the Panasonic DVD-A300 DVD player, a Denon AVR-3600 Dolby Digital receiver, a Paradigm Reference CC-450 center speaker, and a 35-inch Mitsubishi CS-3585 TV on a raw-aluminum-and-glass stand from Progressive Structures, which also makes the stands under the Paradigm Reference LCR-450 speakers on either side. On screen, of course, is Buzz Lightyear from Disney's *Toy Story*. (The sofa is from *Sofa So Good*.)

Photograph by Dan Wagner

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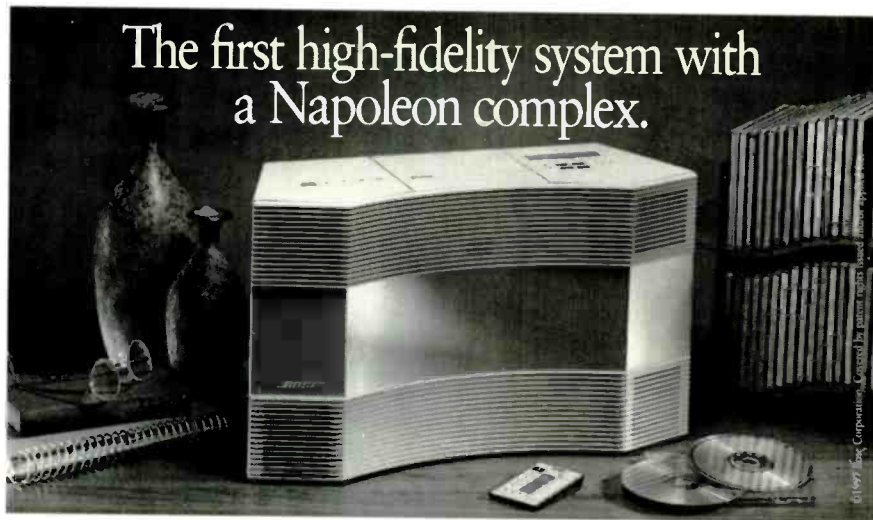


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# LETTERS

## Disgraceland Dissents

It is mind-boggling to me that a critic whose reviews are usually on the money can be so wrong about a particular album. I'm referring to Parke Puterbaugh's selection of Sting's "Mercury Falling" as one of the worst records of last year in "Disgraceland" (February). I read six reviews of this CD: four called it excellent, one very good — and then there was Mr. Puterbaugh. I realize that art criticism is a subjective task, but this much discrepancy is absurd.

ALICIA SORENSEN  
Seattle, WA

A note of disagreement regarding the selection of the Sex Pistols' "Fifty Lucre Live" as one of the worst records of the year. In his blurb, Parke Puterbaugh doesn't really criticize the musical content of the CD but the *reasons* for its release. But there is no contradiction between anarchy and capitalism. While other punk bands, such as Killing Joke, have fallen prey to the leftist rock-and-roll hypocrisy of making millions while denouncing capitalism and private property, the Pistols say, "We're here to make some cash, and we'll do with it what we choose!" And it's a pretty damned good performance as well.

GARDNER GOLDSMITH  
Amherst, NH

I was wondering why you gave Jimmy Buffett's "Banana Wind" a good review in your September 1996 issue, yet in February 1997 his recording ends up in "Disgraceland." I think this CD shows a more mature side of Mr. Buffett and his chameleonlike ability to keep entertaining us as we, as well as he, grow older but not up.

MEGAN PATRICK  
Palm City, FL

*The "you" Ms. Patrick refers to needs a little clarifying. The September review of Jimmy Buffett's "Banana Wind" was written by Alanna Nash, but it was Parke Puterbaugh who nominated the CD as one of the worst recordings of the year. One critic's pleasure is another critic's pain. Then the Buffett album and all other nominees for "Disgraceland" were considered at an editorial meeting. Clearly, some of the editors agreed with Puterbaugh about "Banana Wind" — and about the Sting and Sex Pistols CD's, too.*

## Lost at the Movies

January's letter from reader William K. Saunders is right on target regarding the mindless dialogue in today's movies. Most of the so-called acting is pieced together in the cutting room.

I rarely go to a movie theater because I can't control the sound level. At home I can lower the sound, but then I can't hear the dialogue. A critical assessment of today's movies will become possible only when we can separate voices from sound effects and

music. Surely this would be technically possible with a button or two.

WILLIAM H. WEICKER  
Monroe, CT

*Have you tried rebalancing your home-theater system to boost the volume in the center channel, which has most of the dialogue, relative to the other channels? It won't be what the movie producers intended, but you may find the results more satisfying.*

## Dolby Digital via Satellite

If a person has one of the new A/V receivers with Dolby Digital built in and also has a satellite dish and receiver, will a new satellite box on the TV be required to decode future Dolby Digital satellite transmissions, or can they be decoded by the A/V receiver?

GEORGE HEIDEL  
Redding, CA

*So far, none of the major satellite TV program providers — like DirecTV or USSB — have announced plans to broadcast audio in the 5.1-channel Dolby Digital format. Right now, doing so would require technical modifications in both the broadcasting and home-based receiving equipment — in other words, your current satellite receiver would probably have to be replaced or modified. And you would still need a DD decoder like the one in your A/V receiver to decode the DD bitstream unless hardware makers decided to include DD decoders in their satellite receivers — which is unlikely because the tendency is toward lowering the cost of satellite hardware, not increasing it.*

## Who Needs "Exotic" Amps?

Regarding Corey Greenberg's "Exotics" in January: It is amazing to me that a subset of hi-fi consumers have nothing better to do with their money than to spend \$252,500 on an amplifier.

Please don't misunderstand: I'm sure that the Audio Note Gaku-On is a fine amplifier, and I'm sure that the lucky people who have had an opportunity to listen to it or own it believe that it does indeed perform "like a cruise missile." Of course, I like to believe I sound like Pavarotti in the shower, but evidence suggests otherwise.

The article contains a remarkable number of claims of breakthrough audio technologies with little or no empirical evidence backing them up. The Gaku-On employs 22 pounds of finely crafted silver wire in its manufacture. So what?

All amplifiers have one common objective — amplifying and reproducing a musical signal so that it can be manifest through a set of speakers. Most well-engineered amplifiers on the market do a fine job of faithfully amplifying a signal, some slightly better than others. Manufacturers of recording-

studio amplifiers, preamplifiers, and other equipment do not employ 22 pounds of silver in their components, nor do such components cost \$252,500. Most studios don't spend that much total on their equipment!

Given that relatively inexpensive (note that I didn't say unsophisticated) equipment was used to record, mix, and shape the music we listen to, what specifically is the benefit of employing exotic equipment, such as the Gaku-On, in reproducing it? And what of amplifier-speaker interaction, speaker and microphone construction and placement, room acoustics and acoustic coupling, recording media, processing, mixing, and equalization — or the 30¢ mass-produced binding posts on the ends of the \$30-a-foot speaker wire?

STEREO REVIEW remains one of the few publications in the world that take a reasonable, scientific approach to helping readers understand the processes inherent in the reproduction of music. Hey, I enjoy an occasional voyeuristic look into the exotics freak show just as much as the next guy, but if you want to focus on high-end products, focus on the work of true technological revolutionaries, such as Bob Carver's Sunfire amplifier, not the bizarre claims of lunatic-fringe manufacturers.

ERIK JOHNSON  
Tigard, OR

## CD Storage

Rebecca Day's January article on solutions for CD storage made no mention of Uni-venture products. The company's three-ring CD binders enable me to store forty discs in one sturdy album. I have stored nearly 400 CD's in less than 2 feet of shelf space.

THOMAS R. MARK  
Fort Collins, CO

*We couldn't cover every worthy product available; the article was intended to suggest a variety of solutions readers might consider. Thanks for the additional tip.*

## Corrections

The caption for a photo of the Infinity Compositions Overture 3 speaker on page 52 in the March issue gave an incorrect price. The speaker lists at \$1,400 *each*, not \$1,400 a pair.

We printed an incorrect telephone number for Magnepan, which makes Magneplanar brand speakers, in February's "Directory of Manufacturers." The correct number is 1-800-474-1646. □

**We welcome your letters. Please address correspondence to Editor, Stereo Review, 1633 Broadway, New York, NY 10019. You should include your address and telephone number for verification. Letters may be edited for clarity and length.**

# Audiophiles are getting into metal.

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## INTRODUCING THE DIE-CAST ALUMINUM MICRO90 SYSTEM FROM BOSTON ACOUSTICS.

Regardless of your musical leanings, the new Boston Micro90 will alter your view of subwoofer/satellite systems. One reason: The satellites are die-cast from an aluminum alloy, creating a housing of incredible strength and rigidity. So all of the speaker's energy is projected as pure, clean acoustic output instead of being wasted as cabinet vibration. That's how a Micro90 satellite, which fits in the palm of your hand, can fill a room with astonishing sound. Its anodized aluminum tweeter with AMD handles lots of power, yet reproduces highs with virtually zero distortion. And its optional swivel-mount pedestals make for simple shelf or wall mounting. The Micro90's powered subwoofer, with its clean 75-watt amp and 8-inch DCD bass unit, produces enough bass to satisfy fans of both Ozzy and Offenbach. Best of all, the Micro90 is available in a complete home theater package, with a matching die-cast center channel and your choice of direct or diffuse-field surrounds. Hear the Micro90 at your Boston dealer.



This Micro90t Home Theater Package includes: Two die-cast satellites; a die-cast, sonically matched Micro90c center channel; a 75-watt powered subwoofer and a pair of VRS diffuse-field surrounds (available separately).

**Boston**Acoustics

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# NEW PRODUCTS



## ▲ PIONEER

Pioneer's Elite DVL-90 combi-player handles the new DVD movie discs, laserdiscs, and CD's. Performance is said to be enhanced by 20-bit D/A converters for audio and a 9-bit D/A converter and digital noise reduction for video. Both RF and conventional coaxial and optical digital outputs

are provided for Dolby Digital soundtracks. Highlights include two-sided play for laserdiscs, a separate loading drawer for DVD's and CD's, a simplified remote control, and a graphical on-screen user interface. Price: \$1,750. Pioneer, Dept. SR, 2265 E. 220th St., Long Beach, CA 90810.

## ▼ SANSUI

Sansui's RZ-8150AV A/V receiver, in brushed aluminum, is rated at 75 watts per channel across the front and 25 watts to each surround speaker, or 120 watts per channel in stereo. The seven surround modes, including Dolby Pro Logic, all feature variable digital delay with memory recall.

Five audio and two video inputs are provided along with a karaoke mic input and a remote control. Also available in black as the RZ-8200AV. Price: \$699 (either finish). Sansui, Division of Regal Electronics, Dept. SR, 4251 Burton Dr., Santa Clara, CA 95054. • Circle 121 on reader service card



## ▼ ROTEL

The Rotel RCD 990 CD player incorporates a Pacific Microsonics PMD-100 HDCD digital processor/filter chip for playing back HDCD-encoded music discs; this chip is also said to provide superior digital filtering for non-HDCD-encoded discs. Other features include Burr-Brown

20-bit D/A converters, a heavily damped mechanical suspension, an analog stage with high-performance components, and a full-function remote control. Price: \$1,500. Rotel, Dept. SR, 54 Concord St., North Reading, MA 01864.

• Circle 120 on reader service card



## ▼ WHARFEDALE

The Modus Four bookshelf speaker from Wharfedale has a ¾-inch silk-dome tweeter in a pivoting pod that's designed to help users obtain good stereo imaging despite uneven speaker placements. The cabinet, with an acoustically inert molded baffle, houses a 7-inch mineral-loaded

polypropylene woofer. Standing 23 inches tall, the Modus Four has a rated low-end limit of 48 Hz and is available in rosewood or black ash veneer. Price: \$750 a pair. Wharfedale, distributed by M. Rothman & Co., Dept. SR, 50 Williams Dr., Ramsey, NJ 07446.

• Circle 122 on reader service card



# NEW PRODUCTS



## ◀ COINCIDENT

The Coincident Triumph is a two-way bass-reflex speaker with a 6½-inch polypropylene woofer and a 1-inch silk-dome tweeter. Built of 1-inch MDF, the 16-inch-tall cabinet is finished in black acrylic; a wood-frame grille is optional. Low-end limit is given as 40 Hz, impedance as 8 ohms, and sensitivity as 90 dB. Price: \$799 a pair; grilles, \$25 a pair. Available direct from Coincident Speaker Technology, Dept. SR, 51 Miriam Cres., Richmond Hill, Ontario L4B 2P8; phone, 905-886-6728.

• Circle 123 on reader service card



## ▲ MB QUART

MB Quart's D1200Si powered subwoofer packs a 12-inch copolymer driver and a 185-watt high-current amplifier into a ported cabinet measuring 20¼ x 14¾ x 16⅞ inches (W x H x D). It features line-level inputs and speaker-level inputs and outputs; internal low- and high-pass

crossovers are adjustable. An equalizer switch selects enhanced midbass response for movie soundtracks or flat response for music. Usable output is said to extend below 30 Hz. Price: \$799. MB Quart, Dept. SR, 25 Walpole Park S., Walpole, MA 02081.

• Circle 124 on reader service card



## ▲ CLASSÉ AUDIO

The CAP-100 stereo integrated amplifier from Classé Audio is rated to deliver 100 watts per channel into 8-ohm loads. Four RCA inputs, one balanced line-level input, and a tape-monitor loop are standard; a plug-in phono-stage module is optional at extra cost. Pre-out/main-in jacks

are provided to accommodate future upgrades, and there is an all-aluminum remote control for volume adjustment and muting. Price: \$1,995; phono module, \$200. Classé Audio, Dept. SR, 5070 François Cusson, Lachine, Quebec H8T 1B3.

• Circle 125 on reader service card



## BOSTON ACOUSTICS ▲

Boston Acoustics' MicroMedia powered speaker system includes 3½-inch cube satellites and a bass module measuring 7 x 9¾ x 10 inches. Each magnetically shielded satellite has a 2½-inch driver and comes with a desk stand, an L-bracket for computer monitor mounting, and a keyhole for wall-mounting. The

bass module houses a 5¼-inch driver and an amp rated to deliver 15 watts to the woofer and 5 watts to each satellite. A remote volume control attaches to one satellite. Available in black or gray. Price: \$249. Boston Acoustics, Dept. SR, 300 Jubilee Dr., Peabody, MA 01960.

• Circle 127 on reader service card



## ◀ EDL

EDL's passive "inverse-RIIA" module allows a line-level source to be plugged into a phono input on a receiver or preamp. Price: \$30. Electronic Design Laboratory, Dept. SR, 17 Caledonia Pl., Clifton, Bristol BS8 4DJ, U.K.; phone, 44-117-974-1918.

• Circle 126 on reader service card

# Introducing MovieWorks. No-Compromise Home Theater Surround Sound Made Simple.



140 Watt, 12"  
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Surround Speakers

Shielded, Two-Way  
Main Speakers

Shielded, Low-Profile  
Center Speaker

For many, many people, MovieWorks is the perfect home theater speaker system. It delivers incredible no-compromise performance that doesn't require disclaimers or apologies. We don't know of any other system in its price range that approaches its performance.

### What Is MovieWorks?

MovieWorks is a set of carefully matched speakers – including a powered subwoofer – for Dolby Pro Logic® or Dolby Digital® (AC3) surround sound systems. Each speaker is designed to accurately reproduce music and movie soundtracks with outstanding realism.

### Main Speakers.

The left and right speakers in MovieWorks use a two-way, shielded design. They are acoustically similar to the satellite speakers in our acclaimed Ensemble® speaker system, which Audio magazine called "the best value in the world."

### The Center Speaker.

The center speaker is a wide-dispersion, high-output shielded design with two 3 1/2" midrange drivers and a tweeter identical to that in the main speakers. Its low profile makes it ideal for use above or below a TV monitor.

### The Surround Speakers.

For the rear channel, we chose an acoustically matched dipole radiator speaker. Each speaker has two high-frequency drivers – one facing forward, one to the rear. They send out-of-phase signals to the front and rear of the room, where they reflect off walls, "surrounding" the listener. We feel dipole speakers are ideal for home theater – including Dolby Pro Logic and Dolby Digital (AC3) systems.

*"The Cambridge SoundWorks dipole surround speaker sounded absolutely great. These will stay on my surround speaker shelves for a long time."*

Home Theater magazine-3/96

### The Powered Subwoofer.

For bass reproduction, we chose an amazing powered subwoofer. It uses a 12" woofer with a 140-watt amplifier for outstanding bass in music and soundtracks. Sound & Image says it's, "a winner, pounding out first-rate 108 SPL... a knockout."

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*"Cambridge SoundWorks' Powered Subwoofer was clearly the best subwoofer of the pack... it blew them away on dynamics."*

Stereo Review-9/96

## HOW DOES *MovieWorks* COMPARE TO THE COMPETITION?

	DIPOLE SURROUND SPEAKER?	WOOFER SIZE	SUBWOOFER POWER	PRICE
CAMBRIDGE SOUNDWORKS	YES	12"	140 WATTS	\$1,299
POLK (M5, M3 I, CS250S, PSW300)	NO	10"	125 WATTS	\$1,499
BOSTON ACoustICS (Micro90, 90X, 90C)	NO	8"	75 WATTS	\$1,399
KL PSCH (KSS3, KSS2, KSS1)	NO	6.5"	50 WATTS	\$1,199

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# NEW PRODUCTS

## ▼ ALPINE

Alpine's 3DE-7985 in-dash three-disc car CD changer/tuner uses a new cartridge-loading mechanism that is said to enable disc changes in as little as 9 seconds. The cartridges (one is supplied) are also suitable for CD storage. Other features include a regulated 1-bit D/A converter, disc-title

memory and display for up to thirty CD's, an AM/FM tuner with station-title memory, dual preamp outputs for the required outboard amplifiers, and a wireless remote control. Price: \$530. Alpine, Dept. SR, 19145 Gramercy Pl., Torrance, CA 90501.

• Circle 128 on reader service card



## ▼ SONANCE

Sonance's top-of-the-line D8001 in-wall speaker uses aluminum drivers, including an 8-inch woofer, a 2½-inch midrange, and a 1-inch pivoting dome tweeter. Grilles for the 10 x 16 x 3½-inch weather-resistant speaker are white cloth or metal. An extended pole piece and an inverted rubber surround on the woofer are said to extend bass response; a back box is optional. Low-end limit is given as 30 Hz -2 dB, sensitivity as 92 dB, and power-handling as 150 watts continuous. Price: \$1,799 a pair. Sonance, Dept. SR, 961 Calle Negocio, San Clemente, CA 92673.

• Circle 129 on reader service card



## ▲ CERWIN-VEGA

Cerwin-Vega's AL-1000 speaker has a 15-inch woofer, an 8-inch midrange driver, and a 1-inch soft-dome tweeter mounted in an aluminum flange. Standing 43¾ inches tall and finished in textured gray vinyl, it is said to be able to play loud (123 dB) and to handle up to 1,000 watts of power. Rated low-frequency limit is 28 Hz -3 dB, impedance 4 ohms, and sensitivity 95 dB. Price: \$1,198 a pair. Cerwin-Vega, Dept. SR, 555 E. Easy St., Simi Valley, CA 93065.

• Circle 131 on reader service card



## ▲ SM'ART

Sm'art Designs' SR-4 Ne-Onn Prism A/V Rax combines illuminated storage for fifty CD's with space for four components. The 56-inch-tall rack is made from ¾-inch black powder-coated MDF and interlocking acrylic shelves that pick up light from the CD tower. Usable space on each shelf is 19½ x 16 inches, and

the lighting colors can be customized with filters. Other models are available in maple veneer with black, maple, or acrylic shelves. Price: \$499. Available direct from Sm'art Designs, Dept. SR, 1737 W. 132nd St., Gardena, CA 90249; phone, 310-515-5444.

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## ▲ AMFI BY MONDIAL

The AmfiTheater 1 A/V receiver provides Dolby Pro Logic processing along with 75 watts of power to the front left, right, and center speakers and 30 watts to each surround. The use of separate power supplies for the main and center/surround channels is said to enhance

surround-sound effects. There are inputs for two A/V and two audio components, six-channel preamp outputs, and an AM/FM tuner with RDS reception. Price: \$499. Amfi by Mondial Designs, Dept. SR, 20 Livingstone Ave., Dobbs Ferry, NY 10522.

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# Introducing The Tower™ Series By Henry Kloss.

Cambridge SoundWorks' new Tower series speakers combine musical accuracy, very natural tonal balance, precise stereo imaging and an incredibly dynamic presence – all without reinventing the laws of physics.



Tower II

CenterStage

Tower III

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“The soundstage of the Towers was stable, deep, and richly three-dimensional...unfettered, solid bass to below 30Hz...an uncommon value.” *Audio, Jan. 1997*

Our new Tower series of speakers was designed by Audio Hall of Fame member Henry Kloss (founder of AR, KLH & Advent). They have the wide range, precise stereo imaging and natural tonal balance of our acclaimed Ensemble® series – and add improvements in efficiency, dynamic range and “presence.”

The result is somewhat unusual: speakers combining the dynamic presence of high-efficiency studio monitors, and the precise musical accuracy and pinpoint imaging of low-efficiency “reference” speakers.

### Tower III by Henry Kloss™

Tower III is a two-way design using a wide-dispersion tweeter and a single 8” woofer. It combines high sensitivity and outstanding dynamic range with the natural, wide-range sound (including terrific bass) of a generously-proportioned cabinet. It has been carefully “voiced” by Henry Kloss for superb tonal balance and precise stereo imaging. These benefits come at a much lower cost than superficially similar models through a combination of Henry Kloss’ design expertise, plus Cambridge SoundWorks’ highly efficient direct-to-the-consumer sales policy. Tower III is the most affordable high-performance floor-standing speaker we know of.

Like other models in the series, Tower III is magnetically shielded and features removable black grilles, fully-finished cabinets (front and rear) and gold-plated binding posts. Finished in black ash vinyl. **Factory-direct price: \$599 pr.**

### Tower II by Henry Kloss™

Tower II is a three-way system substantially larger than Tower III. It has two 8” woofers, a 5 1/4”

midrange, and a 1” soft-dome tweeter.

The large cone area of Tower II’s drivers contributes to an effortless sound quality, giving music a strong feeling of “presence.” That presence, along with Tower II’s smooth, musical octave-to-octave tonal balance and precise stereo imaging, produce what we think is the finest speaker system ever offered under \$1,000.

Tower II is finished in vinyl that simulates black ash or Vermont walnut. Bi-wire/bi-amp capable. **Factory-direct price: \$999 pr.**

*“Tower II can generate the gut-wrenching bass and do justice to a first-rate music system. To top it off, the price is right!”*

Stereo Review

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The flagship of the series is the three-way, bipolar Tower by Henry Kloss. Bipolar dispersion helps eliminate the “point source” effect of direct-radiator speakers, and ensures a proper stereo effect in many listening positions.

Tower features two forward-facing 8” woofers; a forward-facing 5 1/4” midrange driver; a 1” soft-dome tweeter, and separate rearward-facing midrange and tweeter units identical to those used in front.

Because it has even more cone area, Tower’s feeling of “presence” is, if anything, stronger than that of Tower II. That presence, when combined with the three-dimensional sound of Tower’s bipolar design, results in sound that is nothing short of incredible. Available in lacquered walnut or black ash veneers, Tower is one of the finest speakers ever offered. Bi-wire/bi-amp capable. **Factory-direct price: \$1,499 pr.**

### CenterStage by Henry Kloss™

CenterStage is a two-way, three-driver center channel speaker that complements our Tower speakers. Its bass reach is greater than most center speakers, and the dynamic range of its long-throw drivers handles the most demanding of soundtracks. Finished in black vinyl. **Factory-direct price: \$349**

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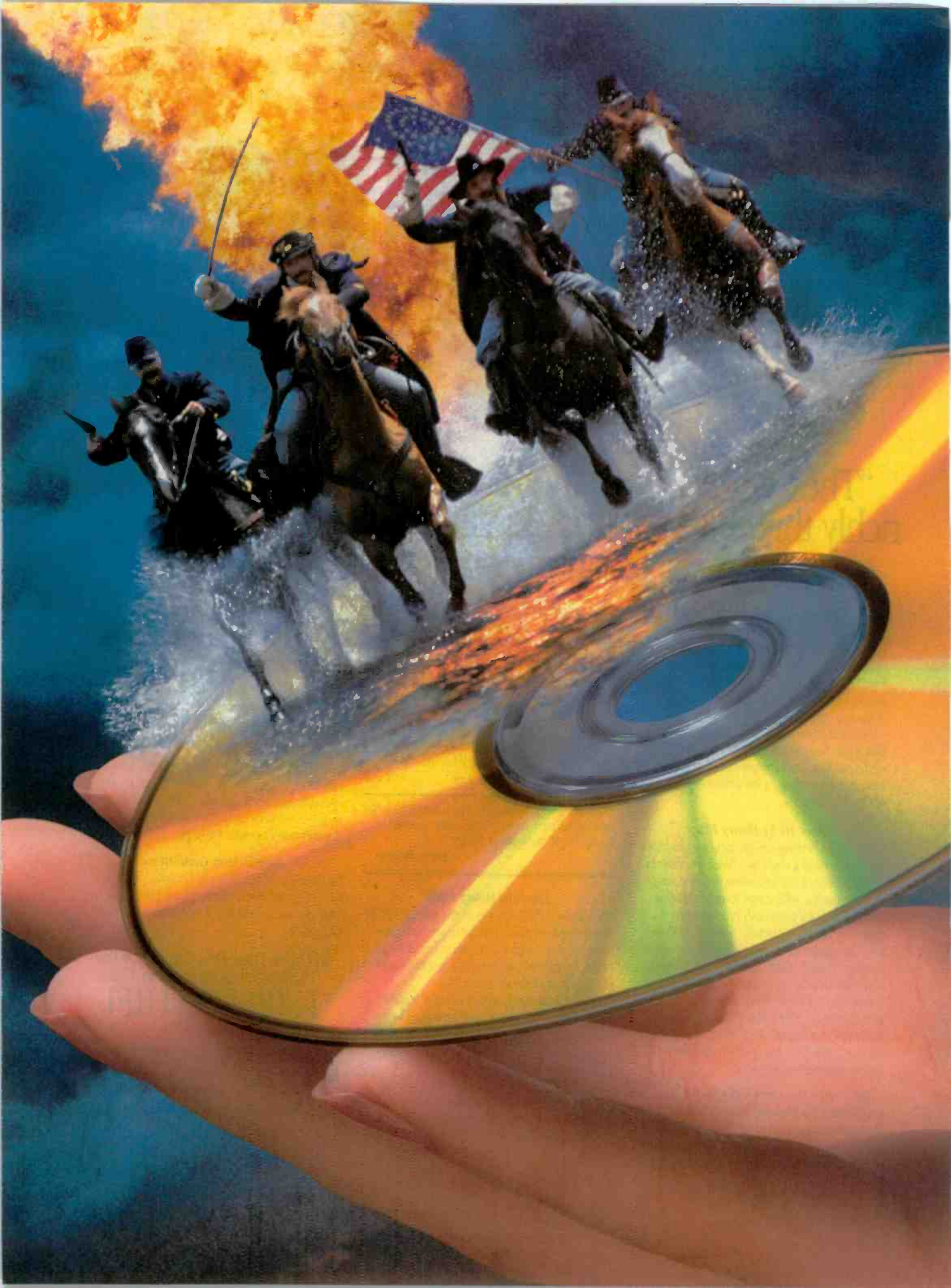
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# TECHNOLOGY UPDATE

## HDTV Gets Closer

BY JIM BARRY

**T**hose of us who have been clamoring for HDTV got a present last Christmas Eve. That's when the Federal Communications Commission finally endorsed a standard for HDTV, or digital advanced television. Many digital-TV fans were prompted to ask, "What took so long?," but the key questions now are: "What does it mean?" "What's next?" "When can we expect to begin watching HDTV?"

When we last looked at the prospects of digital advanced TV ("I Want My HDTV," July 1996), conventional wisdom saw imminent FCC approval and a late 1997 launch. Well, that schedule slipped about a year for a number of reasons that can be summed up in one word: politics. In the last twelve months of this decade-long process — which began during the Reagan Administration amid fears that the U.S. was falling behind Japan in developing the next generation of television — a new set of considerations came into play. We're talking real power politics here, with the competing industries of TV broadcasting, cable, computers, consumer electronics, and Hollywood vying for control. Raising the ante even higher, 1996 was a Presidential election year. One participant described the year-long negotiations, debate, and delay as being "about California's 54 electoral votes."

There's some logic to that reading of the saga, since the FCC ended up deleting less than a page of the 195 pages of recommendations set down in September 1995 by the Advanced Television Systems Committee. The ATSC recommendations resulted from eight years of competitive and cooperative technological development that had brought about the so-called Grand Alliance of developers, including AT&T, General Instrument, MIT, Philips Electronics, Thomson Consumer Electronics

(RCA), Sarnoff Research Center, and Zenith. The standard the FCC adopted included every ATSC recommendation except those regarding the type of scanning format and the aspect ratio of the digital receiver.

The ATSC had proposed a 16 x 9 aspect ratio and eighteen scanning formats including fourteen progressive and four interlace systems. Progressive scanning, in which each line of a transmission is scanned in progression from top to bottom, is commonly used for computer monitors and is generally preferred for data and text displays. Interlace scanning, in which odd- and even-numbered lines of the picture are scanned alternately and then combined, is the method used in our current NTSC broadcast TV system.

Throughout last year, the Computer Industry Coalition on Advanced Tele-

**The FCC's green light  
for HDTV means that now the  
real fun can begin.**



Zenith prototype HDTV

vision Service (CICATS) had lobbied for adoption of only progressive-scanning receivers, maintaining that the ATSC plan would make receivers prohibitively expensive to manufacture. ATSC representatives countered that an all-format receiver would add less than \$50 in cost now and less than \$4 by 2004. Some insiders suggest that the real issue was simply one of control — that CICATS was a stalling action by computer interests led by Microsoft, which had come to realize that FCC approval was a huge step toward having a noncomputer digital pipeline in virtually every American home. When CICATS was joined by motion-picture directors, proponents of alternative digital-audio formats, and advocates of TV-spectrum auctions, a furious lobbying effort was aimed at FCC Chairman Reed Hundt, his colleagues, and the Clinton Administration. But Commissioner Susan Ness told the disputatious parties to get together and agree on what should be in the standard by November 25 or there would be no FCC approval in 1996. With this deadline in mind and with the broadcast community — converted to HDTV advocates by the threat of TV-spectrum auctions and the demonstrated success of digital Direct Broadcast Satellite systems — now on the Grand

Alliance side of the table, negotiations began in earnest.

In the end, the ATSC got pretty much what it wanted, although one of its negotiators described the result as "giving up the sleeves of a vest." Computer interests, meanwhile, expressed satisfaction with the agreement to recommend the ATSC plan deleting just the scanning and aspect-ratio proposals.

The key technological elements of the adopted standard for HDTV, or digital advanced TV, are:

- Digital video compression based on MPEG-2 Main Profile parameters, including the use of "B-Frames," or bidirectional frame-motion compensation, to improve picture quality.

- The Zenith-developed VSB digital modulation transmission system for broadcast and cable, designed to assure broadcasters a wide coverage area, reduce interference with existing analog broadcasts, and provide immunity from interference among digital signals.

- A "packetized" data-transport system that allows the transmission of virtually any combination of

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# TECHNOLOGY UPDATE

video, audio, and data in "packets" made up of digital codes.

- Dolby Digital (AC-3) 5.1-channel surround sound.

Details on the standard can be accessed from the FCC's site on the World Wide Web ([www.FCC.gov](http://www.FCC.gov)). Information on the Grand Alliance specs — involving both progressive and interlace scanning capable of delivering 24, 30, and 60 frames per second, with a maximum potential picture resolution of 1,920 pixels by 1,080 lines — can be accessed from the ATSC's Web site ([www.ATSC.org](http://www.ATSC.org)).

What's next? The entire FCC process actually includes three steps, the first of which was the adoption of a standard. Now the FCC needs to apply or modify its existing rules for the new digital era. And the third step, a big one, is to assign and move broadcasters to new channels. The FCC announced a target date of April 1, 1997, for allocating the new TV spectrum. This is another ticklish situation, since certain stations may end up with wider or narrower broadcast areas in the advanced-TV spectrum, compared with their current NTSC allotment.

Under the FCC's plan, each existing NTSC broadcaster will receive a new 6-MHz slice of the spectrum for a still-to-be-determined digital-TV transition period. Then, probably in the next fifteen or so years, NTSC broadcasts will end and all transmissions will be in the digital standard. That

transition timetable is crucial, and the FCC is on record as saying that the marketplace will not strand consumers who have NTSC sets. The expectation is that by the time NTSC transmissions stop, we'll be able to buy an inexpensive (under \$100) converter box that will translate HDTV signals for display on an NTSC set.

At an HDTV conference at last January's Consumer Electronics Show in Las Vegas, a key Grand Alliance executive noted (with tongue only partly in cheek) that "we got the 'easy' part done" in getting FCC approval. "An industry seldom gets the chance to reinvent itself," he said of the opportunity to "replace 280 million TV sets." But it's going to be a slow process. TV makers say it will take at least a year and a half to get digital-TV receivers ready for production.

So, when can we expect to begin watching HDTV? The first sets should arrive by mid-1998. These will be big-screen models, where picture-quality improvements will be most evident. You'll probably be asked to spend \$1,000 to \$1,500 more than for a comparable NTSC set. Projection sets will probably be available early on as well, since they are readily configurable to the 16 x 9 aspect ratio and because widescreen tubes are likely to be in short supply in the early months.

Because aspect ratio and scanning formats were omitted from the standard, TV makers are free to build pro-

gressive or interlace sets in any screen configuration they choose. Nevertheless, you can expect most TV manufacturers, especially those in the Grand Alliance, to build sets that conform to the Alliance's original specifications for fourteen progressive-scan and four interlace-scan formats and the 16 x 9 aspect ratio. These are, after all, the specifications the ATSC recommended. The widescreen format is well-suited, of course, for showing motion pictures, while interlace scanning can be beneficial for broadcasting old footage recorded in that method. Interlace may also be better for broadcasting in some low-light situations, especially common in electronic news-gathering.

Proponents of the Digital Theater Sound (DTS) system were disappointed that the FCC adopted Dolby Digital (AC-3) as the standard for advanced-TV audio transmission. (Dolby had won out over several other schemes during the Grand Alliance's development process.) The FCC noted that "we are not convinced that the approach suggested by DTS is desirable" and that "DTS did not go through the extensive testing and evaluation where the Dolby System prevailed." Both systems deliver six-channel digital sound. Because HDTV is packetized, meaning you can encode any type of information in those packets and build receivers to decode it, DTS could create a niche for its system in the future.

**A**long with state-of-the-art audio, digital advanced TV promises picture quality four times as good as that of VHS videotape. But the new standard means much more than better pictures and better sound. It is more fundamental than changing from VHS to hi-fi or from black-and-white to color TV. Rather, it's like leaping from telegraph to television, because it ushers in a whole new medium — a 19-million-bits-per-second multimedia pipeline. But just as the driving force for radio, TV, and computers has been what's available on them, so too will it be with digital advanced TV. The real potential of advanced TV will not be realized merely by better pictures and better sound. It will come with the new content that will be developed to take advantage of all the capabilities of the new medium. □



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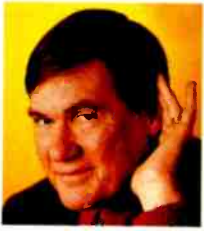
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# AUDIO Q & A

IAN G. MASTERS

## Crackling Controls

**Q** When I adjust the volume on my receiver, I can hear a slight crackling noise from the speakers as the control is rotated. This is undoubtedly caused by dirty contacts. Dust is a real problem in my home. Would a spray contact cleaner fix this problem?

CHRISTIAN WALZEL  
BillERICA, MA

**A** Contact cleaner is often a good solution as long as the resistive material in the control is only dusty and has not been rubbed away by the friction, in which case nothing will help (although the cleaner may prevent further damage). The main problem with contact cleaners is getting at the inside of the controls. Sometimes you can take the knob off and spritz the cleaner up the shaft, or you can put the unit on its back and try to dribble some down the shaft into the control's interior. If neither works and the control has a gap that opens into the interior of the component (as it well might — that's a good way for the dust to get in), you can drip or spray the cleaner by that route. Once you get the cleaner into the control, work it back and forth gently until it spreads itself around; you should hear the crackling lessen and then disappear, if it's going to. You'll probably have to repeat the process once a year or even more frequently.

A word of caution, though. Unless you really know what you're doing, it can be dangerous to poke about inside an audio component. In some cases it will even void your warranty, so it might be wise to suffer the hassles of getting the unit to an authorized service facility for cleaning.

## CD Longevity

**Q** A customer in the retail music store where I work recently told me that she would rather buy music on cassettes than compact discs because she'd heard that CD's only last ten years. I had always understood that a CD would last forever if properly taken care of. Could you help me set the record straight?

JEFF CHEEK  
Bethany, OK

**A** I have 15-year-old CD's, and they seem to be fine. I sometimes wonder where people get these notions; the compact disc format hasn't been around long enough for anybody to know how long they'll last. Though I hear of the occasional disc that develops problems and fails after a few years, there's very little to suggest that the common run of CD's, carefully handled, won't outlive all of us. On the other hand, most of

us have experienced cassettes that jammed or had their tape eaten by a faulty deck, not to mention that magnetic tape particles will eventually flake off with repeated play or age, causing dropouts or other aberrations.

## TV Speakers

**Q** My new 32-inch TV provides excellent off-air reception and a picture beyond description. But the sound quality is harsh and painful to listen to, especially on female voices. Are the built-in speakers at fault? If so, short of feeding the sound through an amplifier, is there any quick fix?

JIM HENSON  
Miami, FL

**A** I have, in fact, heard several TV's with reasonable sound, but they are pretty rare. Usually the speakers are too small, fed too little power, and placed too badly to produce better than mediocre audio. When it comes to upscale sets — and 32-inchers fall into that category — I suspect that TV manufacturers assume they will be used with external audio equipment. They may be right, though lots of viewers use external audio gear for movies while still using the internal speakers for ordinary viewing.

In any case, your experience is unfortunately pretty typical, and there's no quick fix. If your TV has speaker-level outputs you might find that you can feed them to a pair of bookshelf speakers more to your liking, but don't expect to play them very loudly without external amplification.

