

Stereo Review

NOVEMBER 1996 • US \$3.50 • CANADA \$4.50 • U.K. £2.20

SURROUND POWER

A GUIDE TO MULTICHANNEL AMPS

HOW TO SET UP A DOLBY DIGITAL HOME THEATER

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CHOOSING THE RIGHT TAPE DECK FOR YOUR SYSTEM



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Dipole Radiator
Surround Speakers

Shielded, Two-Way
Main Speakers

Shielded, Low-Profile
Center Speaker



MovieWorks Is The Ideal Home Theater Sound System For Those Who Aren't Willing To Compromise. Order By Nov. 30th And Get \$100 Bonus Dollars!

We'll get right to the point. 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. It sounds great.

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 both music and movie soundtracks with outstanding realism.

The Main Speakers.

The left and right speakers in *MovieWorks* use a two-way, shielded design with a long-throw mid-range/mid-bass driver and a 1 3/4" direct radiator tweeter. They are acoustically similar to the satellite speakers in our acclaimed *Ensemble*® speaker system, which *Audio* 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 wide/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

"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

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 and Dolby Digital (AC3) systems.

About Cambridge SoundWorks.

Cambridge SoundWorks manufactures critically acclaimed speakers and music systems. We sell them factory-direct, so you can save hundreds of dollars. *Home Theater Technology*

says our speakers "sound much better than other systems – at half the price." *Inc.* magazine says, "Selling direct allows Cambridge SoundWorks to price speakers hundreds of dollars below the competition." If you'd like more information about our company and our products, call or write for our free 52-page catalog. It includes all our products, plus components from Pioneer, Sony, Harman Kardon and other top brands.

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, M3II, CS250S, PSW300)	NO	10"	125 WATTS	\$1,499
BOSTON ACOUSTICS (Micro90, 90X, 90C)	NO	8"	75 WATTS	\$1,399
KLIPSCH (KSS3, KSS2, KSS1)	NO	6.5"	50 WATTS	\$1,199

†Price includes \$100 Bonus Dollars good towards any product in the Cambridge SoundWorks catalog! Offer ends 11/30/96. Bonus Dollars must be used by 12/29/96.

The Powered Subwoofer.

For bass reproduction, we chose an amazing powered subwoofer. It uses a heavy-duty long-throw 12" woofer with a 140-watt amplifier for outstanding bass in music and soundtracks. In a comparison test, *Stereo Review* says it is, "clearly the best subwoofer of the pack...it blew them away." *Sound & Image* says, "Plain and simple, Cambridge SoundWorks' powered subwoofer is a winner, pounding out first-rate 108 SPL...a knockout. Bravo."

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

Stereo Review-9/96

\$100 Bonus Dollars & Satisfaction Guaranteed.

At \$1,299, we think *MovieWorks* is the ideal home theater sound system for people who aren't willing to compromise on performance. It's what we recommend to our relatives and close friends. As an introductory offer, *MovieWorks* comes with \$100 Bonus Dollars for use towards the purchase of anything in our 52-page catalog!

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CIRCLE NO. 6 ON READER SERVICE CARD

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ate your controller from any room in the house. Press an icon on the screen and you can do everything from adjusting the volume to setting digital delay. And only the choices you need appear. Because like all Stage 3 products, the TouchPanel puts the power over technology back where it belongs. In the hands of the people. For the dealer nearest you, please call 1-800-KENWOOD or check out our brand new web site at www.kenwoodusa.com.



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Vice President, Group Publisher
TONY CATALANO

Consumer Electronics Group Advertising
VP/Associate Publisher
Scott Constantine

Regional VP/Ad Director, East Coast:
Charles L. P. Watson, (212) 767-6038

Regional Account Managers, East Coast:
Christine B. Forhez, (212) 767-6025
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Midwest Advertising Manager:
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Robert Meth, (213) 954-4831

Western Advertising Manager:
Paula Mayeri, (213) 954-4830

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National Record Label Sales Representatives:
The Mitchell Advertising Group (MAG Inc.)
Mitch Herskowitz, (212) 490-1715
Steve Gross, (212) 490-1895

Assistant to the Publisher: Aline J. Pulley
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Classified Advertising: (800) 445-6066
Production Manager: Vicki L. Feinmel
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on the Studio/100

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Paradigm!”

— Andrew Marshall, Audio Ideas Guide
on the Studio/80, CC-450, ADP-450

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CIRCLE NO. 45 ON READER SERVICE CARD

LETTERS

Rectilinears

Julian Hirsch's "Technical Talk" in the September issue regarding the Rectilinear III speaker brought back fond memories. During the summer of 1969 I was a flight mechanic on a Navy aircraft that flew into Guantanamo Bay, Cuba, where I saw a pair of Rectilinear III speakers, still in their original cartons, in the base exchange. Recalling Mr. Hirsch's glowing review, I purchased them on the spot, \$424 for the pair. Getting my new speakers back to home base was the fun part. Crewmates helped me strap them into the bomb bay of the aircraft. For the next 10 hours of flight, I was worried sick that the bomb-bay door might open accidentally and let my speakers fall out.

Finally, I got them home safely, and I have been enjoying them for twenty-seven years. Not only are they great with music, but they are superb home-theater speakers.

JAMES A. PROVIDENCE
Virginia Beach, VA

I've enjoyed Julian Hirsch's articles for years, and it was particularly interesting to read his fond recollection of the old Rectilinear III speaker in "Loudspeakers Then and Now" (September "Technical Talk").

As the owner of a pair of these fine old speakers, I can attest to their excellent performance. I work as a production manager for three radio stations, and I hear high-quality audio from our professional studio monitors all day. When I come home and hear the Rectilinears, I am still amazed at their accuracy, transparency, and neutrality. Many modern home and professional speakers will outperform these Rectilinears, I'm sure, but, at least for now, I'm very satisfied.

WILLIAM K. JOHNSON
Elk Grove, CA

Rock Hall of Fame

I read with interest the article "Rockin' in Cleveland" in September. I believe the concept of a Rock and Roll Hall of Fame is a good one, allowing members of future generations to achieve a perspective on the musical customs of their forefathers and letting members of other cultures get a glimpse of the American musical landscape and its foundation. After reading the complete list of inductees, however, I found myself asking, where are the white women?

I am glad I have lived here in the U.S.A. for the last forty years, affording me the

memory of such famous musical talents as Linda Ronstadt, Carly Simon, and Joni Mitchell. It seems inconceivable to me, and suspiciously disingenuous on the part of the nominating board of the Rock Hall of Fame, that fewer than 10 percent of the entire inducted body are women, and fewer than 3 percent are white women. I think it is safe to assume that, at the very least, women are being held to a more stringent standard when considered for induction. It's too bad. I really would like to take the Hall of Fame seriously, but I can't.

NAME WITHHELD BY REQUEST
Bronx, NY

Joni Mitchell has just been elected. —Ed.

Costello v. Milano

Unlike Brett Milano, who reviewed Elvis Costello's "All This Useless Beauty" in September, many EC fans, including me, are impressed with the depth and energy of the performance on the new album. But who *does* warrant positive reviews from Mr. Milano? Def Leppard, Metallica, and Iggy Pop. I'm sure Mr. Milano is a young Gen X'er, like myself, but his train of musical

just listen

Life is stressful. You could spend a few thousand dollars rushing to a weekend getaway at a rejuvenating retreat. You could mortgage your home for one of those "quiet as a recording studio" motor cars you've seen on television. Or you can keep the family fortune and relax in the sanctity of your own home with a pair of Sennheiser headphones. Discover the ultimate in surround sound... at a budget you can easily afford.

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There's more to a good subwoofer than thunderous, wall-rattling bass. Even a small percentage of distortion can take all the clarity out of the signal, leaving you with a muddy, undefined sound. It's thunder without the lightning. And who wants that?

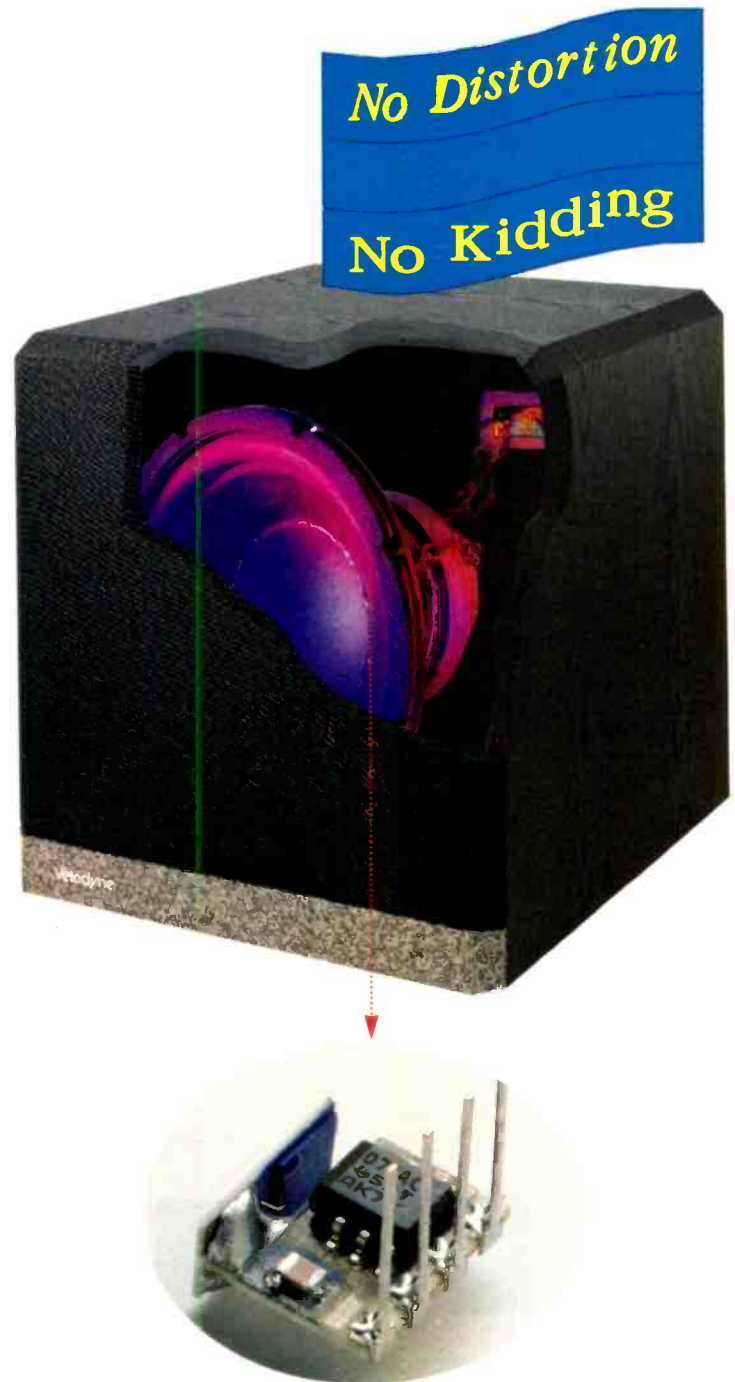
You'll hear all the impact *and* all the fidelity from Velodyne's High Gain Servo subwoofers. It's thanks to the accelerometer. This revolutionary device, custom-designed by Velodyne, is mounted directly on the speaker's voice coil, where it takes continuous motion measurements and feeds them to a comparator circuit. Any differences between the measured motion and the source signal represent distortion.

The Velodyne system corrects those differences approximately 3500 times every second for a precise match with the input signal. The resulting sound is clean, powerful and, at less than 1% THD, virtually without distortion — a combination no other subwoofer has been able to achieve.

Why let distortion get between you and the power and definition you expect in a subwoofer? Audition a Velodyne speaker system, including an F-Series sub, today. Call 1-800-VELODYNE for the authorized dealer in your area.

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development seems to have derailed back when Kiss ruled our musical landscape!

TOM SOSSONG
Drexel Hill, PA

CD Reissue Gripes

Since 1984, when I bought my first CD player, I have been trying to obtain all my favorite music on CD. Finding the oldies I want has been very satisfying, but some things record companies do frustrate me:

1. The CD reissue of a "Greatest Hits" or anthology album often does not include all the songs that the LP had.

2. The reissue producers often change the order of songs. Why don't they just leave them alone? Or else put them in chronological order if they have to tinker?

3. I like "bonus tracks" on a CD version, but not mindless chatter from a recording session. "rough" versions of songs, or versions the artists did not want released. And it's great to include a single from the time

of the album release, but why not the B side of the single as well?

4. A lot of oldies CD's are packaged to look like the original albums but contain live versions of the same songs that don't come close to sounding like the studio versions. Or they may be new recordings by some of the original band members.

5. The sound quality of CD reissues is often poor. If the sound of a reissue isn't at least as good as that of the original release, the package should say so and explain why.

AL LOFTIN
Alexandria, VA

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CIRCLE NO. 17 ON READER SERVICE CARD

Tandberg U.S.A.

August "Bulletin" noted that Tandberg is returning to the U.S., where it will be represented by Jason Scott Distributing of Wyndmoor, PA. I have not been able to obtain the phone number or address of this company. Please help.

PHIL PECHARICH
Clarkdale, AZ

As indicated in October "New Products," the address is: Tandberg, Dept. SR, Jason Scott Distributing, 8816 Patton Rd., Wyndmoor, PA 19038; phone, 1-800-359-9154.

Save Your Ears

My compliments to STEREO REVIEW and Tom Nousaine for the informative article on hearing conservation in July ("What?"). As a practicing school audiologist for more than twenty-four years, I am confronted with hearing losses on a daily basis. Recreational noise exposure is rampant — and largely ignored since it usually isn't painful and the resulting hearing loss occurs slowly over time. In addition to *tinnitus* (constant ear ringing), another common characteristic of sensorineural hearing loss is *recruitment*, which is a hypersensitivity to loudness once you exceed your threshold of hearing.

The primary offenders are target shooting, firecrackers, motorcycles, airplanes, snowmobiles, jet skis, leaf/grass blowers, rock concerts, and loud music from powerful car and home systems as well as the individual earphones attached to radio/CD/cassette players, which can easily exceed the danger level of 90 dB. If you love music and communication as much as I do, please use ear protection during these recreational activities. Be kind to your ears and your neighbors by enjoying music at reasonable and safe levels.

If you have any questions regarding hearing evaluation, monitoring, and ear protection, confer with a professional audiologist. While noise-induced hearing loss is not medically treatable or reversible, it is preventable.

MORITZ L. SCHULTZ
West Palm Beach, FL

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.

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NEW PRODUCTS



▲ ONKYO

Onkyo's TX-SV535 A/V receiver has a 24-bit Motorola DSP chip to digitally process Dolby Pro Logic and four other surround modes. Rated to deliver 65 watts each to the left, center, and right channels and 25 watts each to the rear surrounds, it also has preamp outputs for all channels

plus a subwoofer. Multiroom and multisource functions are provided. An Intelligent Power Management system switches on the receiver and selects the Video 1 input when the TV is turned on. Price: \$600. Onkyo, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

▼ SONY

Sony's MD Bundle3 package is designed to get you off and running with the digital MiniDisc (MD). The MDS-JE500 home recorder offers five edit functions for dubbing from CD, DSS, or other sources, as well as four play modes (continue, shuffle, program, and repeat), twenty-five-track sequencing, and a Smart Space feature that limits "dead air" between songs. The

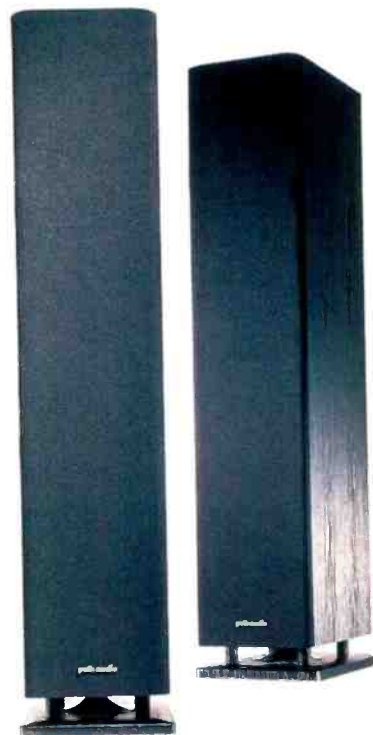
MZ-E40 portable MD player, measuring just slightly larger than an audio cassette, features a 10-second anti-shock buffer memory, bass boost, and a vertical design with controls and LCD screen on top of the unit. A pair of 60-minute MDW-60A blank MD's are also provided (74-minute MD's are available separately). Price: \$599. Sony, Dept. SR, One Sony Dr., Park Ridge, NJ 07656.



▲ POLK AUDIO ▶

The Polk RT20 speaker is a 46½-inch tower with a 1-inch trillaminate dome tweeter, a 6½-inch midrange, and a pair of 8-inch woofers powered by a built-in 100-watt amplifier. All drivers use Dynamic Balance technology, which is said to eliminate cone resonance. The woofers are housed in a ported enclosure, while the midrange and tweeter are sealed. Rated frequency response is 35 Hz to 20 kHz -3 dB, sensitivity 89 dB, and impedance 8 ohms. Price: \$1,998 a pair. Polk Audio, Dept. SR, 5601 Metro Dr., Baltimore, MD 21215.

• Circle 120 on reader service card



▲ MIRAGE

The Mirage MC-3 center-channel speaker is designed to mate sonically and cosmetically with most Mirage models serving left- and right-channel duty. The magnetically shielded MC-3 has two 5½-inch polypropylene woofers flanking a 1-inch ferrofluid-cooled titanium-dome tweeter, all in a 7 x 21½ x 10⅞-inch front-vented cabinet finished

in matte black. Its gold-plated terminals permit biwiring or biamping. Frequency response is given as 45 Hz to 22 kHz ±3 dB, with usable bass cutting off (-10 dB) at 35 Hz. Sensitivity is 90 dB, impedance 8 ohms. Price: \$330. Mirage, Dept. SR, Audio Products International, 3641 McNicoll Ave., Scarborough, Ontario M1X 1G5.

• Circle 121 on reader service card

NEW PRODUCTS

◀ AES

The AES-225S in-wall speaker has a 1-inch ferrofluid-cooled soft-dome tweeter with a neodymium magnet and a 6½-inch polypropylene woofer with a rubber surround. The tweeter swivels to allow adjustment of tweeter output by up to 15°, and a white, paintable steel grille is supplied. Bandwidth is given as 40 Hz to 22.5 kHz, sensitivity as 90 dB. Dimensions are 8 x 11¾ inches, with a 3½-inch mounting depth. Price: \$180 each. AES, Dept. SR, 22 Parsons Dr., Swampscott, MA 01907.

• Circle 122 on reader service card



▼ WOODS

Thunder speaker wire from Woods is a flexible oxygen-free copper (OFC) cable. In its two-conductor version, it's available in 16 gauge in a 50-foot spool, or in 14 or 12 gauge in 50- or 100-foot spools. For in-wall use, 500-foot spools of 16-gauge wire come with two or

four conductors. Gold-plated pins, banana plugs, and spade connectors are available. Price: wire, \$20 to \$207; plugs/connectors, \$6.99 a pair; pins, \$9.99 for four. Woods, Dept. SR, 510 Third Ave. S.W., Carmel, IN 46032.

• Circle 123 on reader service card



◀ FISHER

Fisher's DAC-1560 Studio 150 CD changer uses a bidirectional radial transport that is said to access any of 150 CD's in about the same time as most carousel changers. Discs may be organized and played by category (fourteen preset or up to 150 user-defined), artist, or disc title. Data is automatically alphabetized,

and the Studio 150 can be programmed via its remote control and fluorescent display panel. As many as eighty tracks can be sequenced, and repeat and intro-scan modes are also provided. Price: \$350. Fisher, Dept. SR, 21350 Lassen St., Chatsworth, CA 91311.

• Circle 124 on reader service card



▼ JBL

To mark its 50th anniversary, JBL has reissued its classic Century speaker as the Century Gold. It has a 12-inch paper cone, a 5-inch Kevlar midrange, and a 1-inch titanium tweeter. Its battery-powered crossover is

said to tame phase distortion. Standing 26½ inches tall, the speaker is finished in mahogany veneer. Price: \$5,000 a pair. JBL, Dept. SR, 80 Crossways Park W., Woodbury, NY 11797.

• Circle 125 on reader service card



BILLY BAGS ▶

The Pro-Stand PRG-34 A/V rack from Billy Bags handles four components plus a TV with up to a 35-inch screen. It's made from tubular steel with a wrinkled black finish; the charcoal-colored shelves are adjustable, and the columns may be filled with sand or outfitted with optional isolation feet or casters. The TV platform swivels 360° for easy viewing. Dimensions are 43 x 21 x 34 inches, weight 102 pounds. Price: \$1,578. Optional hanging Audio Duster (shown), \$30. Billy Bags, Dept. SR, 4147 Transport St., Ventura, CA 93003.

• Circle 126 on reader service card



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From bookshelf to 3-way floorstander, the entire range is magnetically shielded for Home Theatre use. And because aesthetics are integral to good design, the two largest models incorporate KEF's new 'racetrack' bass unit. With the performance of an 8 inch driver in the space of a 6 inch, it preserves the slim elegant Q Series design.

With the new Q Series, the competition have been decisively out-classed. The difference is clear.

CIRCLE NO. 34 ON READER SERVICE CARD

Q
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NEW PRODUCTS



▲ YAMAHA

Yamaha's RX-V990 A/V receiver eclipses its predecessor, the RX-V890, by adding five rear RCA inputs for upgrading to 5.1-channel surround. It incorporates Yamaha's Cinema DSP enhancement of Dolby Pro Logic, as well as a variety of music sound-field modes based on acoustics of actual venues. Power

is rated at 100 watts each for the left, center, and right channels and 25 watts each for the rear surrounds. Four audio-only inputs (including phono) and four A/V inputs (all S-video-compatible) are provided. Price: \$999. Yamaha, 6660 Orangethorpe Ave., Buena Park, CA 90620.

• Circle 127 on reader service card

DIAMOND AUDIO ▶

Diamond Audio's S2 HPM-4100 computer/hi-fi speaker system has a 16-inch-tall subwoofer with 8-inch driver and two 8½-inch-tall satellites with 4½-inch paper woofers and poly-aluminum dome tweeters. The wired preamp module has switchable A/B inputs

and "3DSP" sound enhancement. The amp built into the sub is rated at 25 watts x 2 for the satellites and 50 watts for the sub. Price: \$599. Diamond Audio Technology, Dept. SR, 3030 Pennsylvania Ave., Santa Monica, CA 90404.

• Circle 129 on reader service card

◀ KINETIC AUDIO

The Labyrinth four-way speaker from Kinetic Audio has a Tapered Acoustical Trapezoidal Line (TATL) enclosure that's said to improve performance on bass transients. It uses a 12-inch plastic woofer, a 6½-inch plastic mid/woofer, a 2-inch dome mid/tweeter, and a 1⅞-inch dome tweeter. Standing 48 inches tall, the speaker comes finished in oak or walnut veneer; rosewood is optional at extra cost. Frequency response is given as 14 Hz to 22 kHz ±2.5 dB, sensitivity as 91 dB. Price: \$6,500 a pair. Kinetic Audio, Dept. SR, P.O. Box 215, Arlington Heights, IL 60006.

• Circle 130 on reader service card



▲ HIFONICS

The Hifonics Zeus stereo car amplifier is from the Generation X line, which features four interchangeable end-panel/input modules, including a three-band parametric equalizer, a combined two-way crossover with parametric EQ (shown), and both subwoofer and four-channel crossovers. Power is

rated at 325 watts per channel into 4 ohms, and Hifonics's Parallel Output System circuitry allows the Zeus to drive a 1-ohm mono load. Price: amp, \$899; crossover/EQ module, \$150. Hifonics, Dept. SR, Audio Products, Inc., 2510 Commonwealth Ave., North Chicago, IL 60064.

• Circle 128 on reader service card



▼ FULTRON

The detachable face on Fultron's CDP-1 car CD receiver uses an infrared signal to communicate with the deck, eliminating contact pins that can become fouled by dirt. The CDP-1 delivers 7 watts x 2 to the front speakers and 25 watts x 2 to the rear;

RCA preamp outputs allow outboard amplification as well. Other features include eighteen FM and six AM station presets and sixteen-track CD programmability. Price: \$399. Fultron, Dept. SR, 122 Gayoso St., Memphis, TN 38103.

• Circle 131 on reader service card



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Stereo Review



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Home Theater magazine

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There are lots of stereo stores that can sell you a cheap Pro Logic sound system – or sell you a receiver with “free” home theater speakers.

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Just a few years ago, this receiver would have cost hundreds more. It features:

- Even power output – 60 watts each to left, center, right & surround channels.
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- 5 audio inputs, 1 video input & 1 video output – the heart of an A/V system.
- A system remote control.

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The Cambridge SoundWorks’ Ensemble IV Home Theater system was designed by Audio Hall of Fame member Henry Kloss (founder of AR, KJH & Advent). It consists of 5 magnetically shielded satellite speakers and a compact subwoofer. It has a natural, wide-range, accurate sound with very smooth octave-to-octave tonal balance and precise stereo imaging. And it will fit into any room.

“Ensemble IV produces a level of sound quality that is so much bigger and better than what you’d expect from such a tiny, inexpensive system that it’s almost ridiculous. There’s a coherence and rightness to the sound that we just haven’t heard from anything this affordable. In fact, we’ve heard far more expensive home theater speakers that don’t hold a candle to this rig.”
Home Theater Technology

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▼ CHIRO BY KINERGETICS

Kinergetics's Chiro C-800 THX-certified surround processor/preamp/tuner includes Dolby Pro Logic and THX Home Cinema decoding and can handle Dolby Digital (AC-3) processing with the outboard Chiro C-5.1 decoder. The C-800 provides dual-zone/multisource switching for nine audio and five video sources

(two with S-video connections), an audio tape loop, twenty-preset AM/FM tuning, and controls for room lighting, projection-screen operation, and other remote functions. Price: \$2,198; C-5.1 decoder, \$1,298. Kinergetics Research, Dept. SR, 4260 Charter St., Vernon, CA 90058.