## Feeling Lows

**Q** I am looking for a subwoofer that goes down to 15 Hz. Although the human ear can only hear frequencies down to 20 Hz, those extra 5 Hz can definitely be felt. Most models now available are powered subwoofers with their own dedicated amplifiers. Is it possible to drive a powered subwoofer with an external amplifier, and would there be any advantage in doing so?

YEHUDA SEIF  
Brooklyn, NY

**A** I haven't heard every powered subwoofer on the market, but of the many I have, I've never encountered one that had any significant output at 15 Hz. (I have heard of a couple of such speakers, including the Bag End Infrasub-18 reviewed here in February.) But there's practically nothing down there to hear in most recordings other than air-conditioning noise and traffic rumble.

In any event, I doubt that the lack of such low output from most subwoofers has much

to do with their amplifiers; there's not much trick in designing an amp that goes down to DC, which is 0 Hz. It's much harder to make speaker drivers go down that low, so no amount of amplifier upgrading would make much difference. If you want to try, however, there's no reason you couldn't use a passive sub, which requires an external amplifier. Using an external amplifier to drive a powered subwoofer would require getting inside the box and bypassing the internal amp. I can't see much point in that.

## S-VHS Secrets

**Q** I understand what's going on inside most of the components of my home-theater system, but not inside my Super VHS videocassette recorder. I can see a much clearer picture, almost like that from a laserdisc, compared with that from an ordinary VCR. Is the improvement a result of a special tape formulation or a different head technology?

GUILLERMO CUESTA, JR.  
Guayaquil, Ecuador

**A** The development of the Super VHS (S-VHS) system did involve upgrading both the heads and the tape, but that was mostly a matter of refinement, and S-VHS machines can still record and play in standard VHS mode as well as in S-VHS. The picture quality, which as you note approaches that of a laserdisc player, is achieved by recording a much wider bandwidth of signal, among other things. These changes yield significantly improved picture quality, but at the sacrifice of some compatibility: S-VHS recordings won't play in regular VHS machines. For that reason, marketers of pre-recorded video have kept away from the format, unwilling to issue everything (or anything) in two versions. As a result, S-VHS machines are still uncommon and carry fairly high prices, but they do a superb job of recording off-the-air signals even at the slowest speed. Incidentally, despite the incompatibility of S-VHS recordings, the high-grade S-VHS blank tapes can be used to record on regular VCR's, though without the benefits of S-VHS.

## Degaussing CD's?

**Q** I read somewhere that demagnetizing or degaussing a CD can result in noticeable sonic improvement, although there seems to be no consensus as to why this should work. I've also heard there are CD's that, when played, send degaussing signals through your system to improve sonic accuracy. What's your take on this?

BRIAN GOODWIN  
Milford, NH

**A** In 1915, humorist Stephen Leacock wrote a book called *Moonbeams from the Larger Lunacy*, and, if audio had existed then, some of this stuff might have been included. To demagnetize something, it has to be magnetized, and therefore it has to be made of something that can be magnetized. That doesn't include aluminum, polycarbonate, or lacquer, which are what go into a



# SUBWOOFER OF THE YEAR!

CD. In any event, since a CD is read optically rather than magnetically, it seems hard to understand how the presence — or absence — of a tiny magnetic field could affect the playback even if such a field existed.

As for degaussing a whole system, there are certainly lots of things in audio components that could become magnetized, and while it's conceivable that that could affect audio performance, I've never heard any evidence of this sort of degradation. One of the cable manufacturers has produced a CD that is supposed to demagnetize a system when it's played at normal listening level, but I have my doubts.

## Vanishing Loudness

**Q** When I was shopping for a new receiver, I was surprised to find that very few of them still had a loudness control. Instead, what I found were various methods for boosting bass, bearing names like "mega bass," "bass enhance," and so forth. Why have manufacturers dropped this useful feature?

PETER F. VILTER  
Raleigh, NC

**A** The "loudness" or "loudness contour" switch, a staple of receivers and integrated amplifiers from early days, was included to compensate for a characteristic of human hearing: Our ears' sensitivity at the frequency extremes — especially the bass — drops as the overall volume goes down. In effect, as a music system's output gets quieter, subjectively it also gets thinner. The loudness contour progressively boosted the bass as you turned down the level control.

Trouble was, the circuits never worked very well in practice. Component makers had no way of knowing the sensitivity of your speakers, the input levels of your program sources, or the size of your room, so they couldn't predict with any certainty how the position of the volume control would relate to actual perceived level. Thus, the loudness compensation could only be a guess, which meant that it was usually wrong, so when listeners used it they ended up with lower fidelity rather than higher.

At least one manufacturer did come up with an effective loudness scheme. Yamaha provided a variable control that was flat at its full clockwise rotation and added more and more loudness compensation as you rotated it counterclockwise. The idea was that you would turn this control up to its top position and set a comfortable listening level with the regular volume control; when it came time to turn the level down, you would turn down the loudness control, which would add the right amount of boost. Instead of the volume control. Yamaha still includes this feature on its two-channel receivers but has dropped it from multichannel equipment.

**If you have a question about audio, send it to Q&A, Stereo Review, 1633 Broadway, New York, NY 10019. Sorry, only questions chosen for publication can be answered.**



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*Tom Nounsaine on the PS-1200, Video Magazine*

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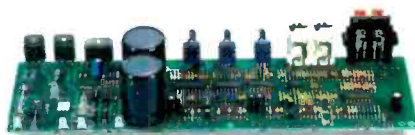
*Andrew Marshall on the PS-1200, Audio Ideas Guide*

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*Wes Phillips on the PS-1000, Sterophile Guide to Home Theater Vol. 2, Number 2*

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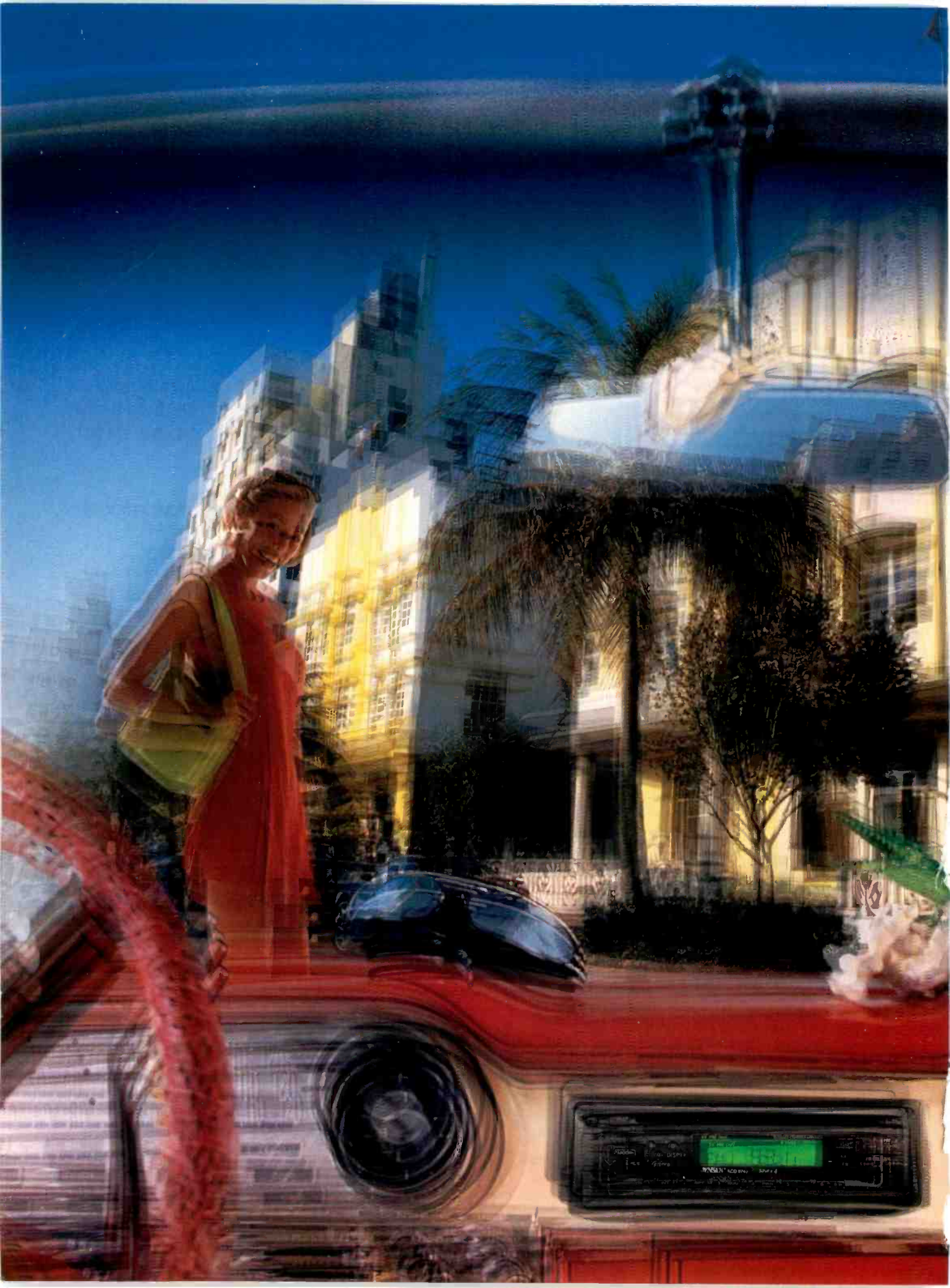
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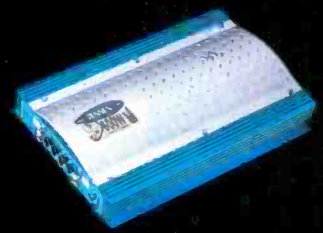
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## SIGNALS

KEN C. POHLMANN

### Unplugged

**T**he twentieth century has been a time of incredible invention. In the span of a single lifetime, man learned to fly and then traveled to the moon. We built the first digital computer, and now we routinely throw away computers that are merely a million times more powerful than that first one. But of all those inventions, perhaps the most startling was the radio. It must have seemed like magic — to be able to coax voices and music out of thin air, to listen in on live events from around the world. We can comprehend things that are connected together with wires, but even the simplest radio's ability to receive information wirelessly is still a marvel of unplugged technology.

Today, however, radio is a technology whose batteries are running dangerously low. More modern inventions like the CD, DVD, and direct broadcast satellite demonstrate that tomorrow's world will be a digital one. Even radio's slightly younger brother, television, is heading toward the digital future with HDTV. Meanwhile, radio is stuck in antediluvian analog. The performance specifications of AM and FM transmission cannot hold a candle to more modern information vehicles. Unless radio upgrades to digital, it will be at best a technological embarrassment, and at worst a bandwidth without listeners.

A few years ago, it seemed that digital radio in the U.S. was just around the corner. Many countries were actively pursuing the requisite technology. Most notably, the European-developed Eureka 147 system worked well in testing, and in 1991 it was endorsed by the powerful National Association of Broadcasters (NAB). But Eureka requires broadcasters to interleave their signals in a common signal, in effect pooling their technical resources, and the idea of cooperation between stations is anathema to America's highly competitive broadcasters. Under pressure from affiliates, the NAB subsequently dropped its endorsement. Moreover, Eureka requires huge chunks of spectral space, and no suitable space was available. Even if there were space, today's budget-minded Congress might decide to sell it, adding to the out-of-pocket costs of broadcasters.

While other countries pursued Eureka,

attention in the U.S. focused on an American solution called In-Band On-Channel (IBOC) broadcasting. With this technology, a digital audio signal is simultaneously broadcast on the same carrier frequency used for analog broadcasting. The system is designed so that the digital signal does not interfere with the reception of existing analog receivers, while digital receivers are able to reject the analog signal and receive the digital version, with greatly improved frequency response and lower noise and distortion. IBOC is a Holy Grail solution because it preserves station independence as well as existing regulatory statutes, allows easy transition from analog to digital, and requires no new bandwidth. Moreover, because the digital signals are simulcast over existing equipment, start-up costs are low — an important consideration in an industry with a

**The rest of the world has moved steadily toward digital radio. Meanwhile, here in America, we are still at the drawing board.**

historically modest return on investment. Understandably, the NAB heartily endorsed IBOC digital broadcasting. As with any mythical object, however, the quest for IBOC proved difficult.

Although Eureka is relatively inefficient and costly, it works fabulously well. Because many stations' signals are combined and spread over a wide band, reception is extremely robust. Even if part of the frequency band is lost (a problem well-known to analog listeners as "picket-fence" interference), the signal can be recovered from other parts of the band. IBOC, on the other hand, faces tough problems. Each digital signal occupies a narrow frequency band, and any interference in that band can spell trouble. Moreover, IBOC inherently creates its own interference by broadcasting two contradictory signals on the same carrier frequency. Only sophisticated encryption

technologies enable the digital signal to be extracted from the much stronger analog signal. The U.S. military has carefully studied the problem of retrieving signals in the presence of strong jamming signals, but the technology remains formidably complicated. In addition, IBOC absolutely must not interfere with the host analog transmission; no radio station would ever add an IBOC signal if it placed its analog market at risk.

Although an IBOC solution would be complex and costly to develop, numerous companies have worked to perfect it, knowing that significant financial rewards await the successful developer. In 1996, field tests were begun on seven digital radio systems, including one AM and two FM IBOC systems from USA Digital Radio and one FM IBOC system from AT&T/Lucent/Amati. None of the IBOC systems survived the testing. USA Digital Radio objected to the testing procedure and withdrew, and the AT&T system had technical difficulties. Although the committees organizing the tests may study the results and make a recommendation to the FCC (which must choose a U.S. system), it is more likely that the entire process will be suspended for further research.

The IBOC developers certainly have not thrown in the towel. USA Digital Radio has consulted with Westinghouse Wireless Solutions, identified weaknesses in its current design, and announced that it will demonstrate an improved system in about a year. Similarly, the AT&T/Lucent/Amati group is forging ahead. Given the complexity of IBOC, it isn't surprising that the initial designs had problems, and it's fortunate that none of the designs moved beyond the testing phase. Moreover, since the problems were exposed, solutions can now be found, thus resulting in improved systems. Optimistically speaking, if you believe in IBOC, these setbacks are ultimately beneficial.

The rest of the world has moved steadily forward toward digital radio, primarily with Eureka. Canadian broadcasters will begin commercial digital broadcasting this year. Germany has established much of the needed infrastructure. With European cooperation, China has gone on the air with digital broadcasting from three cities. Meanwhile, here in America, we are still at the drawing board. It will be a year before the improved IBOC systems are ready, and it will take an additional year or so to complete another round of testing and then — with luck — select a new broadcast standard. The NAB and American researchers have bet the farm on IBOC, and so far they have come up empty-handed. Will Yankee ingenuity prevail, and will American digital radio be better than other world standards? And how long must we wait? Or will IBOC prove to be a dead end? Stay tuned. □



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# Home Theater Made Easy

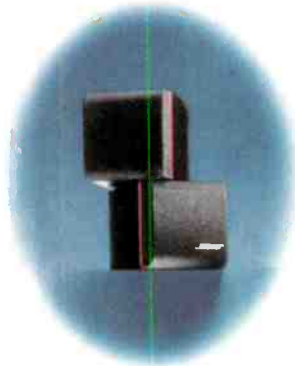
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Home Theater, Feb. 97



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The Sensible Sound, Issue # 60



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Stereo Review, Dec. 96



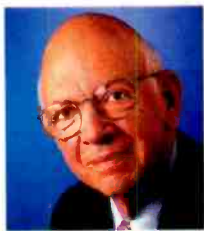
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## TECHNICAL TALK

JULIAN HIRSCH

### Dear Mr. Hirsch:

I enjoy receiving (and reading) mail from readers. Especially welcome are letters that steer my attention to worthwhile products or real-world problem areas of which I might otherwise be unaware.

The sophistication and complexity of so many of today's consumer electronics products (both audio and video) make me wonder how many people have invested in an expensive entertainment system without ever realizing its potential performance qualities. I suspect the number is considerable, although that is not necessarily a reflection on the products or their users — it merely underscores the versatility and value for the dollar that are typical of today's consumer electronics industry, which has brought the benefits of such sophisticated technology into homes across the land.

In recent months I have received an unusual amount of mail from readers asking my opinion of specific audio or A/V components, or asking me to recommend specific models to buy. Although I have no objections to commenting on products with which I am familiar, which I have used or tested, many of the questions relate to products with which I am completely unfamiliar. Obviously, there is little meaningful that I can say about them.

Another category of reader inquiry assumes a much more encyclopedic knowledge on my part than I can claim. When someone experiences a failure or deterioration in the performance of a favorite speaker (or amplifier, or receiver, or tape recorder), perhaps after twenty years or more of faithful service, often the first thought is to have the component restored to its original specifications, and I am sometimes asked to suggest a suitable repair facility to accomplish that.

Although I understand and sympathize with anyone in this situation, the fact is that such restoration, if it's possible at all, is quite likely to be more expensive than purchasing a new, up-to-date component, which would almost certainly perform far better than the old one. And, as is the case with automobiles and other complex machines, having an obsolescent electronic audio component restored would probably cost more than you could sell it for after restoration.

The same goes for having the driver or drivers in a favorite loudspeaker recond or otherwise restored to "like new" condition. Even if your old speaker was a first-rate one to start with, the loudspeaker art has progressed amazingly over the past few decades. In most cases, you will find that a typical 1997 speaker, even one at a moderate price, is likely to sound better than your 25-year-old "classic" used to sound in its heyday.

There are exceptions, of course, and there is always the imponderable factor of individual taste, but in general today's hi-fi products represent a remarkable bargain (in constant dollars) compared with their predecessors. One of the most dramatic examples of this happy state of affairs is in the category of relatively powerful stereo receivers. A full-featured 100-watt-per-channel receiver, complete with basic surround-sound capabilities, can be bought

for around \$200. And, judging by my tests of some of these components, they can hold their own against many more prestigious (and costly) products.

Even large-capacity CD changers holding 50 to 100 or more discs, a product category that did not even exist a few years ago, are now available at bargain-basement prices. Personally I find the elaborate programming of these changers to be unnecessarily complex, and I have no need or desire for nonstop music in any case, but anybody who does find their features attractive can acquire one without breaking the bank.

My point in all this is to show that there is a viable alternative to an expensive purchase when your elderly music system starts becoming unreliable, inoperative, or too expensive to maintain. If you have a sentimental attachment to your venerable components, and they continue to function to your satisfaction, there is certainly no need to make a change. If repair is impractical or too costly, replacement with equal or superior new components is usually an economical alternative. But I cannot tell you whether you *should* repair or replace a specific piece of equipment. I am not in the business of troubleshooting audio equipment by remote control. Even if (as sometimes happens) you send me a legible schematic of an audio product that you suspect is giving you trouble, the chances of my solving your problem are infinitesimal! □

### *In Memoriam: Saul B. Marantz*

On January 16, 1997, one of the pioneers of the high-fidelity industry passed away at the age of 85. Saul Marantz, founder of the company that bears his name, will be remembered for the uncompromising quality that has always characterized Marantz products.

In the 1950's and 1960's the Marantz name was associated with a series of audio components (all vacuum-tube designs) that set standards, still unsurpassed, for elegant styling and state-of-the-art performance. It was in that period that I first met Saul Marantz and his chief engineer, Sidney Smith, and came to appreciate the engineering expertise and integrity associated with Marantz products.

Later Marantz and Smith were joined by Dick Sequerra, an exceptionally innovative tuner designer. Sequerra and Smith ultimately brought the legendary Marantz Model 10B FM tuner to completion after several years of development. I recall that each year during the tuner's development, Marantz would display the current version

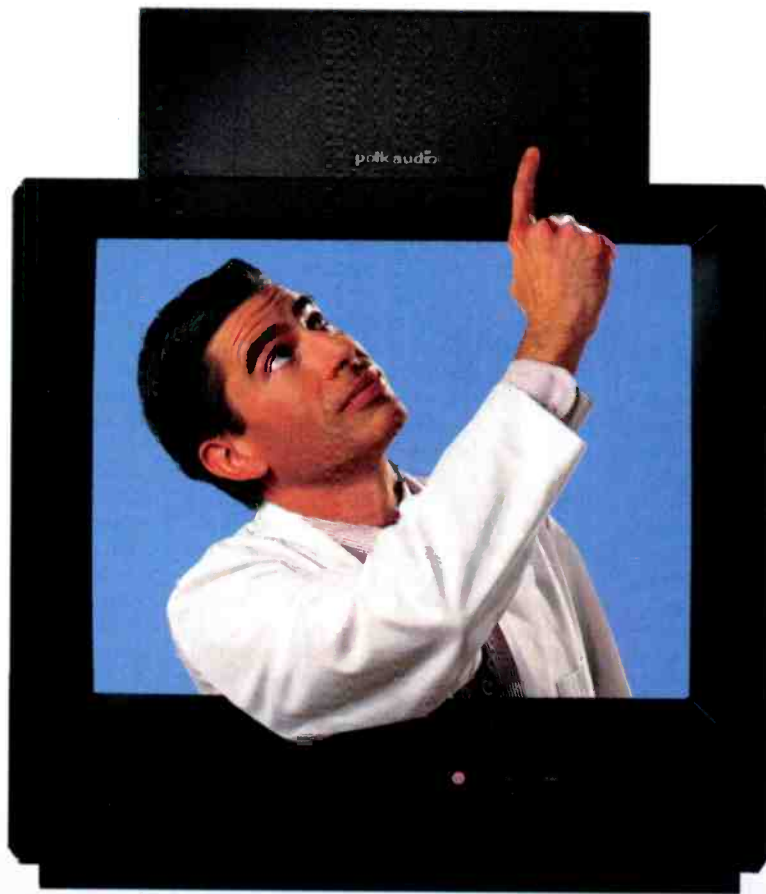
of the Model 10B at the New York Audio Fair, but actual delivery was somehow always delayed. Unfortunately, the creation of the 10B, one of the great tuners of all time, was such a costly process that it contributed to the demise of the company in its original form.

In 1964 Marantz was sold to Superscope, Inc., and is currently owned by Philips Electronics of the Netherlands, which has introduced a line of components based on the original Marantz designs under the name of Marantz Classics. Saul Marantz eventually retired from the Marantz company, but he later became co-founder, with Jon Dahlquist, of the Dahlquist company, a maker of high-quality loudspeakers with which he was associated at the time of his death. In fact, I understand that Saul was returning from a meeting with Dahlquist when he died.

Saul Marantz is survived by a daughter, a brother, a sister, and three grandchildren. His dedication and quality standards are legendary, and he will be missed.

—J.H.

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BOOK & LEUNG

## Lexicon DC-1 Dolby Digital Audio/Video Preamplifier

DAVID RANADA • TECHNICAL EDITOR

It's a rare home-theater product that can perform both Dolby Digital (AC-3) decoding and fully digital Home THX processing, including THX-5.1 enhancements. It's an altogether extraordinary device whose additional processing features can force those cutting-edge technologies to take second billing. Such a product is Lexicon's DC-1, an A/V preamplifier — or, to use THX nomenclature, a controller — of exceptional versatility and performance.

That versatility starts with the DC-1's complexity and cost, as the unit comes in three versions and you can step up from one to the next with dealer-installed upgrades. The upgrade price is the difference between your model's cost and that of the target version, but even the least expensive model, the \$1,995 DC-1 Base, possesses an array of features that has few rivals at any price. For example, the analog audio inputs include connections and switching for three audio-only sources (labeled tape, tuner, and CD) and five A/V sources (TV, auxiliary, "V-disc," and two VCR's). The video signals from videodiscs (laserdiscs or DVD's) and VCR's can be in either composite-video or S-video format, and there are two composite-video and one S-video monitor outputs. The base model also has four SPDIF digital audio connectors, two optical

and two coaxial, that can be assigned to any of the other inputs.

There are eight line-level outputs: The standard six for a surround system (front left/right, center, surround left/right, and mono subwoofer) as well as an extra two outputs for "rear" speakers. Lexicon expects that the surround speakers — which other companies usually designate "rear" speakers — will be placed to the sides of the main listening position. The DC-1's rear outputs, on the other hand, are indeed intended to drive speakers placed toward the rear. It is how the DC-1 uses this combination of side and rear surround speakers in a full-blown eight-speaker playback system that provides much of the unit's sonic appeal, even with the base model.

A separate stereo line-level output is provided for driving a remote playback system, and several second-room functions are controllable with the DC-1's remote. The final rear-panel

**DIMENSIONS:** 17¼ inches wide, 11½ inches deep, 3½ inches high

**WEIGHT:** 10½ pounds

**PRICES:** DC-1 Base, \$1,995; DC-1 THX, \$2,995; DC-1 Dolby Digital, \$4,500

**MANUFACTURER:** Lexicon Corp., Dept. SR, 3 Oak Park, Bedford, MA 01730; telephone, 617-280-0300

connections are an input for an infrared receiver and a five-pin DIN connector carrying programmable trigger signals to activate such elaborate functions as light-dimming or screen-lowering in spare-no-expense home-theater installations. These connections are inadequately explained in the DC-1's two (!) otherwise complete but rather wordy manuals.

Back to audio features. The base model DC-1 has very elaborate and versatile bass-management facilities. It contains low-pass filtering for the subwoofer output with selectable crossover frequencies of 80, 100, or 120 Hz, all with rolloffs of 24 dB per octave. Matching high-pass filtering is available on the front, side, and rear outputs. The center output's high-pass filtering adds crossover points of 35 or 145 Hz. You can also set the DC-1 for use in a system with or without a subwoofer, with no side speakers or no rear speakers, or with neither side nor rear speakers. With the side outputs you also get the choice of optimizing operation for forward-radiating or dipole speakers. Even the mute control has selectable volumes.

Finally, we get to the sonic core of the DC-1 and its reason for being, its digital processing modes. The base model gives you a choice of eleven modes: Two Channel (normal stereo), Panorama (interaural-crosstalk cancellation for very wide stereo stages), Party (stereo through front left/right, side, and rear speakers), Church, Cathedral, Concert Hall, Nightclub (the last four all use digital ambience generation), good old Dolby Pro Logic, Music Logic and TV Matrix (general-purpose surround modes for music and video programs, respectively), and

## TEST REPORTS

Mono Logic (with monaural material this sends music and effects through the side and rear speakers via ambience generation while keeping dialogue in the center).

And that's just the base model. The next step up, primarily a software upgrade, is the \$2,995 DC-1 THX. To the features of the base model it adds three more digital surround modes: full THX processing (re-equalization, surround equalization, surround decorrelation), Logic 7 (a seven-speaker general-purpose cinema surround mode that can give the sensation of stereo surrounds with standard soundtracks), and Music Surround (a seven-speaker general-purpose music mode similar to Music Logic). You also get digital bass and treble controls and a traditional loudness control that introduces a bass boost inversely proportional to the volume setting.

The big jump, in features and price, comes with the deluxe DC-1 Dolby Digital model, which goes for a super-deluxe \$4,500. Part of the price jump comes from the addition of a 5.1-channel decoder daughter board to the basic DC-1 motherboard. There was a Dolby Digital decoder chip from Zoran on our test unit's 5.1-channel daughter board, and Lexicon may eventually make other multichannel decoding chips available as plug-ins. The DC-1 Dolby Digital provides not only standard AC-3 decoding but also THX 5.1 processing (the same as standard THX processing but with a wider bandwidth in the surround channels and surround decorrelation that automatically switches on or off depending on whether stereo surround signals are available), 5.1 Logic 7 (a general-purpose enhancement of Dolby Digital decoding for soundtracks), Music 5.1 (the same thing for Dolby Digital-encoded music, should it become available), and an enhanced "stereo" mode that allows two-channel recording of 5.1-channel material through the rear-panel (analog) recorder output.

Dolby Digital data for the top DC-1 model comes in through its SPDIF digital audio input connectors. With a DVD player you'll need only an appropriate cable (most likely a Toslink optical cable) to get rolling. With most AC-3-ready laserdisc players, however, you'll need an external RF demodulator box. Any demodulator will probably suffice, but Lexicon conveniently makes a suitable model, the \$699 LDD-1, which is what I used.

Along with Dolby Digital decoding,

with the top DC-1 you get a number of features intended to optimize 5.1-channel playback. The most important is time alignment of all the speakers during Dolby Digital playback, which improves imaging and can greatly improve the possibility of getting a good frequency-response "splice" from the main speakers to the subwoofer. You can also deliberately reduce the dynamic range of Dolby Digital recordings for late-night viewing, limiting the signal peaks and boosting low-level signals. This requires that the program material contain the necessary AC-3 compression data, however.

One new general-purpose feature is an interesting frequency-response "tilt" control. At its maximum setting it introduces  $\pm 3$  dB seesaw tilts of the entire audio spectrum, with the "fulcrum" centered at 1 kHz. A slight downward tilt at the top end often tames the harshness that many people hear in flat-response speaker systems.

Lastly, indicating to what lengths the designers of the DC-1 have gone in order to optimize performance in high-end home-theater systems, the top DC-1 model incorporates an A/V sync delay. This is to get the sound and picture back in sync in case the picture is delayed for a tiny fraction of a second by advanced video signal processing such as a line doubler.

The DC-1's front panel is the same in all three models. It has a volume knob, pushbuttons for the most basic operations, such as input-source and surround-mode selection, and a two-line alphanumeric display. With only a little practice it is possible to fully operate the DC-1 using just the front-panel display and the remote control; for music listening it isn't even necessary to see the TV-screen display, which provides an instructive level readout for the encoded low-frequency effects (LFE) channel in the 5.1-channel modes. The remote itself is rather simple considering the number of adjustments that can be made with the DC-1 — not only the basic setup parameters but every surround mode has several fine-tuning adjustments. With one important exception, the remote is also remarkably easy to use.

You don't need a high-end A/V



playback system to appreciate the qualities of any DC-1 model. Many of those qualities were obvious from our laboratory measurements, which included, for the first time, AC-3 tests made with computer-generated test tones of known good behavior. For example, we can at last state the test unit's frequency response during Dolby Digital playback without our usual caveats about the inadequacy of the first Dolby Digital test laserdisc. And in the case of the DC-1, the results were uniformly excellent to superb (check out that channel separation).

Our tests also revealed some of the reasons why the music processing afforded by the four ambience modes (Concert Hall, Church, Cathedral, and Nightclub) was so intensely realistic. With suitable music, usually acoustic and especially classical music and some jazz, these modes had the uncanny ability to acoustically transform our listening room into a completely different music-performance environment. Timing graphs of the artificial reflections produced by these modes show that, compared with the simplistic processing incorporated into the music-enhancement modes of other processors and A/V receivers, Lexicon's ambience modes introduce a high reflection density and a randomness of spacing unmatched even by those devices that generate echo patterns derived from actual concert halls.

Little more need be said here about the sonic quality of the DC-1's ambience processing, as we've positively reviewed similar modes in earlier Lexicon processors. Suffice it to say that if you don't find one of the default ambience settings suitable for your acoustic music, they are all adjustable enough that you'll probably eventually arrive at settings that are pretty close to ideal.

If the ambience modes still don't work well, and with much popular music they do introduce too much spaciousness and distance, try the general-purpose surround modes, Music Logic and Music Surround. These use advanced signal-steering rather than ambience generation and can produce a very pleasant and sometimes spectacular surround-sound redistribution

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# TEST REPORTS

of the sonic image without making the performers seem too far away. Music Logic is the first surround mode I've found in any processor that has provided playback of Dolby Surround-encoded music CD's that was clearly superior to plain stereo. Delos Records' VR<sup>2</sup> symphonic recordings and BMG's Dolby Surround classical and soundtrack releases, for example, have always sounded better to me in stereo; I haven't liked the way standard Dolby Pro Logic decoding moves and destabilizes the stereo image up front, and the mono surround channel doesn't help as much as you'd think in recreating the desired concert-hall spaciousness. But the DC-1's Music Logic mode, with its stereo-like imaging of the three front channels and its stereo treatment of the surround (and rear!) channels, *does* help, and it's available even in the base model.

The general-purpose movie modes (TV Matrix, Logic 7) can also produce spectacular results with lowly Dolby Surround material that would normally only be decoded with Dolby Pro Logic or with THX processing. Logic 7, for one, can produce stereo-like surround information from the monaural

surround channel of Dolby Surround movies, a different effect from THX decorrelation and often superior to it.

AC-3 playback was as spectacular as usual, with such recent Dolby Digital laserdiscs as *Independence Day* making for some impressive, if overly explosive, multichannel listening. And the enhancements to Dolby Digital operation (such as Logic 5.1) made AC-3 soundtracks seem more theatrical — through the use of steering that includes the rear speakers — without making them sound cavernous by introducing unwanted artificial reflections the way other processors claiming to "enhance" Dolby Digital playback do.

I found only one serious fault with the DC-1 (in all models): its frustrating sequential method of selecting the surround mode, which is one of my pet peeves. To get from one mode to another you might have to cycle through half of the selections. Not only that, but if you choose the wrong direction to cycle, you might have to go through all the modes that are clearly inoperable (such as the 5.1-channel modes when you're playing a standard CD) to get to the one you

want. While this arrangement indicates the wealth of signal-processing abilities the DC-1 possesses, I would have gladly put up with a larger, more complicated remote control that contained a separate button for each surround mode.

It is most unusual to find only one consistently irritating operational fault in a device so complex: There are probably more chips under the DC-1's cover than you'd find in a typical PC. One minor fault — the time alignment of speakers is available only in the top model's 5.1-channel modes instead of in all modes for all speakers with all models — may be fixed in the software by the time you read this. If so, that will push the DC-1 still higher above other surround processors than it already stands. Even the DC-1 base model offers enough features and performance to immensely enhance music ranging from Gregorian chant to acid rock and house music, and enough home-theater smarts to satisfy all but the technological avant-garde. Trend-setters can step up to the DC-1 THX or, better still, the Dolby Digital DC-1 and, figuratively and literally, have a blast. □

## MEASUREMENTS

### DOLBY DIGITAL PERFORMANCE

All measurements taken in Dolby Digital 5.1 mode with computer-generated AC-3 test signals and all outputs set for "large" speakers. Results are for the left front channel but are representative of performance on all five main channels (three front and two side outputs). dBFS = decibels referred to digital full scale.

**REFERENCE OUTPUT LEVEL** (1 kHz)  
-20-dBFS input, volume at 0 dB . . . . . 155 mV

**FREQUENCY RESPONSE**  
20 Hz to 20 kHz +0, -0.19 dB

**DISTORTION** (THD+N)  
20 Hz to 20 kHz . . . . . <0.035%

**NOISE** (re reference output, A-wtd) . . . . . -74.5 dB

**EXCESS NOISE** (with signal)  
16-bit (EN16) . . . . . +2.3 dB

**LINEARITY ERROR**  
at -90 dBFS . . . . . -0.6 dB

**CHANNEL SEPARATION** (1 kHz)  
re 1.55-V output with 0-dBFS inputs . . . . . >100 dB

### DOLBY PRO LOGIC PERFORMANCE

All data for analog input signals, all "large" speakers, output volume at 0-dB setting.

**FREQUENCY RESPONSE**  
front . . . . . 20 Hz to 20 kHz +0.02, -0.22 dB  
center . . . . . 20 Hz to 20 kHz +0.01, -0.13 dB  
surround . . . . . 20 Hz to 7.47 kHz +0.1, -3 dB

**NOISE** (A-wtd)  
front . . . . . -73.9 dB  
center . . . . . -74.7 dB  
surround . . . . . -72.2 dB

**DISTORTION** (THD+N, 1 kHz)  
front . . . . . 0.033%  
center . . . . . 0.045%  
surround . . . . . 0.06%

**SURROUND-DECODER INPUT-OVERLOAD MARGINS** . . . . . N/A\*

**SURROUND-CHANNEL NOISE-REDUCTION CALIBRATION ERROR**  
re THX level (141.4 mV) . . . . . +1 dB

**CHANNEL SEPARATION** (worst case)  
left out, center driven . . . . . >31 dB

**THX RE-EQUALIZATION ERROR**  
worst case . . . . . -0.6 dB at 20 kHz

**THX SURROUND EQUALIZATION ERROR**  
worst case . . . . . +0.9 dB at 1.6 kHz

\* automatic gain control prevents input overloads

### STEREO PERFORMANCE, DIGITAL INPUTS

(dBFS = decibels referred to digital full scale)

**REFERENCE OUTPUT LEVEL** (1 kHz)  
-20 dBFS, volume at 0 dB . . . . . 174 mV

**FREQUENCY RESPONSE**  
normal . . . . . 20 Hz to 20 kHz +0, -0.21 dB  
deemphasis on . . . . . 20 Hz to 20 kHz, +0, -0.23 dB

**DISTORTION** (THD+N)  
1 kHz at -20 dBFS . . . . . <0.003%

**NOISE** (re reference output, A-wtd)  
normal . . . . . -74.5 dB  
de-emphasis on . . . . . -77.5 dB

**EXCESS NOISE** (same without/with signal)  
16-bit (EN16) . . . . . +1 dB  
20-bit (EN20) . . . . . +14 dB

**LINEARITY ERROR**  
at -90 dBFS . . . . . 0 dB

### STEREO PERFORMANCE, ANALOG INPUTS

**OUTPUT AT CLIPPING** (1 kHz) . . . . . >6.39 V

**SENSITIVITY**  
(for 0.5-V output, max volume) . . . . . 175 mV

**DISTORTION** (THD+N, max volume)  
0.5-V input, 6.39-V output . . . . . 0.007%

**INPUT OVERLOAD LEVEL**  
(auto-gain control on) . . . . . 7.9 V\*\*

**NOISE** (A-wtd, re 0.5-V output) . . . . . -94 dB

**FREQUENCY RESPONSE**  
20 Hz to 20 kHz +0, -0.22 dB

**STONE-CONTROL RANGE**  
100 Hz . . . . . +4.6, -4.3 dB  
10 kHz . . . . . +5.9, -5.8 dB

**TILT CONTROL RESPONSE** (max downward tilt)  
20 Hz . . . . . +3 dB  
20 kHz . . . . . -3 dB

\*\* = +12 dB re 2-V standard CD output

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## TEST REPORTS



BOOK P. LEUNG

Klipsch speakers tend to have higher-than-average efficiency.

The KLF 20 is one of two speakers in the new Klipsch Legend series (soon to grow, we're told). It's a fairly large and heavy (almost 90 pounds) three-way floor-standing speaker whose handsomely veneered cabinet is available in light or medium oak or a black satin finish. A removable black cloth grille covers the front of the cabinet, and the rear is finished in black.

With the grille removed, you can see that virtually the entire front panel of the KLF 20 is occupied by drivers. At the top is a 1-inch compression tweeter with a rectangular exponential horn. Below it is a 1½-inch compression midrange driver with a larger (90 x 60-degree) Tractrix horn. Immediately below the horns are two 10-inch woofers with oversize magnet structures. These operate in a bass-reflex enclosure vented through a pair of flared ducts at the back of the cabinet.

Two pairs of gold-plated binding posts are recessed into the bottom rear of the cabinet. Normally they are paralleled by gold-plated straps, but removing the jumpers allows the system to be biamplified or biwired.

Frequency response of the KLF 20 is given as 34 Hz to 20 kHz  $\pm 3$  dB, sensitivity as 100 dB sound-pressure level (SPL) at 1 meter with 1 watt input, and power handling as 200 watts continuous (800 watts peak). The system's crossover frequencies are specified as 750 Hz (woofers to midrange) and 7 kHz (midrange to tweeter).

Klipsch suggests placing the KLF 20 speakers at least 3 feet from the wall behind them, angled slightly toward your favorite listening position. This is a typical placement recommendation for columnar speakers like this one. The KLF 20 comes with adjustable spikes and feet, which we did not use for convenience in moving the heavy speakers around on our carpeted floor.

The smoothed room response of the KLF 20 was unusually uniform, within  $\pm 3$  dB from 38 Hz to 20 kHz. The horizontal dispersion of the horn radiators was also excellent over a  $\pm 45$ -degree horizontal angle.

We measured the bass response of the system with close microphone placement. The combined and summed outputs of both woofers and their ports were adjusted for the relative areas of the two sources. The resulting bass response was  $\pm 2$  dB from 34 to 200 Hz, essentially as rated.

# Klipsch Legend KLF 20 Speaker

**JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES**

**S**ince Paul Klipsch designed the almost legendary (and still unique) Klipschorn more than fifty years ago, many notable loudspeakers have carried his name. Although the Klipsch product line has diversified considerably since then, it is fair to say that virtually every Klipsch speaker has been designed for high efficiency, which was an especially important consideration in the early days of hi-fi, before high-power amplifiers became available (and affordable).

Surprising as it might seem nowadays, when amplifiers rated at 100 watts or more are commonly used even in moderately priced receivers, back when the Klipschorn was the

undisputed king of the speaker world a 25-watt amplifier was considered "powerful," and more than 50 watts was almost unheard of. Even today, despite the widespread availability of affordable amplifiers capable of delivering more than 100 watts per channel,

**DIMENSIONS:** 40¾ inches high, 12 inches wide, 16 inches deep

**WEIGHT:** 86½ pounds

**FINISH:** medium oak, light oak, or black satin

**PRICE:** \$1,499 a pair

**MANUFACTURER:** Klipsch, Dept. SR, 8900 Keys-one Crossing, Suite 1220, Indianapolis, IN 46240; telephone, 1-800-554-7724

Although the Klipsch KLF 20 has a nominal impedance rating of 8 ohms, its measured impedance was substantially lower than that over much of the audio range. We measured an impedance of about 3 ohms from 100 to 200 Hz and less than 8 ohms at most frequencies below 1 kHz (although it reached 8 to 10 ohms between 5 and 20 kHz).

When a speaker's impedance dips as low as 3 ohms it can be a problem, depending on the capabilities of the driving amplifier, if its sensitivity is also low (or even average). Because the KLF 20 has an exceptionally high sensitivity, however, it is most improbable that anyone will experience any problems with it. Our measurements essentially confirmed the KLF 20's 100-dB sensitivity rating, with a reading of 99 dB SPL measured at a distance of 1 meter with an input of 2.83 volts.

The potential problem with a very low speaker impedance is that such great demands are placed on the amplifier that it may be unable to deliver the required current without distortion or (worse) damage to itself. But thanks to its high sensitivity, the KLF 20 is able to generate very high sound levels with a small fraction of the input power that would be required for most speakers (actually, about one-tenth of the power that would be required by a speaker with a more typical 90-dB sensitivity rating).

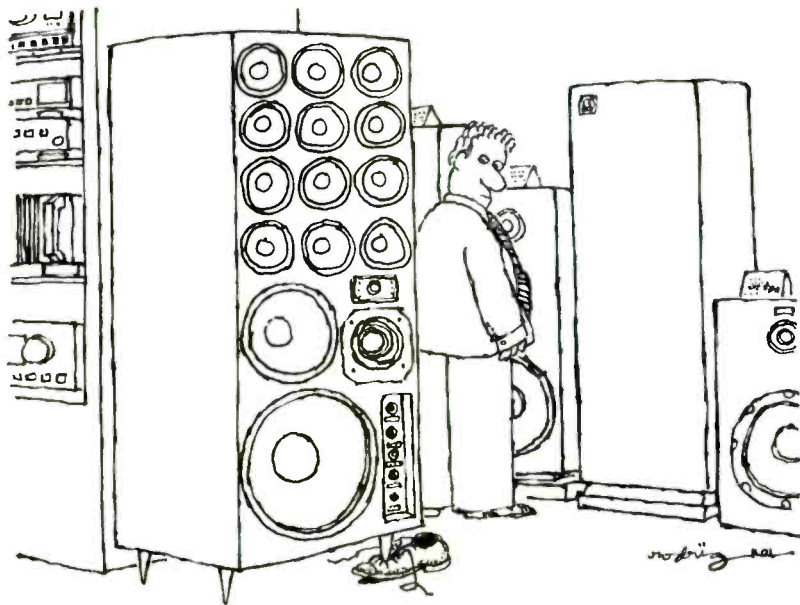
Bass distortion at an output level of 90 dB was relatively low, presumably due, at least in part, to the KLF 20's high sensitivity. The distortion mea-

sured 7 percent at 30 Hz, 3 percent at 50 Hz, and 2 percent above 60 Hz.

Quasi-anechoic (MLS) frequency-response measurements at distances of 1, 2, and 3 meters from the speaker showed a response within  $\pm 4.5$  dB from 300 Hz to 20 kHz. The curve showed appreciably less peak-to-peak amplitude variation over its full frequency range (especially at the higher frequencies) than most otherwise comparable response curves we have plotted, but this characteristic is not easy to interpret in terms of sound quality.

In any case, the overall sound of the KLF 20 was excellent. The output of the array of drivers was perfectly blended, with a stable stereo stage. Although the tweeter and midrange driver are large compared with the more common small dome drivers, the frequency balance and angular dispersion of these horns are such that a listener is never aware of their size when the speaker's grille is in place.

The growing popularity of powered subwoofers, sometimes designed as integral parts of a speaker system, invites a comparison with the Klipsch KLF 20 system. Its bass drivers, operating below 750 Hz, are obviously not true "subwoofers," but they are first-rate bass reproducers in their own right. Disregarding semantic considerations, it is apparent that the KLF 20, whose useful bass response extends to the vicinity of 25 to 30 Hz, offers most of the performance that you would get from a speaker with an integral powered subwoofer, but at the cost of a more conventional speaker. □



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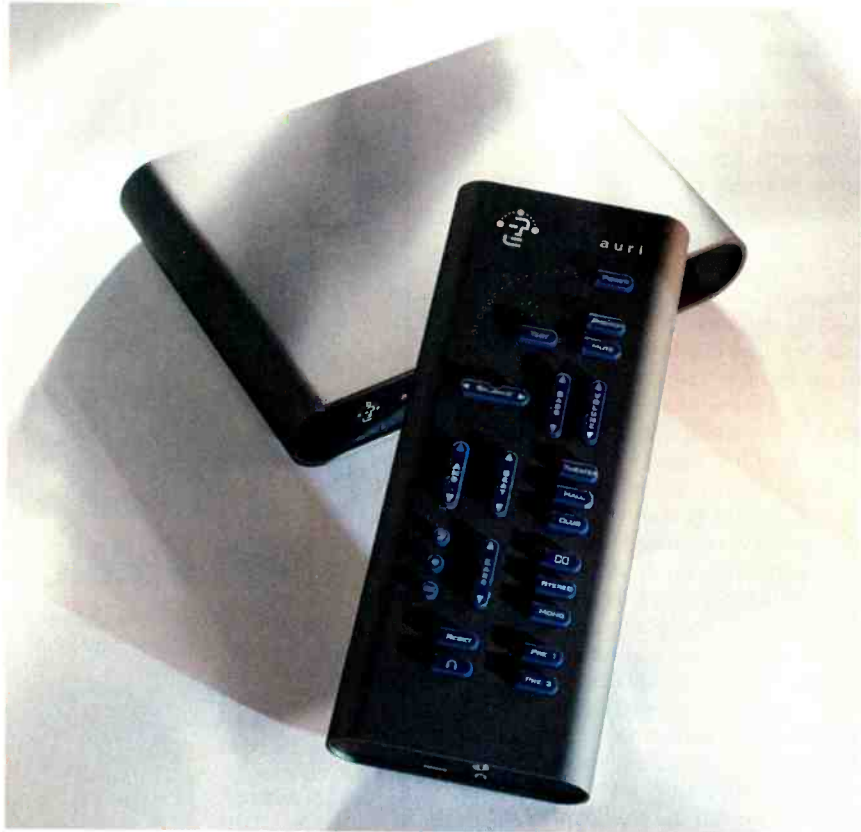
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## TEST REPORTS



# Virtual Listening Systems Auri Headphone Processor

DAVID RANADA • TECHNICAL EDITOR

**T**hink of Virtual Listening Systems' Auri as the inverse of systems like SRS, Spatializer, Carver's Sonic Holography, Polk Audio's Stereo Dimensional Array, and the Panorama mode on Lexicon surround processors. Very broadly speaking, those systems try to create the wide, 180-degree-plus sonic stage of headphone listening over loudspeakers. The Auri, on the other hand, was designed to produce the sensation of listening to a surround-sound speaker system driven by a Dolby Pro Logic decoder *over headphones*. Although this objective is easily described, it is not all that simple to accomplish, and the Auri uses some advanced digital signal processing (DSP) to do it.

What looks like a remote-control handset in the photo above is actually an infrared remote control combined with a digital wireless-headphone receiver. It comes with a set of recharge-

able Ni-Cd batteries, good for approximately 4 hours of continuous use, as well as an AC adaptor/charger; six alkaline AA cells can be used, too. Plug any set of stereo headphones into the handset, and they become wireless headphones that receive audio signals, via a 900-MHz radio link, from the Auri "mother ship," which may be up to 30 feet away.

Well, it might not look like a mother

**DIMENSIONS:** handset, 3 $\frac{1}{8}$  inches wide,  $\frac{7}{8}$  inches high, 7 $\frac{1}{8}$  inches deep; processor box, 7 $\frac{1}{4}$  inches wide, 1 $\frac{1}{4}$  inches high, 5 $\frac{1}{4}$  inches deep

**WEIGHT:** handset with batteries, 1 pound; processor box, 1 $\frac{1}{4}$  pounds

**PRICE:** \$499

**MANUFACTURER:** Virtual Listening Systems, Dept. SR, 4637 NW 6th St., Gainesville, FL 32609; telephone, 352-379-0807; e-mail, sales@vls-toltec.com

ship, but the small, plain box shown behind the handset actually contains most of the Auri system's electronics: analog-to-digital and digital-to-analog converters, an advanced DSP chip, a 900-MHz transmitter, infrared receiver circuits, and a microcomputer to control everything. The DSP chip, made by Motorola, performs Dolby Pro Logic decoding and Virtual Listening Systems' Toltec "virtual-speaker" processing.

You connect the processor box's single set of audio inputs to the outputs of a home-theater source component (the manual mentions a stereo TV, a hi-fi VCR, a laserdisc player, "or any other stereo source") with a normal stereo RCA cable, and it is powered with a second supplied AC adaptor. Inside, the processor box converts the input signals into digital data, performs Dolby Pro Logic decoding (if desired), and sends the results through Toltec processing. The data stream is then modulated onto the 900-MHz radio signal and transmitted to the handset. There it is demodulated, converted to an analog audio signal, and sent to the handset's stereo headphone output.

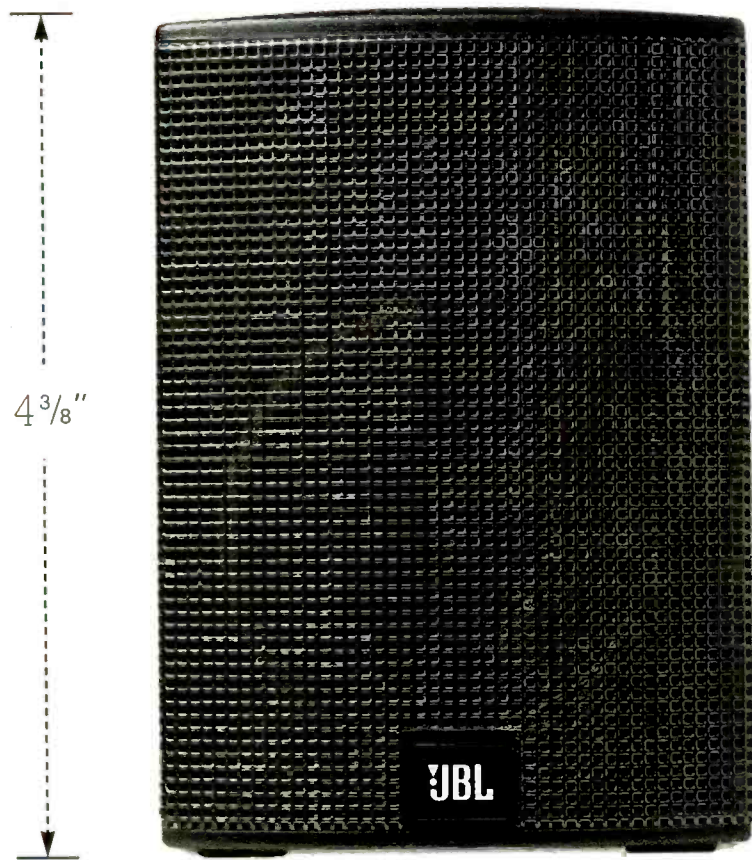
The Auri handset "talks" to the processor box by means of conventional infrared commands, so you have to be fairly close to the box when making adjustments. Among the controls on the handset are volume, balance, bass, and muting, and you can select the type of surround processing (Dolby Pro Logic, stereo, mono) and the level and type of digital ambience (Theater, Hall, and Club). There's a Phantom button to switch Toltec processing on and off (for before/after comparisons), a couple of preset buttons that memorize many of the other settings, and a reset button to restore all settings to their factory defaults. A fascinating Seat control will sonically "slide" you toward or away from the front virtual speakers the Auri creates.

Holding down the button with the headphone icon switches the Auri into a simple Dolby Pro Logic decoder that feeds five line-level RCA output jacks on the back of the processor box (for left, center, and right front speakers and two surrounds). Our Dolby Pro Logic measurements were made in this mode. (Another VLS product, the \$299 Auri Direct, builds the mother-ship functions into the handset, eliminating the radio and infrared links. The handset is wire-connected to the A/V preamp or source component.)

The most important and interesting



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# TEST REPORTS

buttons on the handset are the one large and three small buttons located above the reset key. These are used to match the Auri's Toltec processing to your ears, a refinement that is, to my knowledge, unprecedented in a consumer product. The need for these controls will be clear once you understand how the Auri works, which requires a short course on audio virtual reality.

When you listen to music over a pair of loudspeakers, each ear hears both speakers, in contrast to headphone listening, where each ear hears only one of the two stereo channels. Therefore, to imitate speaker listening using headphones there must be some crossfeeding of the stereo signals: some left-channel signal leaked into the right ear, and vice versa. But such a simplistic approach to crossfeeding will only produce a more mono-sounding headphone image in the center of your head. The objective of Auri's Toltec processing is far more ambitious: to form the sonic image *outside* your head, just like one produced by loudspeakers.

That requires a far more detailed simulation of speaker listening than just crossfeeds, because as speaker signals approach the ears they are affected by the presence, shape, and size of your head and outer ears. By the time the sounds enter your ear canals,

diffraction, acoustic shadowing, and resonances have produced substantial changes in frequency and phase characteristics. In psychoacoustical research, these alterations have been given the imposing name of Head-Related Transfer Functions (HRTF's), a term that is now quite prominent in ads and manuals for sonic virtual-reality products and sprinkled liberally through their patents.

HRTF's "encode" the direction of sound. The left front speaker in a surround-sound system will produce different HRTF's at the left and right ears than will either surround speaker. Having learned through experience how sound direction is encoded by your own HRTF's, your brain can "decode" them — it assigns a perceived direction to a sound whose characteristics match, in both ears simultaneously, an original sound altered by the two HRTF's associated with that direction.

HRTF's can be measured, as mine have been, by sticking tiny microphones into the ear canals, then playing test tones from various directions around the person's head while measuring the frequency-response and phase/time changes at the microphone. It is a tedious and uncomfortable process, but the results can be used to simulate by DSP what happens around your head acoustically, which is precisely what the Auri does.

From a four-channel decoded Dolby Pro Logic signal (left, center, right, surround), the Auri develops the direct and crossfeed signals for each of the five speakers in a home-theater system (two surround speakers, remember). Each of these signals then has its frequency and phase response modified by the HRTF appropriate for the direction of the selected virtual speaker. For each ear, the direct and crossfeed signals are then mixed together to produce a two-channel headphone signal. If all goes well, the listener will experience the sensation of a virtual surround-sound speaker system rather than headphones.

The strength of this illusion depends primarily on three factors:

1. *HRTF/listener match.* The brain's direction-decoding system learns how to operate using a person's own HRTF's. But small changes in the shape or size of the ears or head can create radically different HRTF's, so there's little chance that your HRTF's will exactly match someone else's, much less the single averaged set of

HRTF's that is typically embodied in primitive virtual-reality systems. Yet a close HRTF match is essential if a listener is to properly "decode" the locations of the Auri's virtual speakers, hence the need for the Auri's ear-matching buttons (remember them?). The buttons switch among eight different sets of HRTF's, which were chosen to cover the range of individual HRTF variations. One set should match your actual HRTF's fairly closely. If you're really lucky, the default power-on HRTF set will match yours.

2. *Headphonelistener match.* The Auri will work — and sound — best when your headphones and your ears *together* produce a smooth, if not perfectly flat, frequency response. But high-quality headphones themselves come in two "flavors." Top models from European makers like Sennheiser and Beyer and open-back models from Koss as well as the one I used for most of my listening with the Auri, the ear-canal Etymotic ER-4S (\$330 from Etymotic Research, telephone 708-228-0006), contain what is known as a "diffuse-field correction," a lower-treble boost designed to compensate for the alteration in ear-canal resonance introduced by the headphone. On the other hand, some top headphones as well as most closed-back units lack this correction and can sound somewhat dull or bass-heavy in comparison. Accordingly, all but one of the Auri's sets of HRTF's also come in two flavors, *with* a diffuse-field-correction treble boost (which changes slightly with the selected HRTF's) and *without* the boost. The default power-on HRTF set contains a smaller lower-treble boost that's a compromise between the two flavors.

3. *Individual susceptibility to "externalization."* Even if the Auri's HRTF's perfectly matched your own, you might still not perceive the virtual speakers it creates as located "outside" your head. Getting HRTF-processed sound to pop out of the head has always been the most difficult problem in headphone-based virtual-reality audio. Listeners vary greatly in their ability to externalize HRTF-processed sound if other important spatial cues aren't also present (such as the change in HRTF's as the head is moved or the halo of room reflections surrounding the sound from a real speaker).

Unfortunately, I am one of those nonexternalizing listeners, as I have known for more than a decade from experiences with binaural recordings

## MEASUREMENTS

### DOLBY PRO LOGIC PERFORMANCE

All measurements with processor box switched to line-level Dolby Pro Logic operation without Toltec processing (see text).

#### FREQUENCY RESPONSE

front ..... 20 Hz to 18.6 kHz +0, -3 dB  
center ..... 100 Hz to 20 kHz +0, -3 dB  
surround ..... 20 Hz to 6.9 kHz +0, -3 dB

#### NOISE (A-wtd)

front ..... -68.7 dB  
center ..... -66.6 dB  
surround ..... -59.8 dB

#### DISTORTION (THD+N, 1 kHz)

front ..... 0.06%  
center ..... 0.13%  
surround ..... 0.15%

#### SURROUND-DECODER INPUT-OVERLOAD MARGINS (at 1 kHz)

front (re 2-volt input) ..... +0.5 dB  
center (re 1.4-volt input) ..... +0.6 dB  
surround (re 1.4-volt input) ..... +0.6 dB

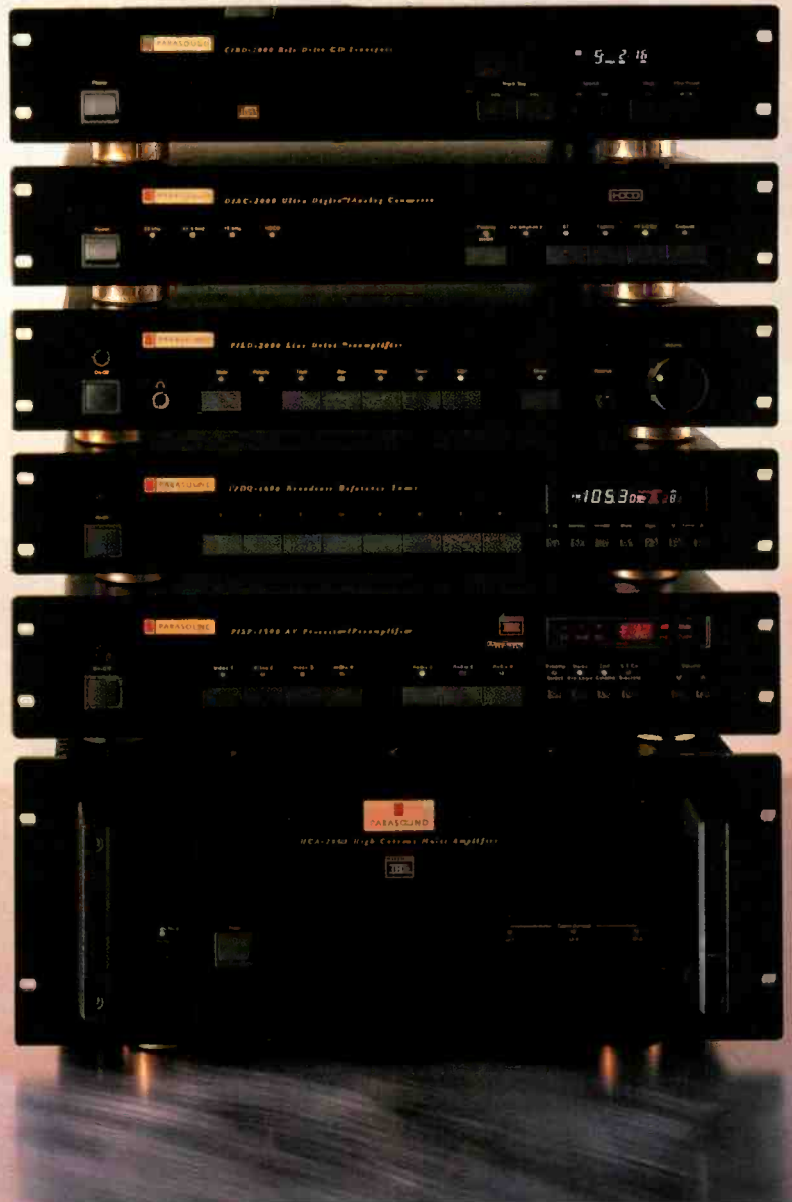
#### SURROUND-CHANNEL NOISE-REDUCTION CALIBRATION ERROR

re Dolby level (251 mV) ..... 0 dB

#### CHANNEL SEPARATION (worst case)

left out, surround driven ..... >38 dB

Be prepared to eat  
*way too much take out food.*



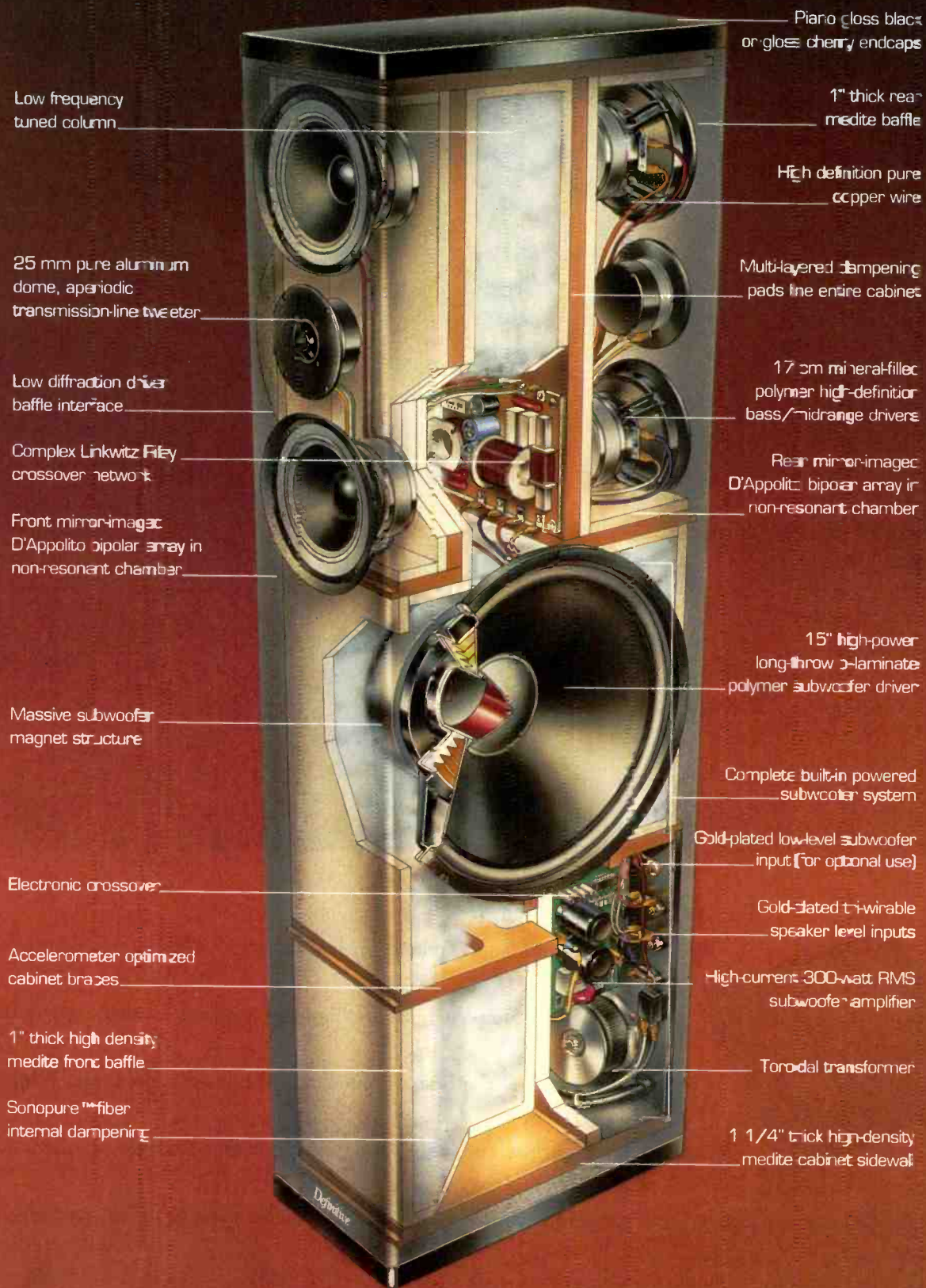
Bring Parasound home and you might never want to leave again. Which is just fine, since we offer a complete menu of high-end products to satisfy any musical taste. You see, we insist on the best designers and the finest ingredients. People like the renowned John Curl, whose audio designs have time and again set the standard for life-like reproduction of music. And premium parts that far exceed what you'd expect to find in components priced from \$250 to \$2,250. All of which means you can now enjoy incredible sound, and still afford to order that extra topping on your pizza.



PARASOUND

Parasound Products, Inc. (415) 397-7100.

# Inside Definitive's Revolutionary BP2000



Low frequency tuned column

25 mm pure aluminum dome, aperiodic transmission-line tweeter

Low diffraction drive baffle interface

Complex Linkwitz Riley crossover network

Front mirror-image D'Appolito bipolar array in non-resonant chamber

Massive subwoofer magnet structure

Electronic crossover

Accelerometer optimized cabinet braces

1" thick high density medite front baffle

Sonopure™ fiber internal dampening

Piano gloss black or gloss cherry endcaps

1" thick rear medite baffle

High definition pure copper wire

Multi-layered dampening pads line entire cabinet

17 cm mineral-filled polymer high-definition bass/midrange drivers

Rear mirror-image D'Appolito bipolar array in non-resonant chamber

15" high-power long-throw 3-laminate polymer subwoofer driver

Complete built-in powered subwoofer system

Gold-plated low level subwoofer input (for optional use)

Gold-plated tri-wirable speaker level inputs

High-current 300-watt RMS subwoofer amplifier

Toroidal transformer

1 1/4" thick high-density medite cabinet sidewall

**"Definitive's new BP2000 absolutely kills most more-expensive speakers!"**  
 —Bret Butterworth, Home Theater Technology

# Julian Hirsch Says, "...I Would Choose These Speakers for Myself."

*BP2000 is "the first speaker I have been able to audition in my own familiar surroundings that has given me that special thrill that usually costs ten or more times its price..."*

—Julian Hirsch, *Stereo Review*

*"This slammin' system will probably kill any other you've ever heard or seen."*

—Brent Butterworth, *Home Theater*

## Speaker of the Decade

The experts agree: Definitive's BP2000s are an amazing achievement! We have literally reinvented the loudspeaker and combined a six-driver dual D'Appolito bipolar array with a built-in (side-firing) 300-watt powered 15" subwoofer. (Yes, a complete powered subwoofer built into each speaker!) The result is extraordinary sonic performance beyond anything you've ever heard.

Both music and movies are reproduced with unequalled purity, transparency and lifelike realism. And the astounding high resolution imaging and awesome bass impact totally envelop you in sonic ecstasy.



*Definitive's complete AC-3\* ready BP2000 Home Theater System is the perfect choice for ultimate music and movie performance.*

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## The Ultimate Home Theater

In addition to being an audiophile's dream, the BP2000s are also the main speakers in Definitive's AC-3\* ready Ultimate Home Theater System. This astonishing system is absolutely the finest sounding available. It recreates a "you are there" spatial reality that actually puts you into the soundspace of the original cinematic action.

The complete system combines the BP2000s (\$1499 ea.) with a C/L/R 2000 center (\$650 ea.) and BPX bipolar surrounds (from \$399 ea.). Of course, dual 15" powered subwoofers are already built into the sleek BP2000 towers. Truly the ultimate listening experience! Visit your Definitive dealer today.

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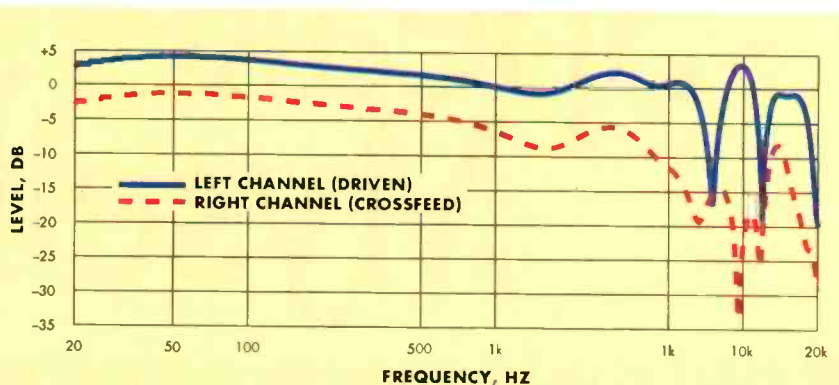
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AK- Alaska Audio; Juneau; Pyramid; Anchorage.  
 AL- Cohen's Electronics; Montgomery; Kincaid's TV; Tuscaloosa;  
 Likis Audio; Birmingham.  
 AR- Custom Audio Video; Little Rock.  
 AZ- Jerry's Audio Video; Phoenix; Tucson.  
 CA- Access to Music; Larkspur; Accurate A/V; S. Lake Tahoe;  
 Ahead Stereo; Los Angeles; Audio Concepts Long Beach; San  
 Gabriel; Bay Area Audio; San Jose; Boots Camera; Fresno;  
 Christopher Hansen; West LA; Coast Home Ent.; Ascadero; Orcutt;  
 Creative Stereo; Santa Barbara; Ventura; David Rutledge Audio;  
 Palm Desert; DB Audio; Berkeley; Digital Ear; Justin;  
 Dow Stereo Video; San Diego & Suburbs; La Jolla; El Cajon; Chula  
 Vista; Escondido; Lee's Home Theater; Visalia; Monterey Stereo;  
 Monterey; Paradyme; Sacramento; Performance Audio;  
 San Francisco; Systems Design; Redondo Beach; Videotek;  
 Westminster; Wilson Home Theater; Woodland Hills.  
 CO- Audio Visions; Grand Junction; Listen Up; Denver; Boulder,  
 Colorado Springs; Soundtrack; Denver & Suburbs; Boulder,  
 Ft. Collins, Colorado Springs.  
 CT- Al Franklin's; Greenwich; Audio Etc.; Orange; Carston's Audio Video;  
 Danbury; Roberts Audio Video; New London; The Sound Room;  
 Westport; Stereo Shop; Hartford.  
 DC & Suburbs; Myer-Emco.  
 DE- Sound Studio Newark; Wilmington.  
 FL- Absolute Sound; Winter Park; Audio Advisors; West Palm Beach;  
 Audio Center; Deerfield Beach; Audio Video Store; Tallahassee;  
 The Audiohouse; Vero Beach; Cooper for Stereo; Clearwater;  
 Hoyt Stereo; Jacksonville; Palm Audio; Destin; Sound Components;  
 Coral Gables; Sound Ideas; Gainesville; Sound Insight; Ft. Pierce;  
 Stereotypes; Daytona Beach; Stuart A/V; Stuart.  
 GA- Laser Disc Enterprises; Atlanta; Merit TV; Columbus;  
 Stereo Connections; Valdosta; Stereo Festival; Atlanta.  
 HI- Audio Center; Honolulu; Waipahu.  
 IA- Audio King; Cedar Rapids; Des Moines; Archer Audio Video;  
 Ft. Dodge; Audio Video Logic; Des Moines; Audio Visions; Sioux City;  
 Camera Corner; Davenport.  
 ID- Ultimate Electronics; Boise; Wise Buy; Idaho Falls.  
 IL- United Audio Centers; Chicago & Suburbs; Good Vibes;  
 Champaign; Jon's Home Ctr.; Quincy; Sound Forum; Crystal Lake;  
 Sundown A/V; Springfield.  
 IN- Classic Stereo; Ft. Wayne; Mishawaka; Good Vibes; Lafayette;  
 Kings Great Buys; Evansville; Ovalton Audio; Clarksville; Indianapolis.  
 KS- Accent Sound; Overland Park; Advance Audio; Wichita;  
 Audio Junction; Junction City; Manhattan.  
 KY- Ovalton Audio; Lexington; Louisville.  
 LA- Alterman Audio; New Orleans; Metairie; Lake Charles Music; Lake  
 Charles; Mike's Audio; Baton Rouge; Wright's Sound Gallery; Shreveport.  
 MA- Cookin'; Chatham Hill; Saugus; Goodwins Audio; Boston;  
 Shrewsbury; Nantucket Sound; Hyannis; Northampton Audio;  
 Northampton; Pittsfield Radio; Pittsfield.  
 MD- Gramophone; Baltimore; Elicott City; Myer-Emco; Gaithersburg;  
 Beltsville; Rockville; Slight & Sounds; Easton; Soundscape; Baltimore.  
 ME- Cookin'; Portland.  
 MI- Peter's; Detroit; Troy; Classical Jazz Holland; Classic Stereo; Kalamazoo;  
 Grand Rapids; Sand North; Iron Min.; Stereo Center FRAV; Flint;  
 Court St. Listening Room; Midland; Saginaw.  
 MN- Audio King; Minneapolis & Suburbs; Rochester; St. Cloud;  
 Audio Designs; Winona.  
 MO- Independence A/V; Independence; Reference Audio; Sedalla;  
 Sound Central; St. Louis.  
 MS- Ideal Acoustics; Starkville; McLelland TV; Hattiesburg;  
 Players A/V; Ridgeland.  
 MT- Aspen Sound; Missoula; Kalispell; Avitel; Bozeman;  
 Car & Home Stereo Ctr.; Billings; Rocky Mt. Hi Fi; Great Falls.  
 NC- Audio Video Systems; Charlotte; Audio Visions; Wilmington;  
 Now Audio Video; Durham; Greensboro; Raleigh; Winston Salem;  
 Audio Lab; Wilmington.  
 NE- Custom Electronics; Omaha; Lincoln.  
 NH- Cookin'; Nashua; Manchester; Newington; Salem; S. Nashua.  
 NJ- Cookin'; Stereo; Trenton; Manalapan Stereo; Shrewsbury; Sound Waves;  
 Northfield; Woodbridge; Stereo; West Caldwell; Woodbridge.  
 NM- Ultimate Elect.; Albuquerque; Sound Ideas; Albuquerque.  
 NV- Ultimate Elect.; Las Vegas; Upper Ear; Las Vegas.  
 NY- Audio Breakthroughs; Manhasset; Audio Den; Lake Grove;  
 Audio Expressions; Newburgh; Clark Music; Albany; Syracuse;  
 Stereo Exchange; Manhattan; Hart Elect.; Vestal; Innovative Audio;  
 Brooklyn; Listening Room; Scarsdale; Rowe Camera; Rochester;  
 Speaker Shop; Amherst.  
 OH- Audio Craft; Akron; Cleveland; Mayfield Hts.; Westlake;  
 Audio Etc.; Dayton; Classic Stereo; Lima; Paragon Sound; Toledo;  
 Stereo Visions; Columbus; Threshold Audio; Heath.  
 OK- Audio Dimensions; Oklahoma City; Ultimate Electronics; Tulsa;  
 Photo World; Bartlesville.  
 OR- Bradford's HiFi; Eugene; Chelsea A/V; Portland; Beaverton;  
 Kelly's Home Ctr.; Salem; Magnolia HiFi; (Portland); Beaverton;  
 Clackamas; Stereo Plant; Bend.  
 PA- Audio Junction; Pittsburgh; Gary's Elect.; State College;  
 GNT Stereo; Lancaster; Hart Elect.; Blakely; Hi Fi House;  
 Abington; Broomall; Camp Hill; Harrisburg; Listening Post;  
 Aspenburg; Palmer Audio; Allentown; Pro Audio; Bloomsburg;  
 Stereo Shop; Selinsgrove; Williamsport; Stereoland; Natrona  
 Heights; The StereoShop; Greensburg.  
 RI- Stereo Discount Ctr.; Providence.  
 SC- A/V Design; Charleston; Custom Theater & Audio; Myrtle Beach;  
 Upstairs Audio; Columbia.  
 SD- Audio King; Sioux Falls; Sound Pro; Rapid City.  
 TN- Collette HiFi; Chattanooga; Hi Fi Buys; Nashville; Now Audio Video;  
 Knoxville; Modern Music; Memphis; Sound Room; Johnson City.  
 TX- Home Entertainment; Dallas; Houston; Plano; Audio Tech; Temple;  
 Waco; Audio Video; College Station; Brock A/V; Beaumont;  
 Bunkley's Sound Systems; Abilene; Bjorn's; San Antonio; High Fidelity;  
 Austin; Krystal Clear; Dallas; Marvin Electronics; Ft. Worth; Sound  
 Quest; El Paso; Sound Systems; Amarillo; Sound Towne; Texarkana.  
 UT- Alpine Elect. Pro; AudioWorks; Salt Lake City; Crazy Bob's; St. George;  
 Stokes Bros.; Logan; Ultimate Elect.; Layton; Murray; Orem; Salt Lake City.  
 VA- Myer-Emco; Falls Church; Tyson's Corner; Fairfax; Audio Connection;  
 Virginia Beach; Audiographics; Roanoke; Home Media Store; Richmond.  
 WA- Magnolia HiFi; Seattle & Suburbs; Tacoma; Silverdale; Spokane;  
 Aspen Sound; Spokane; Pacific Slight & Sound; Wenatchee;  
 Tn. Ear; Kennewick.  
 WI- MA; Sound Post; Princeton.  
 WJ- Audio Emporium; Milwaukee; Absolute Sound & Vision; Sheboygan;  
 Hi-Fi Heaven; Appleton; Green Bay; Sound World; Wausau.  
 Puerto Rico- Precision Audio; Rio Piedras.  
 Canada- A & B Sound; Calgary; Edmonton; Kelowna; Vancouver &  
 Suburbs; Victoria; Advance Electronics; Winnipeg; Bay Floor Radio;  
 Toronto; Canadian Sound; Brampton Ont.; Digital Dynamics;  
 Clearbrook; Kebeeson; Montreal; Lipton's; New Market Ont.;  
 Peak Audio; Halifax; Sound Room; Vancouver; StereoLand;  
 Windsor; Treble Clef; Ottawa.  
 Mexico- Contact Grupo Volumen; Mexico City.