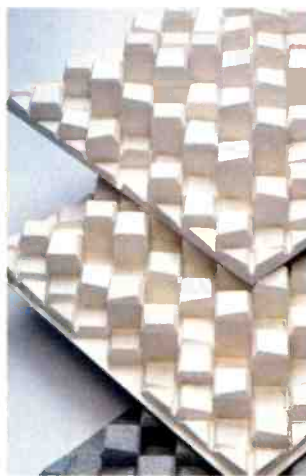
• Circle 133 on reader service card



SDG ►

The Model C Art Diffusor from SDG is a thermoplastic panel with wells that diffuse sound waves. Treating a ceiling with the paintable, 2 x 2-foot panels is said to increase sound clarity and enhance stereo imaging. Flanges permit panels to be hung on a standard T-bar ceiling frame. Price: \$130 each. Systems Development Group, Dept. SR, 5744 Industry Lane, Suite J, Frederick, MD 21701.

• Circle 135 on reader service card



ALCHEMIST ►

The Axiom APD26A integrated stereo amplifier from the British manufacturer Alchemist is rated to deliver 30 watts per channel into 8 ohms with 0.15 percent distortion. Six line-level inputs accommodate audio and video sources, and one tape loop is provided. The 18¼-inch-

wide chassis is finished off with a faceplate of brushed aluminum with gold-plated details. Price: \$684. Alchemist, distributed by Royal Music Imports, Dept. SR, 308 W. 104th St., New York, NY 10025; phone, 212-666-7788.

• Circle 137 on reader service card



▲ BOSTON ACOUSTICS

The CR400 powered subwoofer from Boston Acoustics is part of the company's Compact Reference series. The approximately 15-inch cube, finished in black ash vinyl, holds an 8-inch long-throw woofer in a vented chamber and a high-current 75-watt amplifier. Line-

level and speaker-level inputs, an adjustable (50- to 150-Hz) low-pass filter, a polarity switch, and automatic on/off switching are provided. Low-frequency limit is given as 35 Hz. Price: \$399. Boston Acoustics, Dept. SR, P.O. Box 6015, Peabody, MA 01960.

• Circle 134 on reader service card



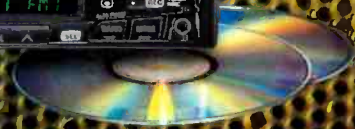
▲ SHARP

Sharp's MD-R1 MiniDisc record/play deck allows easy dubbing of CD's. Features include a synchronized recording circuit that detects incoming audio signals and automatically begins recording, four edit functions (move, erase, divide, and combine), 100-character

alphanumeric titling, twenty-track sequenced or random playback, a jog-dial control, and an optical digital input. Just 10% inches wide, the MD-R1 is designed to mate with minicomponents. Price: \$700. Sharp, Dept. SR, Sharp Plaza, Mahwah, NJ 07430.

• Circle 136 on reader service card

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— VS —

COMPONENTS

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but which is best
for you?*

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By an integrated system we refer to one in which the electronics and the speakers are engineered together and sold as a unit. If such a system is properly designed it can always outperform a system built from separate components.

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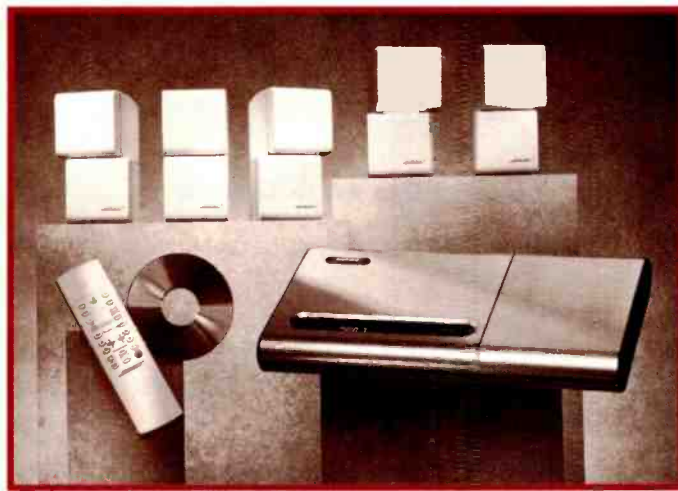
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If you already own a home theater system with separate components and are looking to improve the sound without replacing all your equipment, we now offer the new Acoustimass 10 home theater speaker system specifically engineered for this purpose.

The key to the performance is Acoustimass speaker technology. Recently there are visual copies of the Acoustimass module called ‘subwoofers.’ None of them are similar to Acoustimass modules on the inside and none have the performance. Be sure to look for the Acoustimass label on the speakers you purchase.

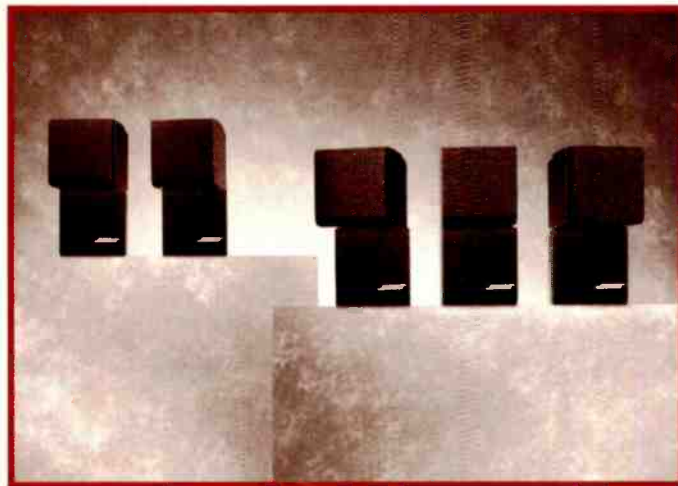
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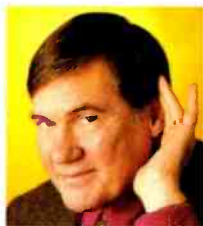
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CIRCLE NO. 70 ON READER SERVICE CARD



AUDIO Q & A

IAN G. MASTERS

Separates vs. Receivers

Q I want to upgrade my ancient system, and I've heard that separate components are better than receivers. Other than the number of components and wires, what are the advantages and disadvantages of separates compared with receivers?

B. ERIC JOHNSON
Auburn, AL

A It's a question almost as old as audio itself. Combined components — receivers and such — do offer economies in terms of money, ease of setup, and space occupied by the equipment. The downside is that you have to take what the package offers. If you want more power, say, you will probably get a few more features along with it that you might not need but will have to pay for. Separate components let you customize your system to a greater degree, and they make later upgrading much simpler. But the initial costs are usually higher. On the other hand, there's such a wide variety of equipment available today, you may well find a combined component that does exactly what you need, with no fat. In that case, you're home free. Although purists may argue the point, I don't believe you have to sacrifice performance quality for convenience.

Fading Stereo

Q I recently rented a videocassette of a popular movie, but when I watched it, I noticed that the stereo indicator on my hi-fi VCR was on only some of the time and that the stereo signal faded in and out. When it was gone, a fuzzy sound came out of only the front speakers. Should I have my VCR checked, or is the problem the result of tape wear caused by numerous rentals?

IVAN IRAD HODGE
West Point, VA

A The problem may well be wear on the tape, but it may also be aggravated by oxide buildup on your VCR heads, so a cleaning could improve the situation. That normally doesn't require a visit to the repair shop, however; there are lots of head-cleaning kits available.

To understand what's happening, you must remember that almost all videotapes these days contain two soundtracks with essentially the same material but with very different quality. The stereo hi-fi soundtrack is recorded and picked up by special heads on the spinning head drum, and it comes fairly close to digital audio in terms of sound quality. For compatibility with older machines that lack hi-fi sound, however,

there is also a linear mono audio track recorded along the edge of the tape.

A hi-fi VCR will always default to the hi-fi track; if it doesn't find one, it switches to the low-quality linear track. In your case, the hi-fi signal is varying enough in level to drop below the VCR's capture threshold, and the deck is switching to the linear track and back again. Not only do you notice a severe drop in fidelity and an increase in noise (your "fuzzy sound"), but the mono signal causes the surround sound to collapse. The phenomenon is quite common — and very annoying — but it generally does not signify that there's anything wrong with your equipment.

One Speaker Set, Two Uses

Q I have both a stereo receiver and a set of separate components, including a Dolby Pro Logic decoder. I would like to use the receiver for music and the separates for home theater, but I would like to use the same speakers in both cases. Is that possible without going to a great deal of expense?

JAMES C. RALSTON
East Orange, NJ

A It can be done inexpensively by adding a double-pole/double-throw switch between the output terminals of the amplifiers and the speakers, to select one amp or the other. It's important that you prevent both amp output sections from being connected to the speakers at the same time, however, as this could damage the amps. For that reason, not only will you need the switch, but it must be a "break-before-make" type, which breaks one connection before making the other. Such switches are available at Radio Shack and other electronics parts stores, but unless you're sure you have the right type of switch, don't take a chance.

TV/CD Mystery

Q I have cable TV, and it seems to be affecting my CD player. When the cable is hooked up, certain discs hesitate before they play or when I try to track forward or backward, and then there's an audible scratching sound. If I disconnect the cable from the wall or from my A/V system, everything's fine. The cable is attached to my VCR's antenna input, and the VCR's RF output to the TV's antenna terminal. The VCR's audio line output is connected to the receiver's A/V input, and the CD player to the CD input. The receiver's TV monitor output is connected to the TV's video input. I've talked to the cable company and even

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tried an attenuator in the cable line, but nothing works. Is there something else I can do to solve this problem?

WAYNE HOLLINGSHEAD
Salt Lake City, UT

A This is a strange problem, and I can only speculate as to what's going on. It seems you have two independent connections between your television and the other components: the RF cable from the VCR to the TV's antenna terminal, and the video cable from the receiver to the TV. This setup might be causing a ground loop in the system, and while that usually leads to hum problems, there's an outside chance that it is having some effect on the control mechanism in your CD player. Try unhooking one of these signal paths and see whether that clears things up. If so, I'd suggest ditching the RF connection and simply routing the VCR's line outputs through the receiver to the TV using the line-level connections you already have.

Discrete Outputs

Q I've heard salespeople tout the advantages of discrete output devices in some equipment. What are they talking about, and what are the sonic advantages, if any?

DAVID GONIGAM
St. Petersburg, FL

A Many inexpensive audio components have amplifier output stages consisting of a single integrated circuit rather than separate (discrete) transistors. This is an excellent way to keep costs down, but it limits the flexibility available to the audio designer. In particular, IC outputs usually cannot be used in amplifiers designed for high power output or high current capability. So long as those limits are not exceeded, however, you are unlikely to hear any difference between discrete and IC outputs.

Disappearing Dialogue

Q My surround-sound receiver is about six years old and has no provision for a center-channel speaker. I'm happy with what I have, but I have found when listening to movies that when the dialogue is at an acceptable level, the music and effects are way too loud. I end up continually raising and lowering the volume to compensate for the difference. Is there a simple solution to this problem?

MICHAEL PATINELLA
Glendale, AZ

A With a four-speaker surround system — which is the same as the "phantom" center-channel mode in Dolby Pro Logic — the dialogue and front effects are reproduced by the same speakers, so such level imbalances should not be a problem. I suspect that the culprit here is the spectral balance of your speakers. If they exhibit a significant sag in the midrange portion of their frequency response, then that would affect voices, which are mainly midrange, more than broadband music and effects. If that's the case, some judicious tweaking with a

graphic equalizer might solve the problem. The alternative is to try new speakers with flatter frequency response.

Melting CD's?

Q Years ago, I foolishly left a vinyl LP in my car on a hot, sunny day. When I pulled it from the sleeve later, it resembled a Dali watch. I know CD's are made of tougher stuff, but I am concerned about the effect temperature extremes might have on the discs. Is there the remotest chance of shortening their lives? If so, should I stick with cassettes?

DAVID ENGLISH
West Somerville, MA

A You can roast a cassette fairly easily as well, though perhaps not with the same dramatic visual effect as with an LP. Plastic is, well, plastic — capable of being molded and otherwise formed and deformed. The polycarbonates and other space-age materials used in CD's are pretty resistant to the effects of temperature, but I would not advise leaving them on the dashboard in the summer sun.

I've never had a problem with CD's affected by the environment as long as I take rudimentary precautions. I put them in the shade (under a seat is good). I don't leave them in the car overnight in winter, and I let them warm up before playing them. And I handle them as little as possible in hot weather, not because of their vulnerability but to keep the perspiration and grease from my hands off them. Frankly, I don't know that such care is absolutely necessary, but I don't know that it's not, either.

Surrounded by Confusion

Q Some VHS tapes claim to be recorded in Dolby Surround, while others claim Dolby Stereo. I thought most tapes made nowadays were recorded in Dolby Pro Logic. Why the difference?

JIM BUYNO
Tupelo, MS

A It's a semantic difference rather than a technical one. When movies are encoded in surround sound for theatrical release, the process is called Dolby Stereo, and this phrase often turns up on videocassette packaging, which just reproduces the original movie credits. When Dolby Stereo soundtracks are transferred to videotape or laserdisc for home use, the term Dolby Surround is used, and this often (but not always) replaces the theatrical term on videotapes and laserdiscs; either way, the two are identical. Dolby Pro Logic is a decoding technique that extracts a center channel from in-phase material that exists in both of the stereo channels at the same level and a surround channel (usually reproduced by two speakers) from information that is out of phase.

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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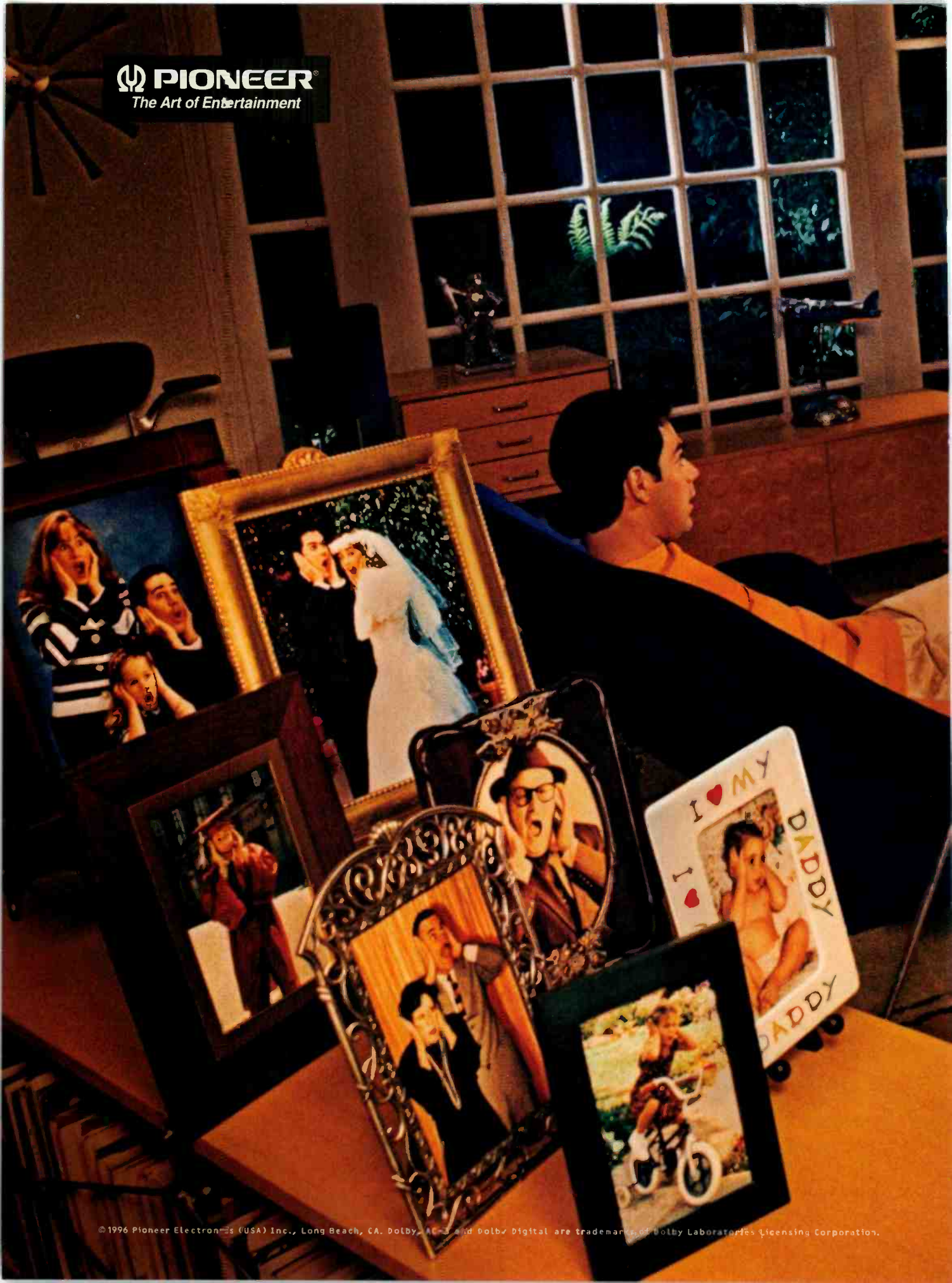
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TECHNICAL TALK

JULIAN HIRSCH

The Audio Tower of Babel

Although I rarely refer to the Bible in relation to the world of hi-fi, I find a disturbing parallel between some current trends in hi-fi product design and the Biblical tale of the Tower of Babel. In that instance, a people became so impressed with their talents as builders that they attempted to build a tower higher than any previous man-made structure. The Lord punished them for their overweening pride by replacing their common language with a multitude of tongues so that they could no longer communicate, effectively shutting down their construction project.

What has this to do with hi-fi or stereo? I regret to say that I see a parallel situation in the ongoing evolution of home-theater electronics. There seems to be a trend toward making A/V receivers (especially top-of-the-line models) so complex and unintuitive to operate that I don't see how a nontechnical person could possibly use more than a small fraction of their capabilities.

While I doubt that the audio industry faces a divine intervention as drastic as the one that was applied to those early builders (such as, for example, having all connectors suddenly becoming incompatible with their mating parts, or all display panels blanking out), I think that a real price is being exacted in the form of the potential exclusion of a sizable segment of the buying public from experiencing the true potential of the expanding world of home theater.

It has always been relatively easy to install and use most conventional hi-fi components, and for decades their performance improved as their cost decreased. Let's take a look at how things used to be for comparison with where the current trend may be taking us.

In the early days of consumer hi-fi, the need for standardization of signal connectors was recognized and acted upon. I do not know who first decided to use the so-called RCA (phono) plug/jack combination for signal connections, but it was used in the early 1940's and survives to this day. For convenience, low cost, and reliability, the RCA-type connector has yet to be surpassed. In the late 1950's, when I was working for a major manufac-

turer of spectrum analyzers, we found that the lowly phono plug/jack combination was a fully functional and reliable connector for radio frequencies up to the range of several hundred megahertz (the intermediate frequency of our microwave spectrum analyzers, which sold for many thousands of dollars back then). The connectors cost pennies, compared to many dollars for precision gold-plated military connectors that were no more effective or reliable in that application.

The lesson of such experience for a practical engineer — it stayed with me during my twenty-five active years in the profession, and still does — was that the least expensive way of solving a design problem generally results in the most cost-effective product. And, all else being equal, such products have a better chance to be successful in the marketplace.

**Many of today's deluxe
A/V receivers have an
excess of arcane functions
and idiosyncratically
labeled controls.**

Suppose that the signal and AC power connectors of today's audio components were designed simply to suit their designers, without regard to the mating connectors they would have to match in a real installation. Can you imagine the bedlam and confusion that would result? Would you buy such a system? Would anyone?

Fortunately, mating connectors is not yet a significant problem. The same cannot be said, however, for the control features of many full-featured, deluxe A/V receivers. Their functions are frequently arcane, and their markings may convey little understanding of a control's actual purpose.

Suppose that conventional stereo receiver controls were marked according to the whim or preference of their designers. We might find one knob marked "Acoustic Sound Pressure Modifier," another marked "Spatial Emphasis Adjustment,"

and a large knob identified as a "Complex Audio Program Selector." Even worse, nowadays they probably would be abbreviated to their initials, becoming ASPM, SEA, and CAPS, respectively.

Do you think that such a practice, resulting in wildly different labels on each company's products, would be compatible with creating a successful and growing industry? Wouldn't it make more sense to identify the controls, as they are on most stereo receivers, in such easily understood terms as volume, balance, and input? Suppose that, in addition to idiosyncratic labeling of the main controls, the component's black front panel was studded with a large number of small black pushbuttons also marked with cryptic acronyms, possibly in a barely contrasting color such as gray. What are the odds on your being able to enjoy that component and make effective use of all its features? Pretty slim, in my judgment. Yet that is a fair representation of my personal reaction to several deluxe A/V receivers I have tried to use in the past few months.

What about my own favorite advice to people having difficulty in using a fairly complex piece of home electronics — "When all else fails, read the instructions!" I must confess that I don't always follow my own advice in that department. After using and testing a good number of basically similar products, I assume that they will probably be more alike than different, and that has been the case with conventional stereo receivers.

Unfortunately, the trend I see in A/V receivers, especially at the upper end of the price range, is to throw that rule out the window. These components are so complex that each must be viewed as a unique device, sufficiently unlike otherwise comparable products that even if you are quite familiar with Product A, you'll have little chance of using Product B or Product C without thorough examination of the manual and plenty of hands-on practice. Yes, read the instructions, but be prepared for some heavy studying. Some of these new receivers are sufficiently unlike any stereo receivers as to demand a fresh approach to using their myriad features. Nevertheless, if a deluxe home theater is your goal, the reward may well be worth the effort.

Still, I can't believe that *all* of the complication is really necessary. Surely the ingenuity that went into the creation of these amazing products (and "amazing" is a mild adjective for some of them!) could make them easier to use without loss of essential performance.

I firmly believe that goal is achievable without divine intervention. And everyone — manufacturers, dealers, and consumers — would benefit from a more rational approach to this increasingly popular product category. □

Remember your first stereo?

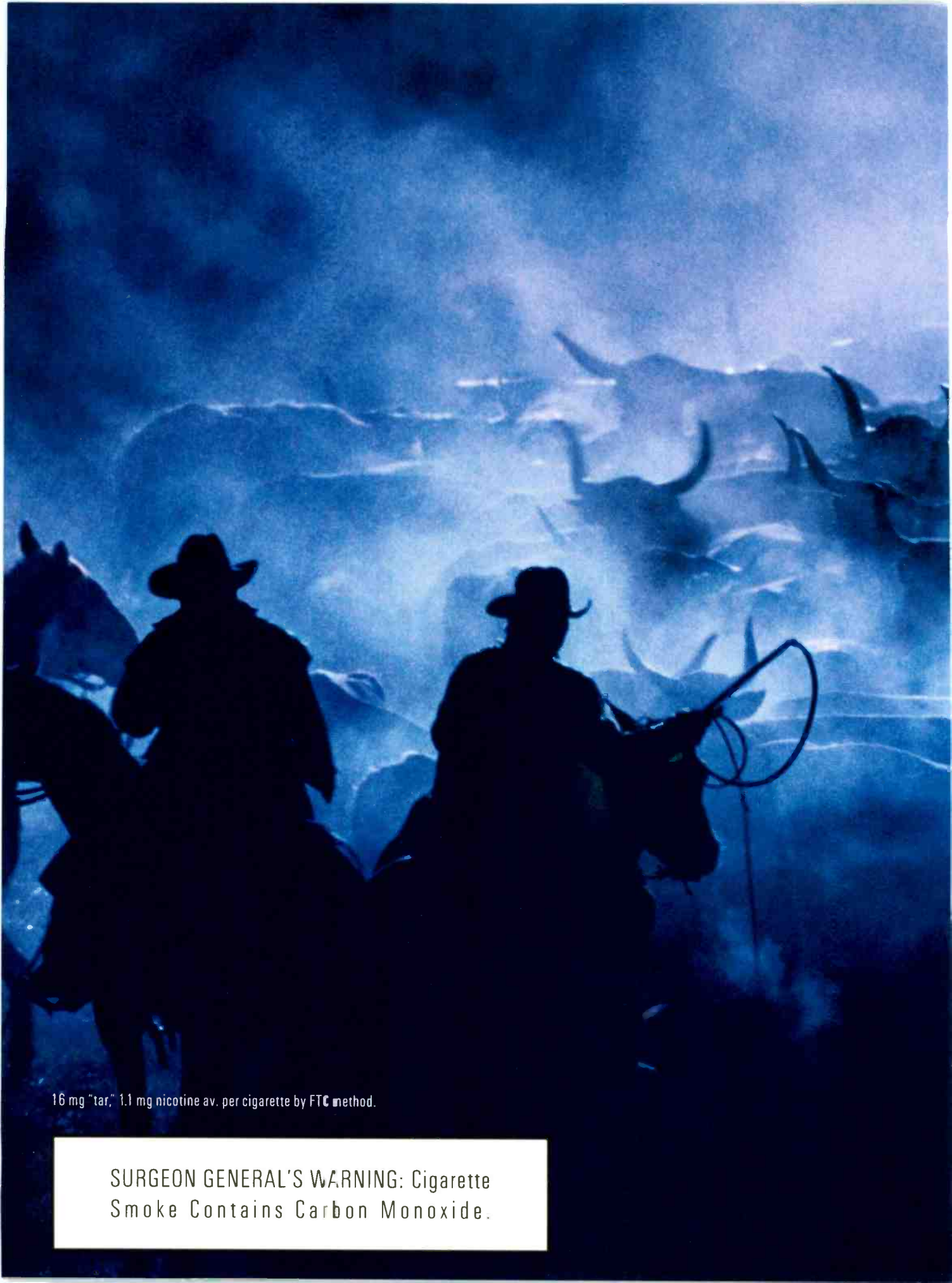


It came wedged between styrofoam, and produced that most wondrous of effects — a left and right channel. Suddenly your favorite songs sounded like music, and not the intercom system on a WWII submarine. You've come a long way in your appreciation of audio since then. All the way to NHT. We create some of the industry's most celebrated products, including the Model 2.5. It features components and ideas from our acclaimed bookshelf speakers, together with a built-in subwoofer, producing the clarity and imaging of the finest 2-way designs with the dynamic range of much larger systems. We're able to design products such as this because, like you, we've never lost our love for sound.