## TEST REPORTS

made through molded copies of my own ears. But while I didn't get externalization with the Auri, that doesn't mean I found it useless. Far from it. Even though the image remained inside my head, the Auri beneficially rearranged it. For example, when I listen over headphones without the Auri to an *undecoded* Dolby Surround soundtrack, the surround-channel signal usually imparts a phasey quality to the sound. But because the surround signal is encoded out of phase on the left and right channels, the Auri eliminated that phaseyness in its Dolby Pro Logic mode, making soundtracks sound far more "solid" than usual with headphones. Sometimes, depending on the program material, I even got the sensation of stereo surrounds (a true

frequency response at the left (solid) and right (dashed) headphone outputs with the Auri's power-on default HRTF setting when only the left channel of the processor is driven (the right-channel signal shown is therefore a crossfeed). Note the vertical scale, which spans a far larger range than in most frequency-response graphs. The peaks and dips are huge, but they are also similar to those produced by your own head and ears. Their complexity makes their sonic effect very difficult to describe. Besides, the colorations change greatly with the selected HRTF and headphones. While the change in frequency response may sound excessive as you switch the Auri's processing on and off (using the Phantom button), it will



Frequency response at the Auri's headphone outputs with all of the power-on default settings (left channel only driven).

illusion, since Dolby Pro Logic produces a mono surround signal). The front-channel sounds moved away from the line between my ears inside my head to "locations" further forward and slightly upward. Front separation was reduced to something resembling that obtained with speaker listening. With all the soundtracks I tried, the Auri's Pro Logic mode produced a sonic experience superior to plain, non-Auri headphone listening, which produces an ear-to-ear image that is far too wide to match a movie's on-screen events even remotely.

Aside from changes in the apparent locations of the sound sources, the Auri's most noticeable sonic characteristic was a colored frequency response with soundtracks and, especially, with music. This is, however, precisely what the Auri is *supposed* to do, and it will occur even if your headphones produce perfectly flat response with your ears in non-Auri listening.

The accompanying graph shows the

frequency response at the left (solid) and right (dashed) headphone outputs with the Auri's power-on default HRTF setting when only the left channel of the processor is driven (the right-channel signal shown is therefore a crossfeed). Note the vertical scale, which spans a far larger range than in most frequency-response graphs. The peaks and dips are huge, but they are also similar to those produced by your own head and ears. Their complexity makes their sonic effect very difficult to describe. Besides, the colorations change greatly with the selected HRTF and headphones. While the change in frequency response may sound excessive as you switch the Auri's processing on and off (using the Phantom button), it will

be minimized if you have selected, using those HRTF-selection buttons, the HRTF that best matches your ears and headphones. Once you find that setting, you'll get used to the response change and may eventually prefer the frequency balance produced by the Auri as being more realistic. Space restrictions prevent me from covering all the subtleties of Auri operation, like using program material instead of the built-in test tone for selecting the right HRTF setting. But that should only encourage you to explore the Auri's fascinating effects for yourself. I can only reiterate that its effects are *strongly* listener/headphone-dependent. This product may well be the ideal solution for those whose budget or listening situation forbids investment in home-theater speakers. I urge you to give this innovative processor a try. Who knows? — you may be one of the lucky ones for whom the Auri produces an out-of-body experience

## TEST REPORTS



LOOK P. LEUNG

# Optimus PRO LX10 Speaker

**JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES**

In the May 1995 issue of *STEREO REVIEW*, we reported on an unusual small loudspeaker, the Optimus PRO LX5, marketed through Radio Shack stores. The PRO LX5 featured an unconventional tweeter, designed and manufactured by Linaeum Corporation, that radiates in a dipolar pattern (a horizontal figure-8), with its lobes facing front and rear and its nulls (minimum output) at the sides. The PRO LX5 proved to be an excellent speaker for its price, although its single 5-inch woofer was obviously not intended to satisfy the requirements of serious high-fidelity listening.

Radio Shack has now taken the logical step of using the Linaeum tweeter in larger speaker systems that have

greater bass capability, adding two new models to the Optimus PRO LX series. The LX8 is a bookshelf speaker with an 8-inch woofer, and the LX10, the subject of this report, is a floor-standing tower with two 7-inch woofers operating in a vented enclosure.

**DIMENSIONS:** 34 inches high, 9 inches wide, 11 inches deep

**WEIGHT:** 32 pounds

**FINISH:** black woodgrain vinyl veneer; gray edge trim

**PRICE:** \$250 each

**MANUFACTURER:** Optimus by Radio Shack, Dept. SR, 1500 One Tandy Center, Ft. Worth, TX 76102; telephone: 1-800-843-7422; <http://www.radioshack.com>

Each of these speakers uses an identical Linaeum tweeter located at the top of the enclosure and protected by a basket-like housing that safeguards its delicate plastic diaphragm while providing free access for its acoustic output to the room. (The Optimus literature calls the tweeter "bipolar," but in actuality its operation is *dipolar*. In a bipolar speaker the front and rear radiation is *in phase*, making it less directional than a dipole, where the front and rear radiation is *out of phase* and therefore falls off on either side.)

The cabinet of the LX10 is made of black woodgrain vinyl, with gray front-edge trim and a full-length black cloth grille. As with the other PRO LX speakers, the housing concealing the tweeter is also covered with acoustically transparent black cloth. With the housing removed, the pliable figure-8 driver elements, about 1 $\frac{3}{4}$  inches wide, are clearly visible.

In the PRO LX10, the two woofers have polypropylene cones and are located in the upper portion of the slender tower enclosure. The bass vent is on the front panel, below the drivers. The connection terminals, on the rear of the speaker, are gold-plated binding posts spaced 1 $\frac{1}{8}$  inches apart. Although they do not accept dual banana-plug connectors, they are compatible with single banana plugs or spade lugs.

The manufacturer's specifications for the Optimus PRO LX10 list a bandwidth of 50 Hz to 25 kHz, power handling of 80 watts continuous or 160 watts peak, a nominal impedance of 8 ohms, and sensitivity of 90 dB sound-pressure level (SPL) at 1 meter.

For listening and room-response measurements, we placed the PRO LX10 speakers at the front of the room, about 7 feet apart and 3 feet in front of the wall behind them. The microphone was located on the axis of the left speaker, about 12 feet away, and we measured the response separately for each speaker. Their averaged room response was  $\pm 3$  dB from 50 Hz to 3 kHz, rolling off at higher frequencies to  $-6$  dB at 10 kHz and  $-15$  dB at 15 kHz. Apparently the absorption of the high-frequency energy radiated from the rear of the Linaeum tweeter (and reflected toward the front of the room) was sufficient to significantly affect the room-response curve under the measurement conditions.

Our quasi-anechoic MLS frequency-response measurement produced very different results, however, more

## TEST REPORTS

consistent with what we heard at the normal listening position about 10 or 12 feet from the front of the speakers. This measurement, made at a distance of 1 to 3 meters from the speakers, produced a response curve within  $\pm 4$  dB from 300 Hz to 15 kHz, which is typical performance for good speakers we have measured under similar conditions. But the MLS measurement al-

summed and weighted in proportion to the areas of their sources, yielding a total bass response for the system. The measurement was made over the range from 200 to 20 Hz.

The measured bass output was consistent with the specifications of the LX10, within  $\pm 2.5$  dB from 50 to 200 Hz and falling off gradually at lower frequencies to  $-10$  dB relative to the

Listening to the PRO LX10 speakers provided a pleasant surprise. They created a soundstage that was as stable and believable as any we have heard in the same room. The speakers were virtually invisible acoustically as well as being unobtrusive visually. The apparent soundstage stretched across the front of the room, with individual instrumental and vocal sources that were simply and believably "there."

Although our bass-response measurements confirmed the speaker system's rated lower limit of 50 Hz, they also indicated that the response extended well below that frequency, albeit at a somewhat reduced level. When we played the subwoofer sweep track of the Delos "Surround Spectacular" test CD, we were surprised (and gratified) to hear a clean, strong output down to the vicinity of 30 Hz. Very few speakers we have tested have delivered a useful bass output almost an octave *below* their specified bass limits.

Judged by its very reasonable price and excellent performance, the Optimus LX10 is certainly one of the better values in today's loudspeaker market. □

**The Optimus PRO LX10 speakers, as invisible acoustically as they were unobtrusive visually, created a soundstage that was as stable and believable as any we have heard in the same room.**

so indicated a pronounced and rapid falloff of output above 15 kHz, which is certainly not consistent with the claimed response to 25 kHz.

The bass response was measured separately, with one microphone located midway between the two woofers and another one close to the port on the front of the cabinet. The outputs of the two microphones were electrically

maximum output level (which occurred at 95 Hz).

The maximum impedance was 30 ohms at 80 Hz, with another peak to 27 ohms at 21 Hz, but over most of the audio range it measured close to 8 ohms and was essentially resistive. Sensitivity measured 89 dB SPL with a 2.83-volt pink-noise signal, just slightly less than rated.

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...SRS can place some sounds off to the sides of the listening area or even to the rear of it in some cases. The result is a seamless soundstage that wraps around much of the room and makes the pair of speakers seem to "disappear" sonically.

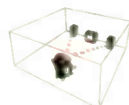
John Sunier,  
Audio Magazine April 1996



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CIRCLE NO. 25 ON READER SERVICE CARD



## CAR STEREO



LOOK P. LEUNG

# Blaupunkt CDM147 Las Vegas CD Receiver

**KEN C. POHLMANN • HAMMER LABORATORIES**

**T**oday's car CD players are a far cry from their earliest ancestors. Over the course of a decade, they have evolved to provide better sound quality, shock-resistance, and security. Most CD head units now double as CD changer controllers, too, and they offer a host of user conveniences. It is almost hard to believe that a high-quality CD player, AM/FM tuner, and four-channel power amplifier can be crammed into a DIN-size package at such a moderate price as \$400. But Blaupunkt's CDM147 Las Vegas CD receiver is part of this new generation of car CD receivers, and it represents an attempt to push the envelope even further.

The Las Vegas continues the Blaupunkt tradition of naming its head units after famous (and cool) cities. Moreover, its front panel embraces Blaupunkt's relatively new Euro-styling. Whereas older Blaupunkt (and other European) heads often used small, square, identical-looking buttons, the new style is quite bold, with a sculpted panel and buttons that are larger, rounded, and ergonomic. Specifically, a rocker switch adjusts the volume in 1.25-dB increments, and an audio button attenuates it; the mute level is adjustable. When pressed and held, then pressed again, the audio button steps through bass, treble, and balance/fader modes, which are adjusted with the four-way Select rocker and can be set independently for the tuner, CD, and auxiliary input. The source (SRC) button is used to select radio, CD, aux. or CD changer (if con-

nected). A blue button turns the head unit on and off; when it is turned off, the head automatically stores the source setting and the current station or track. When the ignition is off, any button can be pressed to show clock time.

The display/menu button takes you into an extensive control menu that can be used to customize the Las Vegas's features. You can program a forty-character turn-on message that scrolls across the display, adjust the clock, defeat button beeps, choose different audition scanning durations, adjust the mute and maximum volume levels, choose either of two loudness contours for each source, program up to thirty radio station names of up to eight characters each, and program up to ninety-nine CD names of up to seven characters. The display/menu button also provides access to a feature that we haven't come across on any other head unit: You can program the tuner to turn on at a specific time so you won't miss the big game.

The Select rocker is also used for seek and manual tuning. Radio sensitivity can be switched between local and distant settings by pressing and holding the sensitivity/loudness but-

**DIMENSIONS:** 7 x 2 x 6½ inches

**PRICE:** \$400; optional Thummer steering-wheel remote control, \$100

**MANUFACTURER:** Blaupunkt,  
Dept. SR, 2800 S. 25th Ave., Broadview,  
IL 60153; telephone, 1-800-950-2528;  
<http://www.blaupunkt.com>

ton; otherwise the button switches loudness compensation on/off. A band button selects among four tuner-preset groups totaling eighteen FM and six AM stations. The Travel-Store feature automatically finds and saves as presets the six FM and six AM stations with the strongest signals; these override any previously programmed stations. The Las Vegas also automatically stores the last-tuned station whether or not it was preset. The scan (SCA) button lets you audition stations in the selected band or, when pressed and held, only the preset stations.

When a disc is loaded, the Select control lets you skip from track to track or fast-search through tracks. The repeat button (Preset 4) lets you repeat the current track. The mix button (Preset 5) engages random track playback. The Las Vegas can also control CD changers featuring Blaupunkt's DISC management system, allowing users to program playback of specific discs and tracks, name discs, scroll through the list of names while another disc is playing, and select discs by name.

As noted, some of the operations require pressing a button longer than half a second, and those buttons are programmed to beep when held. This is an intelligent use of audible cues, far better than head units in which *all* buttons beep.

Like many other contemporary head units, the Las Vegas features a detachable face. A release button pops the face away from the chassis; a plastic carrying case is provided. The face sports green illumination. The LCD panel provides alphanumeric for radio-station frequency and CD tracks and timing as well as readouts and icons to indicate the mode of operation. Like most CD players, this one uses a 1-bit digital-to-analog (D/A) converter.

The four-channel power amplifier is rated to deliver a maximum of 35 watts to each channel, or 13.5 watts at 1 percent distortion (THD). The four preamp outputs are each rated at 3.0 volts. The unit also provides an auxiliary input, which is mounted on a 2-foot cable for use with portable tape and CD players. The Las Vegas is accompanied by a credit-card-size infrared remote control with eight buttons, including volume.

If you're in a Blaupunkt-buying mood, you should also know that Blaupunkt has introduced a unique wireless control option called the Thummer. Its

## CAR STEREO

crescent shape allows it to attach to the inside of a steering wheel. As its name implies, the Thummer is designed so that you can use your thumb to operate eight principal head-unit features via the infrared receiver already built into the head.

Installation of the Las Vegas and the Thummer did not pose any problems. I first secured the head's mounting sleeve into my dashboard's DIN opening by bending tabs, then slid in the head and secured it with a rear strap. Wiring was simple because most of the leads connect to the head unit with supplied plug-in wiring harnesses. I connected the antenna, ignition, battery, and ground leads. The unit's front/rear fader lets you use either the speaker-level or line-level outputs. For this particular test, I wired the front speaker outputs to my door-mounted front speakers and the rear line-level outputs to an external power amplifier, which powers two subwoofers. Because I also had a Blaupunkt CDC-A05 CD changer on hand, I invested the extra time needed to install it in my trunk and connect it to the Las Vegas with a supplied DIN cable. Finally, I powered the Thummer by insert-



Wireless operation is possible using either the optional Thummer steering-wheel control (left) or the supplied credit-card-sized remote.

ing a small battery pack, then connected it with a supplied plastic strap to my steering wheel at about the 3 o'clock position. Installation completed, I hit the road.

I first checked out the Thummer. I thought it was both convenient and beneficial because it allows you to keep your hands on the wheel. But its price of \$100 is pretty hefty considering that the Las Vegas itself goes for only \$400, including its own wireless remote. The Thummer is nice, but not essential.

Next I turned my attention to the various features of the Las Vegas. The

tuner timer is essentially a clock radio, automatically turning the tuner on, or switching from CD to tuner, at a preset time. I found it easy to program a starting time, and I'm sure that this feature would be useful for listening to things like stock-market or traffic reports. If nothing else, it would be fun to scare the hell out of unsuspecting passengers. Other features, such as station and disc naming, as well as the CD-changer control, worked well and add value to this head unit.

Bells and whistles aside, I focused on the nitty-gritty. As I navigated through my tuner torture route of high-rise buildings and urban canyons, I was extremely pleased with the tuner's ability to lock onto weak signals and stay with them through multipath interference. Given a strong signal, the FM sound quality was topnotch. Based on my road work, I judged this to be an excellent tuner. I was similarly pleased with the CD player. Its track access was snappy, and the laser pickup did not skip over most rough paving, though there was some skipping while I was cornering sharply over a very rough road. I was completely happy with its sound quality. Clearly, external power amplifiers are needed to take full advantage of the output signal and to achieve loud volume levels, but the internal amplifiers proved to be quite peppy and would suffice for modest installations.

Following a pleasurable drive, I ran bench measurements on the Las Vegas, which confirmed its pedigree. For example, the CD player's line output pumped out a generous 4.1 volts, both dynamic range and signal-to-noise ratio (S/N) exceeded 90 dB, THD plus noise at 0 dB was a low 0.06 percent, channel separation exceeded 84 dB at 1 kHz, and the laser pickup tracked through a 3,000-micrometer disc defect. These are all great numbers. Low-level linearity was good but not great. The tuner was superb on the test bench. FM frequency response was excellent, as were 50-dB-quieting sensitivity (18.5 dBf) and mono S/N (71.0 dB). Selectivity was about par.

Although this CD receiver is named after the gambling capital of the world, you don't have to bet a lot of money on its purchase, and it's a safe bet that you'll be happy with it. I was entirely pleased with its features, sound quality, and measured performance. You may or may not want to add a Thummer, but the Las Vegas is definitely ready to cruise the Strip. □

## MEASUREMENTS (HAMMER LABS)

### CD SECTION

<b>MAXIMUM OUTPUT LEVEL</b>	4.1 volts
<b>FREQUENCY RESPONSE</b> (20 Hz to 20 kHz, re 1 kHz)	+0 dB, -1.1 dB
<b>DE-EMPHASIS ERROR</b> (at 16 kHz)	+0.03 dB
<b>SIGNAL-TO-NOISE RATIO</b> (A-wtd, re 0 dB)	90.9 dB
<b>DYNAMIC RANGE</b> (A-wtd)	95.8 dB
<b>CHANNEL SEPARATION</b>	
1 kHz	84.4 dB
20 kHz	60.2 dB
<b>DISTORTION</b> (THD+N, 1 kHz)	
0 dB	0.060%
-20 dB	0.23%
<b>LINEARITY ERROR</b> (at -90 dB)	+1.7 dB
<b>MAXIMUM INTERCHANNEL PHASE SHIFT</b>	1.1° at 20 kHz
<b>DEFECT TRACKING</b> (Pierre Verany disc)	3.000 μm

### TUNER SECTION

All measurements for FM only except frequency response.

<b>SENSITIVITY</b> (50-dB quieting) mono (75-ohm input)	18.5 dBf
<b>AM REJECTION</b> (at 65 dBf)	66.1 dB
<b>DISTORTION</b> (THD+N at 65 dBf)	
mono	0.37%
stereo	0.65%

### SIGNAL-TO-NOISE RATIO (at 65 dBf)

mono	71.0 dB
stereo	66.2 dB

### CHANNEL SEPARATION

(at 65 dBf, 1 kHz)	35.6 dB
--------------------	---------

### CAPTURE RATIO (at 65 dBf)

	2.5 dB
--	--------

### SELECTIVITY

adjacent-channel	16.1 dB
alternate-channel	78.5 dB

### FREQUENCY RESPONSE

FM	30 Hz to 15 kHz +0.96 dB, -0.76 dB
AM	30 Hz to 3 kHz +3.8 dB, -5.2 dB

### MAXIMUM OUTPUT

(100% modulation)	2.8 volts
-------------------	-----------

### AMPLIFIER SECTION

Unless otherwise noted, all measurements made with 14.4-volt DC input, all channels driven into 4 ohms.

### OUTPUT AT CLIPPING (at 1 kHz)

8 ohms	9.4 watts
4 ohms	17.7 watts

### SIGNAL-TO-NOISE RATIO

(A-wtd, re 1 watt)	76.4 dB
--------------------	---------

### DISTORTION

(THD+N at 1 kHz, 1 watt)	0.10%
--------------------------	-------

### FREQUENCY RESPONSE

20 Hz to 20 kHz +0 dB, -1.74 dB
---------------------------------

### TONE-CONTROL RANGE

bass (100 Hz)	+11.5 dB, -11.6 dB
treble (10 kHz)	±11.6 dB



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CONSUMER ELECTRONICS SHOW 1997 WINTER CONSUMER ELECTRONICS SHOW

# SHOWSTOPPERS

1997 WINTER CONSUMER ELECTRONICS SHOW 1997 WINTER CONSUMER ELECTRONICS SHOW

## The hottest audio and A/V gear from CES

The defining moment of the 1997 Winter CES actually came on the eve of the show, when Columbia TriStar Home Video and Sony Music announced that they would release DVD titles in April to coincide with the arrival of DVD players in stores. At that same press conference, called to announce Sony's DVD marketing plans, mega-retailer Blockbuster said that it would promote DVD in fifty major-market stores with demonstration kiosks featuring Sony DVD players. Warner Home Video, MGM Home Entertainment, and New Line Home Video also announced plans to ship DVD movies to stores in March or April.

The commitment by the home-video arms of two major Hollywood movie studios — Columbia TriStar (owned by Sony) and Warner Bros. — to deliver DVD titles signaled that the prickly copyright-protection issues that had held up the release of players were resolved. And when the previously uncommitted Blockbuster threw its support behind the DVD launch, we knew that the fledgling format had finally shaken its "vaporware" status.

By the end of the four-day trade gathering in Las Vegas, more than a dozen hardware manufacturers had announced revised timetables for bringing DVD players to market at prices ranging from \$599 — for Panasonic, RCA, and Toshiba players — to \$5,500 for a statement piece from video-processing king Faroudja. Most companies planned to start rolling out players in March or April, although Pioneer was poised to become the first to market with a \$1,000 combination DVD/laserdisc player slated for February. Other companies that announced or reiterated plans to have DVD players on store shelves in the near future include Denon, Samsung, Philips, Harman Kardon, Meridian, Onkyo, Sherwood, JVC, Goldstar, and Akai — the last announced plans to make a high-tech re-entry into the U.S.

consumer market with only a DVD player and a TV-top Internet box.

A quick post-show survey revealed that well over fifty DVD titles should be on hand to usher in the DVD era and its promise of sparkling picture quality and dramatic 5.1-channel Dolby Digital sound from CD-size discs that can hold a 133-minute movie on one side. Included in the initial batch are *Space Jam* from Warner, the special edition of *Close Encounters of the Third Kind* from Columbia TriStar, *The Wizard of Oz* from MGM, and *The Mask* from New Line. Even Beavis and Butt-head managed to weasel their way into the launch lineup in *The Final Judgment*, a collection of the duo's "classic" episodes (if such a thing is possible) from Sony Music.

The unified DVD launch set for spring was bolstered by a new round of more affordable, Dolby Digital-equipped A/V receivers from Kenwood, Denon, Harman Kardon, Marantz, Pioneer, Sherwood, and Yamaha; prices range from \$800 to about \$1,600. Many of the same companies also introduced DD-ready receivers featuring

## DVD NOW

One of the dozen or so CD/DVD players due out this spring, Sony's DVP-S7000 (\$1,000) boasts a high-performance component-video output, composite-video and S-video jacks, enhanced high-speed/slow-motion modes, optical and coaxial digital audio outputs, and a versatile on-screen menu system.



the special six-channel inputs needed to accommodate an outboard DD decoder.

Such outboard processors were showcased by AMC, Harman Kardon, Rotel, Technics, and Sony. HK took the wraps off the \$3,000 Model 5.0 A/V preamp/processor in its upscale Citation line, which incorporates the Fosgate-designed Six-Axis steering technology for enhanced surround performance.

Beyond the buzz surrounding the new generation of 5.1-channel components, the 1997 WCES witnessed the beginnings of an exciting new category recently endorsed by Dolby Labs, virtual home theater. Systems designed to reproduce Dolby Pro Logic's four channels or Dolby Digital's six channels using only two speakers were demonstrated by several companies. Most intriguing were the systems that can handle Dolby Digital signals, including SRS Labs' TruSurround system, Spatializer's N-2-2 Digital Virtual Surround technology, and QSound's QSurround process. A/B comparisons between real and virtual Dolby Digital proved that virtual setups can be quite convincing — as long as the listener remains in the sweet spot.

Meanwhile, Adcom summoned showgoers to a hotel suite to test out a prototype home-theater control system that it plans to bundle into a \$6,000 A/V amp/preamp separates package later this year. The heart of the system is a black-box controller that can be programmed to operate any infrared-controllable device. All system functions are consolidated in a user-friendly on-screen graphical control panel, which is manipulated using a three-button RF remote dubbed "The Ball" for its centrally located track ball.

Sansui celebrated its fiftieth anniversary with new management and a revamped product lineup comprising forty-one audio and A/V components, including a 30-watt-per-channel tube amplifier that recalls the company's roots. Pioneer continued to hack away at the prices of home CD-R decks with the introduction of its lowest-price CD recorder yet, the \$1,000 PDR-04, which can record 74 minutes of audio using the latest CD-R discs. The PDR-04 is half the price of its predecessor, the PDR-99, which was half the price of the PDR-09 introduced in 1994. (We like this trend.)

On the analog recording side, Pioneer introduced two cassette decks incorporat-



## DOLBY DIGITAL PRICE BUSTERS

Kenwood and Technics get the nod for making Dolby Digital (DD) gear more affordable. Kenwood's Model 1080VR (\$800, top) will be the lowest-price receiver with onboard DD decoding when it hits stores this spring. Rated to deliver 120 watts across the front and 60 watts to each surround channel, it features eight additional surround modes for movies and music, including Dolby Pro Logic, an AM/FM tuner that receives RDS (Radio Data System) text broadcasts, and a FutureSet remote control with back-lit keys that's preprogrammed to operate "most" components. Codes for new components can be "downloaded" by telephone: You call an 800 number, enter the brand and model number of the component, and hold the remote up to the phone — now *that's* cool! Technics will offer a \$700 DD solution with its SA-AX710 A/V receiver (\$400, middle) and companion SH-AC300 outboard decoder (\$300), due in April and June, respectively. Rated to deliver 100 watts to each of five channels, the SA-AX710 features the company's Class H+ "dual-rail" power-amp circuit, designed to prevent excessive heat buildup and boost dynamic headroom.



**PLUG 'N' PLAY** Heard as part of a \$5,300 home-theater speaker setup that wowed us, the Paradigm Reference Studio/20P (\$1,400 a pair) is one of the brand's three new powered speakers with precision-matched electronic crossovers. The 14-inch-tall 20P, shown finished in cherry laminate, is biamplified, with 110 watts going to its 6½-inch woofer and 50 watts to its 1-inch tweeter. Response is said to be flat within 1 dB from 48 Hz to 22 kHz, and usable bass should extend to 35 Hz in most rooms.

## SATELLITE SURFING

Ideal for infotainment junkies, the 21-inch Convergence antenna from Hughes Network Systems receives signals from both Digital Satellite System (DSS) and DirecPC program services. The dual-purpose dish feeds TV programming to a DSS receiver while providing a lightning-fast 400-kbps Internet link for computers equipped with a DirecPC card. Total cost for a DSS receiver, DirecPC card, and Convergence dish is less than \$1,000.



## OMNIPOLAR

Miraga, a champion of bipolar speaker design, says that the contoured cabinet and strategic driver placement of its 45½-inch-tall OM-6 Omnipolar speaker (\$3,000 a pair) enable it to achieve a spherical sound-radiation pattern. Middle and high frequencies are handled by two 5½-inch woofers and two 1-inch titanium tweeters, one driver pair in the front and the other in the back, and the lows by a powered subwoofer section in the base that contains a 150-watt amp and two 8-inch drivers mounted on opposite sides of the enclosure. Usable bass output is given as 18 Hz.



## AUTO JUKEBOX

Pioneer's CDX-P5000

CD Server (\$650), the first trunk-mountable mega-changer for the car, is the company's response to research showing that we spend more time listening to music in our vehicles than anywhere else. The 11¾ x 9½ x 6-inch CD Server can be controlled by a number of Pioneer head units, and it has a "swap-slot" on top for loading and unloading single discs without removing the fifty-disc magazine. The real fun begins when you add the CD-VC50 Voice Commander kit (\$250, not shown), which lets you cue up discs without taking your hands off the wheel.



**DTS FIRSTS** When the B&K AVR5.1 (top, \$2,200) and the Sherwood Newcastle R-945 (\$1,299) become available later this year, they will be the first A/V receivers to offer both Dolby Digital and DTS Digital Surround 5.1-channel decoding. Both models also provide Dolby Pro Logic decoding and six audio inputs, and they are rated to deliver 105 and 100 watts, respectively, into each of five channels. The AVR5.1 has six composite-video and three S-video inputs and is said to be upgradable with either software or hardware. The R-945 offers five composite-video inputs, including one on the front panel.

## SHOWSTOPPERS

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ing a proprietary digital noise-reduction circuit that suppresses tape hiss; the result is a signal-to-noise ratio of 90 dB with any analog tape, Pioneer says.

Technics and Pioneer previewed CD-Text-capable CD megachangers, scheduled to hit store shelves this summer, that display song titles and artist names when specially encoded CD's are inserted. The big question is, when will CD's containing text data appear in record stores?

Definitive Technology demonstrated its first compact subwoofer/satellite-based speaker system, the ProCinema 100. Due in stores by late spring, the system will be available in three pieces (\$799), four pieces (\$998), or six pieces (\$1,348). Revel, a new no-holds-barred speaker company formed by Harman International, previewed its maiden speakers, the \$6,000-a-pair Gem and the \$7,500 Sub-15/LE-1 subwoofer/electronics package.

Appealing to bass purists, Velodyne introduced two powered subs that have a crossover-bypass (Subwoofer Direct) mode for use with Dolby Digital systems. On the car side, Infinity introduced the

UniPlane line of thin speakers featuring shallow 3/4- to 2-inch mounting depths.

The Best CES Party award goes to Digital Theater Systems (DTS) for its bash at Planet Hollywood featuring an all-star band anchored by Edgar Winter and Jeff "Skunk" Baxter of Steely Dan and Doobie Brothers fame. The company announced that 5.1-channel DTS decoders would appear later this year in home components from Sherwood, Rotel, and others and in a car processor from KEF. Some two dozen DTS-encoded music CD's are now available according to DTS, and more than a dozen laserdisc movies carrying DTS soundtracks should be in stores by the end of April.

The big news in video was the proliferation of projectors that use Texas Instrument's Digital Light Processing (DLP) technology. DLP demos rivaling the best movie-theater pictures were staged by Runco, Vidikron, Onkyo, and others. Onkyo also demonstrated a prototype laser projector that uses no optics, therefore requires no refocusing. Now, take a look at our best-of-show picks. — Bob Ankosko



## DIGITAL SURROUND IN A BOX

The home-theater-in-a-box craze reaches new heights with the Leading Edge system (\$1,999) from Acoustic Research, which comprises five satellite speakers, each with a 1-inch tweeter and a 5 1/4-inch woofer, and a powered subwoofer/"brain" module containing a 12-inch driver with its own 150-watt power amp, an electronic crossover, a 60-watt amp channel for each satellite, and a Dolby Digital decoder/preamplifier with two digital and two analog inputs. The system is operated with a seven-button remote control and an on-screen graphical user interface.



## FLAT SPEAKERS

Imagine a home theater in which the center speaker doubles as the video screen and the front left/right and rear surround speakers are wall-hanging panels less than an inch thick. New Transducers Ltd. (NXT), a new company formed by England's Verity Group, demonstrated just such a prototype system, but with a conventional bass module, as well as a variety of flat-panel speakers, including free-standing models like the two pictured here. Still a work in progress, NXT's "distributed mode" technology produces full-range, bipolar sound above 80 Hz by embedding a drive element in a light, rigid panel made from a number of materials. The company is seeking licensees for the technology while Verity gears up to introduce flat-panel speakers under its Mission and Wharfedale brands late this year.



ELECT

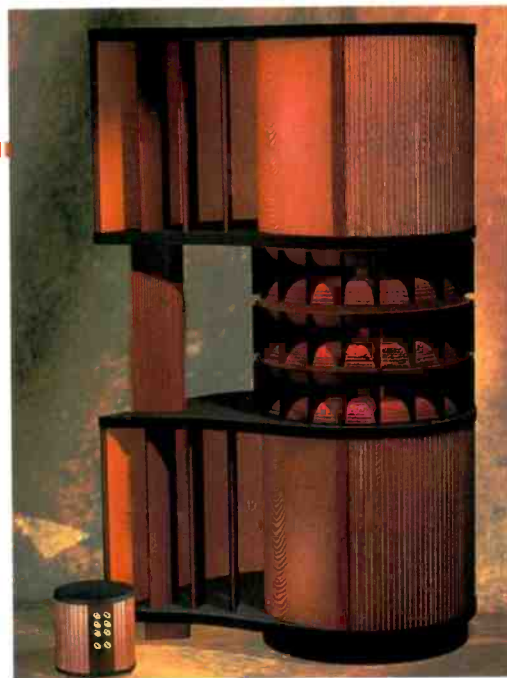


1997 WIN

7 WIN

## RUMBLE SEAT

Concealed beneath the frisé upholstery of Modernica's Sound Immersion Chair (\$5,975) are ten — that's right, ten — strategically placed speakers: a couple of small woofers and angled tweeters in the top corners of the seat back, a pair of woofers rated down to 30 Hz in the seat, and pairs of woofers and angled tweeters in the armrests. Whether the 135-pound, wood-frame chair is jacked into a home-theater system or a video-game console, it's guaranteed to give new meaning to the term "surround sound."



## ART OF MUSIC

Looking as if it belongs in the Museum of Modern Art, Platinum Audio's stately Air Pulse 3.1 speaker (\$140,000 a pair) stands 6 feet tall and is handcrafted from wood composites finished in exotic veneers. It comprises bass, midrange, and treble horn modules, each designed for 360-degree sound radiation. Platinum's primary goal was to overcome the deficiencies of traditional horns, namely aggressive mids and highs, while maximizing their virtues of high sensitivity, good dynamics, and low distortion — all in an effort to capture the scale and authority of a live performance. Bass output, rated down to 20 Hz, is described as "frightening."



## 5.1-CHANNEL-READY

Yamaha's DSP-E492 (\$399) is the first Dolby Digital-ready surround processor/amp. It can convert a stereo receiver or amplifier (with pre/main couplers) into a multichannel surround receiver, or add six-channel inputs to a standard A/V receiver so that it can be easily upgraded to Dolby Digital with an outboard decoder. The DSP-E492 provides Dolby Pro Logic decoding, three 60-watt amp channels for center and surround speakers, a set of six-channel audio inputs, eight surround modes, three stereo inputs, and three A/V inputs.

## JUST ADD VIDEO

JBL's entry into the goof-proof-home-theater arena, the eight-piece ESC550 system (\$1,699), features The Source (far right — no, it's not a typewriter), a wall-mountable control center that includes a CD player, an A/V preamp with Dolby Pro Logic decoding, and an AM/FM tuner. Power for the three two-way satellite speakers (35 watts each) and two surrounds (23 watts each) is tucked away in the 15¾-inch-tall bass module along with two 6½-inch woofers and a 100-watt bass amp.



# SUPER

## THE LOWDOWN ON SIX SMALL POWERED SUBWOOFERS

YOU  
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by Tom Nousaine

HOME THEATER, the audio success story of the Nineties, has brought huge gains in sonic realism to movie and music enthusiasts. A multichannel home-theater system stabilizes images with its dedicated center-channel speaker and envelops listeners in an ambient sound field with its surround speakers. But the best thing about the advent of home theater, in my opinion, is that it's made subwoofers as common as cotton candy at a county fair. And that's a boon whether your passions run to John Coltrane or *Jurassic Park*, because no matter what the program material, having a separate sub gives you control over bass performance. For my money, the ability to put the subwoofer in a corner — or whatever

position delivers the very best bass — is reason enough to make the investment.

Fortunately for consumers, that investment appears to be shrinking. Stand-alone subs have been around for years as an adjunct to traditional stereo systems, but until recently they were an option only for people with the energy and resources to buy (or build) and hook up a separate subwoofer, an outboard electronic crossover, and an additional amplifier. Now, the popularity of home theater — and the desire to bring dinosaurs to life in the living room — has encouraged manufacturers to combine all those elements in powered subwoofer systems that are affordable and relatively small in size. Today's powered subwoofers integrate the driver, amp, and crossover in a single cabinet that typically requires only 2 to 3 square feet of floor space. Prices range from a few hundred dollars to several thousand, with most costing between \$400 and \$1,000. The best of these systems can de-

liver an average sound-pressure level (SPL) of 103 dB in the 25- to 50-Hz region — low enough and loud enough to jar your molars when T-Rex goes after that smarmy attorney. The reason I can be so specific is that I've tested over fifty powered subs in the past few years.

The problem, of course, is that many of these all-in-one bass boxes are still too big for some rooms or too costly for some budgets. What if you're on a tight budget or don't have a dedicated theater room where you can plop down a giant subwoofer? Are you out of luck? To find out, we rounded up a six-pack of powered subs that list from \$400 to \$600 and range in size from small to very small. Then we put them through their paces to see if they could keep up with the big boys.

Included in the test batch are models from Boston Acoustics and M&K with 8-inch drivers, subs with 10-inch drivers from AudioSource and Phase Technology, and a pair with 12-inch drivers from Acoustic Research and Mirage. The drivers, which are mounted in either sealed (acoustic-suspension) or ported (bass-reflex) enclosures, are powered by amplifiers rated to deliver from 50 to 150 watts, and the enclosures occupy only 1 to 1 $\frac{3}{4}$  square feet of floor space. Each sub has a level control, an adjustable electronic low-pass crossover, line-level RCA inputs, and a full set of speaker-level inputs and outputs. All but one have a signal-sensing auto-on circuit as well as a switch that conveniently reverses the phase of the input signal if that

is found necessary. In other words, our test subjects have features rivaling more expensive powered subs and provide everything you need to integrate them into a home-theater or stereo system.

As mentioned, all of the subs have a variable electronic low-pass crossover. The crossover filters out frequencies above a user-selected cutoff point (usually between 50 and

Clockwise from top left, facing page: AudioSource SW Eleven, M&K VX-7 MkII, Phase Technology Octave Power 10, Mirage PS-12, Acoustic Research S 12 HO, Boston Acoustics CR400

# CUBES



150 Hz) that complements the range of the main speakers. Generally the slope of the crossover is sharpened above 100 Hz, resulting in steeper 18- to 36-dB-per-octave attenuation at higher frequencies. Below approximately 80 to 100 Hz most of these mighty mites roll off at 12 dB per octave. This sliding-filter approach works rather well, allowing integration with a large variety of main speakers — especially small satellites that simply can't handle low frequencies.

The Mirage and Phase Technology subs also have passive high-pass filters that shield the main speakers from bass frequencies below 80 and 100 Hz, respectively. Although including a high-pass filter expands the versatility of the subwoofer, the actual performance of the filter depends on the impedance of the main system and can vary significantly.

### Test Procedures

I ran each subwoofer through a set of performance measurements and individual listening tests in my home theater/listening room. The space itself is 12 feet wide and 22¼ feet long, with an 8-foot ceiling. The room is somewhat "live" acoustically, with the kind of reflective surfaces (sheetrock walls and ceiling, windows) typical of the modern family and listening rooms where these systems might ultimately be installed. All tests were made with each subwoofer optimally positioned in the right rear corner of the room, which is 2 meters from the primary listening position. (I had previously determined the best subwoofer location in this room — for the deepest extension, maximal smoothness, and loudest output — with a precise response mapping of the entire room at 2-foot intervals relative to the primary listening location; see "Subwoofer Secrets," January 1995.)

Measurements included static frequency response using a MLSSA analyzer and an appropriate noise signal. The measurement was taken at an 85-dB SPL in each case. Maximum sound-pressure level for each subwoofer was measured two ways. First, I used a special sine-wave tone-burst signal to test the output at 100 Hz and the one-third-octave points below that (16, 20, 25, 31.5, 40, 50, 62, and 80 Hz) with a maximum distortion limit of 10 percent. I also checked each sub for the maximum SPL it could generate with no obvious overload or extraneous noise while playing the explo-

sion scene in Chapter 14 of the laser-disc of *Clear and Present Danger*, which depicts a mountain mansion being destroyed by an aerial missile.

Each subwoofer's level and crossover controls were carefully balanced to match my reference 15-inch subwoofer



## Acoustic Research S 12 HO

### HIGHLIGHTS

- Woofer size: 12 inches
- Enclosure: slot-loaded bass-reflex
- I/O: line-level RCA inputs; speaker-level spring-clip inputs and outputs
- Variable low-pass crossover (40 to 200 Hz)
- Phase control
- Auto-on
- Finish: black ash woodgrain vinyl

### DIMENSIONS

16 x 16 x 15¾ inches (W x H x D)

FOOTPRINT: 1¾ square feet

GROSS VOLUME: 2½ cubic feet

WEIGHT: 44 pounds

### MANUFACTURER'S SPECIFICATIONS

AMPLIFIER POWER: 140 watts continuous

BANDWIDTH: 20 to 200 Hz

### WARRANTY

Speaker: 5 years; electronics, 1 year

PRICE: \$549

MANUFACTURER: Acoustic Research, Dept. SR, 9424 Eton Ave., Suite J, Chatsworth, CA 91311; telephone, 818-407-4820

### MEASUREMENTS

FREQUENCY RESPONSE: 38.6 to 220 Hz  
±4 dB

LOW-END EXTENSION (at 10% distortion):  
32 Hz

AVERAGE SPL (from 32 to 60 Hz, 10%  
distortion): 97 dB

MAXIMUM SPL (see text): 101 dB

er, the Velodyne F1500R, as closely as possible, enabling each one to blend optimally with my reference home-theater speaker system and allow level-matched listening comparisons. Programs for the listening tests included stereo CD's played through a Lexi-

con DC-1 preamp/processor set to Music Surround mode and several minutes from Chapter 14 of *Clear and Present Danger* played back in both Dolby Pro Logic and Dolby Digital modes, the latter with the help of a Marantz DP870 Dolby Digital decoder. In addition to jet fly-bys and the spectacular explosion mentioned above, this movie segment contains some dialogue, which makes unwanted subwoofer colorations easy to detect.

Music programs included Rob Wasserman playing acoustic bass on *Ballad of the Runaway Horse* from the album "Duets" (MCA) and Oscar Peterson's *You Look Good to Me* from "We Get Requests" (Verve). Both cuts offer a good test for buzzes, rattles, and odd noises caused when a driver's suspension or the amplifier is overloaded. The Peterson track features acoustic bass, both plucked and played with a bow, cleanly recorded entirely in the right channel. It is a good test for spectral balance and imaging accuracy. In addition, electric bass was provided by Melissa Etheridge on *Similar Features* from her debut album (Island) and synthesizer material by Bass Erotica on *It's Live* from the CD "Bass Ecstasy" (Neurodisc). Finally, *Jurassic Lunch*, from Telarc's "Great Fantasy and Adventure Album" with the Cincinnati Pops, provided a good complement to *Clear and Present Danger*. This special-effects track, unlike the *Jurassic Park* movie soundtrack, includes dinosaur stomps containing true 10-Hz information that can push a subwoofer right to the edge. A faint footstep heard in the distance about 12 seconds into the track is a particularly good test — it's only audible with subs that can resolve low-level, low-frequency details.

## Acoustic Research S 12 HO

The Acoustic Research S 12 HO has a 12-inch woofer driven by a 140-watt amplifier. It has the biggest footprint and the largest gross volume of our size-conscious test group. Its larger size and unusual design help it to extend down to below 40 Hz gracefully and to crank out over 100 dB SPL on typical movie soundtracks. In addition to a full complement of features, it has a long (6-foot) detachable power cord, which is a nice touch.

The driver and port in the S 12 HO both face the floor and communicate to the outside world through a pair of 1½-inch slots on the front and rear of the enclosure near the floor. The nomi-



## AudioSource SW Eleven

### HIGHLIGHTS

- Woofer size: 10 inches (dual voice coil)
- Enclosure: bass-reflex
- I/O: line-level RCA inputs; speaker-level spring-clip inputs and outputs
- Variable low-pass crossover (40 to 180 Hz)
- Phase control
- Auto-on
- Finish: black ash woodgrain vinyl

### DIMENSIONS

15 x 13½ x 16 inches (W x H x D)

FOOTPRINT: 1⅔ square feet

GROSS VOLUME: 1⅞ cubic feet

WEIGHT: 32 pounds

### MANUFACTURER'S SPECIFICATIONS

AMPLIFIER POWER: 100 watts continuous

BANDWIDTH: 30 to 250 Hz

WARRANTY: 5 years

PRICE: \$399

MANUFACTURER: AudioSource, Dept. SR, 1327 N. Carolan Ave., Burlingame, CA 94010; telephone, 415-348-8114

### MEASUREMENTS

FREQUENCY RESPONSE: 43.5 to 180 Hz ±5 dB

LOW-END EXTENSION (at 10% distortion): 32 Hz

AVERAGE SPL (from 32 to 60 Hz, 10% distortion): 88 dB

MAXIMUM SPL (see text): 97 dB

nal markings on the S 12 HO's crossover control were remarkably accurate. For example, at the 50-Hz minimum setting the actual crossover point (measured at the listening position) was 56 Hz.

Like many a ported system, when driven to overload the S 12 HO tended to "chuggle" loudly because of the combined effects of air turbulence in the port and stress on the driver suspension. The way to avoid this is to set the level control just below the point where driver distortion becomes noticeable with the deepest and loudest bass programs.

On the whole, the S 12 HO was a good performer. It delivered bass that was loud, clean, and smoothly integrated with my main speakers. And with music the bass was firmly locked to the front stage even though the subwoofer was in a rear corner of my listening room. The S 12 HO's output did not degrade vocals or any other higher-frequency sounds, although occasionally electric-bass lines sounded a tad more "woofy" than with the other models tested. Still, in this price range, it held its own quite nicely.

## AudioSource SW Eleven

The AudioSource SW Eleven uses a 10-inch driver that's mounted in a bass-reflex enclosure and powered by a 100-watt amp. Like the other subs reviewed here, it has a full set of features that will allow it to work with any modern home theater or two-channel stereo system. In appearance it is among the more stylish of this crowd, with a curved cloth grille that gives it a less boxy-looking cabinet than the others, and in size it fits right in the middle of the pack, with a footprint of 1⅔ square feet (versus an average of 1½ square feet) and a gross volume of 1⅞ cubic feet (about average). The electronic low-pass crossover rolls off at 24 dB per octave above 180 Hz, and the detented controls make finding a previous setting easy.

The SW Eleven's output was somewhat limited. Although it averaged 88 dB SPL from 32 to 60 Hz, at 32 Hz the sub produced just 78 dB SPL with less than 10 percent distortion. Its output was down 3 dB at 43.5 Hz, which is very good by main-speaker standards but not on par with the better performers in this group.

Nonetheless, the SW Eleven should perform adequately in a smaller listening room like a bedroom or den, especially if used to augment a basic stereo system, and its good looks may make it a winner in installations where the subwoofer will be clearly visible.

## Boston Acoustics CR400

The Boston Acoustics CR 400 has a relatively short warranty and is only average in size among this group, but it shines in all other respects. Despite its 8-inch driver and modest 75-watt amplifier, its average output over its bandwidth was the best of the lot, measuring 99 dB SPL, or just 4 dB short of a typical powered sub costing nearly twice as much. It reached down to a solid 25 Hz with low distortion,

and its static frequency response was among the best of the group.

The CR 400 looks clean, stylish, and well thought out. The cabinet is finished on all six sides, the twin rear vents are flared to reduce port noise, and the subwoofer is shielded to eliminate color effects on a TV (although I am not sure why anyone would need to place the sub next to the video monitor). It has dual-banana speaker-level connectors, which I appreciate.

Sonically, the CR 400 lived up to its superb measurements, with real subwoofer extension and excellent output for its size. It worked extremely well



## Boston Acoustics CR400

### HIGHLIGHTS

- Woofer size: 8 inches
- Enclosure: bass-reflex
- I/O: line-level RCA inputs; speaker-level, binding-post inputs and outputs
- Variable low-pass crossover (50 to 150 Hz)
- Phase control
- Auto-on
- Finish: black ash vinyl veneer

### DIMENSIONS

14½ x 14¾ x 15⅜ inches (W x H x D)

FOOTPRINT: 1½ square feet

GROSS VOLUME: 1¾ cubic feet

WEIGHT: 33 pounds

### MANUFACTURER'S SPECIFICATIONS

AMPLIFIER POWER: 75 watts continuous

BANDWIDTH: 35 to 150 Hz

WARRANTY: 1 year

PRICE: \$400

MANUFACTURER: Boston Acoustics, Dept. SR, 300 Jubilee Dr., Peabody, MA 01960; telephone, 508-538-5000

### MEASUREMENTS

FREQUENCY RESPONSE: 26.6 to 115 Hz ±3 dB

LOW-END EXTENSION (at 10% distortion): 25 Hz

AVERAGE SPL (from 32 to 60 Hz, 10% distortion): 99 dB

MAXIMUM SPL (see text): 100 dB



## M&K VX-7 MkII

### HIGHLIGHTS

- Woofer size: 8 inches
- Enclosure: acoustic-suspension
- I/O: line-level RCA inputs; speaker-level spring-clip inputs and outputs
- Variable low-pass crossover (50 to 125 Hz)
- Finish: black ash woodgrain vinyl

### DIMENSIONS

14 x 10<sup>3</sup>/<sub>4</sub> x 10<sup>1</sup>/<sub>4</sub> inches (W x H x D)

**FOOTPRINT:** 1 square foot

**GROSS VOLUME:** 7/8 cubic foot

**WEIGHT:** 21 pounds

### MANUFACTURER'S SPECIFICATIONS

**AMPLIFIER POWER:** 50 watts continuous

**BANDWIDTH:** 20 to 125 Hz

**WARRANTY:** 3 years

**PRICE:** \$495

**MANUFACTURER:** M&K Sound, Dept. SR, 10391 Jefferson Blvd., Culver City, CA 90232; telephone, 310-204-2854

### MEASUREMENTS

**FREQUENCY RESPONSE:** 25.1 to 110 Hz ±3 dB

**LOW-END EXTENSION** (at 10% distortion): 32 Hz

**AVERAGE SPL** (from 32 to 60 Hz, 10% distortion): 89 dB

**MAXIMUM SPL** (see text): 93 dB

as long as I kept levels below those that produced port chugging. Overall, it's hard to imagine finding a better subwoofer for \$400.

## M&K VX-7 MkII

The M&K VX-7 MkII draws the proverbial line in the sand on size. This subwoofer, with a footprint of less than 1 square foot, had a static (benchmark) frequency response that extended to 25 Hz. So why would anyone want a sub even one silly millimeter bigger? That's the granddaddy of all subwoofer questions, and the answer is, to achieve a higher sound-pressure level. Although the VX-7 MkII consumes little space and looks great on the test bench, it produced an average of just 89 dB SPL with less than 10 percent distortion over its primary bandwidth of 32 to 60 Hz.

As with the AudioSource SW Eleven, this may be enough for a small room. For a large living room it isn't. The VX-7 MkII, despite an electronic limiting circuit that stopped it from self-destructing, began emitting loud suspension-stress noises at fairly modest playback levels. Below its overload point it sounded quite good — muscular and strong. But even with a relatively forgiving sealed-box design, the tiny enclosure and small, 8-inch woofer just could not produce serious bass at normal volume levels in my listening room.

The VX-7 MkII also lacked a couple of niceties that were pretty much standard among the other models tested, such as a phase switch and an automatic power-on circuit. Indeed, the VX-7 MkII had no power controls at all, meaning that there's no way to turn it off without removing its power cord from the wall. Combine this modest complement of features with the VX-7 MkII's limited SPL, and you have a sub that seems best suited for use in a small room where its tiny footprint would be a real advantage.

## Mirage PS-12

Mirage's PS-12 is a subwoofer that is easy to like. With its 12-inch cone and 150-watt amplifier in a sealed cabinet, the PS-12 is the second largest sub in the group, and the most expensive, but it brims with features and performance. Bench tests revealed the lowest extension of all the subwoofers tested here (23.2 Hz), though the PS-12 would not do 25 Hz with less than 10 percent distortion at reasonable loudness. On the other hand, it did average 96 dB SPL over the critical 32- to 60-Hz operating range, and it whacked out a stout 101 dB SPL on the big blast in *Clear and Present Danger*.

The PS-12 comes with a 6-foot detachable line cord, banana-jack speaker-level inputs and outputs (thanks!), thick floor-protecting rubber feet (with one of those "spike kits" for people who like to punish finished floors), and auto-on. There is no power switch as such, which means you could get a bit of a surprise if there's a live signal at the input when you plug in the line cord (make sure the level control is turned all the way down).

The PS-12 was easy to set up, and the scales on its crossover and level controls correlate well with what happens to the signal when you actually twist the dial. In particular, the cross-

over was perfect across its range: 50 Hz means 50 Hz, and 100 Hz means 100 Hz.

The PS-12 also offers a three-position equalization switch that can be set for normal response, a 3-dB boost (for movie soundtracks), or a 3-dB cut (to reduce boominess in some rooms). With the EQ switch in the +3-dB position, I measured +3 dB from 30 to 50



## Mirage PS-12

### HIGHLIGHTS

- Woofer size: 12 inches
- Enclosure: acoustic-suspension
- I/O: line-level RCA inputs; speaker-level banana-jack inputs and outputs
- Variable low-pass crossover (50 to 100 Hz); high-pass crossover at 80 Hz
- Phase control
- Auto-on
- EQ switch
- Spike kit
- Finish: black ash woodgrain vinyl

### DIMENSIONS

15<sup>5</sup>/<sub>8</sub> x 17 x 15 inches (W x H x D)

**FOOTPRINT:** 1<sup>2</sup>/<sub>3</sub> square feet

**GROSS VOLUME:** 2<sup>1</sup>/<sub>3</sub> cubic feet

**WEIGHT:** 45 pounds

### MANUFACTURER'S SPECIFICATIONS

**AMPLIFIER POWER:** 150 watts continuous

**FREQUENCY RESPONSE:** 25 to 100 Hz +0, -3 dB

**WARRANTY:** 1 year

**PRICE:** \$600

**MANUFACTURER:** Mirage, Dept. SR, 3641 McNicoll Ave., Scarborough, Ontario M1X 1G5; telephone, 416-321-1800

### MEASUREMENTS

**FREQUENCY RESPONSE:** 23.2 to 115 Hz ±5 dB

**LOW-END EXTENSION** (at 10% distortion): 32 Hz

**AVERAGE SPL** (from 32 to 60 Hz, 10% distortion): 96 dB

**MAXIMUM SPL** (see text): 101 dB

Hz, but in the -3-dB position, the sub measured -2 dB from 25 to 50 Hz in my room. The +3-dB position flattens and extends raw bass response, and I would recommend starting the subwoofer in that position.

Overall, the PS-12 sounded quite good with the overall playback level limited to its optimal operating range, comparing favorably with bigger and more expensive subwoofers.

### Phase Technology Octave Power 10

The Phase Technology Octave Power 10, with a 10-inch driver and a 100-watt amplifier (described as a "servo" design) in a bass-reflex cabinet, is another special subwoofer. It could do 25 Hz with less than 10 percent distortion, it averaged 98 dB SPL over the crucial 32- to 60-Hz bandwidth, and it boomed out a league-leading 103 dB SPL in the *Clear and Present Danger* explosion scene, beating even the two 12-inch subwoofers we tested. It has a full set of features, including a convenient front-mounted level control. Despite its higher-than-average performance, it is dead average in size among this group, chewing up a not too unreasonable 1½ square feet of floor space.

The Power 10 was easy to use and exceptionally easy to listen to, primarily because it behaved more gracefully at its outer limits than any of the other subwoofers we tested here. In other words, it tended to hold its own in the face of overload conditions. And its warranty is the most generous of the lot. Like the Boston Acoustics CR400, this is one little subwoofer that's hard to beat!

### The Bottom Line

As a follow-up listening test, I connected all six subwoofers and my expensive 15-inch reference sub to a switching device that constantly rotated among them at 5-second intervals. The subwoofers were all stacked in the same corner, and I recalibrated the crossover and level settings to match the reference sub as closely as possible. When I played music with electric and acoustic bass at levels that did not tax the subs' loudness or extension limits, it was impossible to tell when the switcher changed from one to another — in other words, all of them, even the reference, delivered comparable sound quality as long as they were operating within their limits.

Of course, when I played anything



### Phase Technology Octave Power 10

#### HIGHLIGHTS

- Woofer size: 10 inches
- Enclosure: bass-reflex
- I/O: line-level RCA inputs; speaker-level spring-clip inputs and outputs
- Variable low-pass crossover (60 to 180 Hz); speaker-level high-pass crossover at 100 Hz
- Phase control
- Auto-on
- Front-mounted level control
- Finish: black oak laminate

#### DIMENSIONS

14½ x 15¾ x 14⅞ inches (W x H x D)

FOOTPRINT: 1½ square feet

GROSS VOLUME: 2 cubic feet

WEIGHT: 30 pounds

#### MANUFACTURER'S SPECIFICATIONS

AMPLIFIER POWER: 100 watts continuous

BANDWIDTH: 35 to 100 Hz

WARRANTY: Speaker, 5 years; electronics, 3 years

PRICE: \$399

MANUFACTURER: Phase Technology, Dept. SR, 6400 Youngerman Cir., Jacksonville, FL 32244; telephone, 904-777-0700

#### MEASUREMENTS

FREQUENCY RESPONSE: 33.9 to 115 Hz ±3 dB

LOW-END EXTENSION (at 10% distortion): 25 Hz

AVERAGE SPL (from 32 to 60 Hz, 10% distortion): 98 dB

MAXIMUM SPL (see text): 103 dB

that called for delivering lots of volume or frequencies below 30 Hz, the differences became apparent. As I turned up the volume, sound quality remained pretty equal until a given subwoofer reached overload, when I heard driver-suspension noise or port turbulence. Both of these contain much higher frequencies than the bass notes a sub tries to reproduce. The re-

sult is that the listener is either distracted directly by the noise or becomes aware of the subwoofer's location. It's only natural that a small, inexpensive subwoofer will run out of steam and start heaving before a big, expensive one does. This is largely a direct result of the smaller enclosure.

That said, this batch of subwoofers demonstrates that speaker manufacturers have been doing their homework. Only a couple of these budget subs cut back on the features we have come to expect from more expensive models, and all of them provide the required input and output flexibility to complement most systems while offering significant savings in cost and floor space. The real price you pay with these subs is roughly 3 to 6 dB less maximum SPL (with an optimal corner placement and a 10 percent distortion limit) than you could get from some larger and more expensive models.

That performance is still superior to most full-range stereo speaker pairs, in which the woofers typically work from a poor location and cannot benefit from the low-frequency reinforcement of a corner placement. If you buy one of these smaller subs, I'd recommend placing it in a *front* corner of your listening room. You'll probably be tempted to push it to the edge of its potential, and putting it up front will help keep port noise or an overtaxed driver suspension from betraying its location.

Most small subwoofers I've encountered are not *subwoofers* at all, merely woofers that augment bass response without really reproducing the bottom octave. But the best of this bunch, particularly the Boston Acoustics and Phase Technology models, can carry the name "subwoofer" proudly. No one who purchases one of these will need to apologize for the bass in his system.

In closing, frequency extension and SPL are the main criteria for subwoofer quality. If you do not listen to musical sonic spectaculars, movies with explosive soundtracks, or other really demanding program material, then buying a big, expensive subwoofer rather than one of these small subs will gain you nothing. In fact, for a great number of applications one of these little wonders will fill the subwoofer bill handily. Just don't expect something for nothing — these babies do have their limits. But within those limits, they work as well as the best subs money can buy. □

# FRONT AND CENTER

## THE CENTER SPEAKER IS ONE OF HOME THEATER'S STAR PERFORMERS

TO MOST PEOPLE home theater is synonymous with grand sound effects: exploding projectiles, ricocheting bullets, space ships zooming by, cars screeching out of control. There's no question that whiz-bang effects, aided and abetted by a subwoofer and a rearward pair of surround speakers, are a big part of what makes watching movies on a

good audio/video system so exciting. But the true keystone of home theater — after the jumbo TV screen, of course — is found front and center, not toward the back of the room: center-channel sound.

In a movie theater, virtually all of the dialogue is reproduced by a big speaker located directly behind the screen,

which is perforated with thousands of tiny holes that let sound pass through. This center speaker is carefully optimized: 1) to insure excellent coverage so that everyone in the theater, even the poor souls sitting in the far corners, can hear the whispers as well as the screams; 2) for controlled directivity so that the dialogue is intelligible, which is accomplished by shaping the speaker's "aim" so that most of the sound reaches the viewers' ears

directly, before bouncing off the ceiling, floor, and walls; 3) for accurate tonal balance and wide dynamic range, which further enhance clarity and "throw" — generous amplifier power plays a key role here, too.

Whether you're in the movie palace or in your living room, the primary job of the center-channel speaker is the same, to keep dialogue locked firmly onto the screen where the action is. This is critical to the cinematic illu-

sion, especially for viewers seated far to one side. But it's important to note that the center channel of most soundtracks also contains substantial music and sound effects, making its function all the more . . . umm, central.

First-generation home theaters relied on the "phantom" center image produced by the front left and right speakers since the Dolby Surround decoders used in those systems had no provisions for a dedicated center

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**B Y D A N I E L K U M I N**





The Paradigm Reference CC-450 center speaker on top of the TV is from the same series as the LCR-450 front left/right speakers and uses the same 1-inch tweeter and dual 6½-inch woofers. Its black-finished cabinet measures 2<sup>3</sup>/<sub>4</sub> x 8<sup>1</sup>/<sub>8</sub> x 17<sup>1</sup>/<sub>2</sub> inches (W x H x D). Rated sensitivity is 90 dB, and power handling is 175 watts. Price: \$500.

PHOTO BY DAN WAGNER SCREEN IMAGE FROM DISNEY'S TOY STORY



**Cambridge SoundWorks' Center Channel II (left, \$160), designed to match the satellite speakers in the budget-price Ensemble and Ensemble II sub/sat systems, puts the same tweeter and dual 3½-inch woofers in a cabinet measuring 14 x 7¾ x 4¼ inches (W x H x D). The larger CenterStage (\$350), designed to complement CSW's Tower series speakers, has two 5¼-inch woofers as well as dual front ports in a 25 x 8¼ x 6¼-inch cabinet. Both models are finished in black vinyl.**

speaker. This phantom image is precisely what you get when you play music over a conventional stereo system; vocals and certain instruments appear in the center of the soundstage between the two speakers. While a phantom center usually works fine for the one or two listeners lucky enough to be seated dead center, dialogue seems to originate off-screen for everyone else — and putting Sandra Bullock in one place and her voice in another doesn't exactly enhance the cinematic effect.

But with a correctly positioned center speaker and Dolby Pro Logic or Dolby Digital surround decoding, dialogue remains firmly anchored to the picture regardless of seating position. Given that Pro Logic is all but universal these days, and that 5.1-channel digital audio is catching on fast, selecting a good center-channel speaker should be a top priority for any home-theater-bound shopper. And

manufacturers have been only too happy to oblige, offering dozens of specially designed center speakers ranging in price from less than \$100 to well over \$1,000.

#### Center-Channel Basics

Before we take a look at some of the center speakers you'll find on store shelves, let's go over a few basic points. First, the center channel is by far the most important channel in *any* home-theater surround system, even those that have five, six, or more channels. So don't skimp on quality — or on the amount of good, clean power directed to the center speaker. Fortunately, most A/V receivers nowadays dedicate equal power to all three front channels. This is important because the center channel in most movie soundtracks contains *more* dynamics than the left and right channels, not less. Also, because the center-channel speaker is often less efficient (read:

has a lower sensitivity rating) than the front left and right speakers, it needs at least as much power as they do.

You'd think it would be obvious that the center speaker should be placed halfway between the front left and right speakers — above or below the TV screen, depending on the type of TV and whether it's housed in a cabinet — yet even in this enlightened age we continue to hear tales of enthusiasts (and even the odd manufacturer) who advocate using dual center speakers or (shudder!) the cheesy speakers built into the TV to convey center-channel sound. *Wrong!* Using two center speakers is guaranteed to muddle the sound, and that goes triple for routing the center-channel signal to the speakers built into a TV — a clear no-no.

Choosing a center speaker is not all that different from selecting any other speaker. You establish a budget and decide what size and style of enclosure will work in your setup. Then — even more important — you look for a speaker that matches as closely as possible the tonal quality and dispersion characteristics of the front left and right speakers you intend to use. Otherwise, an eighteen-wheeler barreling across the screen could sound more like a Volkswagen as it passes through the middle — not very convincing.

Ideally, the center speaker should be identical to its left and right mates. That's how it's done in movie houses and in many home theaters designed to meet the Home THX standards developed by Lucasfilm. But using three identical speakers across the front is impractical for many of us — especially if the left and right speakers are



**M&K's least expensive center speaker, the Center-75 (\$295), features a Phase-Focused crossover and an unusual asymmetrical configuration for its 1-inch tweeter and 5¼-inch woofers; these are said to optimize off-axis response and improve horizontal dispersion. The 18¼ x 7 x 7½-inch (W x H x D) cabinet is finished in woodgrain vinyl. Sensitivity is rated as 90 dB.**

**The C/L/R 2000 (\$650), Definitive Technology's top-of-the-line center speaker, is timbre-matched to its BP2000 tower speakers and rated to handle up to 350 watts of power. It has two 6½-inch woofers and a 1-inch dome tweeter in a nonresonant 21½ x 8½ x 15-inch (W x H x D) cabinet covered by a wrap-around "sock" grille and gloss-black end panels.**



largish bookshelf models or floor-standing towers. To get around this obstacle, manufacturers have developed dedicated center-channel speakers specifically designed to sit on top of the TV or on a shelf below. Many of these center speakers, which look like skinny bookshelf speakers turned on the side, are acoustically matched to a specific model or family of speakers.

But achieving a sonic match between a low and wide center speaker and its vertical brethren is not as easy as it sounds. For one thing, the lateral woofer-tweeter-woofer configuration of many center speakers tends to create a dispersion pattern that is taller and narrower than that produced by a conventionally vertical speaker. And when you put speakers with divergent dispersion patterns together, tonal balance and ambient cues can easily become compromised, diluting cinematic realism. Happily, a growing number of speaker companies are exploring alternate designs and taking special care to achieve the best possible match between left, center, and right front speakers.

### A Few Examples

Speaker makers have several different strategies for dealing with the dispersion dilemma: The most obvious is simply to align the drivers vertically. THX-certified speakers use variations on this basic theme to meet Lucasfilm's stringent vertical-directivity requirement. Stacking the drivers — often with a pair of tweeters between two woofers — does an excellent job of reducing vertical dispersion, which in turn enhances dialogue intelligibility. The drawback to this approach is that it's difficult to design a set-top-friendly cabinet with stacked drivers.

M&K's S-150THX (\$750), which is intended for any of the front channels in a THX setup, reduces cabinet height by using adjacent vertical driver arrays, a pair of 5¼-inch woofers next to three 1-inch dome tweeters. It may not be the sleekest-looking center speaker around, but at 13 x 13 x 10 inches (H x W x D), it is shorter than most other THX speakers.

Atlantic Technology was one of the first speaker companies to offer a THX-certified center speaker specifically designed for TV-top placement. Part of its 300 Series THX suite, the



**Polk Audio's CS250S (\$300), designed to match any of Polk's S Series speakers, is in the middle of its center-speaker line. The two 4½-inch woofers and 1-inch dome tweeter are housed in a cabinet measuring 18 x 6 x 8½ inches (W x H x D). The CS250S's rated sensitivity is 90 dB, and 10 to 150 watts of amplifier power is recommended.**



**The Boston Acoustics Micro90c (\$250) features a proprietary 1-inch Lynnfield VR dome tweeter and two 3½-inch woofers in a rigid, black, die-cast aluminum enclosure that's 12 inches wide, 4¾ inches high, and 5¼ inches deep. Rated sensitivity is 90 dB, and recommended amplifier power is 15 to 125 watts.**

Model 353C (\$549) has a vertical midrange-tweeter-midrange grouping flanked by a pair of 5¼-inch woofers; the tweeter is a 1-inch dome, and the midrange drivers are 3-inch cones. Since the three-driver array in the middle covers most of the vocal region, vertical dispersion is controlled where it counts most. At 10 x 26 x 8 inches (H x W x D), the 353C is one of the larger horizontally configured center speakers out there.

One time-honored way of managing loudspeaker directivity is putting a driver inside a horn, which makes dispersion predictable and controllable. A variety of horn-loaded center speakers are available from companies like Klipsch, JBL, and Triad.

Triad's THX-certified InRoom Gold LCR speaker deploys 6½-inch woofers above and below a beautifully crafted maple-laminate horn that controls the output of a 1-inch dome

tweeter. The complementary InRoom Gold Horizontal LCR center speaker (\$1,150) essentially lays the InRoom Gold on its side and rotates the horn a quarter-turn; since the orientation of the horn determines directivity, the speaker's high-frequency behavior remains unaffected (although it doesn't retain the THX certification of its vertical mates).

JBL, whose founder James B. Lansing developed the biradial horn loudspeaker design used in many movie theaters to this day, makes a horn-based home-theater ensemble whose center speaker also has a "rotated" horn. The SVA Center (\$549) has a horn-loaded soft-dome tweeter and a 5¼-inch woofer on either side; the identical driver complement, in a vertical alignment, appears in JBL's matching SVA1500 bookshelf speaker, which is designed for use as either a main- or a surround-channel speaker.

Klipsch offers several horizontal, horn-loaded center speakers that range in price from \$599 for the KV 4 down to \$199 for the KV 1. The top-of-the-line KV 4 mates the company's Tractrix horn tweeter, which has a 2-inch aluminum diaphragm, with a pair of 8-inch woofers in a rather bulky cabinet measuring 10½ x 27¼ x 9¼ inches (H x W x D). At the other end of the spectrum, the KV 1 pairs a 1-inch Dhorn tweeter with two 5¼-inch woofers in a much smaller cabinet whose dimensions are 6¾ x 20¼ x 6 inches.

Another approach to center-channel speaker design is simply to match the speaker to a specific timbral "target" from the get-go. NHT's VS-1.2 center/satellite speaker (\$300), a compact 5½ x 19 x 8 inches (H x W x D), has two 4½-inch drivers and a 1-inch dome tweeter, the same high-frequency driver complement as the VT-1.2 tower speaker. The result is said to be a near-perfect timbral match. NHT also recently introduced the AudioCenter-1 (\$450), which is designed to match the sonic characteristics of its popular Model 1.5, Model 2.5i, and Model 3.3 audiophile speakers.

Placing a tweeter physically (and acoustically) at the center of a cone woofer is another technically elegant approach to designing a center speaker. One example is KEF's imposing Model 200C, which is intended for

Atlantic Technology's Model 253.1C (\$349) is claimed to be the only center speaker with rear-panel tone controls to match its timbre to the main front speakers. The black-finished 15 x 6<sup>3</sup>/<sub>4</sub> x 7<sup>3</sup>/<sub>4</sub>-inch (W x H x D) cabinet has a tilting base to aim the output of the 3/4-inch dome tweeter and dual 4-inch woofers. Rated sensitivity is 90 dB, power handling up to 150 watts.



The Klipsch KV 3 (\$399) features a dual-vented enclosure with an adjustable angle to aim its two 6<sup>1</sup>/<sub>2</sub>-inch woofers and 1-inch horn-loaded tweeter toward the listening position. Sensitivity is rated as 95 dB and power handling as 75 watts continuous, 300 watts peak. The 21<sup>1</sup>/<sub>8</sub> x 7<sup>7</sup>/<sub>8</sub> x 7<sup>3</sup>/<sub>4</sub>-inch (W x H x D) cabinet is finished in a choice of real wood veneers.

use with the company's Reference Series Model Three and Model Four speakers. The 200C's centrally located 6<sup>1</sup>/<sub>2</sub>-inch Uni-Q driver, a woofer with a 1-inch dome tweeter at its core, is flanked by a pair of 6<sup>1</sup>/<sub>2</sub>-inch woofers that reproduce only bass frequencies. The dispersion of the Uni-Q driver determines the directivity of the system's treble output, and that is determined by the large cone surrounding the tweeter, which acts rather like a horn in managing the spread of midrange and high frequencies so that it is predictable and controlled. Such engineering elegance doesn't come cheap: The 200C checks in at \$950, though KEF offers less rarefied center speakers with Uni-Q drivers that start at less than \$400.

By now you've probably noticed that most of the center speakers I've mentioned are more or less "high end" in design and price. In truth, the subtleties of timbre-matching and directivity control pursued in most of these speakers may well have little relevance for the more casual home-theater movie fan. So let's note that more conventional — and affordable — center speakers can also provide very satisfactory sonic results.

Subcompact home-theater speaker ensembles featuring "micro-monitor" satellite speakers with separate bass modules often deliver very good center-channel performance because the center speaker is identical to its front/left/right counterparts. A good exam-

ple is the six-piece Bose Acoustimass 10 system (\$1,299), which comprises a compact bass module and five identical double-cube satellites, each of which contains two 2<sup>1</sup>/<sub>2</sub>-inch drivers. (In this case, however, you can't purchase the satellites separately.)

Another interesting exercise in tiny-tot home-theater speakers is Boston Acoustics' new Micro Reference series. This miniature family includes



The B&W CC3 (\$179) has a 1-inch soft-dome tweeter flanked by 4-inch woofers in the company's slot-ported Prism enclosure, in which randomly arrayed tapered pyramids on the inner rear baffle are said to eliminate internal standing waves, enhancing clarity in the critical lower midrange. The cabinet measures 16 x 5 x 6 inches (W x H x D) and is finished in black ash vinyl. Sensitivity is rated as 91 dB, maximum recommended power as 100 watts continuous.

the elegant Micro90c center speaker (\$250), which combines dual 3<sup>1</sup>/<sub>2</sub>-inch woofers and a 1-inch aluminum-dome tweeter in a cabinet that's only 5 inches tall, 12 inches wide, and 5 inches deep. Like the left/right speakers it's designed to be used with, the Micro90c boasts a nonresonant die-cast aluminum enclosure.