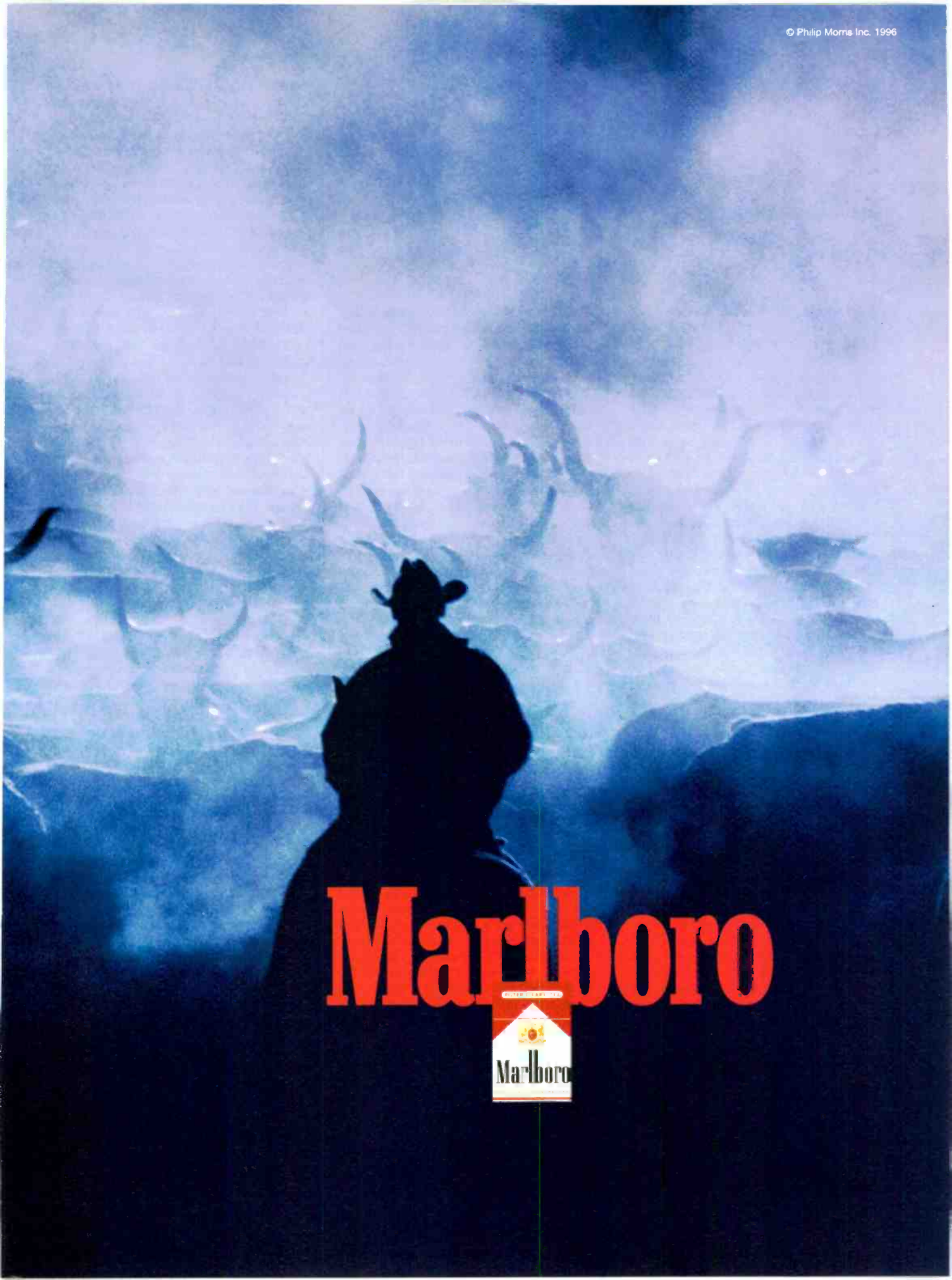
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SURGEON GENERAL'S WARNING: Cigarette
Smoke Contains Carbon Monoxide.



Marlboro





SIGNALS

KEN C. POHLMANN

Prime Cut

Last month I plunged STEREO REVIEW readers into the depths of despair by describing some of the awful things that can happen to a recording on its way to your CD player. For example, recording studios are fabulously complicated environments filled with esoteric equipment and great adventure. One false move, and noise and distortion can be irrevocably added to a recording. Sometimes it's the fault of the equipment; some professional gear is stuffed with the same electrical parts you'll find in boomboxes. Likewise, most CD pressing plants are expertly run, but a few are shops of horror, and in any case, when you're cranking out a couple of million discs every week, quantity occasionally triumphs over quality. The point is, your playback system is a minority player in a long chain. It's the upstream processing that largely determines what you hear. And, as I said last month, too many recordings are like hot dogs: You're better off not knowing the ingredients.

Now, don't get me wrong. I happen to like hot dogs. But if you're looking for a serious culinary experience, even a foot-long kosher frank won't cut it. That's when you turn to a good restaurant with a world-class chef. Fortunately, in the audio world there are a number of sonic chefs who have founded their careers on the pursuit of recorded perfection. Working within the state of the art of available technology (while always driving it forward), these individuals have become legends in the business. Simply put, their recordings sound better than anyone else's.

There are several fabulously good mastering and recording engineers, but at the risk of slighting the rest of them, I'll single out one. Tom Jung has spent the past fourteen years cultivating audio perfection, pioneering the newest audio technology along the way. The jazz catalog of his DMP label represents microphone techniques, editing electronics, and storage media all focused on the job of getting the best possible reproduced sound.

Jung was one of the first recording engineers to seize upon digital storage as the wave of the future. Way back in 1977, the early days of digital audio, Jung began using a temperamental prototype 3M tape recorder to create live recordings

that electrified the audio community and proved that digital audio was viable and competitive with analog technology. To commercialize his straight-wire audiophile approach to recording, he founded the DMP label in 1982 and released two of the very first jazz CD's. Instead of relying on multitrack recording and overdubbing, Jung employed direct-to-two-track digital recording without remixing.

Moreover, Jung pioneered minimalist microphone techniques — for example, clustering a dozen horn players around one mike. It was a far cry from the batteries of microphones used in most sessions, and a damn good approach when you consider the acoustical phase cancellations caused by multiple microphones, not to mention the way each microphone acts as a tiny source of nonlinearity in a recording. Worse yet, many studio micro-

**Tom Jung has spent
fourteen years cultivating
audio perfection,
pioneering technology
along the way.**

phones originally engineered for analog recording contain a high-frequency bump to overcome analog rolloff. If you collect the signals from many of these microphones, you get a harshness that is often unfairly attributed to the digital medium, which is merely preserving the signal supplied to it with great accuracy. By minimizing his microphone count, and through his intelligent microphone selection, Jung was — and remains — miles ahead of the mainstream.

Jung was also one of the first recording engineers to employ 20-bit analog-to-digital (A/D) conversion and storage to expand dynamic range. Recording engineers must allow 5 to 10 dB of headroom when recording, resulting in an actual recorded dynamic range equivalent to 14 or 15 bits. With 20-bit conversion and storage, the CD's full 16 bits of dynamic range can be utilized. Nonetheless, many "20-bit" re-

cordings, while utilizing a 20-bit converter, are actually recorded with 16 bits and only processed with 20-bit noise-shaping to lower the subjective noise floor. Not so for DMP recordings, which use a 20-bit signal path straight through conversion, storage and editing, all the way to final disc mastering. To achieve this, Jung uses a Yamaha digital mixing console/recorder that accepts 24-bit signals, and he records 20-bit signals through an outboard rack of high-end A/D and D/A converters. The dithering and noise-shaping processes required during transfer from 20 to 16 bits is done entirely by ear. Jung knows that different types of music demand different noise-shaping algorithms, and each permutation must be tested and evaluated to find the best one for the job.

Always pushing the envelope, Jung is again playing the innovator with his recent development and use of Circle Surround matrix encoding. With Circle Surround, stereo recordings are encoded with surround information but retain stereo compatibility. Full-range stereo surround signals and a center channel can be recovered when a CD is played on a four- or five-channel matrix surround system. In addition, DMP has begun to produce *discrete* multichannel CD's through a new company called Music As Software. Using DTS Technology encoding, the company's CD's can deliver five discrete channels when played through a DTS decoder. Jung is firmly convinced that multichannel-surround music recordings will ultimately eclipse conventional stereo.

No matter how good your playback system is, it cannot be better than the sound of the recording itself. Because recording engineers like Tom Jung lie awake at night, worrying about how to make things sound even cleaner, we are able to enjoy some truly great recordings. And thanks to the broad availability of high-quality digital audio storage, transmission, and processing, weak links in the long signal-recording/reproduction chain are being strengthened, and the level of professionalism is rising.

Even so, there is much work to do, and the advance of newer technology is again raising the bar. Very generally, I would estimate that experts such as Tom Jung use 90 percent of the sonic potential of the CD; the music-industry average is probably less than 70 percent. The pending multichannel DVD audio format, with its likely 24-bit word length and 96-kHz sampling frequency, will have perhaps seven times the bandwidth of the CD. Determining how much of the expanded capacity will be audible, and inventing tools and techniques to exploit it, will keep audio experts busy for decades to come, and their successes will delight listeners. If it's true that music is food for the soul, then your soul should be licking its chops. □



MONSOON

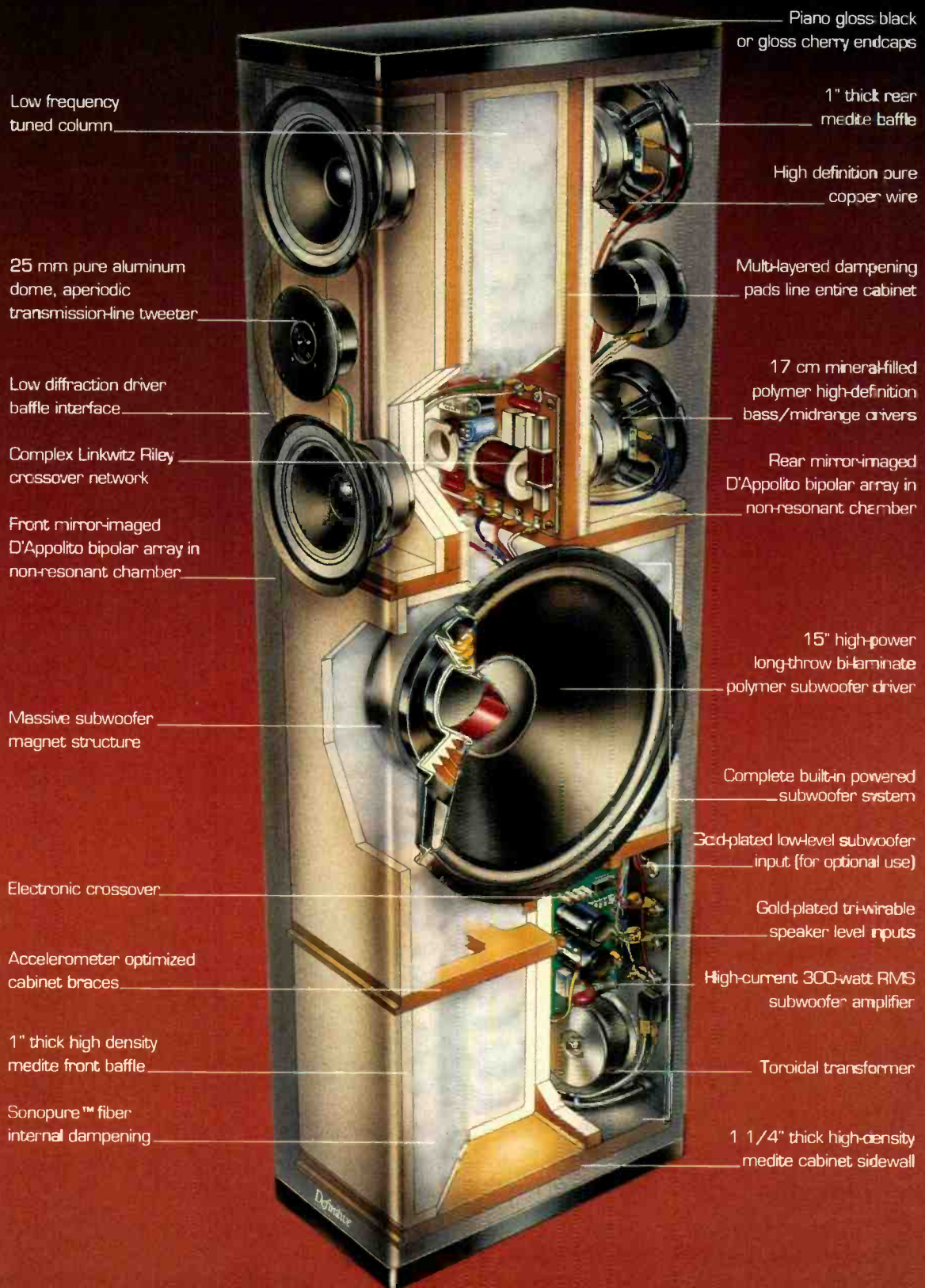
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"Definitive's new BP2000 absolutely kills most more-expensive speakers!"

—Bert 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*

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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 AC3 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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Denon AVR-3600 Dolby Digital Receiver

DAVID RANADA • TECHNICAL EDITOR

To judge from Denon's well-equipped and well-performing AVR-3600 A/V receiver, manufacturers are at last beginning to get the hang of incorporating Dolby Digital (AC-3) decoding into their products. While a few early components have exhibited notable (and easily avoidable) flaws, Denon has done nothing wrong and a great deal very right in this receiver.

The AVR-3600 is second from the top in Denon's receiver line, the top model being a deluxe THX-certified Dolby Digital unit. While the AVR-3600 is not THX-certified, it's a good bet that much of its circuitry is THX-influenced. Certainly the amplifier power ratings hover in the THX region: 90 watts per channel for all five channels in surround mode, 110 watts per channel in two-channel stereo. Equally important, Denon has implemented a good bass-management system consisting of 80-Hz high-pass crossover filters on the receiver's speaker outputs and a matching 80-Hz low-pass filter on its line-level subwoofer output. (Dolby Labs' requirements in this regard are considerably more relaxed than Lucasfilm's.)

The high-power THX heritage, with

the resulting need for a large power transformer and large heat sinks, may be the major reason the AVR-3600 is so heavy (over 47 pounds), although the thickness of its outer casing no doubt also contributes substantially to its mass. It is unusually deep, too, which could present a placement problem. Furthermore, to avoid overheating, Denon recommends maintaining about 4 inches of clearance around the top, rear, and sides of the receiver.

Like other high-power A/V receivers, the AVR-3600 provides several digitally processed surround modes in addition to Dolby Digital and Dolby Pro Logic. Its Super Stadium, Rock Arena, Jazz Club, Classic Concert, and Matrix modes all generate delayed artificial "reflections" and feed them out in various timings and levels through all the speakers in a surround-

sound system. These reflections can be controlled to some extent in spacing (Room Size) and amplitude (Effect Level) using the remote control and the receiver's on-screen menu system. Your TV screen must therefore be on for these and other adjustments.

In Dolby Digital and Pro Logic modes, a mild high-frequency rolloff can be engaged via the on-screen menu or by pressing the Cinema button on the AVR-3600's front panel. This function is similar in intent to THX's re-equalization processing, which reduces harshness on soundtracks, but its response curve is different. The effect is much like turning the treble control down about halfway. For those Dolby Digital soundtracks that carry the necessary data stream, you can also switch in three degrees of dynamic-range compression, which should help reduce peak sound levels during late-night listening.

The AVR-3600's front-panel styling is conservative and traditional. The central window contains a white fluorescent alphanumeric display that usually indicates the selected surround-sound mode (or normal stereo) and input. This display can be dimmed or shut off altogether using a button on the remote. To its left are small indicators for Dolby Digital operation, digital-input selection, and analog-input overload. The central window also contains a numerical red LED display of volume level, starting from full mute, then jumping to -60 (dB) and running up in approximately 1-dB steps to +18 (dB). This readout, which

DIMENSIONS: 17½ inches wide, 7½ inches high, 19½ inches deep

WEIGHT: 47 pounds, 6 ounces

PRICE: \$1,800

MANUFACTURER: Denon, Dept. SR,
222 New Road, Parsippany, NJ 07054;
telephone, 1-201-575-7810

A Breakthrough! “Definitive’s New BP2002 Achieves An Impossible Dream.”

—Peter Moncrieff, *International Audio Review*

At \$999 ea., the bipolar BP2002 with dual built-in 125-watt powered 12" subwoofers approaches the ultimate performance of Definitive’s reference flagship BP2000.

Your Dream Comes True

When *Stereo Review*’s Julian Hirsch wrote of the BP2000, “...I would choose these speakers for myself,” we were thrilled and honored by this highest of compliments. In fact, since its introduction last year, Definitive’s top-of-the-line BP2000 has clearly established itself as the most award-winning and highly reviewed speaker of all time.

Now, our newest breakthrough, the BP2002, incorporates similar cutting-edge technologies in order to achieve mind-boggling sonic performance which closely approaches that of our flagship BP2000. And most importantly, the BP2002’s significantly lower price and more compact size will allow many more lucky listeners like yourself to own speakers of this ultimate quality level.



Experience sonic ecstasy! Hear for yourself why top high-end guru Peter Moncrieff raved the “BP2002 achieves an impossible dream.”

Music & Movie Perfection

The extraordinary BP2002s incorporate bipolar technology, which turns your whole room into a sweet spot with three-dimensional depth and a huge sonic image ideal for music and movie perfection. Truly a unique combination of delicately detailed musicality and totally controlled brute force for your ultimate listening pleasure!

Whether incorporated in a super audiophile stereo music system or combined with matching CLR2002 center channel (\$499 ea.) and our bipolar rears for a truly remarkable AC-3* ready home theater system, Definitive’s magnificent BP2002 will achieve your impossible dream, too.

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is always on (bravo!), is necessary because the large, lightly detented volume control rotates continuously.

Directly below the display window is a row of input-selector buttons, one of which selects the rear-panel AC-3 RF input for use with some laserdisc players. The lowest two rows of buttons are used to pick the surround mode, select one of the forty available tuner presets (preset programming must be done with the remote), choose the recording source, and select the source feeding the receiver's line-level multiroom output. The two small knobs are conventional bass and treble controls.

We've seen the AVR-3600's remote control before, as versions of it have been supplied with previous Denon receivers. We can only reiterate here that among conventional programmable re-

notes it is one of the best. It groups buttons of different shapes, sizes, and colors to vividly differentiate between functions. From a layout standpoint, its only drawback (which for some may not be a drawback at all) is the use of a flip-open door to hide some of the less frequently used controls such as tuner programming, analog-input level setting, and the on-screen menu functions. The remote's principal operational drawback is the round-robin routine required to select surround modes, coupled with the excessively long muting time when you switch between them.

The receiver's rear panel is as conventional looking as the front, with A/V connectors vertically arrayed in several columns. Confusingly, you won't find all the audio jacks for an A/V component right next to its corre-

sponding video connectors, which are equipped with both composite-video and S-video jacks. A/V connections are furnished for two VCR's, a laserdisc player, a cable/satellite decoder, and one auxiliary source. There is one set of video-monitor outputs, with the on-screen display signal superimposed on the composite-video output. The AVR-3600 has audio-only connections for two tape decks (one set labeled DAT), a CD player, and a moving-magnet phono cartridge. Six line-level preamp outputs are available, five corresponding to each of the speaker outputs (three fronts, two surrounds) and one for a subwoofer. The speaker connectors are multiway binding posts.

As befits a Dolby Digital device, the AVR-3600 has three means of receiving Dolby Digital signals: an AC-3 RF jack for the output of certain laserdisc

MEASUREMENTS

DOLBY DIGITAL PERFORMANCE

All data obtained with digital AC-3 signals from Dolby AC-3 test disc; no subwoofer in speaker configuration.

FREQUENCY RESPONSE

front L,R,C 20 Hz to >18 kHz ± 0.25 dB
surround L,R 85 Hz to >18 kHz -3, +0.25 dB

NOISE (A-wtd, re 1-watt with -20-dBFS* input)

front left/right -81.0/-80.4 dB
center -77.15 dB
surround left/right -77.22/-76.9 dB

DISTORTION

(worst case, THD+N, 1 kHz, -20-dBFS* input)
right front, left surround 0.03%

CHANNEL SEPARATION

(worst case, 0-dBFS*, preamp outputs)
surround left out, surround right driven >56 dB

* decibels referred to digital full-scale

DOLBY PRO LOGIC PERFORMANCE

All data for analog input signals; no subwoofer in speaker configuration, output volume at 0-dB setting.

FREQUENCY RESPONSE

("large" center-speaker setting)
front 20 Hz to 20 kHz +0, -0.9 dB
center 20 Hz to 20 kHz +0, -1.04 dB
surround 84 Hz to 6.6 kHz +0, -3 dB

OUTPUT AT CLIPPING (8-ohm loads)

left, center, right 145 to 148 watts
surround 130 watts

NOISE (A-wtd)

front -75.9 dB
center -73.8 dB
surround -73.1 dB

DISTORTION (THD+N, 1 kHz)

front 0.03%
center 0.04%
surround 0.14%

SURROUND-CHANNEL NOISE-REDUCTION

CALIBRATION ERROR
re Dolby level (247 mV/-15 dBFS*) +1 dB

SURROUND-DECODER INPUT-OVERLOAD

MARGINS (at 1 kHz)
front (re 2-volt input) +0.6 dB
center (re 1.4-volt input) +3.5 dB
surround (re 1.4-volt input) +3.5 dB

CHANNEL SEPARATION (worst case)

surround out, left/right driven >46 dB

* decibels referred to digital full-scale

STEREO PERFORMANCE

Except where noted, all data for analog input signals.

OUTPUT AT CLIPPING (at 1 kHz)

8 ohms 129 watts
4 ohms 186 watts

CLIPPING HEADROOM (re 110-watt rating)

8 ohms 0.7 dB

DYNAMIC POWER

8 ohms 147 watts
4 ohms 241 watts

DYNAMIC HEADROOM (re 110-watt rating)

8 ohms 1.26 dB

DISTORTION AT RATED POWER 0.018%

SENSITIVITY (for 1-watt output)

CD/laserdisc 14.7 mV
phono 0.29 mV

INPUT-OVERLOAD LEVEL (re 2-volt input)

CD/laserdisc 8.3 dB

NOISE (re 1-watt output)

CD (500 mV input) -80.2 dB
phono (5 mV input) -67.3 dB

RIAA PHONO-EQUALIZATION ERROR
(20 Hz to 20 kHz) +0.13, -0.33 dB

ANALOG INPUT FREQUENCY RESPONSE

20 Hz to 20 kHz +0, -0.2 dB

TONE-CONTROL RANGE

100 Hz +9.0, -8.3 dB
10 kHz +8.7, -9.0 dB

DIGITAL INPUT LINEARITY ERROR

-90 dBFS* -1.8 dB

DIGITAL INPUT EXCESS NOISE

(without/with signal)
EN16 (16 bits) +0.5/+2.1 dB
EN20 (20 bits) +14.8/+15.0 dB

DIGITAL INPUT DISTORTION

re -20 dBFS* 0.024%

DIGITAL INPUT NOISE

(0-dBFS*, A-wtd, re 100-watt output)
de-emphasis off -95.2 dB
de-emphasis on -97.2 dB

DIGITAL INPUT FREQUENCY RESPONSE

de-emphasis off 20 Hz-20 kHz +0.01, -0.82 dB
de-emphasis on 20 Hz-20 kHz +0.09, -0.82 dB

* decibels referred to digital full-scale

TUNER SECTION

All figures for FM only except frequency response.

SENSITIVITY (50-dB quieting)

mono 15 dBf
stereo 23 dBf

NOISE (at 65 dBf)

mono -79 dB
stereo (mostly pilot-carrier leakage) -34 dB

DISTORTION (THD+N at 65 dBf)

mono 0.22%
stereo (mostly pilot leakage) 1.6%

CAPTURE RATIO (at 65 dBf)

. 1 dB

AM REJECTION 74 dB

SELECTIVITY

alternate-channel 60 dB
adjacent-channel 7 dB

PILOT-CARRIER LEAKAGE

19/38 kHz -35/-81 dB

HUM -80 dB

CHANNEL SEPARATION

100 Hz 46 dB
1 kHz 50 dB
10 kHz 44 dB

FREQUENCY RESPONSE

FM 100 Hz to 15 kHz ± 1 dB
AM 75 Hz to 3 kHz +1, -6 dB

“All Definitive’s New Bipolar Towers Deliver Astounding Sound for Music & Movie Perfection”

Our extraordinary new BP30, 10B, 8B and 6B (from \$299) now have BP2000 Series technology for dramatically superior sonic performance!

“Truly Outstanding”

— *Stereo Review*

Absolute sonic superiority and unexcelled value have made Definitive the leader in high-performance loudspeakers. We are now pleased to introduce a new series of incredible-sounding bipolar towers which incorporate drivers, pure aluminum dome tweeters, crossovers and cabinet technology developed for our flagship BP2000 Series.

These exquisitely styled, American-made, bipolar (front and rear radiating) systems totally envelop you in a symphony of sonic perfection. They combine lush, spacious sound-staging, lifelike depth-of-field, razor-sharp resolution, pinpoint 3-D imaging, powerful subwoofer-quality bass (to below 20 Hz), high efficiency and ultra-wide dynamic range for unsurpassed reproduction of music and movies in your home.



The breathtaking performance of our award-winning bipolar speakers makes your music and movies really come alive.

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“Music and Movie Sound was Stunning”

— *Video Magazine*

Combine the BP6B, 8B, 10B or 30 with our matching centers, bipolar surrounds and optional PowerField subwoofers for the most lifelike, spectacular “you are there” music and home theater available. All are completely Dolby Digital AC-3* ready.

Award after Award Confirms Definitive’s Sonic Superiority

- *Stereo Review* “Dream System”
 - *Video Magazine* Product-of-the-Year
 - *AudioVideo* Speaker-of-the-Year
 - CES Design & Engineering Awards
 - *Sound & Vision* Critic’s Choice
 - *Inner Ear Report* Editor’s Choice
- You owe it to yourself to hear these remarkable speakers today.

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players and both coaxial and optical digital connectors. The coaxial and optical jacks can also accept two-channel digital signals in the S/PDIF format. The manual's instructions for the coaxial and optical connections are confusing. To hook up a laserdisc player, we recommend using either the optical or coaxial input *as well as* the AC-3 RF and analog laserdisc inputs. That way you'll get sound from every type of laserdisc regardless of audio format. The unused digital jack can be connected to a CD player.

We used the digital-input connectors in some of our lab tests in order to gain direct access to the internal digital-to-analog converters (DAC's), which are employed in most of the receiver's operating modes. We applied to the DAC's our battery of special CD-player DAC tests (the results are summarized in the digital-input numbers at the end of the Stereo Performance section of the "Measurements" table, page 42). The performance of the DAC's — at least of those connected to the front channels, which were the only ones we could get to in this way — was very good, if not state-of-the-art. Excess noise at the 16-bit level was deceptively good because of the negative linearity error measured at -90 dBFS (decibels referred to digital full scale). Otherwise, excess noise was average.