The high-price spreads are not the only source of center-channel innova-

tion. Toshiba recently entered the serious-speaker market with an attractive home-theater lineup incorporating an hourglass-shaped dipolar tweeter developed by Linacum. The SSC-5300 center speaker places one of these nominally 2-inch devices between a pair of 5<sup>1</sup>/<sub>4</sub>-inch woofers in an otherwise typical horizontal cabinet. The combination is said to provide broad but controlled vertical dispersion and excellent clarity from a speaker that is quite reasonably priced at \$250.

The RSC-300 from Eosone, a relatively new company on the audio scene, is priced the same and also features a dipole tweeter array, as do the three tower speakers it's designed to complement. Twin 5<sup>1</sup>/<sub>4</sub>-inch cone woofers flank a 3/4-inch titanium-dome tweeter on the front panel, and there's a rear-firing 1/2-inch tweeter. This arrangement is said to produce an open, spacious sound with a broader listening area and reduced side-wall reflections.

The Alpha Midi from Canada's PSB is the latest member of that firm's well-respected and highly affordable Alpha speaker series. With a 5<sup>1</sup>/<sub>4</sub>-inch woofer and a 1/2-inch tweeter, the Midi (\$109) is essentially a two-driver version of the Alpha Mini turned on its side and repackaged in a classy TV-top cabinet. The latest center-channel creation from Rock Solid Sounds, a division of the respected British speaker maker B&W, is the C100 (\$149), which packages two 4-inch drivers and a 1-

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inch tweeter in a horizontal layout. Like its companion S100 satellite speaker, which is also part of the new Solid Solutions series, the C100 has a nonresonant copolymer enclosure with low-diffraction, molded baffles.

Obviously, the models mentioned here are just a small sampling of the

many center speakers you'll find in stores. If you have a favorite pair of speakers that you wish to use in a home-theater setting, check with the manufacturer to see whether a matching center speaker is available. Failing that, look for a center speaker that has similar sonic qualities. If, on the other

hand, you're starting from scratch, your options are wide open, from complete home-theater speaker packages that include a matched center speaker to mix-and-match options from just about any major speaker maker you can think of. Now it's time to start listening. □

# GETTING CENTERED:

## WHAT TO LOOK FOR

Any center speaker should meet a few important criteria. First, it should be magnetically shielded so that it doesn't distort the color picture of the direct-view TV on which it is likely to be placed (virtually all of today's center speakers are shielded).

Next, its sensitivity and power-handling ratings should both be high. Obviously, the more center-channel power you have on tap, the less critical the sensitivity, but keep in mind that a 3-dB decline in sensitivity requires a compensatory *doubling* of amplifier power (in watts) to maintain dynamic range. Center speakers usually list power-handling capability in terms of the maximum recommended input power, but that should be looked on more as a guideline than as a hard-and-fast rule. In fact, too *little* power can be more dangerous than "too much," since the distorted output from a habitually overdriven amp can damage a speaker's voice coil.

Finally, and most important, the speaker should have good sound quality. You'll need to carefully assess its tonal balance, clarity and intelligibility, bass extension, and timbral (tonal) match with the companion front speakers. Generally speaking, a center speaker should provide smooth, evenly balanced response and at least respectable low-frequency output. Yes, both Dolby Pro Logic and Dolby Digital surround decoders have a "normal" mode that directs low bass to the front left/right speakers or the subwoofer.

But plenty of male speaking voices demand significant output down to 100 Hz or even below — remember Darth Vader? — so speakers that are able to deliver flat, dynamic output in that region are ahead of the pack.

Develop an ear for intelligibility by listening to a monaural speech source over several center speakers. A male announcer on a strong FM station makes for a readily available test, but dialogue from a movie on laserdisc played through a good Dolby Pro Logic or Dolby Digital decoder is better. Evaluating the spoken voice would appear to be an easy test, but it's not. Our ears are tremendously sensitive to vocal frequencies and qualities.

Step one of the audition process is to listen to each speaker individually. Reject outright speakers that exhibit obvious sibilance, unnatural "boom" on male voices, or harshness in the treble range. Be sure to listen at widely varying volume levels — center-channel sound in movie theaters reaches higher levels than you might guess. A good center speaker should sound natural and unstrained even during extreme peaks in volume. (Keep in mind that the center-channel amplifier plays a large part here, too.)

The best way to gauge a center speaker's timbral compatibility with its left/right mates is to do a quick A/B comparison. Most A/V specialty dealers will be happy to accommodate you — though probably not on a Saturday afternoon. The audition candidates

should be pulled well out into the room and placed close to one another, with their tweeters at roughly the same level from the floor. Ideally, the center speaker should be placed on top of a TV or cabinet (the "baffling" effect of a large surface is quite audible) and its partners on shelves or stands comparable to where you plan to put them at home. Level matching is *critical*. The switcher must be calibrated, using pink noise and a sound-level meter, for a better-than-1-dB match at 1 kHz.

Use monaural audition material with little or no deep bass but plenty of lower-midrange to lower-treble content. FM announcers and movie dialogue are good for starters, but you'll also want to cue up some movie passages that include full-range music and effects. Switch repeatedly between the center and main speakers, listening for changes in overall timbre and vocal qualities, especially on male voices. Perform your tests repeatedly with each candidate, both while listening on-axis (directly in front of the center speaker) and while seated perhaps 20 degrees to either side.

Keep in mind that with this type of audition you're not evaluating "better or worse" as you would with a pair of main speakers. Rather, your mission is to isolate the center speaker that sounds most like the reference, the left/right speakers. You can pretty much disregard lower-bass differences, as these are not the central issue. Focus on voices, openness and sparkle in the treble region, and acoustic depth and "air." You will probably hear more distinct differences while listening off-axis than from a central position, so be sure to weigh these with your anticipated seating plan in mind.

Simply put, the center speaker that most closely matches the sonic qualities of the left/right speakers is the best choice — assuming it also meets the other criteria: adequate sensitivity and power handling, acceptable size, shape, and styling, overall sound quality, and affordability. —D.K.

# "The M&K S-150 THX surround-speaker system sets the performance standard for the \$5,000 region"

Wes Phillips, *Stereophile Guide to Home Theater, Spring 1997*



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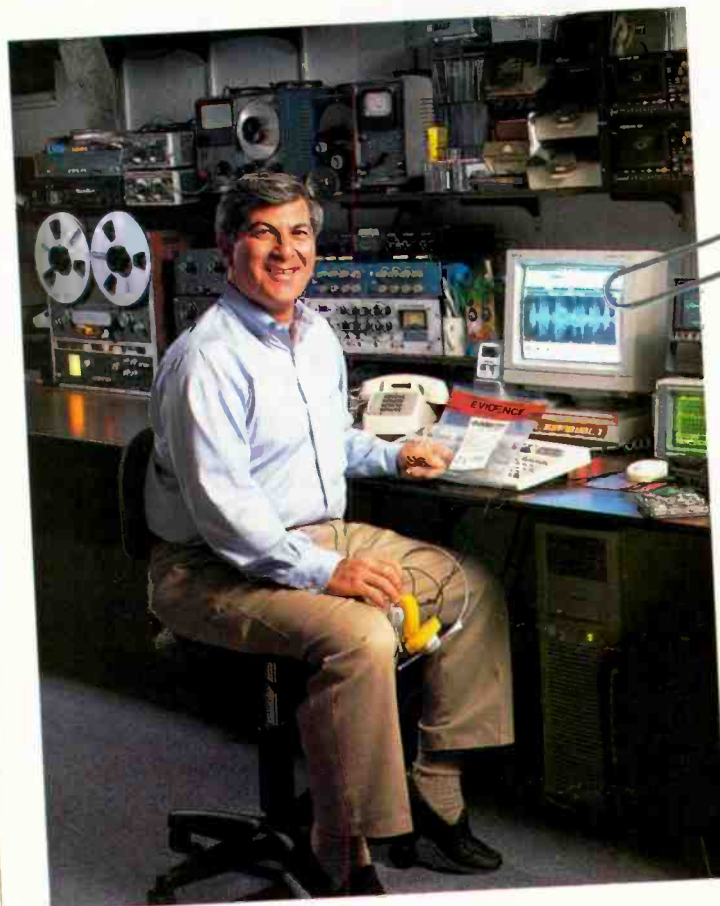


# THE AUDIO DETECTIVE

**P**AUL GINSBERG is an audio detective. That's not to say that he hunts down state-of-the-art audio equipment, although his gear is among the best money can buy. Nor does it even mean he's an audiophile, though his ability to listen critically is renowned.

No, when we say that Paul Ginsberg is an audio detective, we mean just that: a mild-mannered engineer who turned a childhood love of audio and electronics into a life of fighting crime. Ginsberg, 51, runs Professional Audio Laboratories in Spring Valley, New York, and is perhaps the country's foremost forensic A/V expert. That is, he "enhances" and authenticates surveillance tapes and other audio and video-related evidence presented in criminal and civil trials. When the FBI bugged the Branch Davidians during their standoff in Waco, Texas, and the Justice Department needed to tidy up the tapes, they called Ginsberg. When Mia Farrow accused Woody Allen of molesting her daughter and backed it up with videotaped testimony from the child, Allen's attorney called Ginsberg. And when prosecutors in Ocean County, New Jersey, discovered that car-jack victim Kathleen Weinstein had secretly taped the prelude to her own murder, they called Paul Ginsberg.

In one prominent trial after another, whether the defendants are organized crime bosses, the World Trade Center bombers, or the Hell's Angels, Ginsberg uncovers evidence buried under background



Forensic A/V expert Paul Ginsberg relies on high-tech test gear, a critical ear, and his own ingenuity to clarify taped evidence for criminal and civil trials.

noise and grunge. Then, after pulling the needle from this electronic haystack, he faces prosecutors and pit-bull defense attorneys to present his evidence to jurors. In 23 years, he has participated in more than 1,500 court cases around the country and has testified in 150.

Though Ginsberg arrived at his specialty mostly by luck, his career in electronics was set from the start. As a youngster in Brooklyn, he became fascinated at an early

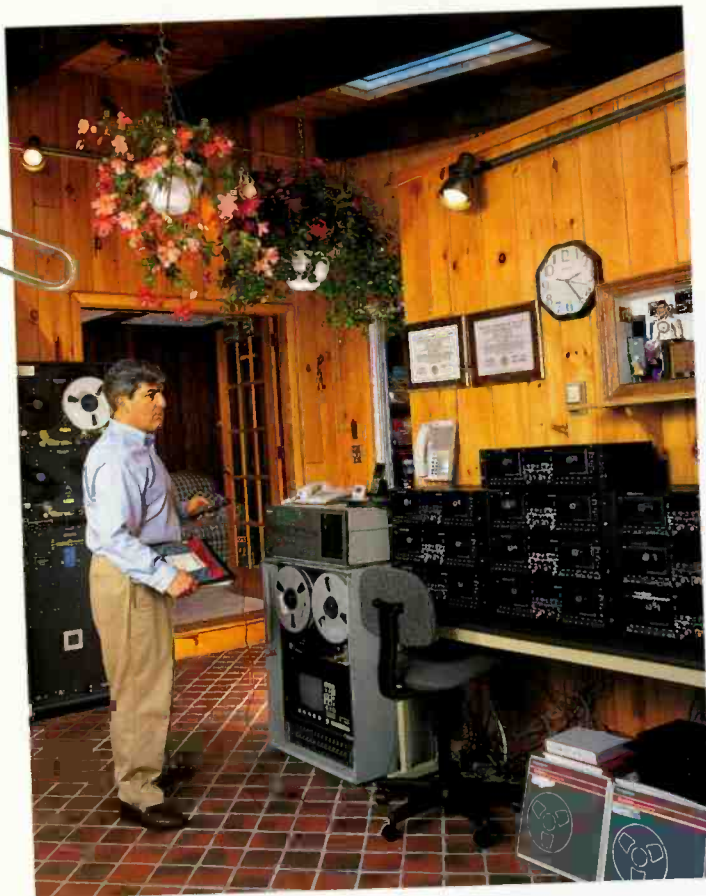
age by the shortwave radio his father kept at his bedside. By the time he was 12 or 13 years old he was experimenting with tape recorders and constructing circuits from *Popular Electronics*. "When most kids were outside playing ball," he says, "this nerdo was building an intercom to wire all my friend's houses together."

Ginsberg earned a full ham-ra-

PHOTOS BY THOMAS MCGINNITY/CGM STUDIOS

A LOVE OF AUDIO HAS LED PAUL GINSBERG TO A "LIFE OF CRIME"

BY ROB SABIN



Flanked by giant multitrack "loggers" and a bank of pro audio cassette decks, Ginsberg prepares to dub copies of an "enhanced" tape in his duplication lab.

dio license at age 15, then spent his late teens knocking on the doors of New York radio and TV stations. Eventually he earned degrees in electrical engineering from City College of New York and went to work for a military contractor. Later, he turned a side business he'd developed building and maintaining recording studios into a full-time occupation.

It was in 1974 that Ginsberg got a surprise call from a U.S. attorney in Newark. The government had a case against the officials of Fort Lee, New Jersey, for taking kickbacks from a developer in return for issuing building variances. The prosecutors had some noisy undercover tapes, and someone thought Ginsberg might help. At first he resisted, but the prosecutor called back and convinced him to come in for a chat. Once he arrived they shoved a contract in his face. "I looked at the numbers," he recalls, "and said, 'Would you just give me a minute to call my wife and tell her I'm in a new business?'"

Ginsberg began offering audio enhancement — which refers to clarifying a tape and stripping away its noise as opposed to altering its content — as well as transcription and cassette-duplication services to provide copies of evidence to all the parties in a case. His reputation grew, and he was soon getting calls not just from prosecutors but also from defense attorneys and, eventually, plaintiffs and defendants in civil cases.

It's been a rewarding but demanding life, and not just because of the technical aspects. "These tapes, by their nature, are gut-wrenching," Ginsberg says. "In effect, you're the fly on the wall — you're able to go back to when the crime or event was being planned or committed." So when he says that he's "heard it all, from birth to death and everything in between," he means it literally. The birth was part of a case in which an expectant couple had a tape recorder in the delivery room to record the event for posterity. "Unfortunately, there was a

problem, and the tape was later used as evidence in a malpractice case," Ginsberg recalls. "That was a very difficult tape to listen to."

The death Ginsberg heard on tape involved a case in which some individuals were scheming to corner the market for New York City taxi medallions — the licenses that allow cabs to operate. An undercover agent with a wired sedan was sent in to catch one of the crooks on tape. The agent parked the car on a street and had just gotten the suspect talking when, suddenly, there was a loud crash. "It turns out that somebody had decided to commit suicide and jumped from a building, landing on the car right in front of them," Ginsberg recounts with a sly grin. "There was a lot of confusion, people running and screaming. And then there was one woman yelling at the top of her lungs: 'Oh my god! Oh my god! Look what he did to my car!' Well, that was the end of *that* conversation."

Child-abuse and custody cases are among the most emotionally trying for Ginsberg. "It's easy to know who the good guys and the bad guys are when there's a container of white powder and the agents are at one table and the defendants at another," he says, "but where kids are involved, it's more difficult."

In the Woody Allen-Mia Farrow custody case, for instance, Ginsberg was asked by Allen's attorney to authenticate a videotape Farrow made of her daughter Dylan describing Allen's alleged abuse. Ginsberg testified at the trial that the tape comprised about a dozen segments recorded at different times, leaving open the possibility that the child had been coached. Ultimately, Allen cleared his name, but in Ginsberg's view it was a no-win situation. "In one scenario the child had been molested by Woody, and in the other she'd been pretty much brainwashed into testifying. So there was no scenario in which the child had not been abused. That was really troublesome."

Even more troublesome was the tape of Kathleen Weinstein, a 45-year-old special-education teacher and mother. In March 1996, she was car-jacked in a store parking lot in Toms River, New Jersey, and subsequently smothered by her kidnapper, a young man who wanted her Toyota Camry as a "present" for his seventeenth birthday. Weinstein managed to secretly record her assailant with a

microcassette recorder she carried. Investigators, who at first found only 22 minutes recorded on one side of the tape, sent it to Ginsberg for enhancement and transcription. He discovered an additional 22 minutes on the second side containing valuable clues that further identified the killer.

With such damning evidence, the suspect pled guilty and, at this writing, is awaiting sentencing. Though the full contents of the tape have never been disclosed, the released portions showed that Weinstein used her skills as a teacher to reason with her abductor, and when that failed she called on God before crying and begging for her life. The tape ran out before the murder, but Ginsberg, who calls Weinstein "an angel," heard as much as he could bear.

Other cases, Ginsberg says, are less emotional but more technically challenging. During the now-infamous 1993 standoff at the Branch Davidians' complex in Waco, FBI agents slipped a bugging device into the cult's compound along with some foodstuffs. The transmitter was active during the "seige" in which agents tried to force the Davidians out with tear gas and then rushed the building with tanks, only to see the whole place go up in flames.

The Justice Department hoped that the recordings made from the bug could shed light on what happened and help prosecute the survivors. Ginsberg was asked to clarify the tapes and make transcripts, but when he heard them he was taken aback. "These tapes had people talking through gas masks. There was screaming, gunfire, tanks advancing, and a lot of confusion. Add to this that the voices were muffled because they were not on top of the device, which has a very low-power transmitter to begin with. These were some of the noisiest tapes I've ever heard."

Undaunted, Ginsberg painstakingly eliminated the different noise elements and made a key finding. "I was able to detect and to make audible the fact that the Branch Davidians were talking about setting fire to the place from within, that the fire had been set by them and not by the Bureau coming in," he says. "It was clear, and we played it for the jury."

Ginsberg had less technical trouble with the tapes in another recent high-profile case, but they caused almost as much stir. Last November a disgruntled former executive at Texaco

released some tapes of a 1994 company meeting in which he and his peers engaged in racial remarks — including, it was claimed, one reference to "niggers." The tapes reignited a dormant class-action racial-discrimination suit. In response, independent investigators hired by Texaco asked Ginsberg to review the tapes.

The cassettes supplied to him were "atrocious" dubs. So Ginsberg went to the FBI offices in New York, where the original microcassettes were being held, and made digital copies with his Sony portable DAT recorder. When he went back to his lab and did the enhancement, it was clear that what was originally claimed to be a racial slur was actually a reference to "Saint Nicholas" — Father Christmas. Ginsberg supplied copies and transcripts of the cleaned-up tapes to newspaper and TV reporters, resulting in front-page headlines. Texaco had won that small battle, but days

"SOME TAPES, BY THEIR NATURE, ARE GUT-WRENCHING."

later the company agreed to a landmark \$115 million settlement.

Though Ginsberg enjoys these moments in the spotlight, he still says that the best part of his job is when he gets to play engineer. If you saw his setup you'd know why. His two labs — one for enhancement, the other for duplication — are loaded with exotic audio and test gear. He keeps tape decks in a half-dozen different formats, including an unusual high-end microcassette deck from a company called Daniel Technology and a tiny "spy" recorder, a Nagra open-reel portable that measures just 4 x 6 x 1 inches and uses 2-inch reels of tape only 0.15 inch wide. There are even a couple of Dictaphone "loggers" — giant multitrack tape decks used by police for tracking emergency calls and by brokerage firms to monitor securities transactions. They can record sixty tracks simultaneously on a reel of 1-inch-wide tape.

Other tools of Ginsberg's trade include a large selection of bandpass and notch filters that are helpful for zeroing in on the voice frequency range — approximately 300 Hz to 3 kHz — or eliminating sounds at cer-

tain frequencies. There's a compression/expansion amplifier used to even things out when the voices on a tape are recorded at different volume levels, a processor that restores the proper pitch to voices if Ginsberg needs to speed up or slow down a tape to clarify it, a "black box" that decodes recorded telephone and calling-card touch-tones, and a small, innocuous tin can containing iron particles in a liquid suspension. Dip a section of tape into the harmless solution, and you can actually see the magnetic tracks, which can determine, for example, whether a tape was recorded in mono or stereo.

At the opposite end of the spectrum are Ginsberg's high-tech digital toys. He uses a fast-Fourier-transform (FFT) spectrum analyzer to visually examine the frequency content of a tape and isolate noise elements from the voices. Likewise, his digital waveform oscilloscope can be used to see

the sonic "signatures" left on a tape by minuscule spikes that occur whenever a recording is started or stopped. And his Pentium computer runs a sophisticated, \$15,000 custom software package that can actually discriminate between voices and interference and remove the noise digitally.

So what kind of stereo system does Ginsberg listen to for fun? Well, his home entertainment system consists of an aging receiver, a CD player, bookshelf speakers, and a rugged Fisher-Price kiddie radio that keeps him company in his solitary work. But this is one golden ear who makes no apologies. Paul Ginsberg lives his passion for sound every day in a way most audiophiles can only dream about. And though you won't find him auditioning home-theater components any time soon, he does apply his most critical faculties when shopping for an automobile. You see, the audio detective spends a lot of time in his car, shuttling evidence tapes back and forth. "I went with a Lexus because it has a quiet interior and an excellent sound system," he notes, adding, "I only wish it had a head-phone jack." □

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# BEST OF THE MONTH

**STEREO REVIEW'S  
CRITICS CHOOSE THE OUTSTANDING  
CURRENT RELEASES**



## Anderson: You Can Play That Again!

**J**azz trombonist Clifton Anderson is no newcomer. He has appeared on numerous recordings since the Seventies, including many pop sessions, and has played with his uncle, Sonny Rollins, since the early Eighties.

But he was determined not to make his own album until he felt good and ready. Having heard him with his uncle's group, I'd say he's been ready for some time, although he has never sounded more relaxed than he does on "Landmarks."

Anderson has the silken tone of Tommy Dorsey when he gets into a mellow groove, as in the two standards here, *I've Never Been in Love Before* and (especially) *My One and Only Love*. When not caressing our ears with the soft stuff, though, he can also be quite biting, as in his crisp torrents of expression in two originals, *P.G. (From Whom All Blessings Flow)* and *Mommy*. He is clearly comfortable with his illustrious "sidemen," who include pianist Monty Alexander leading a rhythm section completed by Rollins regulars Bob Cranshaw on bass and Al Foster on drums. Alto saxophonist Kenny Garrett and trumpeter Wallace Roney are up front for one track each. Garrett makes the most of his appearance in *Mommy*, a bluesy, hip-shifting number. Roney's turn to shine comes in another Anderson original, *Princess Neh Neh*, where he delivers a beautifully constructed open horn solo, and his exchange with the trombonist begs for a future collaboration.

An album of this caliber deserves good liner notes, and jazz writer Bob Blumenthal provides them. "Landmarks" may be Clifton Anderson's debut as a leader, but there will certainly be follow-ups.

*Chris Albertson*

**CLIFTON ANDERSON: Landmarks.**

*P.G. (From Whom All Blessings Flow); Mommy; Landmarks Along the Way; Princess Neh Neh; I've Never Been in Love Before; My One and Only Love; I Thought It Was Understood; Thanks.* MILESTONE 9266 (53 min).

## Anne Sofie von Otter Sings "La Bonne Chanson"

**T**he French love for perfumed exoticism, which revealed itself most spectacularly in the grand operas of Massenet and Bizet, found ideal expression in an eccentric little genre that blossomed in the late nineteenth century, the song with chamber orchestra. Anne Sofie von Otter, one of the most gifted of the prodigious generation of mezzo-sopranos now before the public, has gathered together a fine survey of the genre on a new Deutsche Grammophon CD titled "La Bonne Chanson." The songs range from Saint-Saëns's wispy, three-minute-long *Une Flûte Invisible*, an 1885 setting of a poem by Victor Hugo, to a trio of Christmas songs by the French-Swiss composer Frank Martin from 1947, the final flowering of a tradition of lyrical mood-weaving that had actually begun a century before with Berlioz.

Supported by a fine chamber ensemble

# BEST OF THE MONTH

of Swedish musicians led by pianist Bengt Forsberg, Von Otter illuminates these pieces from within in a way that allows the poetry to pour forth in lucid waves. Compared with such celebrated predecessors as sopranos Régine Crespin and Jessye Norman, she brings a light, cool touch to this material. Some listeners may find her interpretations of such profoundly Gallic oddities as Ravel's settings of Stéphane Mallarmé or Ernest Chausson's *Chanson Perpétuelle* a little too chilly and Nordic, but the emotion is there, trembling on the edge of every verse, and in the Chausson it builds to an exalted climax.

The most adventurous piece in the collection is the *Quatre Poèmes Hindous* by Maurice Delage, a student of Ravel's who made a serious attempt to match the erotic poetry of ancient India with music evoking that world: The pizzicato cello line accompanying *Lahore*, the second poem, is a respectable stab at reproducing the sound of a sitar. The weirdest item is *Rapsodie Nègre*, Poulenc's Opus 1, written when he was just 18 years old, which is basically an orchestral suite of dance melodies with a barbarous, nonsensical — and nonmusical — chant by the singer.

The disc concludes with a lovely, delicate performance of Fauré's *La Bonne Chanson*, a suite of love poems by Paul Verlaine scored for piano and string quintet that moves and breathes like a living creature. Von Otter's program may at first seem like a strange selection of exotic, even alien oddments — and so it is! But it grows on you after a few listenings and be-

comes an increasingly easeful garden of unearthly delights. *Jamie James*

**ANNE SOTIE VON OTTER:**  
**La Bonne Chanson (French Chamber Songs by Chausson, Delage, Fauré, Martin, Poulenc, Ravel, and Saint-Saëns).**

Anne Sotie von Otter (mezzo-soprano); Bengt Forsberg (piano); chamber ensemble. DEUTSCHE GRAMMOPHON 447 752 (69 min).

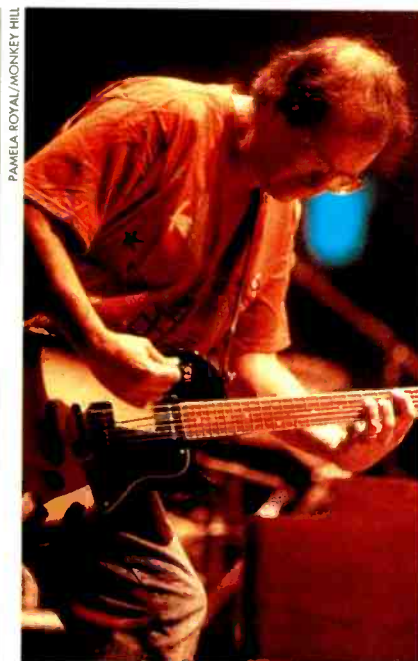
## Personal Holsapple

**P**eter Holsapple has been a critics' favorite for so long that I would not be surprised if it said "cult hero" on his passport. He has earned the reputation, and then some: His old band, the dB's, was among the smartest and most versatile of the Eighties outfits that got lumped in with the power-pop genre, and he's now part of the Continental Drifters, a sort of roots-pop Traveling Wilburys who combine classic Sixties harmonies and a strong Southern accent. Holsapple has written some fine material for both bands, but he's apparently saved his most personal songs for his overdue solo debut, and he's got a lot to get off his chest. Sometimes cranky, sometimes despairing, and always doggedly hopeful, "Out of My Way" is some of the most tuneful catharsis around.

Past and present Drifters, including Holsapple's wife, Susan Cowbill of Sixties pop fame, provide most of the backup, and Holsapple has hung out in New Orleans long enough to know his way around a groove — witness the swampy, slide-guitar-driven approach of *No Sound*. But old dB's fans will be glad to find more than a few echoes of that band's style. The opening *I Been There* has the jangly lead guitars and killer chorus hooks of old but also a mature, been-around lyric that couldn't have been managed before. It's a fitting intro to the album's grown-up but not mellowed-out tone.

Mellow is hardly the word for the record's highlight, *Couldn't Stop Lying to You*, a relentless soul ballad written from the darkest hour of a breakup and featuring a moving lead vocal that's on

**Mezzo-soprano**  
**Anne Sofie von Otter**



PAMELA ROYAL/MONKEY HILL

**Holsapple: a good gig**

the verge of cracking. As you may have guessed, this isn't the happiest album in the world, but its bright moments — notably *Here and Now*, about the healing power of a good gig — ring just as true. If you've got a weakness for smart pop songs that show a few scars and take a few chances, then get "Out of My Way" immediately. *Brett Milano*

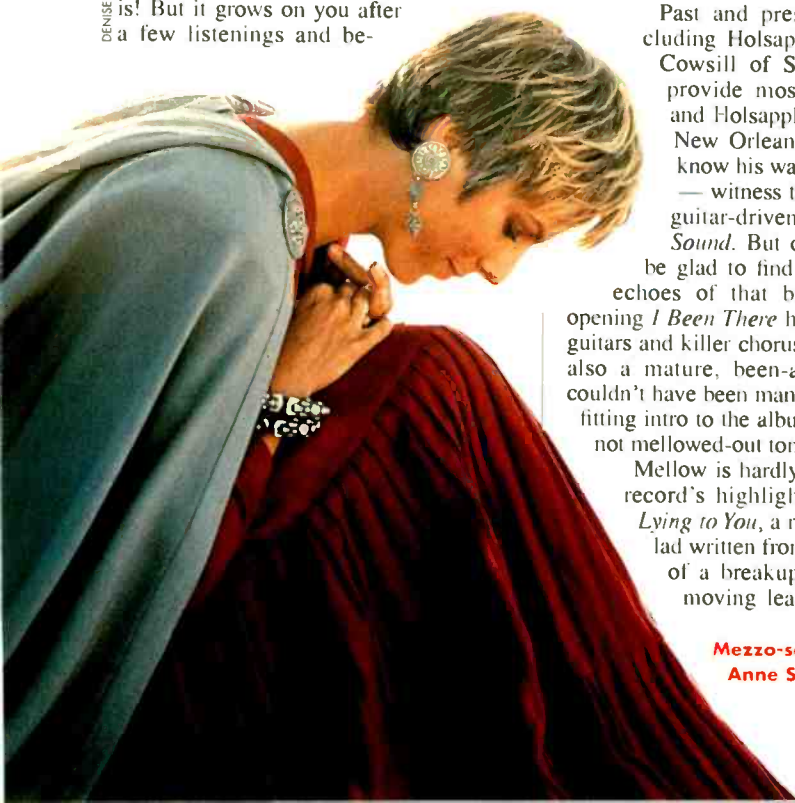
**PETER HOLSAPPLE: Out of My Way.**

*I Been There: No Sound; Away with Love; Pretty, Damned, Smart; Couldn't Stop Lying to You; Out of My Way; Shirley; Mee! Me! in the Middle; I Am a Tree; Don't Worry About John; Here and Now.* MONKEY HILL 8135 (39 min).

## Irresistible Beethoven Piano Rarities

**T**he young Finnish pianist Olli Mustonen, still on the south side of 30, is a provocative performer in the very best sense: neither a slave to encrusted tradition nor seeking difference for its own sake, but plunging in with unreserved vigor and inquisitiveness — and equipped with technical resources that enable him to make the most of his findings. The latest case in point is a clutch of mostly unfamiliar works by Beethoven on a London CD titled "Piano Variations, Dances & Bagatelles."

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# BEST OF THE MONTH



NICK WHITE/LONDON

**Pianist Olli Mustonen**

The only things on this disc likely to be at all familiar to most listeners are the final set of bagatelles (the six of Op. 126) and the Rondo in C Major, the first of the two that make up Op. 51. The only other item that even has an opus number, in fact, is the set of Six Variations on National Airs, Op. 105, which Beethoven actually wrote for flute and piano. The flute part is omitted here, and many listeners may feel the music makes a stronger impression without it — or, at the very least, takes on a new and fascinating character in Mustonen's realization of it on piano alone.

The rest of the pieces here, while far from being major works, are enriching little discoveries, and perhaps not so little after all, because Mustonen has taken them seriously enough to have fun with them on their own terms. These are early works, composed when the young Beethoven was impressing the Viennese with his brilliance as a keyboard virtuoso and improviser. Spontaneity, wit, and a heady level of playfulness are the dominant characteristics of the seven *Ländlerisch* Dances, the six *Ecossaises*, the Variations on the *Menuet à la Viganò*, and the six *Leichte Variationen* — and these are characteristics that suit Mustonen down to the ground.

He may have learned a thing or two from specialists in period instruments, or he may simply be responding instinctively with his crisp but never brittle phrasing, managing to give this music its own sound, as it were, on his modern Steinway. A sure feeling for color and for dynamic shading, an aristocratic lightness of touch, and firm but flexible rhythms all help to delineate unselfconsciously both the music's good humor and its substance. But what we hear in this enliven-

ing recital doesn't call for analysis or even description. It is simply a happy reminder of what musicmaking is (or ought to be) all about, and it is, in a word, irresistible.

*Richard Freed*

**BEETHOVEN:** Variations on Six National Airs, Op. 105; Seven

*Ländlerische Tänze; Six Leichte Variationen; Rondo in C Major, Op. 51, No. 1; Twelve Variations on the "Menuet à la Viganò"; Minuet in E-flat Major; Six Ecossaises; Six Bagatelles, Op. 126; Piano Piece in B Minor.* Olli Mustonen (piano). LONDON 452 206 (69 min).

## NOW ON CD



## POPULAR

### THE CARLA BLEY BAND: I Hate to Sing.

WATT/ECM 20125. Originally released in 1984, this live album steered by the jazz composer, keyboardist, and prankster now includes the previously unreleased bonus track *The Internationale*.

### BOX OF FROGS:

#### Box of Frogs/Strange Land.

RENAISSANCE 106 (P.O. Box 681786, Franklin, TN 37068). A twofer combining both albums by the Eighties band of former Yardbirds Chris Dreja, Jim McCarty, and Paul Samwell-Smith supplemented by the likes of Jimmy Page and Jeff Beck. Other guest guitarists include Steve Hackett and Rory Gallagher; among the vocalists are Graham Parker and Ian Dury.

### CAPTAIN BEYOND: Dawn Explosion.

ONE WAY 33639. The first appearance on domestic CD of the Seventies space-metal supergroup that originally brought together Iron Butterfly guitarist Rhino and bassist Lee Dorman, Johnny Winter drummer Bobby Caldwell, and Deep Purple vocalist Rod Evans (replaced on this third album by Willy Daffern). The band's legendary debut is still *not* on CD.

### TELEVISION'S GREATEST HITS.

**Vol. 4 — Black & White Classics.** TVT 1600. **Vol. 5 — In Living Color.** TVT 1700. **Vol. 6 — Remote Control.** TVT 1800. **Vol. 7 — Cable Ready.** TVT 1900. Four more volumes of TV themes, from *Kukla, Fran, and Ollie* to *The Simpsons*

and from *The Soupy Sales Show* to *Seinfeld*. Original performers include Duke Ellington (*Asphalt Jungle*), the Beach Boys (*Karen*), Waylon Jennings (*The Dukes of Hazzard*), George Clinton (*The Tracey Ullman Show*), Dr. John (*Blossom*), and the Grateful Dead (*The New Twilight Zone*).

## CLASSICAL

### MARIAN ANDERSON: Oratorios and Spirituals.

NIMBUS 7882. Eleven spirituals and seven arias from cantatas and oratorios by Bach and Handel, from 1940's 78-rpm recordings of the celebrated American contralto.

### BRAHMS: Cello Sonatas Nos. 1 and 2. MENDELSSOHN: Cello Sonata No. 2.

Janos Starker (cello); Gyorgy Sebok (piano). MERCURY 434 377. "Both [Brahms sonatas] are masterpieces and here Starker and Sebok do them complete justice" (March 1966).

### DEBUSSY:

#### The Complete Works for Piano.

Walter Gieseking. EMI 58552 (two CD's). One of the great interpreters of Debussy's music, recorded in the early 1950's.

### MAHLER: Symphony No. 6.

New Philharmonic Orchestra.

### R. STRAUSS: Ein Heldenleben.

London Symphony, John Barbirolli. EMI 69349 (two CD's). Barbirolli makes "... an all-out effort to present the Mahler Sixth as an essay in impassioned lyrical polyphony" (November 1968), and in the Strauss "the balance of forces is just about perfect" (June 1971).



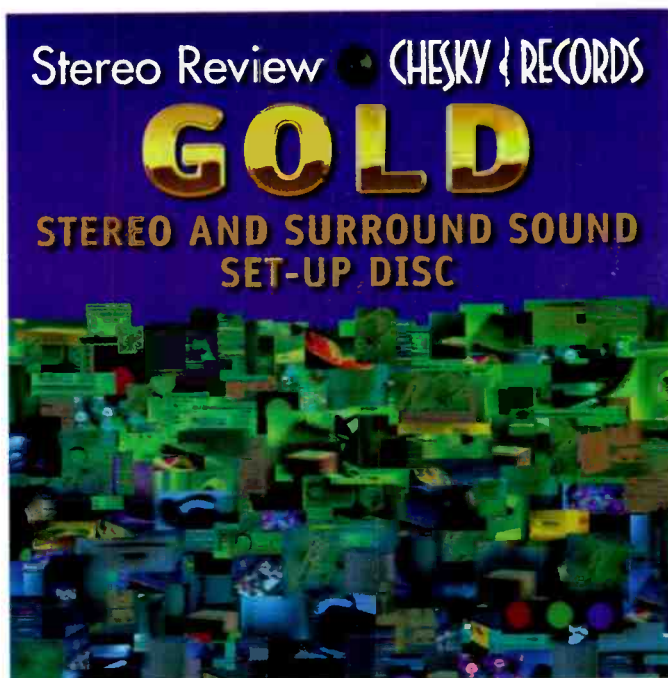
## LISTEN AND LEARN

# Stereo Review and Chesky Records Introduce The Gold Stereo And Surround Sound Set-Up Disc

**S**tereo Review and cutting-edge audiophile label Chesky Records have produced a most entertaining and informative set-up disc. This jam-packed (76+ minutes) gold CD runs the gamut from basics like speaker channel ID and phasing tests, to fun stuff like *The Wandering Audiophile*, which clearly demonstrates how low frequencies are distributed throughout your listening room, and *The Clap Test*, that just might be the first step to improving your room's acoustics. And you won't even have to reach for your bifocals to read the CD booklet—an announcer talks you through all of the tests and demos. You're free to settle back into your comfy chair while you listen and learn.