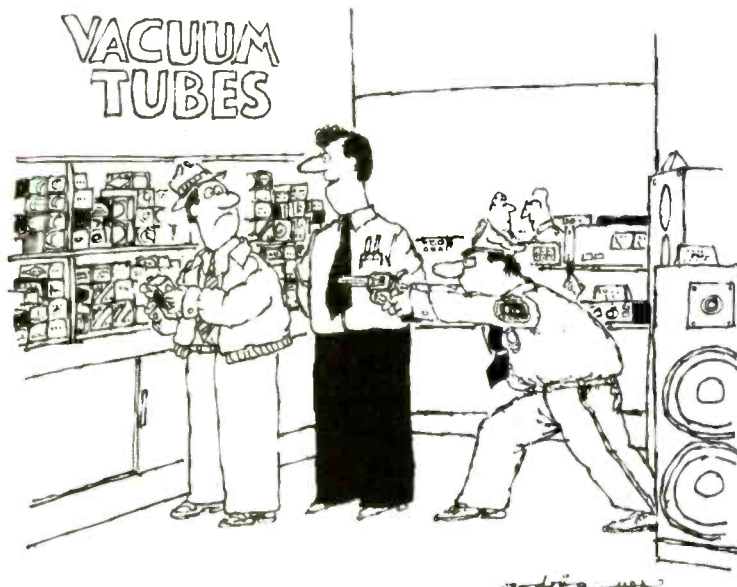
The rest of the lab-test numbers for stereo, Dolby Digital, and Pro Logic operation were also very good. Output power was more than adequate for very loud playback (extremely loud

playback if you use a subwoofer), and noise levels were adequately low. As with our other tests of Dolby Digital components, the frequency-response measurements in Dolby Digital mode were limited at the high end by the contents of the only official test disc available from Dolby Labs (which was really not intended for the kind of testing we do). Tuner performance was average for today's A/V receivers.

Our experience with other Dolby Digital components has proved to us that setting up the system correctly is at least as important as good lab-test performance for obtaining good sound. The setup facilities furnished with the AVR-3600 are sufficiently versatile to produce good results with the kinds of home-theater speaker systems we normally review.

For instance, in the speaker-configuration menu, you are allowed to choose between the use of "large" or "small" front left/right and center speakers. Large is for speakers that can reproduce frequencies below 80 Hz "with sufficient volume." Choosing "small" engages a high-pass filter so that frequencies below 80 Hz are sent to the subwoofer, which presumably has the ability to produce "sufficient volume" at the lowest frequencies.

Provided you use both a subwoofer and a separate center speaker, the "safest" settings for these two controls is "small" for both front left/right and center speakers. High-pass filters are always active in the surround-channel signal paths, which is why the measured surround frequency response



"No cause for alarm, sir, but some of those tubes are quite rare."

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- IL - United Audio Centers; Chicago & Suburbs; Camera Corner; Bloomington; Cars & Stereos; Rockford; Good Vibes; Champaign; Jon's Home Ctr.; Quincy; Sound Forum; Crystal Lake; Select Sound; Naperville; Sundown A/V; Springfield.
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- OH - Audio Craft; Akron; Cleveland; Mayfield Hts.; Westlake; Audio Etc.; Dayton; Classic Stereo; Lima; Paragon Sound; Toledo; Threshold Audio; Heath.
- OK - Ultimate Electronics; Tulsa; Photo World; Bartlesville.
- OR - Bradford's HiFi; Eugene; Chelsea A/V; Portland; Beaverton; Kelly's Home Ctr.; Salem; Larson's; Medford; Roseburg; Stereo Plant; Bend.
- PA - Audio Junction; Pittsburgh; Gary's Elect.; State College; RIT Stereo; Lancaster; Hart Elect.; Bickley; Kingston; Hi Fi House; Abington; Brookville; Camp Hill; Harrisburg; Sound Post; Pittsburgh; Palmar Audio; Allentown; Pro Audio; Bloomsburg; Stereo Shoppe; Selingsgrove; Williamsport; Stereoland; Natrona Heights; The Stereo Shop; Greensburg; Studio One; Erie.
- RI - Stereo Discount Ctr.; Providence.
- SC - A/V Design; Charleston; Custom Theater & Audio; Myrtle Beach; Unstair's Audio; Columbia.
- SD - Audio King; Sioux Falls; Sound Pro; Rapid City.
- TN - College 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.
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TEST REPORTS

falls off below 80 Hz in both Dolby Digital and Dolby Pro Logic modes. Depending on the "size" of the front left/right speakers, the surround-channel deep bass will come out of either the front speakers or the subwoofer. Any front-channel filtering is removed when the "Direct" two-channel playback mode is selected. We recommend using only the "Stereo" mode for two-channel playback because your subwoofer balance may be thrown off when the filtering is removed in the Direct mode.

Getting the subwoofer balance right is immensely aided by incorporating the subwoofer output in the speaker-balance test-tone sequence, a THX-like feature that Dolby Labs does not require in Dolby Digital equipment. While a nifty on-screen thermometer-scale display shows channel balances, presumably so that you can set levels by ear, we recommend using an inexpensive sound-level meter for the most accurate results. The Denon manual actually mentions this and even suggests the meter settings you should use for measurement (bravissimo!).

Once we got the AVR-3600 set up in our listening room, which was easi-



er than usual because of the well-thought-out setup features Denon provides, we achieved extremely good results. Dolby Digital performance was as spectacular as always, and Dolby Pro Logic was decoded with unusual clarity, probably because of the digital processor's low noise and distortion compared with typical analog Pro Logic decoding.

None of the auxiliary surround-sound modes added reverberation to the signal, just ambience reflections. But in some modes these reflections

could extend through a rather long interval (more than a second). The resulting sound quality, as usual, varied with the program material and with the ambience adjustments. The main problem with these modes is that the added reflections are identical on each side (left/right), although they are different for the front and surround speakers. In some setups this could produce an annoying in-the-head "mono" image for the surround-speaker reflections. I did like the AVR-3600's "party" mode (unimaginatively called 5CH-Stereo), which sends signals without added ambience reflections to all five speaker outputs, and also the equally useful Matrix mode, which sends a single reflection to the surround channels. I also admire Denon's bravery in not including specifically labeled ambience-enhancement modes for soundtrack playback. These generally do more harm than good by screwing up dialogue intelligibility.

Such knowing restraint is perhaps the hallmark of the AVR-3600, which in its quietly conservative and competent way is one of the best receivers containing Dolby Digital processing that we've tested. □

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John Sunter,
Audio Magazine, April 1996



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REAL HIGH CURRENT DRIVE

In many ways, the power supply of a home theater receiver is like the engine of an automobile. And you can compare performance in much the same way.

In automotive terms, it's the difference between getting creamed by a semi as you pull onto the highway or leaving it in the dust, and it's called torque. In audio terms, it's a receiver's ability to deliver high power levels into low impedance loads, and it's called High Current Drive. And Onkyo has it to spare.

Pop the hood, er, take the cover off an Onkyo receiver and you'll see why. Oversized power transformers specially designed to minimize flux leakage. Heavy duty capacitors with incredible reserves. An industry first Non Negative Feedback Circuit that uses inverted Darlingtons to reduce IM Distortion to unheard of levels. Discrete Output Stages with hand-selected resistors and transistors. Massive heat sinks more commonly found on only the most exotic amplifiers.

Take the cover off a competitive receiver and you'll have to hunt to find the transformer and capacitors. You'll see less circuitry because they'll use cheaper IC's instead of Onkyo's costlier discrete elements.

And their heat sinks look as though they're made out of tin foil. Which is why they measure their receiver power into wimpy 8 ohm loads.

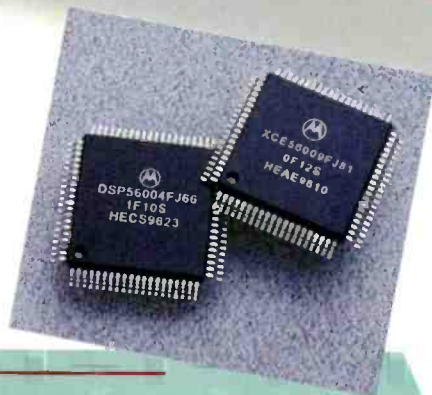
And why Onkyo isn't afraid to measure our receivers into 6 ohms.

What this means to your ears is equally distinguishable. High power and high current into low impedance is the ability to effortlessly handle the most strenuous sonic demands. That's why movie soundtracks heard through an Onkyo receiver have a depth, presence and impact that's missing on other brands. And if you listen, you can hear it, especially on those cinematic passages that explode into your room, like T-Rex's first thunderous bellow in Jurassic Park.

What you're hearing is Real High Current Drive. And only Onkyo makes the ride worthwhile.



ONKYO & MOTOROLA DESIGNED DSP FOR A PERFORMANCE THAT'S UNREAL



When it comes to designing a receiver to recreate the ambience of a theater (or any acoustic) environment, you stop thinking Hz and think MIPS (Millions of Instructions Per Second). It's the microprocessor and software parameters that determine the realism of a receiver's Digital Signal Processing—DSP.

Some audio manufacturers don't want to talk about where their DSP chips come from. Others limit themselves by making their own. But Onkyo seeks out the best global partners, then teams with them to evolve new solutions. And in microprocessors, that partner is Motorola.

All of Onkyo's new home theater receivers utilize a DSP section that's Powered By Motorola™ and programmed by Onkyo. Models incorporating Dolby Pro Logic use the 24-bit Motorola 56004 DSP chip, while those that also include THX and Dolby Digital AC-3 use the new 24-bit Motorola 56009 DSP chip as well.

The Onkyo and Motorola design delivers up to 100% more processing capacity than competitive home theater products. The 50MHz 56004 can execute 25 MIPS using three separate buses to access commands and data simultaneously. The 56009 runs at an even faster 80MHz, with even greater processing capabilities.

The result is the most three-dimensional soundfield you've ever experienced. Forceful dynamics, clear reflections, accurate reverberations—all the key sonic nuances that define how REAL something sounds. At the same time, you can control more of the factors exclusive to your home theater—room size, ambience, equalization, time delay, etc.—thousands and thousands of parameters under your control.

All of which is extremely important when aliens decide to invade your living room. Or a runaway bus races across your den.

A REAL THEATER EXPERIENCE

The future of home theater is here and it's called Dolby Digital AC-3. You'll find it in Onkyo's ED-901 Processor and on our new TX-DS939 and TX-DS838 Integra receivers. You'll also find it in an increasing number of competitive products. The same holds true for THX, the George Lucas inspired performance parameters designed to re-create the ambience of a THX movie theater.

So what makes Onkyo's approach to Dolby Digital AC-3 and THX better? Well, you can start with everything we've told you up to now. Onkyo's Real High Current Drive means that the power and torque are there to handle the demands of Dolby Digital, especially that rear surround signal which is now two separate, power hungry stereo channels. And Onkyo power is more than up to the task of not only meeting THX requirements, but exceeding them.



THX
LASER DISC

DOLBY SURROUND™
AC-3 DIGITAL

Dolby Digital AC-3 also contains much more sonic information than its Pro Logic predecessor. Information that has to come together flawlessly in your room for the experience to be fully realized. And with Onkyo's greater microprocessing capability, which home theater receivers do you think will do a better job making movies come to life?

From the very first AV receiver we built over ten years ago, Onkyo has set the industry standard in home theater performance. And as the Digital Video Disc ushers in a new era of technology, Onkyo again takes its position at the forefront.

To our competitors who create technical buzzwords instead of technical breakthroughs, we say "Get Real". To those who want to own the finest home theater components, we say "Get Onkyo".

From the very first AV receiver we built over ten years ago, Onkyo has set the industry standard in home theater performance. And as the Digital Video Disc ushers in a new era of technology, Onkyo again takes its position at the forefront.



TX-DS838



TX-DS939

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BOOK P. LEUNG

NHT SuperOne Speaker

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The NHT SuperOne is a compact two-way speaker system that, in the manufacturer's words, "sets a new standard for compact performance" and "provides the clarity, balance, and seamless response usually found in only the most expensive loudspeakers."

The SuperOne is an acoustic-suspension (sealed-enclosure) system with a 6½-inch woofer and a fluid-cooled 1-inch soft-dome tweeter. Its drivers are magnetically shielded so that it can be placed close to a video monitor without distorting the picture.

The SuperOne is finished on all surfaces in high-gloss laminate. Our test sample was black, but it is also available in white. The removable black cloth grille is on a frame retained by rubber grommets that hold it about ¾ inch out from the enclosure.

The woofer crosses over to the tweeter at 2.2 kHz, with slopes of 6 dB per octave (high-pass) and 12 dB per octave (low-pass). System frequency response is given as 57 Hz to 25 kHz ±3 dB and sensitivity as 86 dB sound-pressure level (SPL) at 1 meter with 2.83 volts input. The SuperOne is recommended for use with amplifiers

rated to deliver between 25 and 150 watts, and its impedance rating is 8 ohms nominal, 6 ohms minimum.

The NHT SuperOne, which probably qualifies as a minispeaker, is compatible with a variety of placements. According to the manufacturer, its best performance will be realized when it is mounted on stands approximately 26 inches high and placed at least 12 inches from the wall behind the speakers and at least 30 inches from the side walls. We followed that suggestion, which is consistent with how we usually situate speakers for measurements and listening tests.

Since NHT included a pair of its own OneStand speaker stands (\$100 a pair) with the speakers submitted for

review, we used them during our tests of the SuperOne; they are attractive and sturdy, and it was easy to assemble them from their component parts. The instruction manual indicates that a OneBracket is also available for wall mounting (\$90 a pair), and the rear of the SuperOne has threaded inserts for that purpose. The input terminals, recessed into the rear of the cabinet, are insulated binding posts that are compatible with single or dual banana plugs, wires, or spade lugs.

The averaged room response of the pair of NHT SuperOnes, measured about 12 feet from the left speaker and corrected for the high-frequency absorption of the room surfaces, was an excellent ±3 dB from 60 Hz to 20 kHz. A ground-plane measurement (which minimizes room-boundary effects) essentially confirmed that measurement — and the manufacturer's ratings — with a ±3.5-dB variation from 55 Hz to 20 kHz. A quasi-anechoic MLS response measurement (valid only above 300 Hz) further reinforced our initial results, showing a variation of ±3.3 dB from 300 Hz to 20 kHz.

System impedance measured a minimum of 6 ohms at 20 Hz and 150 Hz, with a maximum of 26 ohms at the system's bass resonance frequency of 80 Hz. There was a broad rise in the upper midrange, to 16.5 ohms at 1.5 kHz, and the impedance sloped off to about 8 ohms in the range of 8 to 20 kHz.

The SuperOne's sensitivity measured 85 dB SPL at 1 meter with an input of 2.83 volts of pink noise. At that drive level, the measured distortion in the woofer's range was a low 0.5 to 1 percent from 2 kHz to 1 kHz, rising to about 2 or 3 percent below 500 Hz and climbing more steeply below 100 Hz.

Since the NHT SuperOne is designed for both music listening and home-theater applications, we also measured the magnetic flux level surrounding it. The maximum flux at the surface of the speaker enclosure was only 1 gauss, and on most of the surface it was virtually unmeasurable (under 0.5 gauss). In practical terms, these speakers can be placed anywhere on or near a TV or video monitor without affecting the picture in any way (also verified by experiment).

Our measurements and listening tests both confirmed that the NHT SuperOne is a remarkable speaker even without considering its bargain-base-

DIMENSIONS: 11¾ inches high, 7¼ inches wide, 8½ inches deep

WEIGHT: 10 pounds each

FINISH: High-gloss black or white laminate

PRICE: \$350 a pair

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TEST REPORTS

ment price and Lilliputian dimensions. It had an exceptionally wide and uniform frequency response throughout its operating range, although that unfortunately does not extend much into the lower bass. Offhand, I cannot recall any speaker we have tested with the MLS program in the past that covered the full range from 300 Hz to 20 kHz with a variation as low as ± 3.3 dB. Most were doing well to achieve a ± 5 -dB response over that range (a tweeter resonance peak or a crossover dip has generally been the limiting factor).

Apart from measurements, how did the SuperOne sound? Most strikingly, perhaps, it sounded as if it wasn't there at all! Unlike many other speakers, this one does not seem to have a special sweet spot or require a particu-

Unlike many other speakers, the NHT SuperOne does not seem to have a special sweet spot or require a particular orientation to achieve precise imaging and a very believable soundstage.

lar orientation for precise imaging. There was no need for a "toe-in" angle to give directional or spatial clues to a listener. Simply pointing the speakers straight into the listening area created a very believable stereo stage, which stayed pretty much in place when I moved about the room.

Although the SuperOne's sound quality is very much "all there," it might not satisfy a dyed-in-the-wool deep-bass freak. There are many good powered subwoofers on the market, however, including those from NHT, and adding one to a pair of these small speakers would give you a hard-to-beat combination. I tried such a combination and found it to be very potent, without sacrificing the outstanding imaging qualities of the NHT SuperOne. For most applications, though, this little giant does a superb job on its own. □

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June 1996



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YAMAHA

TEST REPORTS

RAIPH MASULLO



Paradigm Reference Eclipse/BP Bipolar Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

Paradigm is a well-known Canadian loudspeaker manufacturer whose diverse product line ranges from inexpensive bookshelf speakers to large systems in the 100-pound/\$2,000 class. The company recently introduced a pair of bipolar speakers as part of its new Paradigm Reference brand that are obviously designed for serious audiophile installations. We tested the larger of the systems, the Eclipse/BP. The companion Esprit/BP has a smaller enclosure, smaller drivers, and a smaller price tag, but it is identical in its construction and operating principles.

Although we have tested several bipolar speaker systems recently, for

the benefit of new readers let me describe their special qualities. Typically, bipolar speakers consist of two identical groups of low- and high-frequency drivers sharing the same enclosure

DIMENSIONS: 50 inches high, 9¾ inches wide, 17 inches deep

WEIGHT: 95 pounds (each)

FINISH: black fabric grille; high-gloss black top and bottom plates (light oak, dark oak, black oak, and walnut also available)

PRICE: gloss black, \$1,900 a pair

MANUFACTURER: Paradigm Reference, Dept. SR, MPO Box 2410, Niagara Falls, NY 14302; telephone, 905-632-0180



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TEST REPORTS

volume, one group facing forward in conventional fashion and the other group placed directly behind it and facing to the rear. The front and rear outputs are identical and in phase as they leave the speaker. Some larger bipolar systems we have tested recently also contain a single powered subwoofer, but that is not a necessary part of such a speaker system.

Since a bipolar speaker radiates sound from both its front and rear panels, it should typically be placed a foot or more from the wall behind it and preferably 2 or 3 feet from the side wall. As with many conventional speakers, manufacturers of bipolar speakers usually recommend that they be toed in toward the listening position.

The outputs from a bipolar's rear drivers are reflected from the back and side walls before reaching the listener. The resulting time delay relative to the output of the forward-radiating drivers adds a distinctively spacious quality to the sound as the direct and reflected components mingle in the listener's ears.

The Paradigm Eclipse/BP is a columnar tower speaker. Each of its driv-

ers in a more or less normally furnished 15 x 20-foot room, but there was no doubt as to the system's excellence in this area.

ers in a more or less normally furnished 15 x 20-foot room, but there was no doubt as to the system's excellence in this area. That impression was reinforced by the exceptionally low bass distortion of the system, whose sensitivity, rated at 90 dB sound-pressure level (SPL), measured 92 dB at 1 meter with a 2.83-volt input. The (front) woofer distortion at an input corresponding to the rated 90-dB SPL was in the 2- to 3-percent range between 20 and 50 Hz, falling off to a fraction of a percent above 100 Hz.

The room response of the Eclipse/BP, measured with the microphone on the forward axis of the left speaker and about 30 degrees off the axis of the right speaker, was somewhat surprising. It was a good ± 4 dB from 100 Hz to 20 kHz, but from 50 to 100 Hz it dropped down another couple of decibels, and then it *rose* 12 dB between 20 and 30 Hz!

Clearly (as other measurements and listening showed), this unexpected behavior was a result of the interaction between the speakers, their placement, and the specific geometry of our listening room. Although practical considerations limited our placement options, other measurements gave a more valid demonstration of the system's bass performance.

The close-miked response of the front woofer (the rear was identical), including the weighted contribution of the port output, was essentially flat from 20 to several hundred hertz. It is difficult, if not impossible, to quantify the response of a pair of bipolar woof-

ers in a more or less normally furnished 15 x 20-foot room, but there was no doubt as to the system's excellence in this area.

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System impedance ranged between 4 and 10 ohms over the full audio range, which was in line with the Eclipse/BP's nominal 8-ohm rating. There were two impedance maxima, one at 60 Hz and the other at 2.5 kHz.

One of the most impressive aspects of the Eclipse/BP system was the flatness and (relative) smoothness of its frequency response in quasi-anechoic MLS measurements. Though limited to frequencies above 300 Hz, MLS measurements typically produce a somewhat jagged graphical display that is nevertheless repeatable and fairly independent of the effects of room acoustics.

We normally measure the MLS response at distances of 1, 2, and 3 meters from the speaker. The results are usually very similar, with the more distant measurements being somewhat more detailed. The response of the Eclipse/BP was one of the most uniform we have measured in this way. At 3 meters it measured within ± 2.5 dB from 300 Hz to 18 kHz. Considering this flat wide-range response in combination with the system's excellent close-miked woofer response and low distortion, the Eclipse/BP's measured performance was exceptional.

It came as no surprise that the system sounded as good as it measured, creating a believable and stable soundstage (typical of good bipolar speaker systems) that was reasonably independent of the listening position. The deep-bass output (in the 20- to 30-Hz region), though never intrusive when not meant to be, could easily be skin-tlingling. My conclusion from testing and living with the Paradigm Reference Eclipse/BP is that its designers have done a superb job, and the result is a truly topnotch speaker. It's not small, not light, and not cheap, but it certainly sounds great! □

The Paradigm Reference Eclipse/BP speaker

sounded as good as it measured, creating a believable

and stable soundstage that was

reasonably independent of the listening position.

er complements consists of an 8-inch mica-polymer-cone woofer and a 1-inch aluminum-dome tweeter, with the crossover at 1.5 kHz. The drivers are grouped at the top of the enclosure, placing them about 40 to 46 inches off the floor (approximately ear level for a seated listener).

The cabinet, made of medium-density fiberboard, is extensively braced and extremely rigid (the result of our knuckle-rap test was akin to rapping a concrete block!). There are separate pairs of gold-plated input terminals on the rear panel for the tweeters and woofers to allow for biwired or biamplified operation. Normally paralleled by jumpers, the terminals accept wires, lugs, or dual banana-plug connectors. The single bass vent for both woofers, flared to minimize turbulence, is located near the bottom of the cabinet's

and about 30 degrees off the axis of the right speaker, was somewhat surprising. It was a good ± 4 dB from 100 Hz to 20 kHz, but from 50 to 100 Hz it dropped down another couple of decibels, and then it *rose* 12 dB between 20 and 30 Hz!

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Stereo Review - describing system with Cambridge SoundWorks' *Center Channel Plus* and *The Surround II* speakers.

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Stereo Review-9/96

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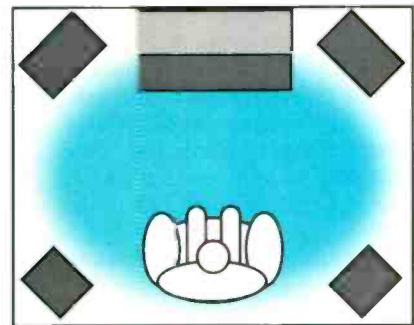
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RALPH MASQUILLO

Rotel RCC-945 Compact Disc Changer

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

The Rotel RCC-945 appears, at first glance, to be a typical front-loading single-disc CD player, with a small but complete display window, a few added control buttons, and a standard-size disc drawer.

Appearances can be deceptive, however. Within that conventional exterior is a changer mechanism that can be programmed to play up to six discs in any desired order. The RCC-945 provides all the features expected of a multidisc changer, including programmed play of up to sixteen tracks, in any sequence, from any or all of the loaded discs.

The shuffle mode plays a random sequence of tracks from a single disc or from all of the discs. In the repeat mode the RCC-945 plays a single track, a single disc, or all the discs indefinitely until the mode is canceled.

All the operating controls are light-touch pushbuttons whose size, shape, marking, grouping, and placement identify their functions and simplify operation. The changer's basic transport controls — including track/search, play/pause, and stop — are considerably larger than the buttons that govern the player's special programming features, which are grouped above the track/search buttons.

A single large, round button is used to open and close the disc drawer.

Discs must be loaded (or retrieved) one at a time: You place a disc on the tray, hit the button, and the player swallows it. The Disc + and - buttons are used to load or retrieve a disc from a particular slot. The scan button plays the first 10 seconds or so (it was about 8 seconds on our test sample) of each track on a disc or each track in a programmed sequence. Pressing the button a second time scans all the tracks on all the discs, and a third press cancels scanning.

The display panel, in addition to showing the customary information on track numbers and playing time (elapsed or remaining), identifies the active disc slots by number (1 through 6). It also shows the player's current operating mode and program mode (when applicable).

The rear apron of the RCC-945 is simple and uncluttered. Apart from the line cord, it has only a pair of left/right analog outputs, a single coaxial digital output, and a small Remote External



jack for linking the changer with a compatible Rotel amplifier, preamp, or surround processor.

The supplied infrared remote control duplicates all of the front-panel operating controls except the power switch. In addition, it provides a keypad for selecting tracks by number and a two-way fast-search mode (forward and reverse).

Although Rotel discourages removing the top cover of the RCC-945 (no user controls are inside the cabinet), we were sufficiently intrigued by its smooth operation and operating versatility to break out a screwdriver and remove the sizable number of screws required to gain access to its interior. The changer mechanism was sturdy, with a slotted structure that receives and stores the discs (horizontally) and an elevator mechanism that moves up and down as required to access the selected disc, move it from its slot to the playback platform, and later return it so another disc can be picked up for playback.

The RCC-945 is very straightforward to operate, and it is certainly versatile enough to satisfy the needs of most home installations. Although the process of loading discs is a bit more cumbersome than with a carousel changer, whose drawer remains open during loading, Rotel's drawer and disc-loading mechanisms are pretty swift. A welcome result of the RCC-945's simple, uncluttered design is an ease of use that is rarely, if ever, found in larger multidisc CD players.