Chesky Records' Producer Steve Guttenberg and Writer/Technical Consultant Anthony Chiarella joined forces with Stereo Review's Technical Editor David Ranada to create this must-have Set-Up Disc. Utilizing test tones developed by David Ranada, the primary goal was to make this disc as easy to use as possible, and to fashion a tool that could effectively improve the performance of most Stereo or Home Theater systems. Mission accomplished!

The *Subwoofer Set-Up* tracks will improve the integration and blending of subwoofers with your main stereo speakers; the *Shake, Rattle, And Roll* test reveals the frequencies of your listening room's resonances; there's a section dedicated to optimizing stereo speaker set-up; you'll be amazed by the three-dimensional acoustics of the *Imaging And Soundstage* demo; and for Home Theater fans, there are a battery of *Dolby Pro Logic*™ surround sound tests. This Gold CD also features a generous sampling from Chesky's latest releases, which serve as musical illustrations for each test. Tracks include new music from Chesky's women of song, Rebecca Pidgeon, Sara K, & Ana Caram; Jazz



legends Oregon and Paquito D'Rivera; guitar virtuosos Badi Assad and Carlos Heredia; a dash of Mozart; some lovely music from the Westminster Choir; even a "Theater Without Pictures" piece from Igor Stravinsky's "The Soldier's Tale".

There's also a track from Chesky's trailblazing New Age/World Music group I Ching's new CD, "Of The Marsh And The Moon". This CD was recorded with a new process dubbed "Natural Surround Sound". Unlike other surround sound systems which require a decoder and four or more speakers, "Natural Surround Sound" is 100% compatible to any conventional two-channel, two speaker stereo system. Remarkably, this process eliminates "magic" boxes or processing of any kind in the recording chain, or even in post-production. As you listen to the I Ching track, you'll hear ambient sounds well in front of the plane of the stereo speakers! Truly an out of this world music experience!

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# POPULAR MUSIC

NEW RECORDINGS REVIEWED BY CHRIS ALBERTSON, FRANCIS DAVIS,  
WILL FRIEDWALD, PHYL GARLAND, RON GIVENS, BRETT MILANO,  
ALANNA NASH, PARKE PUTERBAUGH, KEN RICHARDSON, & STEVE SIMELS

**DAVID BOWIE: Earthling.**  
VIRGIN 42627 (49 min).  
Performance: Holding pattern  
Recording: Could be better

David Bowie has gone quasi-experimental again, drawing from jungle music (the currently trendy hip-hop variant) and from his own late-Seventies albums (mostly "Low" and "Heroes"). If you don't mind that he now follows trends instead of setting them, "Earthling" isn't bad. Although it has fewer standout tunes than 1995's "Outside," it makes for better ear candy and tries less desperately to be cutting-edge.



Brian Eno, Bowie's usual collaborator on left-field albums, isn't aboard this time, and "Earthling" could use some of his flair for sonic detail. But guitarist Reeves Gabrels, who was the saving grace of Bowie's late-Eighties band Tin Machine, is still around, and the mix of his firebrand solos with the techno-loops is usually enough to set the pulse racing, notably in the tense and dense opening track, *Little Wonder*. But the only memorable song here is *I'm Afraid of Americans*, a deliciously nasty mix of arena-rock riffs and satirical, not-quite-broadcastable lyrics.

In fact, songwriting is largely beside the point on much of "Earthling." Singing in his "Low"-era style, Bowie deals less in fully formed melodies than in quick-shot chorus hooks. The lyrics convey images of modern-day industrial dread, but few of them are fleshed-out, and the album's much-hyped spiritual direction is largely a

bust. If "Earthling" confirms Bowie's recent knack for creative club and radio fodder, it doesn't bode well for his doing anything groundbreaking again. *B.M.*

**VIC CHESNUTT: About to Choke.**  
CAPITOL 37556 (45 min).  
Performance: Intense  
Recording: Pure

**SWEET RELIEF II —  
GRAVITY OF THE SITUATION,  
THE SONGS OF VIC CHESNUTT.**  
COLUMBIA 67573 (58 min).  
Performance: Well-meant  
Recording: Variable

Vic Chesnutt of Athens, Georgia, is one of indie rock's buried treasures, a songwriter with a morbid wit, a wounded sensitivity, and a knack for aching lovely tunes. Wheelchair-bound since a teenage driving accident, he is the subject of the latest "Sweet Relief" tribute/benefit album, which, along with his own major-label debut, "About to Choke," should finally get his name around.

The tribute disc, however, is a widely mixed bag that shows how challenging his songs can be to cover. It's worth hearing for R.E.M.'s contribution, the sad and folkish *Sponge*, which Michael Stipe sings in an affectionate imitation of Chesnutt's voice. Kristin Hersh, Sparklehorse, and, more surprisingly, the Indigo Girls also connect with the dark corners and tangled images — but nobody else here does. Nanci Griffith and Hootie and the Blowfish take the irony out of the anthemic title song, *Gravity of the Situation*, and Joe Henry and sister-in-law Madonna make *Guilty by Association*, which Chesnutt wrote about his friendship with Stipe, sound like just another whine about being famous. Worst of all, Soul Asylum turns *When I Ran Off & Left Her* into a melodramatic mess. What's gotten into this once-fine band?

Meanwhile, "About to Choke" is a bitter, depressing, and often brilliant album. Play-

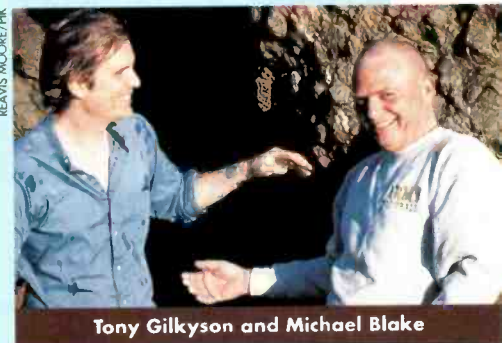
ing acoustic guitar with minimal backup, Chesnutt deals with the bottoming-out of his career, his self-esteem, and a handful of relationships. Yet the tunes are among the most haunting he's written, the vocals are full of rough-edged charm, and the production (with a mix by Bob Mould) is spare but sparkling. Neophytes may want to start with 1994's "Brute" — his most accessible disc, made with the band Widespread Panic — but try "About to Choke" when you're ready for the deep end. *B.M.*

**DERYL DODD: One Ride in Vegas.**  
COLUMBIA 67544 (40 min).  
Performance: Bright future ahead  
Recording: Good

As a writer or co-writer of eight of the ten cuts on his debut, Deryl Dodd knows how to craft commercial yet substantial country songs. He adds a western-swing touch to a groove borrowed from Garth Brooks in *13 MVZ* and weaves a Steve Earle guitar riff into the intro of *That's Just Me*. These instrumental flourishes seem more like smart homages than rip-offs, just as Dodd uses clever but not obnoxious wordplay in the

## STRANGE BANDFELLOWS

What do you get when you take ten spoken-word vignettes by *Dances with Wolves* author Michael Blake and set them to music by X guitarist Tony Gilkyson? You get Blake's "End of the Century" (Pik 7003; Solid Discs, Box 973, North Hollywood, CA 91603), a compelling, mostly straight-



Tony Gilkyson and Michael Blake

ahead rock album that also enlists X drummer D.J. Bonebrake. Blake, who won an Academy Award for adapting *Dances* for Kevin Costner, is now scripting his current book, *Marching to Valhalla: A Novel of Custer's Last Days*, for Brad Pitt. But Blake found time to enter a studio with Gilkyson and lay down tracks that are blunt in both language and sentiment. Sample topics: *Hollywood*, *Congressman*, and *After Seeing John Doe at Raji's*. *K.R.*



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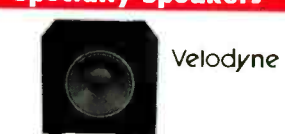
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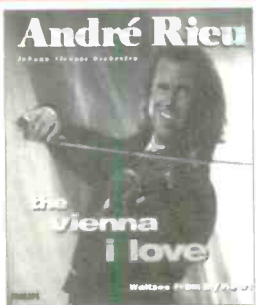
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## LOVE-SICKO BLUES

Calling all stalkers, serial killers, and fans of the musically different: Have I got a record for you! From its cover drawing of a disinterred, stitched-up Hank Williams to its rude, crude subject matter and delivery, Angry Johnny and the Killbillies' "Hankenstein" is not your basic country-punk effort. A sort of theme album, it explores every self-destructive, sadistic, and masochistic act and thought, all because of one tragic event: Johnny's girlfriend dumped him. And, yes, he's angry. So angry that in the opening song, *Life, Love, Death, and the Meter Man*, he slices and dices the guy from the electric company, mistaking him for his ex's



new lover. Whether you consider this parody (and I've been assured that Johnny is the real deal, that all this comes straight from his twisted heart) or just stuff designed to make Jesse Helms fall to his knees, it's well-done. Written with humor and aplomb, the material staggers between country, blues, and garage rock. It'll sure hold your attention. And it's got the best chainsaw effects of any record in recent memory. *A.N.*

**ANGRY JOHNNY AND THE KILLBILLIES: Hankenstein.**  
TAR HUT 0001 (66 min).  
P.O. Box 441940, Somerville, MA 02144.

love ballad *Stayin' Is the Only Way to Go* and the honky-tonker *Friends Don't Drive Friends*. He even resurrects Tom T. Hall's *That's How I Got to Memphis* and infuses it with a palpable urgency. In this day of manufactured hat acts, the bareheaded Deryl Dodd stands apart. *A.N.*

**JUDY GARLAND:**  
*Collectors' Gems from the MGM Films.*  
TURNER/RHINO 72543 (two CD's, 152 min).  
**Performance: Wonderful**  
**Recording: Amazing**

Not exactly a reissue — only five of the forty-six tracks were ever out before — "Collectors' Gems from the MGM Films" chronicles the development of a legend. Despite the concentration on rarities (many cuts are unused outtakes or from extremely obscure movies), the set demonstrates the high caliber of the music Judy Garland prerecorded for her films. As revealed in the opener, the title song from her 1936 one-reeler "pilot" *Every Sunday*, Garland was already an amazingly accomplished vocalist at the age of 14, and she just kept getting better for the duration of her MGM contract, which ended in 1950. The compilers here were astute enough to limit the inclusion of the often overdone "special material" numbers that arranger Roger Edens concocted for her, as well as those ill-informed pseudo-jazz opuses where she merely shouted the word "swing" over and over.

The album shows that soundtrack pre-recordings made in Hollywood's heyday can far surpass the same star's commercial recordings of the same material. So often what sounds comparatively lifeless on one of Garland's Decca discs sounds amazingly vibrant here. The crowning glory is the tracks from her aborted *Annie Get Your Gun*, which suggest that she could have had a whole other career bringing the great heroines of musical comedy to the screen. *W.F.*

**L7: The Beauty Process — Triple Platinum.**  
SLASH/REPRISE 46327 (42 min).  
**Performance: Potent**  
**Recording: Raw**

If the grunge trend should have made superstars of anyone, it was the L.A. quartet L7. Their major-label debut, "Bricks Are Heavy," was among 1992's hardest-hitting albums, with mile-wide hooks, topical bite, punkish irreverence, and a metal-edged guitar sound. And they're female, which gave them fewer arena-rock conventions to fall back on than their Seattle cousins had.

"The Beauty Process — Triple Platinum" is L7's second follow-up to that album, and like 1994's "Hungry for Stink" it falls a bit short songwise: Nothing here is quite as catchy as *Pretend We're Dead* or cuts to the chase as eloquently as *Shitlist*. But they come close with *The Masses Are Asses*, which has to be the first anthem of 1997. And they take their first stab at psychedelia with *Non-Existent Patricia*, making nice use of phasing, feedback, and uncharacteristic weirdness and subtlety.

Mostly, however, "The Beauty Process" is about cheap thrills. *Off the Wagon* thumbs its nose at the current sobriety trend and recalls the sound and spirit of peak-period Kiss. *Drama* bawls out an oversensitive type, and *I Need* sports a wonderfully goofy chorus that stretches the song title to eight syllables. If the record tilts L7 away from punk and toward arena rock, it keeps smarts and attitude intact. *B.M.*

**KATE MACKENZIE: Age of Innocence.**  
RED HOUSE 91 (34 min).  
**Performance: Haunting**  
**Recording: Suitably high-lonesome**

Kate MacKenzie is one of those underrated performers that critics love to discover and climb the highest rooftop to proclaim — even though *Prairie Home Companion* fans have known about her for years, both with her bluegrass band, Stoney

Lonesome, and as a guest host for Garrison Keillor. In short, she's a gem.

On "Age of Innocence" she seems rooted more in the folk tradition, but along with producer Nick Forster of Hot Rize she dresses her songs in first-rate bluegrass arrangements, calling on exemplary musicians like fiddler Stuart Duncan, mandolinist John Reischman, and harmony vocalist Alan O'Bryant. Avoiding vocal pyrotechnics, she concentrates on getting the lyrics, the notes, and the emotion directly out of her head and heart and into yours, putting a definitely bluesy spin on the bluegrass. There's much to recommend here, including *Carolina*, a sensual and moody song of thanks to either a person or a state, and the unforgettable *What's the Matter with the Mill*, a traditional country blues recast as a terrific showcase for these thrilling players.

MacKenzie calls her style "swamp grass." Chances are, you'll just call it good, serious music for folks who want to find something nurturing to carry them through. *A.N.*

**MINT CONDITION:**  
**Definition of a Band.**  
PERSPECTIVE 549 028 (66 min).  
**Performance: Refreshing**  
**Recording: Balanced**

The sextet Mint Condition revives the rhythm-and-blues tradition of Seventies groups like the Ohio Players and Earth, Wind, and Fire, and the talent that was evident on its first two albums has come to full fruition on the consistently inviting "Definition of a Band." These Minnesota players spice the strong melodic lines and danceable beats of classic R&B with touches of jazz, Caribbean, Brazilian, and rock, lending an element of surprise to their work. With Stokley handling lead vocals in a style at times reminiscent of Stevie Wonder, Mint Condition ranges from the suggestive funk of *Ain't Hookin' Me Up Enough* to the soulful entreaties of *What Kind of Man Would I Be* and the lush romanticism of *On & On*, which is so good that it lingers like a lover's kiss. *P.G.*



**VAN MORRISON: The Healing Game.**  
POLYDOR 537 101 (54 min).  
**Performance: Soul-searching**  
**Recording: Good**

A meditative potpourri of blues, jazz, R&B, and Celtic music swirling around his sax-like growl, Van Morrison's "The Healing Game" is of a piece with his previous two studio works, "Too Long in Exile" and "Days Like This." Where it breaks new ground is in his embrace of doo-wop and Fifties-style streetcorner soul.

Here are some of his most subtle and

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## POPULAR MUSIC

exquisite performances. *Fire in the Belly*, a midtempo R&B track similar to his old hit *Wavelength*, is highlighted by longtime accompanist Pee Wee Ellis's playful, darting soprano sax solo. The song boasts a notably earthy lyric as he chants, "Spring in my heart / Fire in my belly, too." *This Weight*, sung in close harmony with Katie Kissoon, is an unguarded glimpse into his psyche. And *It Once Was My Life* looks at the toll exacted on an artist by the mercenaries of business, but whereas he has previously focused on the scars, here he sings about transcendence and recovery. With fingerpopping doo-wop singers flinging his lines back at him, the song becomes improbably positive.

Listening to "The Healing Game" is like witnessing a communion between a man and his muse, with the agonies and ecstasies of that dialogue left in for all to hear. That it turns out to be a triumph of the spirit makes the experience all the richer. You can't help but smile when Morrison sings lines like "Affinity and communication / That is reality / Understanding is the first thing / It means so much to me." What can you add to that but "amen" and "turn it up"? *P.P.*

### REDD KROSS: *Show World*.

THIS WAY UP/MERCURY 524 289 (48 min).

**Performance:** Time to grow up

**Recording:** Good

**R**edd Kross deserves a certain amount of slack simply for being Redd Kross, which is to say that brothers Jeff and Steve McDonald and pals are as cool as

they come: long-haired, bell-bottomed, and proudly pop when the world didn't want to know. Indeed, the tuneful glam-rock of this forever-young band is always something to celebrate. "Show World," however, is a bit of a downer, lacking the exhilarating lift-off and freewheeling fun of "Phaseshifter," their last album (now four years old).

It takes a fine number like *Pretty Please Me* to point up what's wrong with the rest of the disc. From the harmonized guitar lines of the intro to the forceful falsetto harmonies on the chorus, the tune spins you in an irresistible vortex. No other song here can match its excitement level, although numbers like the liltingly psychedelic *Mess Around* and the garage-rock pounder *Teen Competition* have their moments.

In *Secret Life*, Jeff sings ominously of "Dark places that I have gone / Dark places I don't belong." Given a surfeit of such sentiments, there's more goth than froth on "Show World." Redd Kross still seems keen on nailing down the perfect hard 'n' heavy pop song (with mascara), but something's getting in the way. Real life, perhaps. *P.P.*

### MATTHEW SWEET: *Blue Sky on Mars*.

ZOO 31130 (36 min).

**Performance:** Disappointing

**Recording:** Ditto

**M**atthew Sweet's third album since his impeccable "Girlfriend" of six years back is cause for concern. Most obvious, the record lasts barely a half-hour, with two tracks under two minutes each. And what's

here is often nondescript, coming across like rewrites of past zingers. It doesn't help that Sweet has dismissed his crew of terrific backup musicians, opting instead to play almost everything himself, which he does with no great flair. As for the dirty, unimaginative sound, co-producer and mixer Brendan O'Brien slouches around like Brian De Palma.

Don't get me wrong: I love Matthew Sweet. But at this late date in the current pop revival, there are plenty of artists who can toss off catchy tunes. I expect more from Sweet — yeah, kinda like a blue sky on Mars. All I see here is a red sky at morning. Buyer, take warning. *K.R.*

### SWEETHEARTS OF THE RODEO:

#### *Beautiful Lies*.

SUGAR HILL 3857 (39 min).

**Performance:** Finding their niche

**Recording:** Even the standup bass stands out

**A** decade ago, Sweethearts of the Rodeo were the shiny new hope of Columbia Nashville, outperforming Marty Stuart in a critics' showcase and seeming to have all of Music City on a string. Then the singles stopped charting, and these real-life sisters — Janis Gill, wife of Vince, and Kristine Arnold — were out on the street. Not long ago, they resurfaced on Sugar Hill, where they're now making some of the best music of their career.

"Beautiful Lies" finds them capable of much more eclectic material than their mainstream country records ever hinted at. With a strong bluegrass foundation, they make *When Love Comes Around the Bend* seem like something even Bill Monroe might have tackled. The title song benefits from the same treatment, and the album closes with the bluegrass favorite *Muleskinners Blues*. In between, the sisters offer a pretty rendition of Donovan's *Catch the Wind*, a version of Bob Dylan's *One More Night*, a bit of heartfelt gospel, a hint of Sixties British pop, and an original turn or two of delicate, Celtic-influenced folk.

Benefiting both from the duo's dead-on harmony and from Janis's good taste as a producer, "Beautiful Lies" shows once again how Nashville's loss is everybody else's gain. Although Janis's husband may be the reigning king of commercial country, Sweethearts of the Rodeo prove that some of the most satisfying contemporary country can be found on record labels far from Music Row. *A.N.*

### THE VELVET UNDERGROUND:

#### *Loaded* — Fully Loaded Edition.

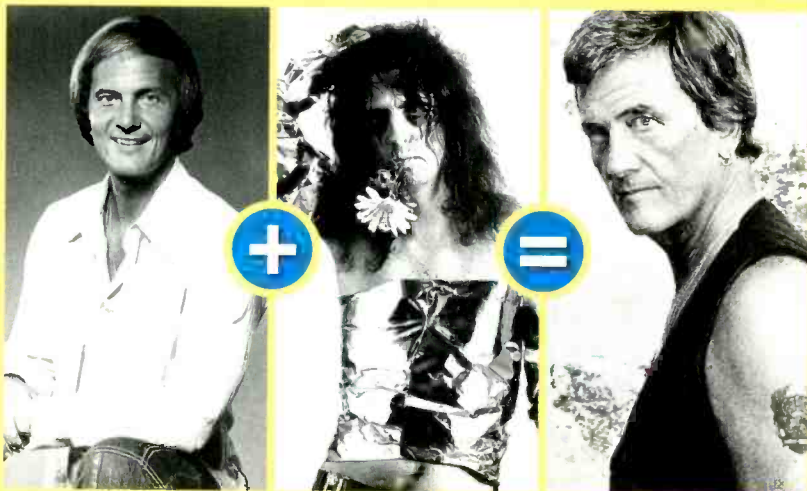
RHINO 72563 (two CD's, 128 min).

**Performance:** Half-essential, half-curio

**Recording:** Good restoration

**T**he Velvet Underground's last official studio album was the odd one out. Unlike VU's other three records, which helped to expand the sound and the vocabulary of rock, "Loaded" was simply a bunch of accessible, well-crafted tunes. And the band was falling apart: A pregnant Maureen Tucker was absent, and Lou Reed split before the album's release.

The "Fully Loaded Edition" of "Loaded"



## ANY QUESTIONS?

The original Pat Boone, shown at left, has really gone Left — or so it would seem from his metamorphosis into the Tattooed Tough Guy at right, by way of Alice Cooper and the other rockers he covers on his new Hip-O album, "In a Metal Mood: No More Mr. Nice Guy." Besides the title track, Boone croons Metallica, Judas Priest, AC/DC, Guns N'

Roses, Deep Purple (with guest guitarist Ritchie Blackmore), Van Halen, Nazareth, Jimi Hendrix, Dio, and Ozzy Osbourne, finishing with — how could he? how could he not? — Led Zepelin's *Stairway to Heaven*. And this isn't just Pat Sings Metal. This is Pat Sings Metal in *big-band jazz arrangements*. Ain't that a game! *K.R.*



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**PLAY YER JOKER!**

In this case, a joker is an "elegant assemblage of junk metal" that also makes music if you strike, scrape, pluck, or wiggle it. Invented by Fred "Spaceman" Long, it's one

of many oddities featured in Bart Hopkin's "Gravikords, Whirlies, & Pyrophones: Experimental Musical Instruments," a handsome book/CD package from Ellipsis Arts. Bored with your plain synthesizer? Try the Trigon Incantor.

Lost your desire for sax? Check out the Photon Clarinet, which, as Tom Waits says in his foreword, "sounds like a keyboard lobster dying on a campfire." *K.R.*



pulls a fast one on collectors by packaging material they likely already own (the original recordings and various outtakes are in the 1995 boxed set "Peel Slowly and See") together with an "alternate album" of newly unearthed versions and mixes. These lack the pop sheen of the finished tracks, but some fans may prefer it that way. *Oh! Sweet Nuthin'* is less moving here but more rocking. *Cool It Down* and *Rock & Roll* have a more primitive feel that harks back to the guitar jams on "White Light/White Heat." The early take of the garage-rocker *Head Held High* is as close to *Louie*, *Louie* as VU ever got. And there's a second, even rougher band version of Reed's solo number *Satellite of Love*.

The one true revelation is a rarity that already appeared in "Peel Slowly and See": the original full-length mix of *Sweet Jane*, including the closing "heavenly wine and roses" bridge, possibly the giddiest moment in the Velvets' catalog. After all these years, *Sweet Jane* has a happy ending. *B.M.*

**WIDESPREAD PANIC:**

**Bombs & Butterflies.**

CAPRICORN 534 396 (54 min).

**Performance: Par for the course**

**Recording: Good**

Sometimes the H.O.R.D.E. groups can seem like the overhanging belly of rock, with a lot of instrumental flab lapping the belt. Widespread Panic has been as guilty as the next band of the genre's shortcomings: plain-as-burlap vocals, songs that serve mainly as launching pads for jams, and an overall lack of personality. But lately the group has become more adept at making interesting records. And while "Bombs & Butterflies" isn't exactly to die for, it's

better than your average studio album by a road band.

At their best, Widespread's songs change tempos and turn corners in ways that open up vistas in the mind's ear. There's even an occasional arresting lyric, such as the serio-comic sci-fi premise of *Greta*, where nature comes knocking on mankind's back door with a little apocalyptic payback in mind. Or check out the gallery of characters in *Aunt Avis*, a quirky collaboration between the band and cult hero Vic Chesnutt. The well-chosen cover of *Hope in a Hopeless World*, a soulful plea for human kindness that first appeared on a Pop Staples album, brings a note of sincerity into the generally more flippant proceedings.

On the downside, hoary Seventies AOR like *Radio Child* and *You Got Yours* will make you think you're back in Kansas again, with Toto in tow. Tracks like these may be bombs, but fortunately they're outnumbered by butterflies on this mostly appealing disc. *P.P.*

**DON WILLIAMS: Flatlands.**

AMERICAN HARVEST 57707 (49 min).

P.O. Box 68, Las Vegas, NM 87701.

**Performance: Worth checking out**

**Recording: Resonant**

In the Seventies and Eighties, Don Williams seemed to own the laid-back country ballad, but then came the prettier, younger men with a more overt (and less cerebral) form of Nashville romance. Now well past middle age, Williams returns to the studio for "Flatlands," with his rafter-shaking baritone as rich as ever and his songwriting skills impressively matured. The updated country sound is fit for the Nineties, but he still needs to vary the pace more. That said, "Flatlands" has some remarkable moments, particularly *Shadow Land*, which takes a painful look back at a troubled childhood, and the sensual *Glass House*, where Williams gets even with the woman who done him wrong. A memorable if uneven effort. *A.N.*

**JEFF WOOD:**

**Between the Earth and the Stars.**

IMPRINT 10006 (36 min). 209 Tenth Ave. S., Nashville, TN 37203.

**Performance: Hirbound**

**Recording: Nashville-perfect**

On his debut, writer-turned-performer Jeff Wood proves to be a contender in Nashville's overcrowded competition for Talented New Good-Looking Guys. A native of Oklahoma, Wood has one foot in country and the other in pop, and he sells both with a big, elastic tenor and undeniable star quality. Still, it's the songs that matter, and while there's a fair share of filler here, there are great singles in Don Schlitz and Vince Gill's *You Just Get One*, a natural singalong, and *Between the Earth and the Stars*, a huge, pretty ballad about learning from past mistakes in love. And there's no denying that Wood is simply a born singer. With the right direction, he could be a consistent chart-topper. Without it, on the other hand, he could be the next Billy Dean. *A.N.*

**Collection**

**SHARED VISION 2 — THE SONGS OF THE ROLLING STONES.**

MERCURY 535 845 (59 min).

**Performance: No satisfaction**

**Recording: Good**

Whereas the first album in the "Shared Vision" series took an illuminating approach to the covers game — that is, turning loose a diverse assortment of artists on songs by Woody Guthrie and Leadbelly, in a celebration of the Folkways label's rich legacy — the second volume is a major letdown. For one thing, the performances were not commissioned but collected, and only three (by the unremarkable likes of L.A. Guns, Cinderella, and Kevin Chalfant and the Blue Collar Band) are previously unreleased. For another, there's little of the generation-bridging insight that comes when acolytes like Bruce Springsteen and Bob Dylan pay homage. I'm sorry, but Thrashing Doves covering *Sympathy for the Devil* with twee synth backdrop fails to qualify as revelatory.

What is offered as tribute here often seems more like unintentional satire: Tom Jones's horrific miscasting of *(I Can't Get No) Satisfaction* in synthesized tux 'n' tails, the Feelies' wind-up-toy version of *Paint It Black*. Buckwheat Zydeco's uncomprehending Cajun arrangement of *Beast of Burden*, and Johnny Cash's remake of *No Expectations* as a silly, toe-tapping hoe-down. There's precious little wheat among the chaff, although Marianne Faithfull's dolorous *Sister Morphine* (which she co-wrote), Dramarama's salty *Memo from Turner*, and Social Distortion's blistering hardcore *Back Street Girl* pass muster. "Shared Vision 2" is a charity for the Lighthouse, Inc., which benefits the blind, but the album fails to focus on the Rolling Stones in any meaningful new way. *P.P.*



**JAZZ**

**GINGER BAKER TRIO WITH BILL FRISSELL AND CHARLIE HADEN:**

**Falling Off the Roof.**

ATLANTIC 82900 (58 min).

**Performance: Subdued power trio**

**Recording: Too much bass**

The 1994 release "Going Back Home," the first album to team drummer Ginger Baker with guitarist Bill Frisell and bassist Charlie Haden, was one of the most pleasant surprises of recent years. "Falling Off the Roof," with cameos by banjoist Bela Fleck and guitarist Jerry Hahn, is a worthy follow-up. The performances are trim and full of snap, thanks in no small part to the uncommon melodic lilt of Baker's rhythmic punctuations. He joins forces with Haden to lock in some irresistible grooves.

That said, it's generally Frisell who sets

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RIVER NORTH 161 207 (45 min).

Sitcom star skywrites a surprise. Bernard has a natural feel for gently rocking New Country, displays an eye-opening talent for songwriting, and knows how to get from the top to the bottom of her limited register without stalling out. *A.N.*



## HAMIET BLUIETT:

### Bluiett's Barbeque Band.

MAPLESHADE 04032 (61 min).

These plugged-in jams recall the days after Miles Davis's "Bitches Brew" when the combination of jazz horns and funk rhythms still held promise. Bluiett's sax ripples with muscle, and Donald Blackman's keyboards create spicy, intricate textures. But Bluiett holds the sauce on three tracks with sanctimonious vocals by Amba Hawthorne or recitations by Shirley LeFlore. Use your Track Skip. *F.D.*

## GEORGE DUCAS: Where I Stand.

CAPITOL 35463 (38 min).

Ducas delivers a country-pop hybrid that salutes the Beatles and other British Invasion bands. There's a kind of manufactured synthesis here, but he could be your man for progressive yet highly commercial country. *A.N.*

## FIREWATER: Get Off the Cross . . .

### We Need the Wood for the Fire.

JETSET 04 (42 min).

Tod A. of Cop Shoot Cop rounds up players from the Jesus Lizard, Soul Coughing, Hugo Largo, and more for a set of gutter-style klezmer, salsa, tango, and gypsy music. A consistent delight. *K.R.*

## THE SIMPSONS:

### Songs in the Key of Springfield.

RHINO 72723 (57 min).

Some of the funniest moments on what is still the most sharply written network-TV show have been musical, and this smartly programmed set collects the best of them, from Homer's *It Was a Very Good Beer* to his country duet with Beverly D'Angelo, *Your Wife Don't Understand You*. There's also the infamous mini-musical remake of *A Streetcar Named Desire*. *S.S.*

## THE THREE HANKS:

### Men with Broken Hearts.

CURB 77868 (32 min).

Give a big welcome to the very definition of a novelty record: the voice of long-dead Hank Williams, Sr., meshed with those of his son, Hank, Jr., and his son, Shelton, billed as Hank III. This is in fact tastefully done — and as much fun as you can have with a corpse and not get arrested. *A.N.*

## EDDIE VINSON: Sings.

BETHLEHEM 4003 (40 min).

A reissue of the blues singer and sax man's entire mid-Fifties Bethlehem output, this is a skimpy CD, but there's ample compensation in the music. The 20-bit remastering is excellent; the 40-year-old liner notes, however, haven't been updated. *C.A.*

## TONY WILLIAMS: Wilderness.

ARK 21 (65 min).

The fusion pioneer turns to another amalgam: jazz and classical music. Being basically jazz with strings, it's not innovative, but Williams blends it further by throwing in some of the old electro-funk. There are fine solos by Pat Metheny and Herbie Hancock (and less interesting but good work by Michael Brecker and Stanley Clarke). Still, it sounds like something we have heard before on pseudo-jazz radio. *C.A.*



## WONDERMINTS.

BIG DEAL 9033 (46 min).

The Wondermints home in on the magical garden of melody and harmony once tended by the Beatles and the Beach Boys in their mid-to-late-Sixties heyday. Those groups, though, weren't ever quite this lightweight, nor would they sabotage a neat tune with needless complexity. But when the Wondermints don't get in their own way, they're as cool and refreshing as their name. *P.P.*

## TRUE LIFE BLUES — THE SONGS OF BILL MONROE.

SUGAR HILL 2209 (52 min).

"True Life Blues" was meant to be a tribute to a living man. Instead, it was released as the Father of Bluegrass was being eulogized. Many of the genre's stellar performers (Del McCoury, Vassar Clements, Peter Rowan, Sam Bush, Jerry Douglas, Roland White, David Grisman) pay homage with spirited, soulful versions of Monroe's haunting songs of reflection and regret. The vocals are all high-quality, and the picking is uniformly first-rate. *A.N.*

the tone. He plays wonderfully throughout, demonstrating his grasp of conventional jazz harmony alongside the overmatched Hahn in Charlie Parker's *Au Privave* and penetrating to the rhythmic core of Thelonious Monk's *Bemsha Swing*. But Frisell is most in his element in the pieces with a slightly rural cast, including Baker's loping *Vino Vecchio* and the guitarist's own brooding blues, *Skeletal*. The only drawback is a bottom-heavy mix, but this is something you can live with. Any album with Frisell on it is worth hearing, and "Falling Off the Roof" is no exception. *F.D.*

## DEE DEE BRIDGEWATER/HOLLYWOOD BOWL ORCHESTRA:

### Prelude to a Kiss —

### The Duke Ellington Album.

PHILIPS 446 717 (52 min).

Performance: Dukish Dee Dee  
Recording: Excellent

Dee Dee Bridgewater embraced jazz when she first started singing professionally, but there came a time — as lawyers say — when she flirted with a more commercial style of music, causing her to be overlooked by the jazz press all too often. Her contribution to "Prelude to a Kiss — The Duke Ellington Album" should correct this. Sounding very much like a young Sarah Vaughan, Bridgewater, now 47, shares billing with and is in part accompanied by the Hollywood Bowl Orchestra, but she is at her best when a stellar group of jazz soloists steps in, including Ira Coleman, Charles McPherson, Bobby Watson, Steve Turre, Cyrus Chestnut, and — making an obligatory appearance — Wynton Marsalis. Highlights are *I'm Beginning to See the Light*, accompanied solely by the jazz group, and *Bli-Blip*, arranged for big band by Slide Hampton. *C.A.*

## OSCAR BROWN, JR.: Sin and Soul.

COLUMBIA 64994 (47 min).

Performance: Never better  
Recording: Ditto

Oscar Brown's wonderful mix of earthiness and sophistication was right in tune with the soulful struts of groups like the Cannonball Adderley and Horace Silver quintets. But while Brown was an engaging vocalist, he was no less interesting a composer and lyricist.

All these talents came together in "Sin and Soul," his Columbia debut from 1960, now on CD with five previously unreleased tracks. Four of these are from *Kicks and Company*, a Brown musical that was aimed at Broadway but missed, and the fifth is the Nat King Cole novelty *Straighten Up and Fly Right*. It adds up to a remarkably diverse program, and Brown is never less than captivating. Here are such memorable numbers as *But I Was Cool*, *Signifyin' Monkey*, *Humdrum Blues*, and the poignant *Brown Baby* plus two of the day's most popular soul-jazz numbers, Nat Adderley's *Work Song* and Bobby Timmons's *Dat Dere*, with superb lyrics by Brown. He was a master of moods and a wonderful storyteller, and it's a marvel how fresh this all sounds thirty-seven years later. *C.A.*

**CHARLIE PARKER: The Complete  
Legendary Rockland Palace Concert.**

JAZZ CLASSICS 5014 (two CD's, 107 min).

**Performance: Soaring Bird  
Recording: Together at last**

**A** covert recording of Charlie Parker's 1952 Rockland Palace gig appeared on an Audio Fidelity LP and on lesser-known bootleg albums, but everything I have heard has been fragmented, off-pitch, and muddy — until this Jazz Classics CD came in the mail. Apparently, a second, more professional recording of the concert surfaced, although it captures only Parker's solos. Much credit is due Doug Pomeroy for skillfully combining the two recordings here in a technical feat that finally makes the material not just bearable but downright enjoyable. What's more, he managed to create true stereo for the extraordinary performance of *Lester Leaps In*, which, as far as I know, thus becomes the famed altoist's only stereo recording.

There are still missing pieces, but this careful reassembly of the Rockland Palace event adds an important page to Bird lore and offers us an opportunity to hear him in an extended live performance that — musically, at least — rivals the famous Carnegie Hall date two years earlier. C.A.

**ART TATUM:**

**20th Century Piano Genius.**

VERVE 763 (two CD's, 137 min).

**Performance: Private and inspired**

**Recording: Excellent, considering**

**W**hen the bulk of this material first appeared on the 20th-Century Fox label in the Sixties, it expanded considerably a growing catalog of on-the-spot Art Tatum recordings. But these privately taped performances evoked particular interest, because rarely had Tatum's artistry been captured so well in an informal setting. The occasions were two gatherings in 1950 and 1955 at the home of Hollywood musical director Ray Heindorf (*Young Man with a Horn*); he had better equipment at home than most people, so the sound is remarkably good. Originally on two LP's, the tracks are by now familiar to Tatum fans, but Verve's reissue offers more: three selections that were released by the Smithsonian and twelve that are previously unissued.

To borrow a truism from Gertrude Stein, Tatum is Tatum is Tatum. His improvisations here are brilliant, his technique dazzling, and it's obvious why his influence is ongoing. Two hours of Tatum is like a day of most artists, for there is so much happening in each track that it can take hours to fully absorb a single performance. "20th Century Piano Genius" is a collection to be savored like a delicate vintage wine. C.A.

**PHIL WOODS/VINCENT HERRING/  
ANTONIO HART: Alto Summit.**

MILESTONE 9265 (56 min).

**Performance: Alto yes, summit no**

**Recording: Average**

**W**ith such blatantly Bird-loving players as Sonny Stitt and Cannonball Adderley long gone, Phil Woods has emerged as the elder statesman of Charlie Parker-

inspired altoists. On "Alto Summit" he is teamed with Vincent Herring and Antonio Hart, and though the result is sometimes dazzling — as in Gigi Gryce's *Minority*, where all three reeds go past the speed limit — mostly it's just a tad above good.

Each player has a solo track, but my socks remained in place throughout. Hart's *God Bless the Child* is abused by David Weiss's dirge-like arrangement, and Herring's *Autumn in New York* begins more like a muggy summer afternoon. Woods's *Stars*

*Fell on Alabama* is the most eventful of the solo turns. Pianist Anthony Wonsey does a commendable job, but Ruben Rogers's bass and Carl Allen's drums are limp.