DIMENSIONS: 17 $\frac{3}{8}$ x 4 $\frac{3}{4}$ x 11 $\frac{3}{4}$ inches

WEIGHT: 14 pounds

PRICE: \$500

MANUFACTURER: Rotel, Dept. SR,
54 Concord St., North Reading, MA 01864-
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TEST REPORTS

The RCC-945's measured performance was on par with its ergonomic properties. The frequency response was ruler-flat (within ± 0.1 dB) from 15 Hz to 7 kHz, with a minute rise at higher frequencies to a maximum of +0.5 dB at about 16 kHz. The channel separation was an excellent 115 dB at 1 kHz, falling to 96 dB at 10 kHz. The D/A converter's linearity at low levels was equally noteworthy, with a maximum error of only 0.5 dB at -90 dB.

The player's ability to track through disc defects (gaps in the recorded digital information) was satisfactory, though not as outstanding as some of its other performance qualities. Playing the Pierre Verany test disc with a series of calibrated defects, the RCC-945 mistracked slightly on a gap of 1.25 millimeters.

The player was also relatively unaffected by physical impacts that can cause audible mistracking. We evaluate a player's susceptibility to impact in a very simple but effective manner by slapping its top and sides while a disc is playing. The RCC-945 required a firm slap on the top cover to induce a brief pause in the program, and it was immune to even a hard slap on one of the side panels.

Overall, the Rotel RCC-945 offers an admirable combination of versatility, simplicity, and uncompromised performance at a reasonable price. □

ROCK P. LEUNG



Pinnacle Classic Gold Tower Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

Pinnacle loudspeakers, which now comprise more than a dozen models, have been a part of the audio scene for some twenty years. From the company's inception most of its speakers have shared several characteristics, including a compact size, moderate price, and consistently good sound quality. A significant factor in the sound of Pinnacle speakers is the company's patented Diaduct bass-vent system, which uses a slanting duct placed diagonally in the cabinet. That permits a longer duct for a given enclosure size, which enables Pinnacle speakers to generate deeper or less distorted bass for a given driver and cabinet size (and price) than would be possible otherwise.

Most Pinnacle speakers are priced

around \$200 to \$400 a pair, but the company recently announced a new top-of-the-line floor-standing speaker, the Classic Gold Tower, as the flagship of its Audio Cinema line.

The Classic Gold Tower is constructed in the popular format implied by its name, though it is not as formi-

DIMENSIONS: 38 inches high, 9 $\frac{3}{8}$ inches wide, 15 $\frac{1}{4}$ inches deep (including removable cloth grille)

WEIGHT: 48 pounds (each)

FINISH: Black or cherry-woodgrain vinyl

PRICE: \$900 a pair

MANUFACTURER: Pinnacle, Dept. SR. 255 Executive Dr., Plainview, NY 11803; telephone, 516-576-9052

MEASUREMENTS

MAXIMUM OUTPUT 2.2 volts

FREQUENCY RESPONSE

(20 Hz to 20 kHz)

de-emphasis off +0.4, -0.07 dB

de-emphasis on +0.5, -0.07 dB

CHANNEL SEPARATION

(at 1 kHz) 77.6 dB

NOISE LEVEL (A-wtd)

de-emphasis off -87.5 dB

de-emphasis on -87.7 dB

DISTORTION

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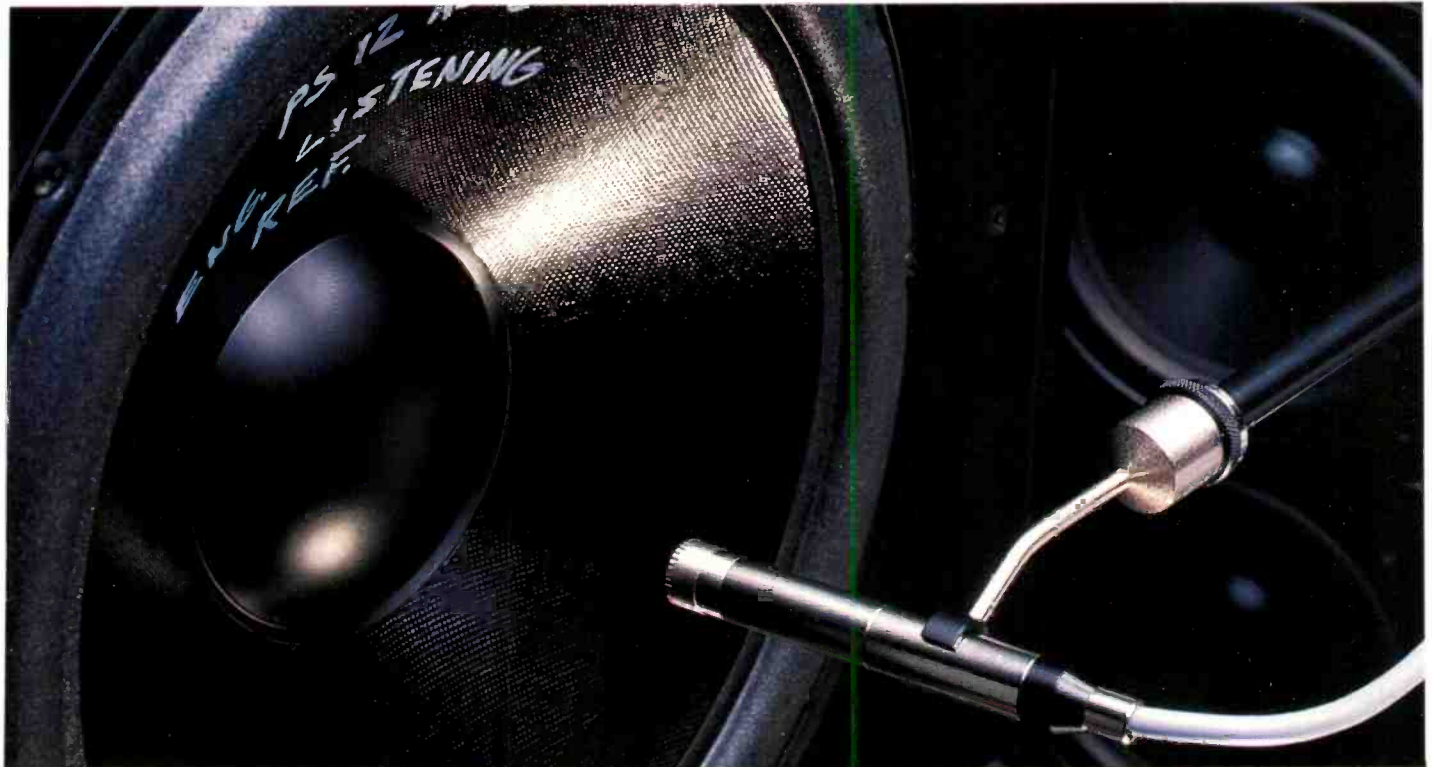
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TEST REPORTS

dable physically as some of the larger tower speakers we have reviewed in recent months. It is a "2½-way" system, with a 1-inch fluid-cooled aluminum-dome tweeter located near the top of the front panel. Below the tweeter are two 8-inch cone woofers, one above the other.

The tweeter and the upper woofer form a two-way system with a first-order crossover (6 dB per octave) at 2.5 kHz. The bottom woofer has a separate low-pass filter and principally covers frequencies below 150 Hz. Over much of the bass range, however, both woofers are active, with the acoustic coupling between them further enhancing the system's bass output.

The internal volume of the cabinet is vented by three Diaduct tubes whose openings are on the rear of the cabinet. Each tube is 3 inches in diameter, which is said to give the venting system an effective port diameter of

tem response or for obtaining higher bass levels.

We placed the Pinnacle Classic Gold Tower speakers approximately as recommended, about 8 feet apart and 3 feet in front of the wall behind them (the Diaduct tubes in the rear require at least several inches of clearance from the rear wall, though the precise distance is not critical).

A close-miked measurement of woofer response, with the microphone between the two woofers, indicated a maximum output at about 95 Hz, but the response was within ± 6 dB from 40 Hz to 2 kHz. Separate close-miked measurements at each of the woofers showed that the upper woofer's response was quite similar to the combined output measured at the front panel between the two drivers. The bottom woofer, on the other hand, delivered its output largely between 40 and 600 Hz.

The Classic Gold Tower created the kind of natural soundstage and stereo imaging that you'd expect from a top-quality columnar speaker costing twice as much.

5¼ inches and length of 13 inches. According to the manufacturer, the port system is principally effective in the lowest three octaves (presumably below 150 Hz), where it reinforces the direct woofer output.

The Classic Gold Tower is a high-efficiency speaker rated for a 95-dB sound-pressure level (SPL) at 1 meter with a 2.83-volt input, which our measurements confirmed. It is also rated to handle 150 watts (400 watts peak) and has a nominal impedance of 8 ohms.

The speakers come with sturdy, solid brass conical mounting feet, whose use is recommended by the manufacturer. To facilitate positioning and moving speakers on a carpeted floor, we never use optional spikes or other pointed feet, although the Pinnacle feet are not the needle-point variety used on many other speakers.

The rear panel of the speaker cabinet has separate gold-plated binding posts for the lower woofer, compatible with single or dual banana plugs, that are normally strapped to the main inputs for the system. This allows the lower woofer to be driven from a separate amplifier if desired. Pinnacle suggests that this mode of operation offers greater flexibility for shaping sys-

tem response or for obtaining higher bass levels. Although those figures are not easily translated into audible terms, they illustrate the separate, synergistic contributions of the two woofers to the speaker's total bass output. A much more striking demonstration of the Classic Gold Tower's bass performance came from a measurement of distortion at a drive level of 1.6 volts, which corresponds to a 90-dB SPL at 1 meter. Over the range of 70 Hz to 1 kHz, the distortion was a virtually constant 0.3 percent, an unusually low figure for a loudspeaker. As expected, it rose at lower frequencies, where cone excursion increases, but reached only 3.5 percent at 20 Hz. Although that might not seem impressive compared with amplifiers and CD players, it is most unusual for a speaker.

The smoothed and averaged room response of the two speakers, measured 12 feet away on the axis of the left one, was within ± 3 dB from 20 Hz to 2 kHz, dropping off by an additional 7 dB at 20 kHz. Room response includes, in addition to the inherent response of the speaker, the effects of absorption at room-boundary surfaces, and since our room is fully carpeted and has an acoustical-tile ceiling, this is not an unusual measurement.

The horizontal dispersion of the system, measured 12 inches from the tweeter over an angle of ± 45 degrees, was good, with a response variation of only ± 5 dB from 1 to 15 kHz. Above 15 kHz the response fell off more rapidly, dropping to about -20 dB at 20 kHz.

Quasi-anechoic (MLS) response measurements yielded very similar results at distances of 1, 2, and 3 meters. With the response plot expanded to show more detail, two salient characteristics were clear: The overall response was an excellent ± 4.5 dB from 300 Hz (the lower limit of the measurement) to 20 kHz, and this range included a relatively narrow notch of about 4 dB at 4.6 kHz.

The notch effect was not audible under any conditions we could devise, and we can only surmise that it was an artifact of the rather unconventional crossover system. Disregarding the notch (only a few hundred hertz wide), the response would be an outstanding ± 3 dB from 300 Hz to 20 kHz.

The Classic Gold Tower has a nominal 8-ohm impedance rating. We measured a minimum impedance of 3.5 ohms at 36 Hz and 4 ohms at 110 Hz, with maxima of 15 ohms at 23 Hz, 70 Hz, and 1 kHz. The manufacturer points out (correctly) that the system's high efficiency makes its 8-ohm rating valid, since no amplifier likely to be used with it is going to be stressed even when driving the speakers to high listening levels.

Our listening experience with the Classic Gold Tower was completely consistent with its measured performance. It created the kind of natural soundstage and stereo imaging that you'd expect from a top-quality columnar speaker costing twice as much. Even the skin-tingling deep bass it delivered had the authority of a much more expensive speaker (its useful lower limit appears to be in the 25- to 27-Hz range).

One of the most impressive things about the Classic Gold Tower is its economy. Unquestionably, there are a number of excellent speakers to choose from if your budget allows spending \$2,000 or so a pair. This new entry from Pinnacle can compete comfortably in that select company at half the price. And you won't have to invest in a high-powered (and high-priced) amplifier to do justice to your system — although the Classic Gold Tower *can* play at house-shaking levels when appropriate and still sound musical. □

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*VTV magazine, April, 1996. From a review of the Polk Audio SRT system with Dynamic Balance technology.

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BARRY MASULLO

JBL Simply Cinema SCS120 Home Theater Speakers

COREY GREENBERG

Blame it on Jack-in-the-Box. Why would anyone spend countless hours going grocery shopping and cooking at home when you can get a complete meal of fried petroleum products "in-a-box" just by driving up to a multi-colored metal clown head and barking like an angry sea lion? "Not I," said the fly as he wiped the hot grease off his chin and spilled a jumbo Coke all over his lap peeling out of the drive-through lane.

Home theater has its own version of the fast-food meal-to-go (hold the grease): home-theater-in-a-box. Typically featuring five small satellite speakers and a separate "subwoofer" bass module packed together in one carton, such speaker packages offer consumers an affordable, easy-to-understand route to adding surround-sound speakers to the living-room TV.

The home-theater-in-a-box concept is all about convenience, but what

about sonics? When judged solely on the basis of sound quality, one-box home-theater speaker packages range from the barely listenable to the surprisingly good. Audiophiles will surely opt for higher-quality (and more expensive) speakers for their home theaters, but state-of-the-art sound quality isn't what a home-theater-in-a-box is all about. People buy these systems because they offer real surround sound that's miles better than what comes out of a TV's own speakers.

At \$1,400, JBL's six-piece Simply Cinema SCS120 is one of the pricier home-theater-in-a-box systems on the market, and at 70 pounds, one of the heftiest — you'll want to warm up with some squat-thrusts and perhaps some light speed-bag work before attempting to carry JBL's king-sized carton out of the store.

The reason for the Simply Cinema system's larger-than-usual size and weight is the larger-than-usual sub-

woofer JBL bundles with the package. Many subwoofers that come with home-theater-in-a-box systems are "passive," meaning they lack an internal power amplifier, containing only a woofer and a speaker-level crossover. Passive subwoofers rely upon the system's A/V receiver (or power amp) to drive them, which can really put a tough load on low-power receivers.

The Simply Cinema system's sub, on the other hand, is an "active" model complete with an internal crossover and a 150-watt amplifier to drive its pair of 8-inch downward-firing woofers; its rated bandwidth is 40 to 120 Hz. And while many of the subwoofers bundled with box systems use bandpass woofer loading to achieve maximum output from a small cabinet, JBL chose to stick with a straightforward ported enclosure, hence the relatively large cabinet, which is made of medium-density fiberboard, or MDF.

Like the satellite speakers it's mated with, the Bass20 is finished in a neutral gray vinyl that's quite good at resisting drink spills, fingerprints, and grape-jelly splats. Longer from front to back than it is wide, the 10 x 17¾ x 24-inch Bass20 appears to take up less floor space than the typical cuboid subwoofer. While the dual woofers are hidden from sight on the bottom of the cabinet (the Bass20's four feet raise it off the floor so that the woofers have enough breathing room to properly woof), a large flared port on the front panel fires forward into the room.

The Bass20's rear panel sports a pair of speaker-level inputs and outputs as well as a level control to dial in the right amount of woof. A nice touch, and one not commonly found on affordable powered subs, is JBL's auto-sensing power switch. Set it to "auto" and the Bass20's internal power amplifier turns on only when an audio signal appears at its input terminals.

The Bass20 also has a stereo pair of line-level audio inputs for use with A/V receivers that have line-level subwoofer outputs. In general, making this connection with the line-level inputs will result in better sound quality, but only if the receiver in question has its own high-pass filters to roll off low bass in the front left and right speakers (in a Dolby Pro Logic receiver, bass in the center speaker's signal is rolled off when the receiver is in Pro Logic's "normal" mode). Rolling off the bass in the main speakers eases their job of reproducing midrange and treble sounds and enables them to play much

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USER'S REPORT

louder and cleaner on movie and music peaks. If a receiver has a line-level subwoofer output but sends a full-range signal to the main speakers (easily detected by excessive woofer motion during low-bass passages), you'll get better sound by using the Bass20's speaker-level connections rather than its line-level inputs. The Bass20 is not magnetically shielded, so it must be located a few feet away from direct-view TV's to avoid picture purpling.

Five identical Sat20 satellite speakers complete the Simply Cinema system. A sealed two-way minispeaker featuring two 3½-inch treated-paper woofers and a ¾-inch composite-titanium-dome tweeter mounted between them, the magnetically shielded Sat20 is designed to handle the frequency range above 120 Hz (the Bass20 subwoofer handles the deep bass below that point).

Unlike the Bass20's fiberboard cabinet construction, the Sat20 features a plastic cabinet like most of the similarly priced "lifestyle" speakers on the market. But while many of those designs merely parrot the shape of a conventional rectangular speaker box, the Sat20 takes advantage of its plastic enclosure, which is molded into a functional and attractive shape that helps improve its sound quality. In addition, three of the five Sat20's come with integral swivel mounting plates and counter-sunk screws for wall mounting. A thin layer of sound-absorbing foam covers most of the Sat20's front panel, with cutouts for the three drivers; the foam's job is to dampen cabinet resonances that might otherwise cause the thin plastic panel to "sing" along with the music and add unwanted coloration to the sound. As with the Bass20, the Sat20's speaker inputs are of the inexpensive spring-loaded type instead of the screw-type binding posts found on some speakers in this price range.

True to its name, setting up the Simply Cinema speaker system was simply simple. After laying one of the Sat20's on its side atop my TV for the center channel and placing two more on 3-foot-tall stands in the rear corners of my living room, I connected all three speakers directly to the appropriate outputs on the back of a Harman Kardon AVR 20 MkII A/V receiver. With the Bass20 located a foot in from the corner on the left side of my big-screen TV and its port facing forward into the room, I ran a pair of speaker

cables from the receiver's left and right main speaker outputs into the speaker-level inputs on the sub's rear panel. Then I ran another pair of speaker cables from the Bass20's speaker-level outputs to the main front pair of Sat20 satellites. These sat on 3-foot-tall stands as well, about a foot and a half to each side of the TV.

The Sat20's light weight encourages the use of some tacky material underneath it to anchor it securely to a shelf or stand. I found that using three little balls of Blu-Tack (that gummy substance found in the stationery aisle) under each speaker did a great job of anchoring the Sat20's in place, eliminating some buzzes and rattles I'd heard when the speakers sat directly on the hard surfaces of the TV and the stands. Because the triangular Sat20 tilts its drivers up a bit when laid on its side as a center speaker, I used a larger ball of Blu-Tack under its backside to tilt it down so that its drivers were aimed at my ear level on the couch.

Now, I have to say that I haven't been overly impressed with the sound of most of the home-theater-in-a-box speaker systems I've heard. Too many of these packages just don't sound very good, even to a casual listener. A nasal, muffled midrange and subwoofers that don't seem to add anything but a dull chestiness to dialogue are the most common traits of the various home-theater-in-a-box speaker systems I've auditioned, even expensive ones from well-known makers.

That's why I was surprised when JBL's Simply Cinema system exhibited neither of those problems. Given the Sat20's structural kinship with other plastic-box speakers I've heard, I expected nothing special from them. But someone at JBL obviously spent some quality time voicing this assemblage of inexpensive parts and drivers into a decently musical-sounding system — it's definitely the best of the home-theater-in-a-box systems I've heard.

The star of the show is clearly the Bass20 subwoofer. It played much lower and louder than the chintzy, passive bandpass subs sold with most home-theater-in-a-box packages. Its sound also had very impressive tightness and clarity, although I did feel that its roaring, rumbling character was better suited to movie-soundtrack effects than, say, to the nimble fingerings of Ray Brown's stand-up bass. On laserdiscs with a lot of deep-bass content, like *Dead Presidents*, the

Bass20's combination of tightness and high output gave the Simply Cinema system a much bigger, bolder sound than any home-theater-in-a-box system I've heard.

I was also impressed with the sound of the Sat20 satellite speakers. While certainly no rivals for audiophile minispeakers, the plastic JBL satellites also surpassed my expectations, producing a smooth and surprisingly clear midrange and virtually none of the hollow, nasal coloration common to the satellite speakers in so many home-theater-in-a-box packages. There was a bit of peakiness in the low treble that called attention to itself more with music recordings of brass instruments than with movie soundtracks. The upper treble range rolled off pretty quickly, which helped to smooth overly bright laserdisc soundtracks but tended to make most music CD's sound a bit dull and distant.

If I had a serious shortcoming to report, it would be the system's limited dynamic capability. Not surprisingly for speakers with 3½-inch woofers and ¾-inch tweeters, the Sat20's distorted earlier than the Bass20 subwoofer when I pushed the system close to theater levels, so very large living rooms will probably be better served by larger, more expensive speaker systems. In my 15 x 21-foot living room, I was able to get fairly loud levels out of the JBL system before it distorted, but I would've liked a little more output capability. Believe me, I would've been shocked into a coma if the Simply Cinema system had been able to belt out *Dead Presidents* at Dolby reference level without distortion — far more expensive speaker systems than this one have trouble reproducing film sound at real theater levels, and it's asking the impossible from a system at this price level.

JBL's Simply Cinema SCS120 system is a fine choice if you're looking for a no-hassle route to surround sound. At \$1,400, the system faces stiff competition from entry-level audiophile home-theater speaker systems offered by NHT, Paradigm, and Atlantic Technology. But Simply Cinema's no-brainer setup, one-carton delivery, and surprisingly musical sound make it the best home-theater-in-a-box system I've auditioned to date.

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Tower III is a two-way design using a wide-dispersion tweeter and a single 8" woofer very similar to those used in *Tower* and *Tower II*. Like the more expensive models in the *Tower* series, it combines high sensitivity and outstanding dynamic range with the natural, wide-range sound (including extended deep bass) that results from a generously-proportioned cabinet. It has been meticulously "voiced" by Henry Kloss for superb octave-to-octave tonal balance and precise stereo imaging. Its comparatively high sensitivity makes it ideal for use with moderately powered amplifiers and receivers, while its robust construction makes it suitable for use with the most powerful amplifiers designed for home use. These benefits have been realized at significantly lower cost than other, superficially similar models through a combination of

Henry Kloss' unique speaker design expertise, plus Cambridge SoundWorks' highly efficient direct-to-the-consumer sales policy. *Tower III* is the most affordable high-performance tower speaker we know of.

Like other models in the series, *Tower III* features removable black grilles and fully-finished cabinets (front and rear), to permit operation without grilles in place. It also includes gold-plated binding posts. Magnetically shielded, *Tower III* is ideal for use in the best home theater systems. Finished in black ash vinyl. **Factory-direct price: \$599 pr.**

Tower II by Henry Kloss™

Tower II is a three-way system that is substantially larger than *Tower III*. It features two 8" woofers, a 5 1/4" midrange driver, and a 1" soft-dome fabric tweeter.



Tower II

The large cone area of *Tower II*'s multiple drivers contributes to an "effortless" sound quality, giving music a strong feeling of dynamic "presence" that is easier to hear than to describe. That high-impact presence, together with *Tower II*'s smooth, musical octave-to-octave tonal balance and precise stereo imaging, produces what we think is the finest speaker system ever offered for under \$1,000.

Tower II is finished in vinyl that simulates black ash or Vermont walnut. It is bi-wire/bi-amp capable and features gold-plated binding posts. **Factory-direct price: \$999 pr.**



CenterStage



Tower

Tower by Henry Kloss™

The flagship of our new series is a three-way, bipolar model named *Tower by Henry Kloss*. The bipolar dispersion pattern helps eliminate the usual "point source" effect of direct-radiator speakers – and ensures a proper stereo effect at the widest variety of listening positions.

Tower features two forward-facing 8" woofers; a forward-facing 5 1/4" midrange driver; a 1" soft-dome fabric 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,

and its smooth octave-to-octave tonal balance, results in sound that's nothing short of incredible. It's *spectacularly realistic*. Available in lacquered walnut or black ash veneers, we believe that *Tower* is one of the finest speakers ever offered. It is bi-wire/bi-amp capable and features gold-plated binding posts. **Factory-direct price: \$1,499 pr.**

CenterStage by Henry Kloss™

Complementing the new *Tower* models is *CenterStage*, a two-way, three-driver center channel speaker for use in home theater systems. With its two 5 1/4" bass/midrange drivers and 1" soft dome tweeter, *CenterStage* perfectly matches the tonal balance

of all three *Tower* models. Bass reach of the system is significantly greater than most center channel speakers, thanks to its dual-vent enclosure. The dynamic range of the drivers is enough to handle the most demanding of video soundtracks, while their dispersion is broad enough to include all listening positions. It is finished in black vinyl.

Factory-direct price: \$349.

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CIRCLE NO. 6 ON READER SERVICE CARD

MULTICHANNEL Power

and as it may be to believe, there was a time when audio systems required just two channels of amplification. (Hey, I can remember the day when power amps had only *one* channel — my dad had a Featikit like that — but then. I'm fast approaching burmudgeony.) The channels were called left and right, and they re-

produced sound that was rather optimistically described as "stereophon-ic," a term derived from combining the Greek words for "so.id" and "sound," which stereo most assuredly was not back in those early days.

That simpler era is fast departing



Amps

as an ever-increasing number of audio systems give at least a nod toward the two, three, or four extra channels demanded by the home-theater/surround-sound age. Consequently, most of today's receivers — still far and away the hi-fi world's most popular source of wattage — are A/V models with four or five channels of power to drive the three front and two surround speakers that have become standard for home-theater playback.

The power-amplifier category, once inhabited solely by one- and two-channel models, is also evolving to meet the needs of multichannel surround sound. Traditional plain-vanilla, two-channel (stereo) amplifiers are being joined by multichannel jobs that come in almost every layout you can imagine and at prices ranging from a few hundred to several thousand dollars. So far, I've encountered three-, four-, five-, six-, eight-, twelve-, and sixteen-channel power amps, and I'm sure it's only a matter of time before seven- and ten-channel models hit the scene.

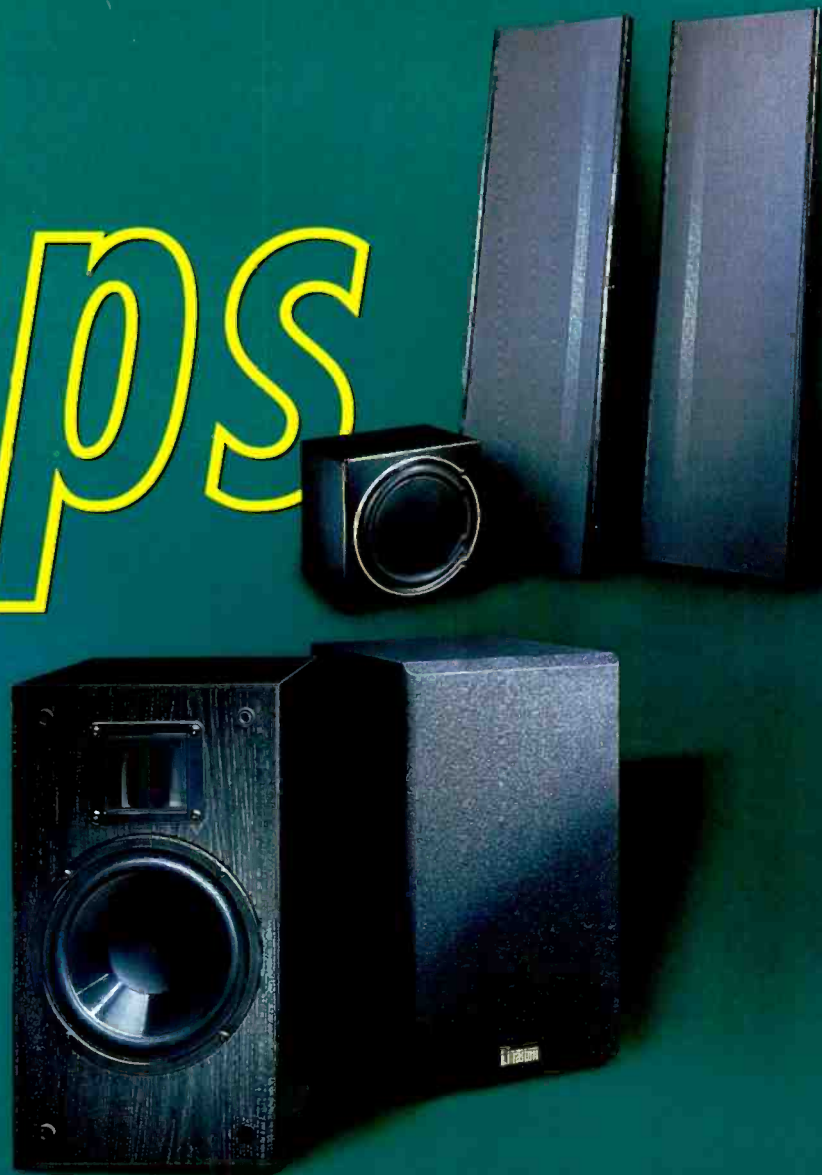
Why such a riot of variety? There's more to audio these days

Home-theater or multiroom systems demand more than a good old two-channel amp **BY DANIEL KUMIN**

than just home theater, though the audio/video marriage is clearly the biggest factor in the evolution of multichannel power amps. Surround-sound music systems, multiroom audio, and whole-house "media systems" all require more than

two speakers, each of which must be hitched to a power source.

In a single room, as many as six amplifier channels can easily be consumed by even a relatively modest home-theater system: three up front for the left, center, and right main





The Acurus Model 200x3 power amp (\$1,299), which combines three beefy 200-watt channels in one chassis, can upgrade a high-performance stereo system to surround-sound status while maintaining ample power for straight two-channel listening.



Containing a half-dozen discrete amplifiers in one 40-pound chassis, B&K's AV6000 (\$1,298) is rated to deliver 105 watts to each of its six channels. It features gold-plated output connectors and an individual level control for each channel.



NAC's Model 916 (\$699) is rated to deliver 30 watts to each of six channels; channel pairs can be bridged to 90 watts to create a three-, four-, or five-channel amp.

speakers, two for the "rear" surround speakers — whether the surrounds are Dolby Pro Logic dual-mono or Dolby Digital discrete — and one for a passive (nonpowered) subwoofer. And should a system's reach extend beyond the main room, as is encouraged by the multiroom outputs and infrared-repeater capabilities offered on many higher-end components, then an extra pair of power-amp channels is in order for each additional listening area or remote room.

Why Multichannel?

You needn't ponder too long to imagine circumstances under which any of the aforementioned multichannel power deployments makes perfect sense. Got a nice two-channel separates system you're upgrading with the purchase of a surround preamp/processor? A three-channel power amp is all you'll need to add: Assign it to the left, center, and right main speakers, and your existing stereo amp can service the surrounds.

Starting from scratch and seeking the maximum bang-per-buck? A solid four-channel power amp can drive a Dolby Pro Logic-based system's five speakers handily, with one channel powering both surround speakers via a simple parallel wiring scheme. (With most good power amps this arrangement will work just fine, even if the surround speakers carry a 4-ohm nominal impedance rating).

Looking for an all-in-one multichannel power block to mate with an A/V preamp/processor or to boost the power capabilities of a good A/V receiver that has line-level outputs? A four- or five-channel amplifier is the obvious choice, assuming you plan to use a powered subwoofer. A six-channel amp is the way to go if the system includes a passive subwoofer.

Multiroom system design brings the multichannel-power imperative into even sharper focus. Whole-house audio and audio/video systems call for multiple amplifier channels, either by way of stereo power amps distributed to each remote listening area or a multichannel amp (or multiple stereo amps) residing in the "master" room. Manufacturers have been quick to respond to this fast-growing market segment. Six- and eight-channel amps are proliferating, many with relatively modest per-channel outputs tailored to the lower-power needs of more casual,

secondary-room listening (often with in-wall speakers).

Such power amps can serve in many ways. The most obvious is in providing power to three or four remote listening areas or rooms equipped for stereo-only playback. But there are other possibilities. A single eight-channel amplifier could power a four-channel surround-sound system in the master room *plus* speaker duos in a couple of remote rooms, or it could drive two surround-sound systems (each with parallel-wired surround speakers) — one in the master room and another in, say, a basement rec-room. Similarly, a six-channel power amp could drive the home theater in the master room plus a single pair of speakers in a bedroom or out on the patio, two popular options.

What to Look For

What should you look for when shopping for a multichannel amp? Value is a popular attribute — in fact, it is the multichannel amp's *raison d'être*. You could simply buy two or three stereo amps (or several monoblocks, for that matter) to do the same job. But a single multichannel unit saves significant manufacturing cost in sheet-metal and power-supply componentry, as well as in packaging materials and printed matter (don't laugh — the packaging can be the single most expensive "component" in the case of some low-end gear).

Beyond these considerations, you should pretty much seek the same virtues as you would in any other amplifier: enough power, good construction quality, and flexible, well-thought-out features. What is "enough" power is an open question, of course, but more is nearly always better — few audiophiles have ever lamented that they had *too much* power. And remember, most surround systems, even the state-of-the-art, all-digital six-channel paragons, spend a lot of time playing plain old two-channel stereo recordings and broadcasts, which means that their front left and right channels must have adequate wattage when working alone.

You cannot, of course, always define electrical quality by the care and workmanship of an amplifier's exterior appearance, but as a broad rule the outside tends to mirror the inside. In other words, if flimsy sheet metal is used and the amp looks cheesy, it probably is. I'm a strong advocate of spending a little more to get some-



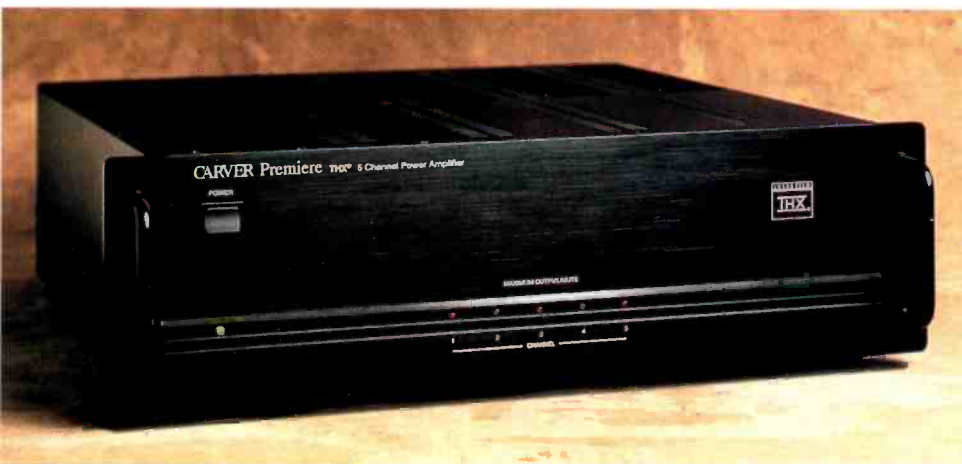
Designed to provide power for a variety of multiroom scenarios, the SI-120 (\$900) from Niles packs twelve 25-watt amplifiers into a 17 x 5¼ x 14-inch box. Channel pairs can be bridged to deliver 50 watts into 8 ohms with 0.1 percent distortion.



Able to power a complete home theater, Adcom's THX-certified GFA-7000 power amplifier (\$1,300) is rated to deliver 130 watts into 8 ohms impedance to each of its five channels; power output jumps to 200 watts per channel with 4-ohm loads.



You could power a home theater plus a pair of speakers in a secondary listening area with McIntosh's Model 7108 (\$2,500), which is rated to deliver 40 watts each to eight channels into 4 ohms; channel pairs can be bridged to deliver 100 watts.



Rated to deliver 125 watts to each of five channels, Carver's THX-certified AV-705x power amp (\$1,199) features power-steering circuitry that's said to increase single-channel output to more than 200 watts on demand; rack handles are optional.



Parasond's HCA-2003 (\$1,650) is ideal for upgrading a stereo system to surround sound. It uses a separate power supply for each of its three channels and is rated to pump out 200 watts per channel into 8 ohms, or 300 watts into 4 ohms.

thing that's obviously well made. Even if it makes no sonic difference whatsoever, it'll give you a warm glow every time you walk by it, even when it's turned off.

Otherwise, the technology behind multichannel amplifiers is no different, with one important exception, from that of one- and two-channel models. Unless the per-channel wattage ratings of two amplifiers you're comparing are significantly different — that is, one offers *at least twice* the output of

the other — it's unlikely to make much of a difference in a real-world setting. Doubling the power buys a just-noticeable 3-dB increase in dynamic range. Along similar lines, there's no need to lose sleep over distortion specs that differ by a fraction of a percent. Few if any of us can hear the difference between 0.5 and 0.05 percent total harmonic distortion (THD) — forget about 0.1 and 0.001 percent. We can also safely assume that almost any power amplifier of

even faintly reputable origins will be all but perfectly flat in its frequency response and, somewhat less universally, sufficiently quiet to deliver useful dynamic range.

One way you can compare quietness among power amplifiers with different power ratings is to compare their signal-to-noise-ratio (S/N) specs. S/N ratings that are referred to 1 watt (for example, "87 dB re 1 watt") can be compared directly (higher numbers are better) since the measurements were made under the same conditions. Unfortunately, S/N specs are usually expressed as a plain number (say, "87 dB"), which you can take to mean that the measurement is quoted relative to full rated power — that is, it expresses the ratio of the amplifier's greatest undistorted output to its inherent noise. Obviously, measured in this fashion a higher-power amp will yield a bigger, better-looking number than a lower-power amp.

To level the playing field so that you can make a valid comparison, you have to convert the full-power rating to a "re 1-watt" rating. That can be done by determining the dBW factor (decibels above 1 watt) of the amp's power rating and subtracting that number from its S/N spec; 100 watts, for example, is 20 dBW (20 dB above 1 watt), 10 watts is 10 dBW, and 4 watts is roughly 6 dBW. Gearheads may want the formula: $\text{dBW} = 10 \times \log(W)$, where W of course equals the rated power in "plain old" watts. Almost any well-endowed calculator can do this trick.

The technology exception alluded to earlier has to do with power-supply design. When multiple channels are drawing from a single power supply, it's possible that the supply could run out of juice if all channels demand full current at once. Such an occurrence is extremely unlikely, however, and for normal everyday use you could probably ignore the whole question with perfect rationality. On the other hand, manufacturers cannot. Designers of topnotch multichannel amplifiers go to great lengths to include over-engi-

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* The subwoofers of both systems are designed to be placed on the floor, not on the same surface as the satellite speakers. © 1995 Cambridge SoundWorks.



one FIVE-CHANNEL amp can POWER a whole HOME THEATER

neered power supplies that are capable of keeping the amplifier's outputs up to spec with all channels driven under almost any absurd set of test-bench circumstances.

That results in hulking power transformers, rank upon rank of juice-can-sized storage capacitors, and massive heat-sink structures. Consequently, high-end multichannel power amplifiers tend to be bulky. The six-channel model on my rack at home (far from the largest of the breed) weighs a hefty 54 pounds and measures roughly 20 x 20 x 8 inches — a true biggie.

Most of us are not accustomed to thinking of power amps as components that have "features" per se — af-

ter all, most amps are just plain black boxes. But there are a handful of useful things to watch for, some more apparent than others.

What type of speaker connectors does the amp have? I prefer five-way binding posts because they're robust and accept stripped wires, single and dual banana plugs, spade lugs, and pin connectors with equal aplomb. Light-duty spring-clamp terminal strips fall at the bottom of my list because they tend to have small contact areas and are usually too small to accept heavy-gauge cable. Signal-input jacks will always be of the standard RCA variety, and while gold-plating on jacks is nearly universal on high-end compo-

nents, it is far from necessary. A few high-end power amps offer balanced signal inputs via pro-style, three-wire XLR jacks. Although a balanced connection is technically superior for long cable runs, there is no universal agreement that it offers any real advantage in consumer audio systems.

While many amps offer "power meters," they are usually not very accurate and are quite unnecessary for home use; I think their rather significant cost would be more wisely spent on better internal components or external fit and finish. On the other hand, some visual indication of power-on status and overload conditions — usually via an LED (or two) per channel — is quite useful.

Amplifiers vary in the degree of protection circuitry they offer to guard their own well-being and that of the speakers they drive. Most audiophiles prefer simple fuses inside the amp to guard against miswiring or overload, though some amps use internal relays that accomplish the same task but reset automatically after the short circuit (or whatever) is corrected. There are still some amplifiers that employ "current-limiting" routines — "smart" circuit monitors that reduce the drive level to the output section whenever they sense that the amp's power devices are entering the danger zone by pumping too much voltage or current. Such protective circuits have earned a widespread reputation, however, for having a negative impact on sonics — often, though not always, a deserved one.

Input-level controls are not quite standard on multichannel amplifiers, but they can be very useful. Although channel balancing in a surround-sound system is usually handled through the A/V preamplifier or processor, amplifier input controls can provide the extra range needed to achieve a proper balance when the sensitivity of the front and surround speakers is wildly different or the room acoustics are particularly odd. In addition, a multiroom installation may well benefit from varying amplifier sensitivities for the different speakers in remote locations.

Finally, you'll also come across



A true multichannel monster, Sunfire's Cinema Grand power amp (\$2,375) is rated to deliver 200 watts each to five channels into 8 ohms. It has a smart power supply that permits per-channel output to double into 4 ohms and quadruple into 2 ohms.



Rotel's five-channel RB-985THX (\$1,000) has conventional RCA inputs as well as a computer-style DB-25 multipin connector to simplify hookup with a compatible Dolby Digital decoder. Power output into 8 ohms is 100 watts per channel.



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Bridge OF SIZE

One of the more confusing wrinkles of modern amplifier technology is a relatively common one: channel bridging. Bridging, or "strapped-mono" operation, describes a scheme in which two amplifier channels work in tandem to create a single channel that puts out twice as much power. It works like this: The input signal sent to one of the two channels is inverted (made 180 degrees out of phase), and the speaker is connected across the "hot" (positive) terminals of the two bridged channels. In real life, bridging usually nets somewhat more than double the power because each member of the bridged channel pair is only driving half the load impedance, which means that the combined channel delivers more current, and thus more power. Although a full quadrupling of power is theoretically possible, the actual result is usually between two and three times as much power as the single-channel rating.

Bridging works by deploying one channel to amplify the positive half of an audio waveform and the second channel to amplify the negative portion. The speaker integrates the two channels in its "parallel" connection, presenting only half its load to each one.

Bridging two channels into one seems like getting something for nothing, and to a certain extent it is. But the quality of the bridging-adaptor circuitry, which is either built into the amp or (very rarely) packaged in an outboard module, is absolutely critical. First, if the inversion of the source signal is less than a perfect mirror of the original, the result will be significant distortion, often occurring in dynamic ways that are difficult to measure and unlikely to be reflected by conventional amp specs. Second, because each channel is only driving half the speaker load (sort of), the effective load impedance is halved. If the speaker is a nominal 4-ohm design,

each bridged channel "sees" a 2-ohm load, which in some cases may demand more current than it will be happy to provide. (That's why some bridgeable amps come with a recommendation to use bridged mode only with 8-ohm speakers.)

For both these reasons, many audiophiles shun bridging. But the negative side effects of bridging — if any — are usually far from audible. Also, there's no denying that combining two channels into one can deliver a useful net increase of 4 to 5 dB in overall dynamic potential, which can be attractive if you have an "extra" amp channel sitting idle. Even finicky audiophiles recognize the virtue of bridging two 100-watt channels to yield, say, 350 watts mono to drive a huge passive subwoofer, where the niceties of ultimate dynamic range and top-octave "air" become meaningless.

Most multichannel amps offer bridging options that typically allow adjacent channels to be paired up simply by sliding a back-panel switch into its "mono" position and connecting the speaker. A 100-watt four-channel amp might become a three-channel job delivering 100 watts each to two channels and 300 watts to a third — or a 300-watt stereo behemoth. The flexibility that bridging brings to amps with five or more channels should be self-evident and may well be a significant factor in the growing popularity of such designs. — D.K.

amps that carry the THX logo, which means they have met rigorous standards set forth by Lucasfilm, including the ability to deliver high power into low-impedance loads with low distortion. As for technological details of design philosophy and topology, I must beg off. While you will find plenty of

argument, I don't care if an amp uses bipolar ("regular") transistors, MOS-FET's, vacuum tubes, "HEXFET's," or hamsters on a treadmill, it can still produce superb sound — I've heard examples of all of those (well, maybe not the rodents). Similarly, I've heard amps designed for Class AB operation

(the vast majority) as well as Class A, Class G, and Class H that all sounded great. In short, don't be easily swayed by claims about technological breakthroughs. Focus instead on the homely virtues of manufacturing quality, value, useful features, and, of course, demonstrable audible excellence. □

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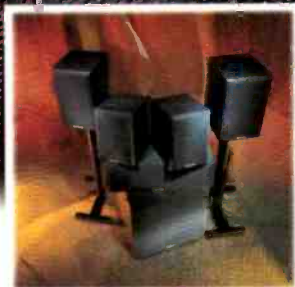
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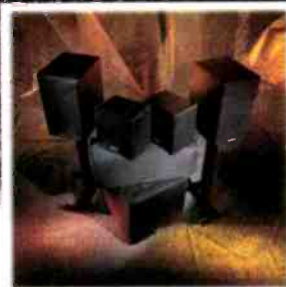
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GOING DOLBY DIGITAL

A GUIDE TO SETTING UP AND ADJUSTING AN AC-3 SURROUND-SOUND SYSTEM BY DAVID RANADA

Not all Dolby Digital (AC-3) decoders are created equal — and not only because there are now two semiconductor companies making AC-3 decoder chips. Significant differences can arise

in the auxiliary circuitry into which the decoder chips are embedded. Moreover, the setup and adjustment of this supplemental circuitry — crossover filters, inputs and outputs, and controls for volume, channel-balancing, and Dolby Digital's special

functions — can have a profound effect on performance. To help you optimize that performance, we've assembled a quick-reference guide with pointers on how to correctly set up and adjust a home-theater system incorporating Dolby Digital processing. Follow our recommendations, and you may never step foot in a movie theater again.

GETTING THE BASS RIGHT

Wouldn't you know it? The most important aspect of setting up a Dolby Digital system is also the most difficult. Getting the bass right is important because an AC-3-encoded soundtrack can deliver so much of it. Besides the five full-range "main" channels (front left, center, and right plus left and right surround), there is also an "auxiliary" low-frequency effects (LFE) channel that handles only bass below 120 Hz and is used for loud special effects, like explosions. In a correctly adjusted Dolby Digital system, a peak-level signal in the LFE channel is supposed to produce a sound level *10 dB higher* than the peak level produced by any other channel. That's quite a jump. Furthermore, getting the bass right in a home-theater speaker system is important because it must also reproduce music, where low-bass *balance*



MARANTZ'S DP-870 OUTBOARD DOLBY DIGITAL PROCESSOR

is every bit as important as maximum low-bass *output* is during movie action sequences.

Proper bass setup in a Dolby Digital system can be tricky because 1) the setup instructions that came with your processor may be excessively confusing or even wrong, 2) adjustments you make may interact with settings elsewhere in the system, such as speaker balances or the use of crossover filters, and 3) your present

setup — and one we've been able to implement with nearly all the Dolby Digital components we've tested so far — involves redirecting low bass away from all the main speakers. Figure 1, provided by Dolby Labs, shows what happens when the decoder is set up for this configuration, which is conceptually the simplest layout a Dolby Digital processor has to offer. Audio signals from the AC-3 decoder chip feed in at the left. After

able to each of those speakers. In this setup, the low bass is instead redirected from the five main channels to the subwoofer channel. This is achieved by adding the three front and two surround channels together (the "Summer" in Figure 1) and then flowing the combined output through a low-pass (high-cut) filter that has the same crossover frequency as the main-channel high-pass filters. The LFE signal is also mixed into the signal that's heading to the

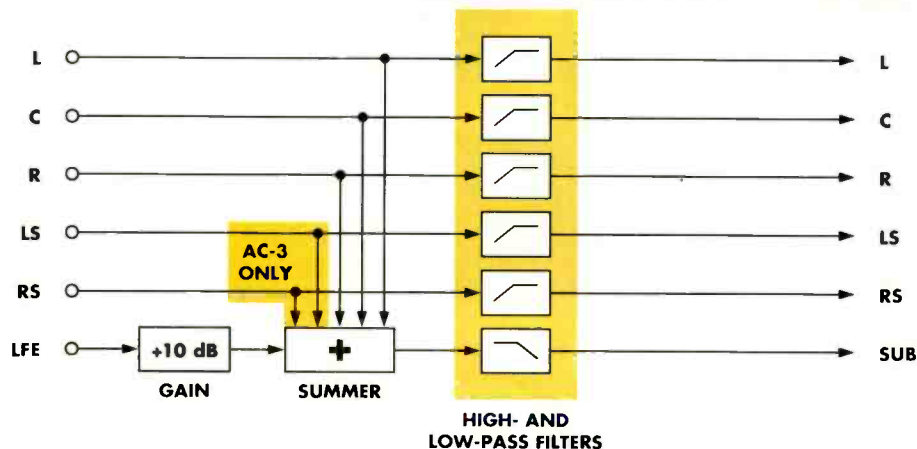
subwoofer, but not before it receives a whopping 10-dB boost relative to all the other channels. Obviously, this configuration places a great burden on the subwoofer and its amplifier, which together must be capable of delivering clean, high-level output at low frequencies.

The Dolby Digital decoders that we have seen, whether the external-processor or built-in variety, typically have switches (or an on-screen-menu equivalent) that allow you to rearrange this processing in case you don't have a subwoofer or you do have full-range front speakers. But unless you have five truly

full-range speakers — which we assume to be the exception — we recommend that you start with the system configuration shown in Figure 1 *regardless of the manufacturers' claims about the bass-handling capabilities of your main speakers*. Provided that your subwoofer has the necessary oomph and the remaining five speakers can all make it down to 100 Hz or so, this configuration will work very well. With a typical Dolby Digital decoder you should therefore use the "small" setting for all of the main speakers and make sure that the subwoofer output is turned on and connected.

If your system doesn't have a subwoofer but *does* have full-range front left and right speakers, set the decoder's left/right front speaker outputs to "large," set the center and surround speaker outputs to "small," and turn the decoder's subwoofer output *off*. If all of the speakers except the center are full-range, use the "large"

FIGURE 1 REDIRECTING LOW BASS



speaker setup may not be able to handle the full bass potential of a Dolby Digital soundtrack. If you are using a powered subwoofer to reach that potential — the right way to go — these factors will compound those that already complicate subwoofer setup, including placement, hookup configuration, and adjustments for level, crossover frequency, polarity, and (sometimes) phase.

The secret to getting Dolby Digital bass right in a typical speaker setup is *bass redirection*. Unless you have six "full-range" speakers — a luxury most of us can't afford — you'll need to redirect low frequencies away from speakers that are unable to produce loud, deep bass to those that can. This is not a new concept: Dolby Pro Logic systems have always offered a "normal" or "small" center-channel setting that sends frequencies below 100 Hz to the front left/right speakers or a subwoofer.

The most practical Dolby Digital

exiting at the right, they may flow through time-delay circuits, channel-balance controls, and a six-channel master volume control before arriving at the system's power amplifiers. In between, however, the signals flow through the bass-management circuit shown, which is a collection of crossover filters. These filters are necessary for optimum Dolby Digital operation with a typical home-theater speaker system comprising three sonically matched (if not identical) front speakers, two matched surround speakers, and a separate subwoofer.

Note that every channel except the subwoofer channel has a high-pass (low-cut) filter in its signal path that removes bass below 100 Hz or so. This has two desirable outcomes: The main speakers don't have to reproduce signals that they can't handle without distortion or a loss in level, and power demands are substantially reduced, which is equivalent to increasing the maximum power avail-

THE KEY TO A DOLBY DIGITAL SETUP IS REDIRECTING THE LOW BASS TO THE SYSTEM SPEAKERS THAT CAN BEST REPRODUCE IT

setting for all of their outputs; turn on the subwoofer output only if you have one connected. In either case, unless your "full-range" speakers can handle very high levels of deep bass and you have substantial amplifier power (say, 100 watts per channel), you'll get better overall performance by using a powered subwoofer and following the configuration in Figure 1. At least start with the Figure 1 setup and, using it as a performance baseline, explore other options.

Now you have to decide what to do with the powered subwoofer's own controls. The most important adjustment you must make is to set the subwoofer's own crossover-frequency control as high as it will go. This will get its processing "out of the way" of the crossover built into the Dolby Digital decoder, avoiding double rolloffs and a frequency-response "hole" between the subwoofer and the main speakers. The other subwoofer controls (level, polarity, and phase) can be set as usual — a subject that would take an article in itself. Since the Dolby Digital decoder in Figure 1 is already performing high-pass filtering, *do not* use the subwoofer's loop-back high-pass-filtered line-level output connections or, for that matter, its speaker-level inputs; feed it only from a line-level subwoofer output.