Incidentally, someone should tell annotator Zan Stewart that *Stars Fell* was not "made famous, jazz-wise" by Adderley. Has he never heard of Jack Teagarden? And then there is a cryptic thank-you to three other altoists "for playing ensemble parts during the rehearsals and recording sessions." What's that all about? C.A.

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# CLASSICAL MUSIC

NEW RECORDINGS REVIEWED BY ROBERT ACKART,  
RICHARD FREED, DAVID HALL,  
JAMIE JAMES, GEORGE JELLINEK, AND ERIC SALZMAN

## BERLIOZ: *La Damnation de Faust*.

Françoise Pollet (Marguerite), Richard Leech (Faust), Gilles Cachemaille (Méphistophélès), Michel Philippe (Brander); Montreal Symphony Chorus and Orchestra. Charles Dutoit cond. LONDON 444 812 (two CD's, 120 min).

**Performance:** Thrilling  
**Recording:** Luminous

**H**ector Berlioz's *The Damnation of Faust* is one of his most extravagant exercises in boundary-bending. Originally conceived as a "concert opera" based on Goethe's drama, it encompasses the genres of opera, symphony, ballet, choral cantata, and song. This exciting, luminous new record-



ing, made three years ago following a memorable series of concerts in Montreal, offers a rich, idiomatic performance from the orchestra, confidently led by Charles Dutoit, and an excellent cast, particularly soprano Françoise Pollet as Marguerite. Her vibrant, red-blooded account of the famous Romance ("*D'amour l'ardente flamme*") captures the full measure of this intensely emotional lament.

The Swiss baritone Gilles Cachemaille makes a suave and companionable Méphistophélès. As Faust, Richard Leech sings with a mellifluous ease and sweetness that recalls the voice I remember from a decade ago. As is often the case with Berlioz, however, the real star of the event is the chorus, which here thunders forth magnificently, negotiating the intricate arrangements with graceful flexibility. As a nice bonus, London has thrown in a half-hour disc of ex-

cerpts from Dutoit's fine recording of Berlioz's mammoth opera *Les Troyens*. *J.J.*

## BIMSTEIN: *Garland Hirsch's Cows; The Louie Louie Variations; Dark Winds Rising; The Door; Vox=Dominum*.

Modern Mandolin Quartet; Turtle Island String Quartet; sonic sampling and mixing, Phillip Kent Bimstein. STARKLAND ST-205 (57 min).

**Performance:** Composer-supervised  
**Recording:** Very good

**P**hillip Kent Bimstein, a graduate of the Chicago Conservatory of Music and former leader of the New Wave band Phil 'n' the Blanks, is now (no kidding) mayor of Springdale, Utah, a staunch defender of that state's environment, and the creator of a truly offbeat, underground, alternative-

music winner, *Garland Hirsch's Cows*. This amusing concerto in three "moovements" based on the ruminations of Bimstein's neighbor, Garland Hirsch, and his happy herd of bellowing bovines, as well as two other works here — *The Door* (a rollicking rock-and-roll version of Pierre Henry's *musique concrète* squeaky-floor classic, *Variations on a Door and a Sigh*) and *Vox=Dominum* (using the vocal and instrumental sounds of Middle Eastern classical music) — are studio deconstructions that manipulate recorded, sampled sound.

*Dark Winds Rising* is for string quartet and the recorded voices of members of the Kaibab Paiute tribe, whose reservation near Springdale was threatened by the installation of a toxic-waste incinerator. *The Louie Louie Variations*, based on a simple rock chord progression, is purely acoustic, scored for mandolin quartet. To put it succinctly, there's a lot of immediacy, wit, and inventiveness on this CD. *E.S.*

## BRAHMS: *Symphonies Nos. 1-4; Tragic Overture; Academic Festival Overture; Haydn Variations; Schicksalslied*.

New York Philharmonic. Kurt Masur cond. TELDEC 13565 (four CD's, 221 min).

**Performance:** In the grand tradition  
**Recording:** Mostly very good

**K**urt Masur's new package of Brahms's major orchestral works was recorded in concert over his first five years with the New York Philharmonic. It is a pleasure to hear new versions of the symphonies steeped in the main Central European tradition, and there are touches of individuality that tell us Masur is very much his own man.

The formidable Symphony No. 1 gets off to a somewhat faceless start, however. I don't hear in the imposing introduction the echoes from the opening of Bach's St. Matthew Passion that I suspect Brahms had in

## Mutter in Berlin

**"T**he Berlin Recital," violinist Anne-Sophie Mutter's latest CD, released in February on Deutsche Grammophon, was recorded live during the September 1995 Berlin Festival. With the pianist Lambert Orkis, she performs works by Brahms, the Debussy and Franck violin sonatas, and Mozart's Violin Sonata in E Minor (K. 304). The Mozart was composed after the death of his mother, and Mutter added it to her program in memory of her husband, who died the month before the recital.

Mutter has always balanced the past with the present quite well, as her interest in contemporary composers like Krystof Penderecki clearly demonstrates. Her recording of his Second Violin Concerto, which he wrote for her, with the London Symphony conducted by the composer, is scheduled by DG for release this fall. Mutter's next big project is her first performances of the complete Beethoven

violin sonatas in concert, with North American cycles already scheduled for 1998 in New York, Chicago, San Francisco, and Toronto.

Violinist Anne-Sophie Mutter



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mind. The performance comes to life with the slow movement, though I am puzzled by an odd whistle that intrudes momentarily 56 seconds into the movement. Otherwise, I appreciate the finely shaded dynamics here and in the third-movement coda. The finale is altogether superb, especially in the *pizzicato accelerando* episodes of the introduction. Jeanne Baxtresser's luminous flute right after the famous Alpine-horn solo is truly a sound to remember. Masur doesn't stint on the drama in the main part of the movement, but his real response is to the lyric element and the long line.

The Second Symphony is a joy from start to finish. As in the First, Masur seems to respond with special warmth to the codas of the first and third movements. The Philharmonic woodwinds are in tiptop form in the *allegretto grazioso*, and the exultant finale goes with terrific drive and gusto. The Symphony No. 3 is another major success.



The heroic opening is given plenty of *sostenuto* quality. Nothing is pushed, but there is no lack of flow. Again the coda of the slow movement is memorable, and Masur brings an ineffably haunting sense of heart-break to the famous third movement with its wonderful horn solo. The finale is exhilarating throughout its main body, infinitely lovely at its autumnal close.

The slow, essentially lyrical pacing of the Fourth Symphony may raise some eyebrows at the start, and the opening movement as a whole is a broody, monumental affair. Again the pace is deliberate throughout the slow movement, but Masur really cuts loose in the scherzo — a welcome contrast. The great passacaglia finale is rock-steady all the way, with lovely dynamic shading where called for, and Baxtresser shines again in the famous flute variation.

The performance of the Haydn Variations, though elegantly shaded, is a bit cautious and foursquare. The *Tragic Overture* needs a more relentless quality than it gets here. The central episode is decidedly on the brisk side, and so is the *Academic Festival Overture*. Its opening procession moves at something of a jogtrot, and the final proclamation needs a more expansive quality. The *Schicksalslied (Song of Destiny)*, set to a poem by Hölderlin that contrasts the Olympian serenity of the gods with the storm and strife of humankind, is a lovely work but seems out of place in this company. The singing by the Westminster Symphony Choir is fine, if a bit lacking in heft.

The set's recorded sound is generally good — a little short in depth illusion and with a tendency for the horns to override here and there. D.H.

**COPLAND: Piano Concerto; Orchestral Variations; Short Symphony; Symphonic Ode.**

Garrick Ohlsson (piano); San Francisco Symphony. Michael Tilson Thomas cond. RCA VICTOR 68541 (66 min).

**Performance: Good to outstanding**  
**Recording: Very good**

**T**itled "Copland the Modernist," this CD offers a formidable lineup of works. The blockbuster Symphonic Ode comes off best. Michael Tilson Thomas captures its go-for-broke grandeur, though I wish he'd used the outsized original 1932 orchestration rather than the 1955 revision. Even so, it sets the ears tingling and the adrenaline flowing.

The Orchestral Variations is Copland's own 1957 reworking of the famous Piano Variations from 1930. It's highly effective, but you should hear Leo Smit's dynamite performance of the piano original on Sony. Thomas comes through with a sure-handed reading of the rhythmically complex Short Symphony, which so baffled both Serge Koussevitzky and Leopold Stokowski back in the 1930's that they canceled premiere performances. The music may be a metrical mare's nest for the players, but it's a real stimulant for the ears. It was written in Mexico, and there are some striking anticipations of Copland's popular 1936 piece *El Salón Mexico*.

I'm not enamored of this new digital version of the 1926 jazz-influenced Piano Concerto. Thomas and soloist Garrick Ohlsson are so laid-back in the opening slow movement that the music goes slack before we get to the "snappy number" that winds the piece up with a bang. Both of the performances with Copland himself — as pianist with Leonard Bernstein on Sony and as conductor with Earl Wild on Vanguard — have the first movement dead on, with a touch more flow and faster pacing. D.H.

**DAUGHERTY: Metropolis Symphony; Bizarro.**

Baltimore Symphony. David Zinman cond. ARGO 452 103 (51 min).

**Performance: Lurid, exhausting**  
**Recording: Impressive**

**M**ichael Daugherty's colorful — not to say lurid — pop symphony is based not on Fritz Lang's famous old movie but on (you guessed it) *Superman* comics! This is aggressively post-Bernstein, post-John Williams, post-modern symphonic funk,



with its zaps, pows, whonks, and splats raised up to symphonic/epic proportions.

The *Metropolis Symphony* has five movements with titles like "Lex" (for Lex Luthor,

one of Superman's arch-enemies), "Krypton," and "Oh, Lois!" In case that isn't enough, there is also *Bizarro*, an encore for big wind band and percussion, also Superman-inspired and even more hard-driven.

No slow movements here; no moments of reflection at all but only comic-book daz-zle in symphonic form. It's all out and over the top, and impressive enough, but eventually aural wear and tear set in. Daugherty is a real symphonic poet of pop, but, to mix the metaphor, he hasn't yet quite figured out how to cook up his spicy raw material so that it blends and transcends. E.S.

**HANDEL: Orlando.**

Patricia Bardon (Orlando). Rosa Mannion (Dorinda). Hilary Summers (Medoro). Rosemary Joshua (Angelica). Harry van der Kamp (Zoroastro); Les Arts Florissants, William Christie cond. ERATO 14636 (three CD's, 169 min).

**Performance: Beauty and drama**  
**Recording: Exquisite**

**I**'ve always thought *Orlando* was Handel's greatest opera. Handel wrote its famous leading role for the great castrato Senesino — and thereby presented posterity with a problem. Orlando is the prototype of the great hero gone off the deep end because of unrequited love. Everything about this character, and especially his madness, is larger than life. We cannot imagine what Orlando must have sounded like in 1733 sung by a male alto, but thanks to William Christie and Les Arts Florissants, we can hear *Orlando* the opera in something like its pristine glory — except for that title role.

This recording is notable for two superb performances at extreme ends of the vocal and dramatic spectrum. As Zoroastro, a kind of master of ceremonies, the Dutch bass Harry van der Kamp — the only male in the cast — supplies the true heroic element in this production; he is witty, sophisticated, and flexible of throat, but staunch throughout. Rosa Mannion's Dorinda the Shepherdess is the other great triumph here. Her flexible Baroque coloratura not only steals the show musically, vocally, and dramatically but also steals your heart away. Angelica, the unwilling object of Orlando's affections, is inherently less sympathetic, but soprano Rosemary Joshua is a strong enough performer to hold her own.

Most of the problems lie with the male characters. Hilary Summers, billed as a contralto (a great rarity these days), has a dark and somewhat covered sound, but her character, Medoro, young and a bit callow, was always intended to be sung by a woman, and this rather delicate interpretation is dramatically as well as musically acceptable. As Orlando, Patricia Bardon sings well enough and meets the criteria for Baroque *bel canto*, but she has only puppy-dog bravado; her performance is not nearly strong enough, vocally or otherwise, for a great Baroque operatic hero gone mad.

Christie and the Arts Florissants players produce an extraordinarily beautiful sound, with masterly phrasing, dynamics, and tempo, and there is drama in the treatment of the orchestral parts and the pacing of the

# CLASSICAL MUSIC

whole. The conductor's style is light and quicksilver, and the idiom (including the cast's Italian diction) is always secure. *E.S.*

**JANACEK: A Fairy Tale; Violin Sonata; Capriccio for Piano and Seven Winds; Concertino for Piano and Chamber Ensemble.**

Mikhail Rudy (piano); Pierre Amoyal (violin); Gary Hoffman (cello); Paris National Opera Soloists. Charles Mackerras cond. EMI 55585 (72 min).

**Performance: Good  
Recording: Close-up**

**P**ianist Mikhail Rudy is the brilliant linchpin for this intriguing CD of chamber works by Janacek. Cellist Gary Hoffman joins him in the quasi-operatic *A Fairy Tale* (1923), inspired by the Russian tale of the Tsar Saltan, as well as in a *presto* movement apparently intended for an earlier version of the piece. The performance has a bit more breathing room musically than the one by Steven Isserlis and Olli Mustonen on RCA, though the close-up studio sonics tend to belie that impression. The Violin Sonata (1914), an impassioned work in the same predominantly lyrical-dramatic vein, reaches its apogee in the second movement, "Ballada." As soloist, Pierre Amoyal offers an aptly intense, sharply focused reading.

The Concertino and Capriccio are late Janacek, complete with the Moravian speech rhythms and the kind of animal depictions encountered in such operas as *The Cunning Little Vixen*. The Concertino adds a pair of violins, a viola, two clarinets, a bassoon, and a French horn to the piano, but the whole ensemble is heard only in the final two movements. The first two movements are more in the nature of dialogues, piano



with horn in the first and piano with clarinet in the second. The work is delightful in its picturesque descriptive humor.

The Capriccio is quite a different matter, with piano, left hand, up against a flute doubled with piccolo, two trumpets, three trombones, and a tenor tuba. It's kind of grumpy-sounding on first hearing but gains with repetition. Tough to play, and no cinch to record, there's nothing else like it in the literature! Charles Mackerras, whose previous Janacek recordings have been of singular distinction, does his usual fine job conducting the ensemble works.

While the CD's programming is altogether splendid, the sonics are rather on the uptight side. For ideal sound and more poetic readings of the ensemble works, I prefer Rudolf Firkusny's RCA recording with Czech Philharmonic soloists and Vaclav Neuman conducting. *D.H.*

## VINTAGE SCRIBIN

**I**t was Ruth Laredo's pathbreaking Scriabin cycle on Connoisseur Society LP's, some twenty-five years ago, that finally achieved a meaningful breakthrough for this composer's piano music. Transferred to Nonesuch LP's in the Eighties, the cycle is only now appearing on CD's. It's all here, and at midprice: the ten sonatas, the Op. 42 etudes, and a few individual pieces.



CHRISTIAN STEINER/NONESUCH

Pianist Ruth Laredo

including *Vers la Flamme*. For more than a few listeners these performances will retain a special level of persuasiveness, for this recording was no mere run-through for the sake of a "Complete Edition." An undertaking of evangelical conviction, it is marked throughout by the pianist's deepest understanding and fullest imaginable commitment.

No one else who has since recorded all the sonatas, not even Vladimir Ashkenazy, has succeeded quite so well in realizing the individual character of each of the ten works, and no other two-disc set of the sonatas includes such a generous clutch of additional pieces. The sound per se, outstanding in its time, still compares well with almost anything of more recent vintage. *Richard Freed*

**SCRIBIN: Piano Sonatas Nos. 1-10; Other Works.**

Ruth Laredo (piano). NONESUCH 73035 (two CD's, 154 min).

**RESPIGHI: La Boutique Fantasque. RACHMANINOFF (orch. Respighi): Five Études-Tableaux.**

Cincinnati Symphony. Jesús López-Cobos cond. TELARC 80396 (66 min).

**Performance: Outstanding  
Recording: Excellent**

**I**t's odd that something as attractive as Respighi's delightful ballet on songs and piano pieces by Rossini should have had so little exposure on CD. But amends are made handsomely by this new Telarc disc. Jesús López-Cobos realizes both the warm-

heartedness and the frisky vitality of *La Boutique Fantasque* more fully than anyone since Ernest Ansermet (who conducted the première in 1919) made the first complete recording some forty-six years ago. The Spanish conductor, in fact, surpasses Ansermet in several sections, and, of course, he has the advantage of nearly a half-century's advances in the art of sound recording.

He brings us, too, a very imaginative companion piece in the form of Respighi's far less familiar orchestral settings of five of Rachmaninoff's *Études-Tableaux*. Rachmaninoff was so pleased with the idea of turning his piano pieces into an orchestral suite that he chose the five pieces himself and supplied descriptive titles for them in their new guise as miniature tone poems: "The Sea and the Gulls," "The Fair," "Funeral March," "Red Riding Hood and the Wolf," and "March." The new recording, I believe, is only the second to offer all five pieces together, and it is without question the most persuasive one yet of any or all of them. As in *La Boutique Fantasque*, López-Cobos achieves maximal results because he seems to believe in the music, and the performances remind us, by no means incidentally, what a fine orchestra the Cincinnati Symphony is. The sound throughout is Telarc at its formidable best. *R.F.*

**SIBELIUS: Symphonies Nos. 1 and 4.**

London Symphony. Colin Davis cond. RCA VICTOR 68183 (78 min).

**Performance: Compelling  
Recording: Excellent**

**I**n this penultimate release in Colin Davis's second Sibelius cycle, which has been consistently richer than his earlier one with the Boston Symphony on Philips, the towering Fourth Symphony receives one of its unquestionably great performances. This work, introduced in the same year as Stravinsky's *Petrushka* (1911), remains a bit of a challenge to listener and performer alike, and particularly to those who are uncomfortable with music they can't assign comfortably to some recognized category: it persists in defining its own terms. Davis neither gratuitously emphasizes its austere character nor errs in the other direction by trying to soften it. His pacing is unhurried, but without the slightest hint of monumentalizing: It is a matter of giving the Sibelian logic enough space to work itself out.

The brooding ruminations of the work's opening unfold without coaxing, as does the great climax of the slow movement, confirming the inexorable logic that moves the entire work forward to its resolution in a finale that is still unique in its undemonstratively gripping power (and in which Davis uses both a celesta and chimes). To suggest that Davis functions more as an "enabler" than as an "interpreter" is to pay him the highest of compliments — and to suggest the rare level of conviction that illumines this performance.

The new account of the First Symphony is a winner, too. While I do not expect in my lifetime to experience another performance of this work to match the glorious one I heard Paavo Berglund conduct in Bal-



time two years ago, Davis, too, manages to minimize the echoes of Borodin and Tchaikovsky while clarifying the textures and rhythms, and the work comes through with an invigorating freshness. The London Symphony, which has a long and rich Sibelius tradition extending back to the time of its founding, responds with what might be termed proprietary zeal throughout both performances, and the sound quality does everyone proud. *R.F.*

**TCHAIKOVSKY: Piano Concerto No. 1. DVORAK: Symphony No. 9 ("From the New World").**

HaeSun Paik (piano); New England Conservatory Youth Philharmonic, Benjamin Zander cond. CPI RECORDINGS 329405 (78 min).

**Performance: Splendid Tchaikovsky Recording: Very good**

For almost a generation Benjamin Zander has been a special ornament in the musical life of Boston. His work as music director of the semiprofessional Boston Philharmonic, which he founded, has been documented tellingly on CD, most notably by the IMP recording of Stravinsky's *Le Sacre du Printemps*. Now we have a sampling of his work with the New England Conservatory Youth Philharmonic Orchestra, an ensemble of young players (eighteen years and under) drawn from the New England Conservatory and other Boston area schools. The CD was recorded at a June 26, 1995, concert in Buenos Aires that was part of the orchestra's South American tour.

For starters we have a very respectable account of the Dvorak "New World" Symphony, noteworthy for its sensitive treatment of the slow movement. The Tchaikovsky Piano Concerto is quite another matter. Korean-born HaeSun Paik, a New England Conservatory graduate, has had the music in her fingers since 1980. Here she not only has the notes down cold, but she communicates their content with enormous volatility and feeling, and the Youth Philharmonic players give their all every bar of the way. The first movement has clarity without bombast, the slow movement genuine tenderness plus a coruscating middle section, and the finale has tremendous spirit, up to and including the great double-octave cadenza. To top it off, the sound engineering, in the concerto especially, is first-rate. If you enjoy hearing gifted young people show their stuff, get this CD. *D.H.*

**Collections**

**HAN-NA CHANG.**

**Tchaikovsky:** *Variations on a Rococo Theme.*  
**Fauré:** *Élégie.* **Saint-Saëns:** *Cello Concerto No. 1.* **Bruch:** *Kol Nidrei.*

Han-Na Chang (cello); London Symphony, Mstislav Rostropovich cond. EMI 56126 (60 min).

**Performance: Auspicious debut Recording: The very best**

Although 13-year-old cello prodigies are not encountered quite as frequently as their violin and piano confreres, we have the real article here in Korean-born Han-Na

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## THE THREE MINIMALISTS

If you want to know what has happened to the minimalist movement, you have to check out the recent releases from Nonesuch, a company that has truly cornered the minimalist market. The evolution of Philip Glass, Steve Reich, and John Adams — mavericks in an odd corner of modern music who have become the most popular “serious” composers of our time — is an extraordinary saga of postmodernism.

These three very different composers are united in at least one major point: They all hate being labeled minimalists. Glass and Reich differ from Adams in that their music was developed through their own ensembles — based on voices, winds, and electronic keyboards rather than the traditional orchestra — and both ensembles are still functioning today. Of the three, Adams is the most distant from the original rhythmic, patterned cycles of repetition and slow change. But, in fact, all three still show some allegiance to their minimalist roots.

Glass has been the most consistently devoted to repetition as a way of life and has made the most extensive explorations of its possibilities. His *Music in Twelve Parts*, dating from the early 1970’s, is his *Well-Tempered Clavier*, a 3½-hour exploration of pattern repetition in its most basic and dynamic forms. Designed for his ensemble, it is a monumental piece of work, typically beautiful, obsessive, hypnotic, and maddening in about equal measure. This is classic minimalism at its most brilliant and extreme.



Philip Glass

The music on Reich’s latest CD, all new and representing facets of his contemporary work, also shows a curious mixture of ideas and techniques from traditional minimalism and even from the historical past. The results are a mixed bag. The text for *Proverb* is from the twentieth-century philosopher Ludwig



Steve Reich

Wittgenstein: “How small a thought it takes to fill a whole life.” Sounds like a minimalist motto to me! The setting of these few words, for three sopranos, two tenors, two vibraphones, and two electric organs, harks back to the earliest Western contrapuntal music for its inspiration and is full of canons, organum in the style of Perotin, and a whole host of other medieval rhythmic and contrapuntal devices. In spite of this philosophical severity, quite typical for Reich, it is an exquisite piece of music.

In sharp contrast, *City Life* is based on actual sounds taken from the urban environment: car horns, door slams, squealing brakes, pile drivers, car alarms, heartbeats, fog horns, sirens, a street vendor’s “check it out,” the field communications of the New York Fire Department during the 1993 World Trade Center bombing! This use of recorded sound harks back to Reich’s early tape pieces as well as evoking such more recent works as *Different Trains* and *The Cave*. The sounds are no longer on tape but are triggered by a synthesizer keyboard so that they can be performed rhythmically and integrated into the musical ensemble. In the end, however, the idea is more fascinating than the realization, which, given the gritty material, is surprisingly tame and low-key. *Nagoya Marimbas*, an occasional piece commissioned for a new concert hall in Japan in 1994, evokes the classic forms of minimalism.

While Adams has evolved the furthest away from minimalism, he has not abandoned it entirely. *El Dorado*, an orchestral piece written for the Columbus anniversary celebrations of 1992, is based on a political, programmatic idea realized in musical form. The first movement, “A Dream of Gold,” creates an obsessive,

unidirectional form that mirrors the drive of the Conquistadors to discover and exploit the riches of the New World; the single-minded development and build of this music is about as antiminimalist as you can get. The second movement, “Soledades” (“Solitudes”), is, in contrast, an image of pre-Columbian wilderness expressed as the organic development of a profusion of musical ideas: it is as gorgeous and evocative as “A Dream of Gold” is powerful and ugly. In its richness of ideas, “Soledades” is not minimalist, but its structure hovers somewhere between Villa-Lobos, Sibelius, and early Adams.

The Adams CD concludes with a pair of rather gloomy encores, his lugubrious chamber-orchestra version of the Busoni *Berceuse Élégiaque* and his moving orchestration of Liszt’s *La Lugubre Gondola*, here called *The Black Gondola*. The traditional orchestral sounds are beautifully managed by Adams (who is an



John Adams

excellent traditional orchestrator), and the English performances and recordings — by the London Sinfonietta under Adams in the arrangements, by the Hallé Orchestra under Kent Nagano in *El Dorado* — stand in marked contrast to the more contemporary sounds of the Glass and Reich ensembles, but all these performances and recordings are equally outstanding. *Eric Salzman*

**GLASS:** *Music in Twelve Parts*. Philip Glass Ensemble, Michael Riesman cond. NONESUCH 79324 (three CD’s, 206 min).

**REICH:** *Proverb; Nagoya Marimbas; City Life*.

Bob Becker, James Preiss (marimbas); Theatre of Voices, Paul Hillier cond.; Steve Reich Ensemble, Bradley Lubman cond. NONESUCH 79430 (42 min).

**ADAMS:** *El Dorado*. **BUSONI** (arr. Adams): *Berceuse Élégiaque*. **LISZT** (arr. Adams): *The Black Gondola*. Hallé Orchestra, Kent Nagano cond.; London Sinfonietta, John Adams cond. NONESUCH 79359 (47 min).

Chang, backed by no less than the lion king of cellists, "Slava" Rostropovich himself.

The CD opens with a performance of the workhorse Tchaikovsky Variations on a Roco Theme that reveals both nimble fingers and a bow arm able to handle the walking-on-eggs harmonics in the cadenzas. So far, so good. It is the poignant Fauré *Élégie*, however, that brings Chang's inherent musicianship to the fore, showing off her remarkable command of long phrases and her beautifully gauged dynamics.

The Saint-Saëns Cello Concerto in A Minor, always fun to listen to, is a course of cellistic acrobatics; Chang passes with flying colors but gives of her best in the delectable central minuet. One of the most affecting performances of the Bruch *Kol Nidrei* I have heard in many a year closes out the program. A major element here and throughout the CD is the handsome orchestral backup, with Rostropovich coaxing singularly lovely playing from the London Symphony. The recorded sound, sumptuous almost to a fault, is up to the highest EMI standard. *D.H.*

**VESELINA KASAROVA: A Portrait (Arias by Handel, Gluck, Mozart, Rossini, Donizetti, and Bellini).**

Vesselina Kasarova (mezzo-soprano): Bavarian Radio Chorus; Munich Radio Orchestra. Friedrich Haider cond. RCA VICTOR 68522 (64 min).

**Performance: Exciting  
Recording: Excellent**

The Bulgarian singer Vesselina Kasarova here asserts her prime position among today's mezzos. Her plush and dusky tone can command the steely component needed for the martial cries of Handel's Rinaldo and all the agility Rossini's writing calls for in the roles of Rosina (*The Barber of Seville*), Cinderella, and the Italian girl in Algiers. Mozart's Cherubino (*Figaro*) and Zerlina (*Don Giovanni*), though well delineated, seem to restrict somewhat the artist's tempestuous leanings, which find proper release in cabalettas of Donizetti (*Anna Bolena* and *La Favorita*) and Bellini (*I Capuleti e I Montecchi*), where she is revealed as a dramatic mezzo in the grand manner. Kasarova's intonation is generally good, though her intense projection at times takes precedence over fine tuning and textual clarity. I applaud conductor Friedrich Haider for not following the practice of many of his colleagues, who give the Gluck *Orfeo ed Euridice* excerpt a revisionist jaunty tempo that contradicts the sense of Orfeo's heart-rending lament. *G.J.*

**JAMES LEVINE'S 25TH ANNIVERSARY OPERA GALA.**

Soloists: Metropolitan Opera Orchestra. James Levine cond. DEUTSCHE GRAMMOPHON 449 177 (72 min).

**Performance: Festive  
Recording: Very good**

More than 72 minutes of the gigantic 7-hour Metropolitan Opera gala honoring conductor James Levine — televised in full on PBS on April 27, 1996 — are captured here, all of it conducted by the jubi-

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# QUICK FIXES



**BACH: Trio Sonatas in G Major (BWV 1038 and 1039) and C Minor (BWV 1079); Partita in A Minor (BWV 1013); Sonata in A Major (BWV 1032).**

James Galway, Jeanne Galway (flutes); Monica Huggett (violin); Sarah Cunningham (viola da gamba); Phillip Moll (harpsichord). RCA VICTOR 68182 (65 min).

In his Bach series — this is Volume 2 — James Galway has lined himself up with the early-music movement, although his playing only fitfully shows the same freedom and panache that he brings to other music and that should certainly be part of any serious recreation of Baroque performance practice. The high point here is the great Trio Sonata from *A Musical Offering*, and Galway proves to be a fine team player in it. The chamber sound is sweet, although, inevitably, it mostly features the first flute. *E.S.*

**BEETHOVEN: Overtures.**

Chamber Orchestra of Europe, Nikolaus Harnoncourt cond. TELDEC 13140 (76 min). With this fine orchestra in its best form, Nikolaus Harnoncourt brings alertness, drama, and an unerring sense of proportion to the eight best-known of Beethoven's eleven overtures — *Coriolan*, *Egmont*, *Fidelio*, the three *Leonores*, *Prometheus*, and *The Ruins of Athens*. *R.F.*

**BOITO: Mefistofele.**

Samuel Ramey (Mefistofele), Michèle Cridler (Margherita/Elena), Vincenzo La Scala (Faust): La Scala Orchestra, Riccardo Muti cond. RCA VICTOR 68284 (141 min).

Although Samuel Ramey is still impressive in the title role of this potent opera, he has recorded it before (on Sony) with more stellar colleagues, and compared with that version — or the one led by Tullio Serafin on London with Cesare Siepi, Mario del Monaco, and Renata Tebaldi — this live recording from La Scala sounds embarrassingly provincial. *William Livingstone*

**CHABRIER: España; Suite Pastorale; Habanera; other works.**

Vienna Philharmonic, John Eliot Gardiner cond. DEUTSCHE GRAMMOPHON 447 751 (66 min).

John Eliot Gardiner, peerless interpreter of

the Baroque, continues to demonstrate his versatility, this time with French fluff from Emmanuel Chabrier and with surprising Viennese partnership. We get the ever-popular *España* plus the Suite Pastorale, the *Habanera*, the quasi-Berliozian-Wagnerian *Gwendoline* overture, the *Loyeuse Marche* (wonderfully played!), the *Fête Polonaise* from *Le Roi Malgré Lui*, and more, all with bright, full-bodied sonics. A delightful hour's listening. *D.H.*

**HERRMANN: The Film Scores.**

Los Angeles Philharmonic, Esa-Pekka Salonen cond. SONY 62700 (77 min).

Six suites, an overture, and a prelude drawn from the revolutionary film scores of Bernard Herrmann (1911-1975) are brilliantly played on this well-recorded, well-packed CD. But five of the eight scores represented, including the best of those done for Alfred Hitchcock plus *Fahrenheit 451*, were recently reissued on two London CD's in vivid late-1960's recordings conducted by Herrmann himself — a pretty hard act to follow! The prize item here is the vividly jazz-flavored *Night-Piece for Orchestra* drawn from the score for *Taxi Driver*. *D.H.*



**KODALY: Hary Janos Suite; Dances of Galanta; Peacock Variations.**

Atlanta Symphony, Yoel Levi cond. TELARC 80413 (69 min).

Yoel Levi and his fine-sounding orchestra go all-out for Kodaly and are particularly effective in the biggest piece here, the *Peacock Variations*. Still, Charles Dutoit's similar collection also includes the *Maroszek Dances*, and the older recordings by such conductors as Antal Dorati and Georg Solti, while less striking sonically, display a total identification with the idiom that provokes a deeper response. *R.F.*

**LIEBERSON: King Gesar.**

Omar Ebrahim (narrator): Yo-Yo Ma (cello); Emanuel Ax, Peter Serkin (pianos); ensemble, Peter Lieberson cond. SONY 57971 (55 min).

Peter Lieberson's *King Gesar* is an exhaustive — and exhausting — setting of Douglas Penick's rendering of a Tibetan epic. The words are set in a great rhythmic rush for speaking, occasionally singing, voice accompanied by a distinguished octet that is curiously reticent and only rarely gets to speak out on its own. Long before the finish, Lieberson runs out of musical and dramatic breath, leaving us lost in the battle haze. *E.S.*

lant and tireless maestro. Renée Fleming recaptures the magic of her exquisite "*Depuis le jour*" from Charpentier's *Louise* and later leads ethereally into the trio from Richard Strauss's *Rosenkavalier*, well assisted by Heidi Grant Murphy and Anne-Sophie von Otter. Ruth Ann Swenson brilliantly delivers Juliet's Waltz Song from Gounod's *Roméo et Juliette*. Roberto Alagna and Bryn Terfel bring dramatic vitality to the audience-pleasing duet from Bizet's *Pearl Fishers*, and the Watch Duet from Johann Strauss's *Die Fledermaus* comes off engagingly in the expert hands of Karita Mattila and Haakan Hagegaard.

Despite some tonal unsteadiness Deborah Voigt's "*Dich, teure Halle*" from Wagner's *Tannhäuser* is sterling, and Plácido Domingo and Samuel Ramey are still impressive in the first-act scene from Gounod's *Faust*, even if lacking their erstwhile vocal luster. Frederica von Stade's tipsy scene from Offenbach's *La Périchole* is exaggerated. In contrast, Ileana Cotrubas's delivery of the torrid "*Meine Lippen*" from Lehár's *Giuditta* is cautious but idiomatic. Dolora Zajic's "*O don fatale*" from Verdi's *Don Carlo* is commanding, crowned with exciting, if pitch-shy, top notes.

Birgit Nilsson's unique and affectionate Viking tribute (Brünnhilde's "Ho-jo-to-ho" from Wagner's *Die Walküre*) concludes the honors for the remarkable "Jimmy," as she calls him, whose work in the pit has brought out the best in the Met Orchestra, elevating it into the major leagues. A fine souvenir indeed. *G.J.*

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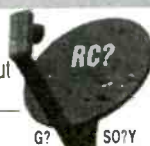
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# TIME DELAY

**30 YEARS AGO**

SPECIAL REPORT: THE TRANSISTOR REVOLUTION  
**HiFi/Stereo Review**  
1967 APRIL 1967  
 ST. CECILIA, PATRONESS OF MUSIC \* POP GOES PARIS \* BORODIN—THE SUNDAY COMPOSER



That's St. Cecilia, Patroness of Music, on the cover of our April 1967 issue, which recommended recordings of works in her honor by Purcell, Handel, Haydn, Gounod, and Britten. Cecilia was murdered in the third century for practicing Christianity, but she was not so easily dispatched. Musicologist H. C. Robbins Landon noted that, when she survived an attempt to either strangle or burn her, an executioner was called, but "after three hefty strokes of the ax, her head was still joined to her body, and she is reported to have lived for another three days."

"Special Report: Transistors 1967" predicted that in two or three years tube amps would likely disappear from the market. Two solid-state



**Switchcraft switcher, 1967**

receivers, Sherwood's S-2300 (\$200) and Heath's AR-15 kit (\$330), were featured in new products. as was Switchcraft's Sound Control Center (\$50) for selecting from eight speaker pairs. And Hirsch-Houck Laboratories tested Fisher's 700-T receiver (\$500), whose amp was "especially well suited to driving electrostatic speakers, which are anathema to many transistor amplifiers."

Reviewing Manfred Mann's "Pretty Flamingo" made Rex Reed long for the days "when I thought the worst thing that could ever happen to music was Guy Lombardo."



**20 YEARS AGO**

Blaupunkt's Berlin car radio (\$1,200), with its "cobra-head" control module, was in the "Sampler of Extreme Temptations" accompanying the April 1977 "Buying Guidelines for Car Stereo." Also tempting was Pioneer's TP-900 Supertuner. "Slowly," wrote Ivan Berger, "first with car amps and now with [the] Supertuner FM series (which lives up to its name),



**Blaupunkt car radio, 1977**

units are appearing whose specifications can be compared with those of home units."

New products included Audio Research's first solid-state gear, the SP-4 preamp (\$695) and D-100 power amp (\$895). In test reports, Audio Pulse's Model One digital time-delay system (\$650) impressed Hirsch-Houck Labs, as did Shure's M24H stereo/quad phono cartridge (\$75): "On the basis of performance alone, the M24H ranks very high; when value for the dollar is considered, it probably has no equal."

Music coverage ranged from Bernard Jacobson's "Making the Case for Elgar" to Lester Bangs's "How to Learn to Love Reggae." Among records cited as Best of the Month were the Eagles' "Hotel California" and Dietrich Fischer-Dieskau's recital of Wolf lieder on Deutsche Grammophon. And a photo report on STEREO REVIEW's party honoring the best of 1976, as chosen for our Record of the Year Awards, showed a copy of the magazine being shared by Patti Smith (Honorable Mention for "Horses") and Eubie Blake.

**10 YEARS AGO**

The April 1987 "Bulletin" was brimming with new formats. Philips planned to launch the CDV, JVC touted S-VHS,

**Patti meets Eubie, 1977**



and Aiwa announced it was shipping the first DAT deck. A feature article was devoted to the rise of yet another technology: surround sound.



American Acoustics' PSW200 glass-topped subwoofer (\$700) and Onkyo's TA-W460 double cassette deck (\$350) were among new products. In a special test, Julian Hirsch reviewed Bose's first Acousti-mass three-piece speaker system, the AM-5 (\$699), saying its sound had "an openness and breadth that must be heard to be believed."



**Onkyo cassette deck, 1987**

William Livingstone, passing the mantle of editor in chief to then managing editor Louise Boundas, offered these parting words: "If you read this magazine, you must be people who, like me, turn to music not just for entertainment but for contact with beauty, for spiritual nourishment from a higher power. May that Force be with you always."

—Ken Richardson

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