In an ideal world, one in which component manufacturers fully understood and followed both the letter and intent of Dolby Labs' circuit configurations, this would be all the advice you'd need for getting Dolby Digital bass right. Unfortunately, we've encountered decoder designs that make it difficult to achieve a proper bass setup unless you have a specific type of speaker system and the decoder is set up in a very precise way. Specifically, make sure that your decoder doesn't arbitrarily switch the high- or low-pass filters in and out when the system moves between Dolby Digital, Dolby Pro Logic, and plain stereo modes. This can

throw bass balance awry, to understate the situation greatly.

GETTING THE SPEAKER BALANCE RIGHT

Once you get the bass/speaker situation sorted out, the remaining Dolby Digital settings and adjustments are comparatively easy. Speaker balancing proceeds as in a Dolby Pro Logic setup except that there are separate level adjustments for the left and right surround speakers. As in a Pro Logic system, you'll get the most accurate results if you use a sound-level meter, with Radio Shack's Model 33-2050 (\$34.95) remaining the instrument of choice (we use one, and you'll find them in professional studios, too). Don't do a sloppy job with speaker balancing; try to get each speaker to register within 1 dB of the others using the test tones and the sound meter. Why? Surround-channel sound effects are usually crafted to produce very specific results, and they can be thrown off if speaker-level imbalances exceed that level.

It would be nice to report that all Dolby Digital devices not only put out level-matching test tones for the five main speakers but also generate a tone for setting the subwoofer level. But only a few provide a subwoofer tone, probably because it isn't absolutely required by Dolby. Home THX components incorporating Dolby Digital decoding are required by Lucasfilm — bless them — to include a subwoofer test tone. Even though there is a "correct" setting for producing the flattest bass response, you'll find decoder manuals that offer such sublime guidance as "adjust the subwoofer to the appropriate level." While there is admittedly some degree of user preference involved in setting the subwoofer level, such advice is useless.

Fortunately, if the equipment is properly designed and hooked up, setting the subwoofer level in Dolby Pro Logic mode will also set it correctly for Dolby Digital operation.

Therefore, you can use a good Dolby Pro Logic test disc (like "Surround Spectacular" from Delos, DE 3179) along with a sound meter to set the subwoofer level in the stereo or Dolby Pro Logic modes.

CENTER-CHANNEL DELAY

Most component-quality Dolby Digital products provide an unfamiliar control, center-channel time delay, that is to be used whenever the center speaker is closer to the listener than the front left or right speakers. The control is used to delay the center speaker's output so that it arrives at the listener's ear at the same time as the output from the left and right front speakers. An incorrect delay setting will produce frontal imaging that isn't as sharp and stable as it could be. Our listening tests have shown that while the correct center-delay setting can produce an audible improvement in most Dolby Digital movie soundtracks, aligning the arrival times from the front three speakers is actually more important with surround-encoded music CD's intended for Dolby Pro Logic playback. That's probably because soundtracks contain few distinct images that last long enough to be evaluated, whereas music tends to contain long-term and stable images.

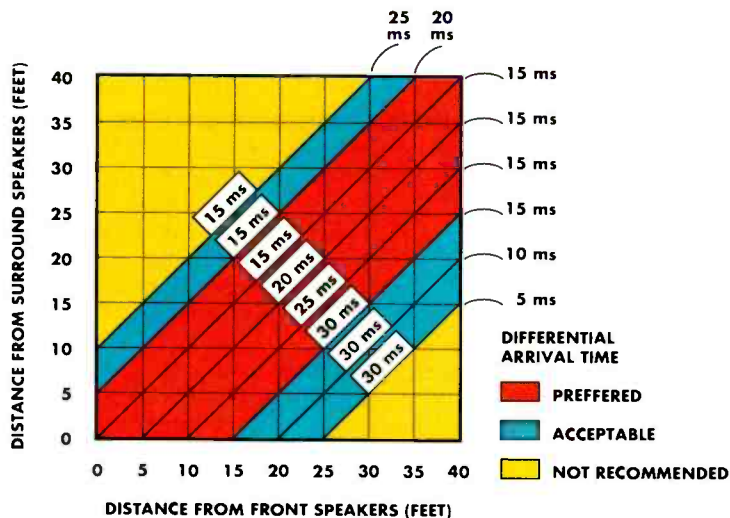
Setting the correct center-channel time delay is easy:

1. Measure the distances from the prime listening position to the front left, center, and right speakers. Ideally, the distances should be identical.

2. If the center speaker is not at the same distance from the prime listening position as the front left or right speaker, determine how many feet closer or farther away it is; round off to the nearest foot. Starting from the 0-millisecond setting, *increase* the center-speaker delay by 1 millisecond for every foot it is *closer*, or *decrease* the delay by 1 millisecond for every foot it is *farther away*.

Unfortunately, the center-channel-delay facilities found on most Dolby

FIGURE 2 PRO LOGIC SURROUND DELAY



playback. Figure 2 shows the ideal Dolby Pro Logic delay settings for various distances from the front left/right and surround speakers to the listener. To use the diagram, measure those two speaker distances in your room and find the nearest corresponding lines in the chart (distance from the front speakers along the bottom, from the surrounds along the left side). Then locate the point where the horizontal and vertical lines intersect. From that point, follow the *diagonal* line to the nearest white box showing a delay time, and set the surround-delay control on your Pro Logic processor to that figure. Feel free to get a more accurate setting by not following the nearest diagonal line but creating a new one and interpolating between the boxed delay times. The numbers *outside* the graph at the top right show the resulting difference between front and surround arrival times at the listening position, which should, ideally, be close to 15 milliseconds in Pro Logic mode.

Figure 3 shows the corresponding settings for Dolby Digital operation, in which there should ideally be no difference (0 millisecond) between front and surround arrival times. In Dolby Digital devices that use one chip to perform both AC-3 and Pro Logic decoding, setting either mode's surround delay correctly is supposed to set the other mode's surround delay automatically. Some components, however, will require you to set each mode separately. This is common when an external decoder is used.

Those are the basics to setting up a Dolby Digital system. Simple, no? Now, if only all the manufacturers of Dolby Digital products would carefully think through why Dolby Labs requires certain circuit configurations and how those requirements should influence the *non-Dolby* Digital aspects of component and system design. If they did, your job in selecting components and setting them up would be greatly simplified, and we'd find fewer flawed products requiring exceptional setup rigmarole. Now's the time for manufacturers to use their creativity to make Dolby Digital even easier to use than Dolby Pro Logic. □

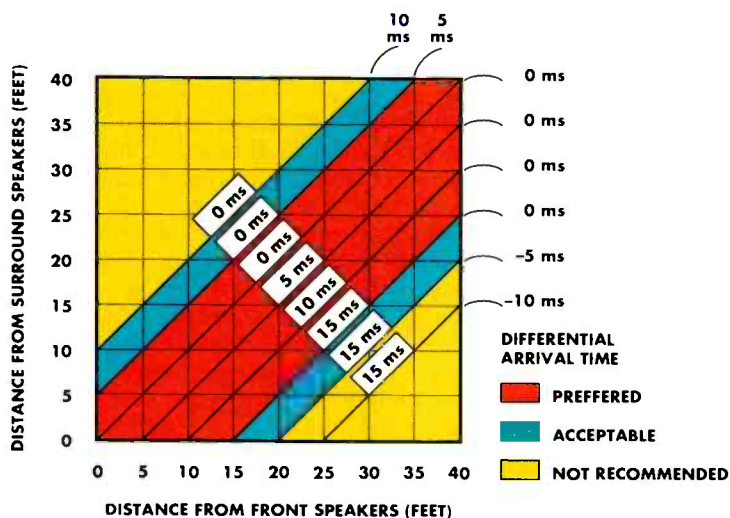
Digital components only provide adjustments for a center speaker that is closer to the listening position, leaving in the lurch those whose center speakers are too far away. The required "negative" center delay — which is actually a delay of all the other channels relative to the center — is more difficult to achieve, but it's likely that only surround-sound perfectionists will seek out Dolby Digital equipment having it. In fact, manufacturers are free to provide both positive and negative delay compensation to all speakers in a sur-

round system, as is the case with components incorporating both Dolby Digital and Home THX processing. Some of these components even supply an adjustable delay to the subwoofer, which can be very helpful in smoothing response at the subwoofer/satellite crossover frequency.

SURROUND-CHANNEL DELAY

Don't confuse the standard Dolby Digital center-channel time-delay control with the familiar Dolby Pro Logic *surround-channel* delay, which still must be adjusted for Pro Logic

FIGURE 3 DOLBY DIGITAL SURROUND DELAY



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DOLBY DIGITAL'S GREATEST HITS

LOOKING FOR EXAMPLES of how thrilling your Dolby Digital home theater can be? Dolby Laboratories suggests some laserdisc demos that will wow your friends.

Amadeus (Paramount/Pioneer)

- *Side 1, Ch 9, 40:00–45:30.* The opening conversation in the center speaker is peppered with footfalls and door creaks from the front left and right channels to help the small environment seem less confined. When the singing starts, the sound fills the enveloping concert hall, where the spaciousness of the stereo surround channels and the width of the front stage are in full glory.

Batman Forever (Warner Bros.)

- *Side 1, Ch 2, 4:36.* An invisible helicopter flies from left surround to right surround.
- *Side 2, Ch 3, 4:40.* Two-Face shoots a rocket, which swirls its way through five discrete channels: center, front right, right surround, left surround, and front left.

Clear and Present Danger

(Paramount/Pioneer)

- *Side 2, Ch 14, 24:44–25:08.* A missile flies down the left side of the room, then back up the right. Wait until 25:40 for the *kaboom* in the right surround.

The Lion King (Walt Disney)

- *Side 2, Ch 27, 35:48.* Elton John sings a *cappella* in the center, “accompanied” by music from the front left and right. Isolation of one or the other is possible by turning off the L/R speakers or the center (and is best when the bass-redirection setting is off).

Nick of Time (Paramount/Pioneer)

- *Side 2, Ch 12, 5:40–6:14.* Interesting and unusual manipulation of the surround channels in a hallucination scene, with speaking voices that are panned around the perimeter.

The Santa Clause (Walt Disney)

- *Side 1, Ch 3, 7:35–8:12.* Monophonic “oldies” mood music comes from front left and right only, while a TV commercial chats in the center.

Stargate (Carolco/Pioneer)

- *Side 1, Ch 5, 31:00–31:38.* The now famous Stargate sequence, a “jump to light speed” with attitude. A flowing, swirling tunnel of sound.

Star Trek Generations

(Paramount/Pioneer)

- *Side 2, Ch 11, frames 24000–27300.* Many effects fire diagonally or occur in isolated places in the sound field, especially in the left and right surrounds.

Strange Days (Fox/Image)

- *Side 1, Ch 2, 2:00–5:20.* Be forewarned: This is a gruesome, brutal, and foul-mouthed excerpt — not for younger viewers or the squeamish. But like other scenes in the movie, it makes effective use of the surrounds to put you in the head of the protagonist for sure. It's *Brainstorm* meets *Dirty Harry*! □

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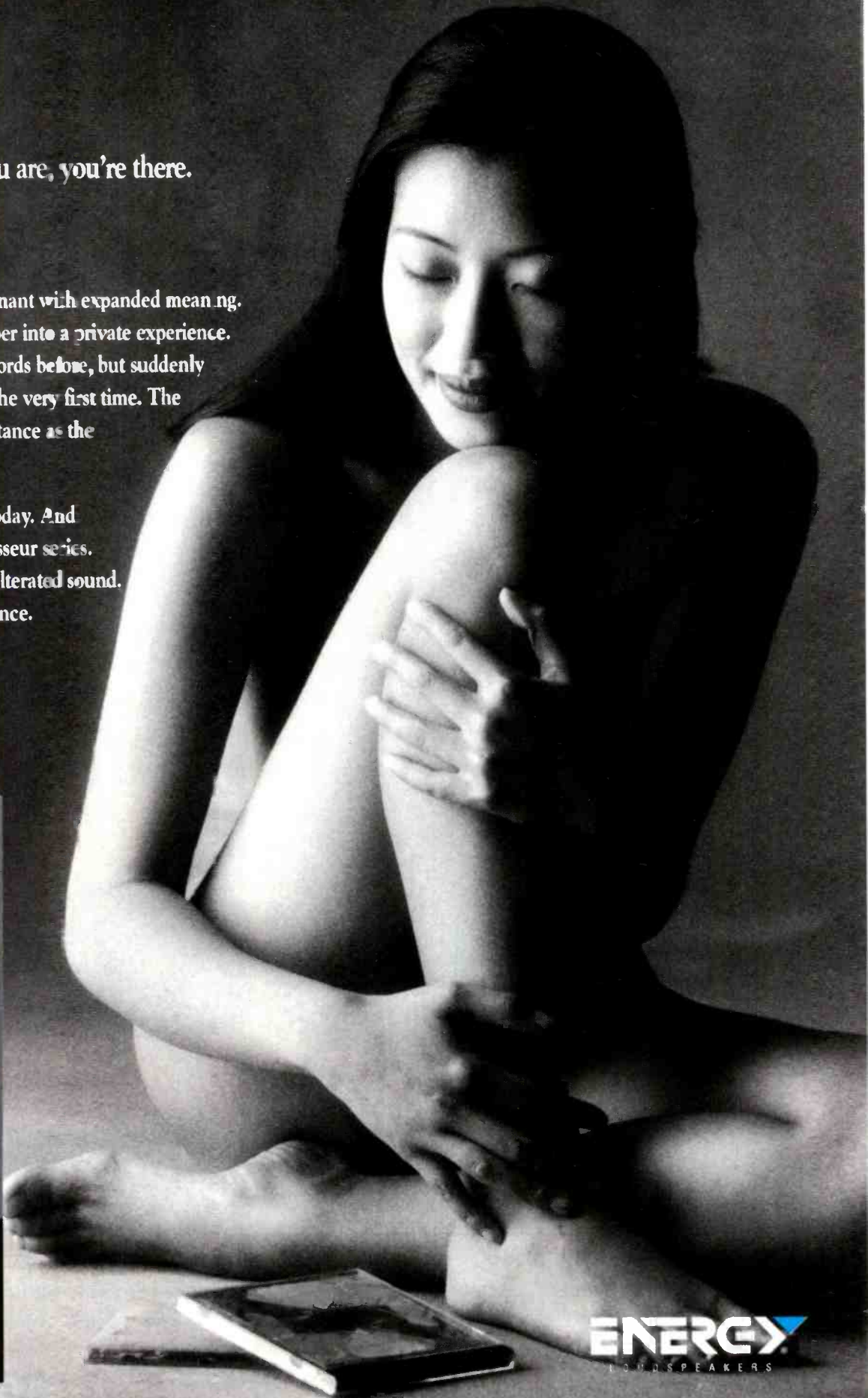
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Digital Audio 101

Back to Basics

If you were around in the early 1980's you probably read reams of articles explaining the new and wonderful technology called digital audio and its scion the compact disc. You probably constructed a good knowledge base of terminology and theory that helped you to understand this marvelous breakthrough. Congratulations. You were one of the pioneers, privileged to witness firsthand a true technological revolution.

Now, some fifteen years later, millions of people have joined the movement, their vast legions reflecting the tremendous success of the revolution. Unfortunately, some

users of digital audio have never had the opportunity to learn what it's all about and may be laboring under misconceptions; in fact, over the years I have seen a serious de-education take place in which hearsay and half-truths have supplanted engineering reality. While it's important to keep up with each month's latest developments in audio, it's also important to maintain a solid understanding of digital audio theory. Otherwise, you'll find yourself simply adding sail to the masts of a boat with a weak hull.

For example, unless you're crystal clear on the basics, you

BY KEN C. POHLMANN

can't make an intelligent purchase of a CD player. And the

same goes a hundred times more when it comes to such advanced applications as DVD. So whether you're a newbie to the audio game, or you've forgotten the lessons of the 1980's, let's get back to basics.

The most important principle of digital audio is this: *Digital audio has almost nothing to do with analog audio.* True, in both cases music goes in and music comes out, but the similarity ends there. An analog signal chain is one of mimicking, in which a change in air pressure at the microphone is imitated and conveyed as a continuous voltage, a groove wiggle, or a magnetic variation on its way to your speakers. The downfall is that the imitating signal is inherently indistinguishable from the system's own noise — the equipment in the recording and playback chain can't tell which is which.

In contrast, a digital audio system consists of numbers that *represent* a waveform. The analog microphone signal is converted into a numerical sequence and converted back into an analog signal just before the speakers. Because numbers are easily distinguishable from the system's own noise, the digital method is inherently superior. Anyone who remembers what long-distance phone calls used to sound like when the phone company used analog circuits and compares that with the "next door" quality of today's digital phone circuits will immediately understand the advantages of digital audio.

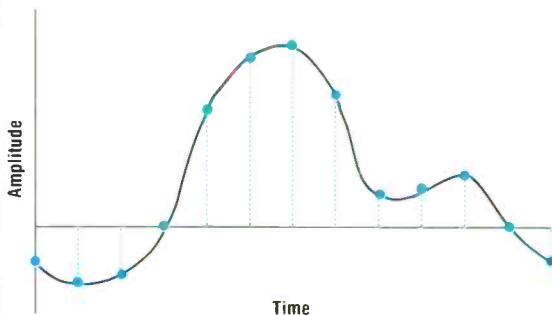
A digital audio system is not only superior to analog; it's also vastly more complex. Conceptually, if analog audio is a wind-up alarm clock, then digital audio is a Pentium computer — the difference in engineering sophistication is at least that significant. It's a self-defeating proposition to try to evaluate digital audio systems in terms of analog thinking. It simply doesn't work and only leads to misunderstanding because the approaches are so different. Instead, digital audio demands its own unique comprehension. Fortunately, although the ins and outs of how sound is reproduced in the digital domain can get fabulously complicated, the primary workings are readily explained.

Analog to Digital and Back

The first essential basis of digital audio is *discrete time sampling*, as described by the American engineer Harry Nyquist back in 1928. On one hand, the nature of sampling is easy to see.

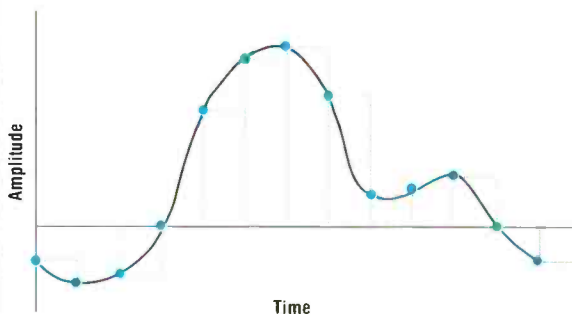
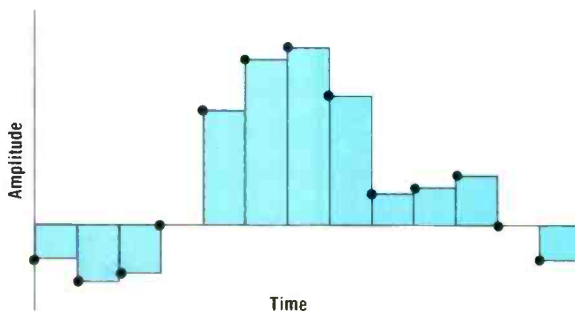
The Digital Audio Process

Analog to digital to analog, step by step



A continuous analog audio signal is sampled at regular intervals and its amplitude is determined. Based on the amplitude, each sample is then assigned a numerical value, which may be stored, as on a CD, or transmitted.

To convert back to analog, each digital sample is read and decoded to determine its corresponding analog amplitude. A signal of that amplitude is then "held" for each sample, creating a staircase signal representing the analog input.



The staircase signal passes through a low-pass filter, which applies a precise mathematical characteristic to each sample to recreate an exact replica of the original analog signal. (A shadow of the corresponding staircase input is shown behind.)

A motion picture is made of a series of still photographs viewed at twenty-four frames per second. Unable to discern the individual pictures, the eye/brain instead creates the illusion of a moving image. In that respect, each movie frame is a sample. Audio sampling is similar, but whereas movie frames merely *trick* the eye into seeing a continuum, a digital audio system integrates samples into an *actual* continuum, thus replaying a true analog signal. Specifically, at the system input, the microphone signal is sampled at a fast rate (44,100 times per second

in the CD format) so that the continuous analog signal is represented as a series of discrete samples. Each sample's amplitude equals the amplitude of the analog signal at the moment that sample was taken. At the analog-to-digital (A/D) converter, each of these amplitudes is assigned a numerical value using a binary code. Then those values can be stored, for example, on a CD.

To reconstruct the analog signal, the stored numerical values are sent to a digital-to-analog (D/A) converter, where each number is converted into

an analog value of corresponding amplitude before passing through a low-pass filter. (The main steps in the chain are shown in "The Digital Audio Process," facing page.) The analog output signal is remarkably similar to the original input signal, with frequency response potentially accurate to within a tenth of a decibel and distortion less than a hundredth of a percent.

It's important to consider exactly how the output signal is reconstructed, because the mechanism is quite subtle. Specifically, the low-pass filter at the output imposes a precisely calculated mathematical characteristic on the samples that pass through it. In particular, it computes the impulse response of an ideal filter in which all signals higher in frequency than one-half the sampling frequency (22.05 kHz in the case of the CD format) are removed. The filter's impulse response calculation spreads the energy from each sample in a precise way so that the output analog signal has the value of each original sample at sampling time. Moreover, the sum of the individual impulse responses from a large number of samples recreates all the intermediate parts of the waveform between samples. In this way, *no* information is lost "between the samples," despite anything you may have heard to the contrary. The final result is a reconstructed signal that is continuous — like the original analog waveform.

The bottom line is this: The digital audio samples can be used to reconstruct an analog output signal that theoretically contains *all* of the audio frequencies up to one-half the sampling frequency. If the sampling frequency is 44.1 kHz, then an audio band of 0 to 22.05 kHz is created. Theoretically, all sound energy in that band, whether derived from simple or complex signals, is fully reproduced. There are no ifs or buts, no drawbacks or exceptions.

Many people still doubt that claim nonetheless. But they're wrong. If your car's top speed is 100 miles per hour, then you can drive at any speed up to 100 miles per hour. A compact disc can convey any and all frequencies up to 22.05 kHz. Moreover, if you feel the need for more "speed" — that is, higher frequencies — it can be achieved by increasing the sampling frequency. The audio band that emerges after D/A conversion always tops out at one-half the sampling frequency. Some proposals for the next-generation DVD audio

format call for a sampling frequency of 96 kHz, yielding an audio bandwidth of 48 kHz. Will that improve sound quality? Yes, but only marginally, because music contains very little energy above 20 kHz, and most people cannot hear frequencies above that.

Quantization

The second fundamental of audio digitization is *amplitude quantization*, the process of assigning to each sample a digital code that accurately reflects the amplitude of the analog signal. It is completely independent of time sampling but plays an essential role in audio quality. Whereas the sampling frequency determines the frequency response of the system, quantization determines the noise floor. When samples are coded into their numerical representation at the A/D converter, the accuracy of the coding determines the level of error in the representation, which in turn governs the noise.

Samples are coded using binary bits. The more bits in each digital "word," the greater the total number of words, or discrete values, available to code each sample and the greater the precision of each word. Specifically, the number of values equals 2^n , where n is the number of bits in a word. We observe that when the word length is increased by 1 bit, the total number of values doubles. For example, a 3-bit word yields eight values, and a 4-bit word yields sixteen values. In the CD format, word length is 16 bits, yielding 65,536 different values. Hence whatever the amplitude of the sample, any one of 65,536 values is available to represent it.

This highlights the fundamental weakness of digitization: Whereas an analog signal can occupy any of an *infinite* number of amplitudes, a digital system can only represent those amplitudes with a *finite* number of values. The result is an inherent approximation error, called quantization error (see "The Quantization Effect" on page 98). The good news, however, is that when 16-bit words are used, it theoretically results in a noise floor flat across the audio band and down 98 dB from the maximum signal level.

Nonetheless, while a signal-to-noise ratio (S/N) of 98 dB is very respectable, it is, ironically, insufficient. Inherent noise masks low-level distortion artifacts in an analog system, but a digital system cleanly exposes them. As a result, low-level nonlinearities resulting from the errors that are inher-

ent in quantization can be audible during soft musical passages.

To overcome this effect, digital systems add something called *dither* to the analog audio signal just prior to A/D conversion. Dither, a very low-level noise signal often placed at around -90 dB, has an extremely beneficial effect. Low-level audio signals that would otherwise be lost in quantization or coded in a very nonlinear way are instead preserved. With dither, a digital audio system can achieve resolution that is much greater than it would otherwise obtain with a given word length. Although dither adds a slight amount of noise to the audio signal, it very successfully lowers distortion by randomizing quantization error, resulting in wider dynamic range and cleaner low-level reproduction.

To further minimize audibility of the noise floor, some systems employ *noise-shaping*, in which the originally flat noise floor is processed so that the noise level in the most critically audible frequency regions (perhaps 1 to 5 kHz) is reduced in exchange for higher noise levels at higher frequencies where the ear is much less sensitive to it. In fact, one of the hottest areas in digital audio is the processing of audio signals according to psychoacoustics, in which the ear's properties are specially considered. Data-compression technologies such as MPEG (used in CD-ROM's), ATRAC (used in the MiniDisc audio format), and AC-3 (used in the Dolby Digital playback system) are all based on psychoacoustics, which allows the amount of data that is stored or transmitted to be reduced in ways that are relatively inaudible. Do you enjoy the sound from your Digital Satellite System (DSS)? Thank data compression for it.

Multibit vs. 1-Bit Converters

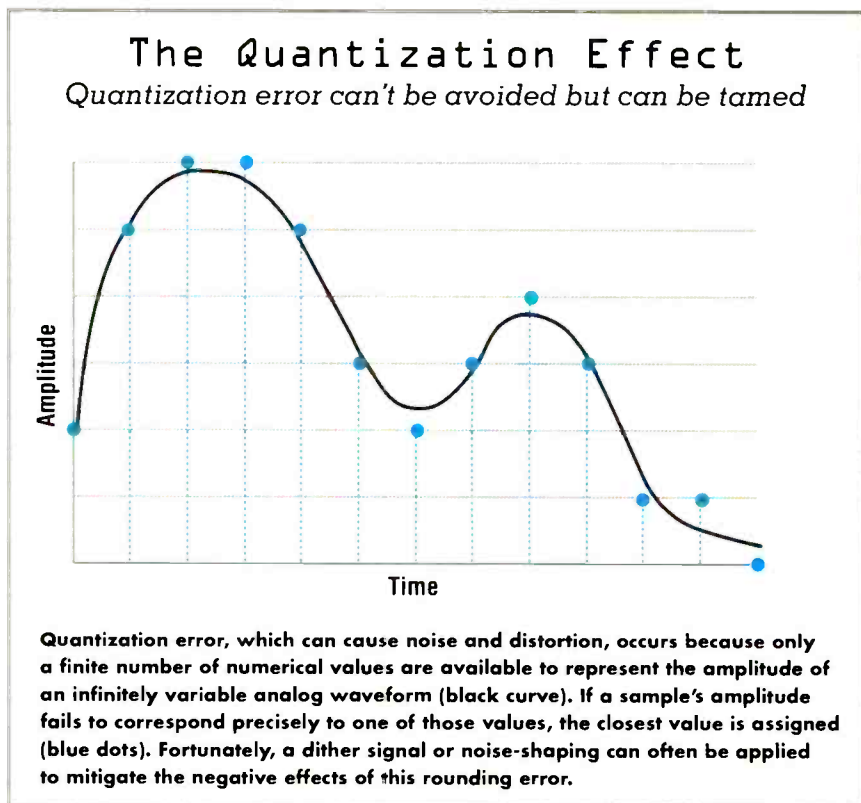
As noted, the CD format, like most other digital audio systems, is based on 16-bit words. This means that the A/D converter must output digital words that are 16 bits long. Traditionally, these converters have used *multibit* techniques in which 16-bit words were processed internally. Today, however, most A/D converters operate on a *1-bit* principle in which the input signal is raised to a very high initial sampling frequency (several hundred kilohertz). Because the sampling frequency is so high, words only one or a few bits long can provide high quantization resolution, and noise-shaping

can easily be used to lower audio-band quantization noise further. At the converter's output, the 1-bit signal is converted to 16-bit (or higher) coding and a regular (lower) sampling frequency.

Similarly, D/A converters nominally accept 16-bit words for reconstruction. In practice, however, many of them also employ 1-bit techniques with very fast internal sampling frequencies and noise-shaping. It is not possible to say whether multibit or 1-bit converters are superior generally. In fact, there are good and bad examples of each. Over the past three years, though, virtually all consumer products have switched over to 1-bit converters. The 1-bit circuit chips are cheaper to make and more stable over time, and they offer extremely good performance in terms of low-level linearity and other properties. On the other hand, expensive high-end multibit converters can sometimes outperform 1-bit converters.

It's also important to note that many products contain D/A converters with accuracy beyond 16 bits. For example, although all CD's store words that are 16 bits long, some CD players contain converters with 18- or 20-bit accuracy. There are several reasons why this is an important improvement. First, the digital filter used in the output stage of most conversion systems performs calculations that increase the word length (the audio samples are multiplied by coefficients that define the filter characteristics). As with any multiplication, the extra digits contain valid information about the original numbers, so it makes sense to apply these longer words to the output converter. Second, everything else being equal, a D/A converter with 18- or 20-bit resolution is more accurate than a 16-bit converter. Usually the converter with a longer word length will do a better job of converting the samples, thus lowering distortion.

Although 18- or 20-bit converters may be used to ease the audio signal's transition into and out of the digital domain, 16-bit words rule the world of digital storage. The CD, DAT, and other consumer media store 16-bit words. With proper conversion techniques, the sound quality is excellent, but proposals for the DVD audio format call for 20- or 24-bit words to store signals. An extra 4 or 8 bits may not sound like much, but it's actually a huge improvement. Recall that each time a bit is added to the length of a



binary word, the number of possible values doubles. Therefore, while a 16-bit word can represent any of 65,536 values, a 20-bit word can have more than 1 million values and a 24-bit word more than 16 million. In other words, 24-bit conversion is 256 times more accurate than 16-bit conversion.

That sounds pretty impressive, and indeed it is, but the task of achieving that kind of accuracy can be daunting. Consider this: If sheets of typing paper were stacked to a height of 20 feet, the thickness of a single sheet of paper would represent one quantization level in a 16-bit system. In a 24-bit system, the stack would actually tower over a mile high; audio converters would have to measure that mile to an accuracy equal to the thickness of a piece of paper. Looked at in another way, if you measured the distance between New York and Los Angeles with 24-bit accuracy, the measurement would be accurate to within 9 inches. If DVD audio systems of the future achieve that kind of resolution, they will truly be engineering marvels. Will 24 bits sound better than 16 bits? Yes, absolutely, but only under the most stringent recording and reproduction conditions.

Avoiding the Jitters

Without question, the art of digital audio requires incredible precision, not

only when performing quantization but also in sampling. Any timing error in the regularity of samples constitutes jitter, and depending on exactly where it occurs, and on how well the downstream circuits are engineered, jitter can be a problem. Ideally, samples are taken periodically so that the timing between them is identical. In practice, the timing intervals may differ slightly, thus creating jitter. There are two principal causes of jitter: speed variations in a digital tape recorder or disc player, and inaccuracies in the clocks that are used to operate A/D or D/A converters.

In many cases, jitter is no big deal. For example, the output of a disc may contain jittered data, but if the receiving circuits can successfully determine the numerical values of the data, then the jitter will not affect the results. Jitter rarely interferes in the task of reading data, and that is why, as every computer user knows, digital data can be easily copied from one point to another without error.

On the other hand, if a D/A converter locks onto that jittered data coming off the CD and uses it as a reference timing signal, the output analog signal will have added noise and distortion. For that reason, to place jitter-induced noise and distortion below the level of system noise, a converter's clock might

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require a timing accuracy of 20 picoseconds. Note that a picosecond is the reciprocal of 1 terahertz, or 1,000 gigahertz, or 1,000,000 megahertz. In other words, the control of jitter requires very tight tolerances.

Audio samples must be acquired with particular care at the A/D converter. Simply put, clock jitter at the A/D converter results in the wrong samples at the wrong time. Moreover, even if these samples are presented to a D/A converter with a jitter-free clock, the result will be the wrong samples at the right time. In that respect, controlling jitter is most

crucial in the A/D converter's clock. Well-engineered crystal oscillators typically have jitter of less than 10 picoseconds, which is sufficiently precise.

But D/A converters are also susceptible to jitter. The quality of samples taken from a perfectly clocked A/D converter will be degraded if the D/A converter's clock is nonuniform, creating the scenario of the right samples at the wrong time. Even though the data values are numerically accurate, the time deviations introduced by jitter will result in increased noise and distortion in the output analog signal. Fortunately,

distortion in the output waveform is a playback-only problem; the input data could be correct and await only a more accurate conversion clock. The samples are not wrong — they're only being converted at the wrong times. Data input to a D/A converter must be clean, and so must the clock used to operate the converter. Good digital audio engineers are well aware of these requirements and design accordingly.

A digital signal may also be jittered following mechanical storage. Fortunately, though, even a badly jittered signal can be cleaned up. A phase-locked-

DIGITAL AUDIO DICTIONARY

Back in the old days, listening to music was pretty easy. You put the needle in the record groove and relaxed. Nowadays, stereo systems are filled with microprocessors, laser beams, and noise-shapers. Pretty soon you'll need a graduate college degree and an operator's license to play your stereo. Until then, and while there's still time, a short digital audio dictionary will help explain the jargon being inflicted on consumers. Read carefully; there'll be a quiz afterward.

A/D (ANALOG-TO-DIGITAL) CONVERTER

An electrical circuit that converts a momentary sample of an *analog* signal to a *digital* word, represented as a *binary* number; both multibit and 1-bit techniques may be used.

ALIASING

Unwanted frequencies created when *sampling* a signal of a frequency higher than half the sampling rate. *Anti-aliasing filters* in digital recorders insure that aliasing will not occur in master recordings.

ANALOG

A physical quantity (or data) characterized by being continuously variable rather than discrete. Acoustical waveforms are analog.

ANTI-ALIASING FILTER

A low-pass filter used at the input of digital audio recorders to prevent *aliasing* by attenuating frequencies above half the *sampling frequency*.

ANTI-IMAGING FILTER

A low-pass filter used at the output of digital audio reproducers, such as CD players, to attenuate frequencies above half the *sampling frequency*.

BANDWIDTH

The range between lower and upper limiting frequencies; the width of a band of frequencies. Also, the maximum amount of *digital data* capable of transmission or storage.

BINARY

A condition in which there are two possible states; for example, the binary number system (base 2) using the digits 0 and 1.

BIT

The smallest unit of *digital data* (abbreviation for *binary digit*); a bit can store only one of two states, 0 or 1, on or off.

BIT RATE

The frequency at which *bits* appear in a bitstream. For raw data from a CD this is 4.3218 million bits per second (4.3218 MHz).

BYTE

A group of *bits* operated on together in a digital circuit; that was 8 bits in early computer systems, so a byte still equals 8 bits when totaling *digital data*, but today's systems usually group bits into bytes of 16 or more.

CLOCK

A timing device that generates the basic periodic signal used as a source of synchronizing signals in digital equipment; crystal control insures precision.

D/A (DIGITAL-TO-ANALOG) CONVERTER

An electrical circuit that converts a *binary* coded word to an equivalent *analog* voltage; both multibit and 1-bit techniques may be used.

DATA, ANALOG

Any physical representations of information processed by an *analog* circuit.

DATA, DIGITAL

Any numerical information processed by a *digital* circuit.

DIGITAL

The use of numbers (typically *binary*) to represent information.

DIGITAL AUDIO

The use of *sampling* and *quantization* techniques to store, transmit, or process audio information.

DIGITAL FILTER

Any filter characteristic accomplished in the *digital* domain. Digital filters use *oversampling* to yield the "brick-wall" characteristic

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... DIGITAL AUDIO DICTIONARY

needed for the *anti-imaging filter* and the impulse response used for waveform reconstruction in the D/A (digital-to-analog) conversion process.

DIGITIZATION

Any conversion of *analog* information to *digital* form.

DISCRETE TIME SAMPLING

The technique of representing a waveform at a discrete instant of time with a set of periodic pulses; the basis of *digital audio*.

DITHER

Analog noise added to the input signal when a digital recording is made to minimize the effect of *quantization error*.

I/O (INPUT/OUTPUT)

Equipment or *data* used to communicate from a circuit or system to other circuits or systems, or to the outside world.

JITTER

Any periodic or random timing variation in a clock or *data* signal; usually not audible in well-designed digital audio systems.

LOW-PASS FILTER

A filter with a characteristic that allows all frequencies below a specified cutoff to pass and attenuates all frequencies above. *Anti-aliasing* and *anti-imaging filters* are low-pass filters.

MODULATION

The process of varying a carrier signal according to the instantaneous value of an input signal.

NOISE-SHAPING

A *digital* signal-processing technique in which noise in one frequency region is shifted to another, less audible region, thus decreasing the overall subjective noise level.

NYQUIST FREQUENCY

The highest audio frequency that can be accurately sampled; one-half the *sampling frequency*. The theoretical Nyquist frequency

(named after Harry Nyquist, the engineer who described the *sampling theorem*) of the CD format is 22.05 kHz.

OVERSAMPLING

The digital technique in which the rate of audio *sampling* is multiplied, typically by eight, to perform *digital filtering* prior to D/A conversion. A gentle analog *anti-imaging filter* is still required after conversion to remove extreme supersonic image frequencies.

PCM (PULSE CODE MODULATION)

A *modulation* method in which digital words in a bitstream represent samples of analog information; the basis of most *digital audio* recordings.

QUANTIZATION

The process of converting the infinitely variable amplitude of an *analog* waveform to a finite series of levels expressed as *binary* words; performed by an *A/D (analog-to-digital) converter*.

QUANTIZATION ERROR

Error resulting from quantizing an analog waveform to a series of discrete levels, leading to noise and distortion. The longer the *binary* word length, the less error. *Dither* is used to decrease the effects of quantization error.

SAMPLING

The process of capturing the amplitude of an *analog* signal at a particular point in time.

SAMPLING FREQUENCY

The frequency at which an *analog* signal is sampled, expressed in hertz (Hz). The sampling frequency used in the CD format is 44.1 kHz. Since the CD stores two-channel stereo sound, 88,200 samples are stored on the disc for each second of playback.

SAMPLING THEOREM

A mathematical theorem stating that a band-limited continuous waveform can be exactly represented by a series of discrete samples. The *sampling frequency* must be at least twice the highest frequency contained in the waveform. — K.C.P.

loop (PLL) circuit accepts the data signal as a timing reference, measures the phase error between the reference and its own output, and uses the error to control a voltage-controlled oscillator. Once locked, the circuit will run at the nominal reference frequency yet prevent jitter from passing through the PLL. In other words, the PLL provides jitter attenuation, thus cleaning up the signal. When jittered data is properly attenuated, potentially audible artifacts do not result.

While jitter control is a valid concern, the magnitude of its effects have been overblown. One audiophile I know claims that he can hear jitter "on most recordings" and that it sounds a lot like wow and flutter. Fortunately, he is wrong, and he is guilty of applying analog thinking to a digital situation. In

fact, jitter does not cause artifacts that sound like wow and flutter; it simply adds very low-level noise and distortion. While designers must be sure to limit jitter in their circuits, traditional analog measurements such as total harmonic distortion plus noise (THD+N) can be used to evaluate the quality of the output signal and will include effects caused by jitter. A poorly designed CD player might exhibit, as a result of very high jitter levels, distortion at 70 or 80 dB below the maximum signal level. While such low-level distortion is certainly not good, its audibility is relatively slight. In a well-designed CD player, jitter effects will be inaudible. In other words, with careful engineering jitter can be successfully controlled in today's high-quality digital audio systems.

It is technology's advance, and its growing sophistication, that makes music recording and playback such an interesting science, as well as an art. Whereas analog audio technology is now quite mature, digital audio is still a young upstart. As digital audio moves forward in the years to come, it will uncover entirely new challenges and discover exciting new opportunities. As quantization words lengthen and sampling frequencies rise in tomorrow's DVD audio format, system tolerances will have to keep up. It's relatively easy to create more audio data and move it around faster, but great expertise will be needed to turn all that data into significantly audible improvements. As digital audio performance approaches the threshold of human perception, that will be its greatest challenge. □



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Brick by Brick

There are audio enthusiasts who get the itch to upgrade with each year's wave of new equipment, but you won't catch Marcus Weiss making any impulsive purchases for his audio/video system. While logging 30 years as a stereo equipment collector — 15 of those reading *STEREO REVIEW* — he has methodically assembled his seven-channel home theater system piece by piece.

Through patient research, auditioning, and trading up, Weiss has managed to amass a killer system that he'll gladly put next to anyone's. But good sound isn't the setup's only virtue: It also happens to be in one of the best-looking A/V cabinets — and in one of the best-looking rooms — you're likely to find anywhere.

Of course, it wasn't always so. Tired of squeezing into a 220-square-foot den in his suburban Atlanta home whenever he wanted to catch a few tunes from his B&W 801 Matrix Series II speakers, Weiss petitioned his wife, Amy, for more listening space. In turn, she had been unhappy about the lack of elbow room in the kitchen. A different couple might have moved. Instead, the Weisses opted to knock down the wall separating the 180-square-foot kitchen from the tiny den, raise the ceiling to 14 feet, and expand the combined room to create a comfortable space all could enjoy. Working from a design by architect Robert Whitfield, builder Chris Killingsworth morphed the two spaces into one, creating an 800-square-foot great room that doubles as kitchen and entertainment room. Now all that sep-

arates "his room" from "hers" is an expansive countertop to the left of the open, airy theater.

Before any sledgehammer could be raised, however, Amy Weiss laid down an important condition: If the sound equipment was to assume such a large role in the redesign, it had to be attractively housed. Again, the Weisses turned to architect Whitfield, who passed off the blueprint for a gorgeous 12½ x 7-foot A/V cabinet to Richard Webb of Berkeley Woodworking. Exact measurements were given for the various components and speakers in the system, and the plan called for including additional space for storage and upgrades.

A music lover at heart, Weiss has come to embrace home theater — but not at the expense of his cherished B&W 501's. He purchased the speakers several years ago, together with a Mark Levinson No. 23 power amplifier, conservatively rated at 200 watts per channel. The two are a match made in heaven, according to Weiss, who paired them after an extensive labor-of-love audition process. "Nothing else I found sounded sweeter with the B&W's than the Levinson," he recalls. "The B&W's are the pinnacle of loudspeaker design, and the Levinson along with them is absolutely invisible. There's simply no noise." Despite the placement of the B&W's in the A/V cabinet, Weiss says he avoided problems with sound dispersion by aligning the grilles with the front of the cabinet.

The dual-mono Mark Levinson amp feeds the B&W's for stereo music and for front left and right theater sound. An Onkyo TX909PRO A/V receiver handles signal processing and serves as switching center for the entire system. It also supplies power to the center and rear surround speakers, as well as to two front-channel effects speakers that are part of a proprietary Onkyo enhancement of the Dolby Pro Logic format.





The front effects are delivered by a pair of Monitor indoor/outdoor speakers from Rock Solid Sounds, positioned in shelves above the 801's. The center speaker, a Cambridge SoundWorks Center Channel Plus, lies across the top of the Mitsubishi 35-inch TV, and the rear speakers, a pair of Cambridge Ambiance in-walls, are hidden. One of the rear speakers — self-contained in its supplied sealed enclosure — rests inside a planter above the kitchen counter and points up to help create a diffuse sound field; the other is built into the wall on the opposite side of the room.

There's no subwoofer in this powerhouse system, and Weiss says that's by design. The foot-wide woofers in the B&W's deliver enough punch to shake the house when the jets fly overhead during his favorite demo clip from *True Lies*. "It's an exciting experience because the whole house is moving," he says. "The sound is crystal clear and dynamic, and it's better than any movie theater I've ever heard."

The Onkyo receiver, with its vast assortment of inputs and outputs, will likely handle anything Weiss adds to the system, and he selected it largely because of that flexibility. He also makes frequent use of its Theater mode, which provides Onkyo's seven-channel variation on Dolby Pro Logic, and its seven-channel Hall mode, which Weiss likes for reproducing music. The addition of the two front-effects channels adds depth to the soundstage and vastly enhances the listening experience, he says. "You are virtually in Carnegie Hall." Or the Fillmore, for that matter, he adds — when he pulls out the Allman Brothers Band's famous "Live at the Fillmore East," the effect is awesome. "We have to move everyone out of the neighborhood," he jokes.

Source equipment for the system includes a Nakamichi CR-7A cassette deck and a tried-and-true Audioquest CD-1 compact disc player. And Weiss is nothing if not loyal. He still plays his 500-or-so LP's, on a Sony turntable,

and he has stuck with the 8mm videotape format since the first Sony Handycam hit the market "light years" ago. He uses the time-shift recording capability of his Sony EVS 700 8mm VCR to record TV programs for the family catalog or to catch favorite shows for later viewing. And just to make sure he'll always have a deck on hand, he has an additional Sony EVS 900 VCR attached to the TV in his bedroom, as well as a Sony GV-9 portable for video-on-the-go.

Weiss's only regret after spending \$20,000 on the equipment and another \$10,000 on the A/V cabinet? Requesting a TV opening in the cabinet that can only accommodate a 35-inch TV. "Now I'd like to have a 60-inch rear-projection TV," he explains. "The sound of my system is too big and mighty for a 35-inch." But not to worry. Like everything else in the system and the A/V room he's patiently built, step by step and brick by brick, it's probably just a matter of time.

—Rebecca Day

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Is It Live....?

*Live recording
is finally
getting a little
respect*

BY JAMIE JAMES

IN THE GOLDEN AGE OF the phonograph, if such a thing ever existed, the live recording was the bastard stepchild of the industry. Except for sensational events, a Van Cliburn recital in Moscow, say, or a legendary festival performance, live recordings had an odor of the disreputable about them. The sound quality was often wretched — muffled bass and screechy treble, liberally garnished with booming coughs and foot-thuds — and there was always the suspicion that the fly-by-night companies that issued most of them weren't exactly scrupulous about the fine points of bookkeeping, especially when it came to royalties.

The record collector, whether an audiophile or a music lover (or both), wanted to hear the great musicians of the day in new recordings made in the studio, where the latest technology could capture their artistry with ever greater fidelity. Recordings served an archival purpose: Each was intended to be a definitive statement about a piece of music by a noted instrumentalist, an orchestra and its conductor, or a cast of singers chosen for an opera recording by the producer.

Thirty years ago, when the New

ILLUSTRATION BY CELIA JOHNSON



“There’s more danger in a live performance, because you can only do it once. That’s what Glenn Gould objected to in live [recording], that it was like a high-wire act in the circus.” — YO-YO MA

York Philharmonic and Leonard Bernstein were ready to record a Beethoven symphony for Columbia Masterworks (now Sony Classical). They went to a sound studio in Manhattan with their producer, John McClure, and thrashed it out, laying down take after take until everyone was happy with what they heard. Those days are gone. Today, when the New York Philharmonic makes its recordings for the Teldec label, the engineers fly over from Europe, set up their microphones in Avery Fisher Hall, and tape a series of public concerts. And the orchestra's music director, Kurt Masur, couldn't be more delighted about it.

"For years I had been trying to convince Teldec to do live recordings," Masur told me. "With an audience out there, there's a different kind of atmosphere. There's more excitement, and the listener can feel that. It's more honest, more alive than a studio recording."

While it might seem that there would be some diminution of control



Glenn Gould with orchestra and conductor Vladimir Golschmann making a studio recording for Columbia Masterworks in April 1958. Six years later Gould abandoned live performance entirely.

over the sound in a live-recording situation. Masur insists that the results are actually better. After the first concert — "Take 1," as it were — he listens carefully to the tapes to check "the sound, the tempo, the balances, as I used to do in the studio." After the last concert, the orchestra stays for another hour "to repair any accident, to patch over any place where there was a bad cough." They also record the final notes of the work to avoid applause at the end of the track.

Another conductor who's switched from studio to live recording is Michael Tilson Thomas, who last year took over as music director of the San Francisco Symphony. Their debut recording for RCA Victor, a suite from Prokofiev's *Romeo and Juliet* arranged by the conductor, was recorded live in

a wonderful feeling for everyone."

In the concerts that were used for the recording of *Romeo and Juliet*, he spoke to the audience from the podium to make them feel a part of the proceedings. "I told them that these are audience-participation pieces, and that their part of it is to remain as silent as possible. Because it's such a long piece, we had a couple of coughing breaks." Thomas also points out that a live recording allows the orchestra to work "at home" rather than being thrust into unfamiliar territory: "For any orchestra working as hard as

most American orchestras are, in terms of the number of programs they play, going into the studio results in diminished rather than heightened energy."

Nonetheless, he believes that there is still a place for studio recordings, especially where there is scope for technological experimentation. As an example, he cited a new recording of Villa-Lobos he made with the New World Symphony in which he and the producer "decided even before we began that whatever instrument had the ostinato rhythmic drive of the piece would be profiled with the mike, so that it would be a much more up-close sound. We recorded the wide swath of the sound of the orchestra, and within that was this kernel of the closely and



"I told them that these are audience-participation pieces, and that their part of it is to remain as silent as possible."

— MICHAEL TILSON THOMAS

the orchestra's home, Davies Hall. Like Masur, Thomas believes that live recording greatly enhances the excitement of the musicmaking:

"You get such a huge boost from the audience, it instantly makes an occasion of any concert that is being recorded. I sense a tremendous spontaneity that comes into the playing. It's

edgily produced rhythm track." Other pieces on the Villa-Lobos disc were built up track by track, the way most pop recordings are made.

The conceptual godfather of this analytical, carefully plotted-out approach to recording classical music was Glenn Gould, who famously gave up performing before live audiences in 1964

in order to devote himself to the creation of “perfect” recordings in the studio. Gould had a fanatical belief in the power of technology. In an essay called “The Prospects of Recording,” published in *High Fidelity* in 1966, he predicted that someday the concert hall would become obsolete and that the listener, the consumer of recordings, would become an active participant in the process.

“At the center of the technological debate, then,” he wrote, “is a new kind of listener — a listener more participant in the musical experience. The emergence of this mid-twentieth-century phenomenon is the greatest achievement of the recording industry. For this listener is no longer passively analytical; he is an associate whose tastes, preferences, and inclinations even now alter peripherally the experiences to which he gives his attention, and upon whose fuller participation the future of the art of music awaits.”

While the current practice of making live recordings in the concert hall would no doubt surprise Gould, the emergence of the interactive CD-ROM makes his other predictions no longer seem so far out. The cellist Yo-Yo Ma, one of the most prolific and successful classical recording artists of our day, says that he is “fascinated with Glenn Gould’s approach. You can actually, with the right skills, do it that way and make really wonderful recordings.”

Ma should know: One of his most popular discs ever was his collaboration with Bobby McFerrin, an inventive, free-form set that conveys all the goofy fun of two very technologically

hip musicians fooling around in the studio. “In the studio environment you can feel very safe,” Ma says. “You can use your mind to choose exactly what you want to hear, time after time. There’s more of a danger in a live per-

archival significance of the modern recording, particularly when composers are able to go into the studio and create “definitive” versions of their own works. What conductor of the future, Gould asked, could possibly ignore



CHRIS LEE/TELDEC

“With an audience out there, there’s more excitement, and the listener can feel that. It’s more alive than a studio recording.”

— KURT MASUR

formance, because you can only do it once. That’s what Glenn Gould objected to in live performance, that it was like a high-wire act in the circus.”

Elsewhere in “The Prospects of Recording,” Gould pointed out the

the recordings of Britten and Stravinsky when preparing performances of their works?

John McClure, who produced most of Stravinsky’s studio recordings, as he did Bernstein’s, now does many live recordings. He gives glowing marks to the sound quality that can be created from a live performance. While lamenting that “live recording is much less interesting for the producer,” he says there is “no question that now the technology is so improved and so flexible, it’s quite competitive with studio stuff.”

According to McClure, it became possible to do live recordings “because the microphones have gotten smaller and less intrusive, and with the advent of digital reverb systems you can ‘fix up’ live recordings and make them palatable.” Nonetheless, he believes that to make a really superb recording, you must begin with a superb

Conductor and composer Leonard Bernstein (right) in March 1961 discussing a project with John McClure, who produced most of Bernstein’s studio recordings.



Y. ERNEST SADOW/SONY CLASSICAL

hall. McClure's favorite American concert halls are Dallas's Morton H. Myerson Symphony Center, Cincinnati's Music Hall, Orchestra Hall in Minneapolis, and Boston's Symphony Hall. Carnegie Hall he describes as "fair, not enough reverb, but it's better now than it was."

The recording industry's increasing reliance on live performances isn't all good news, however. On balance it has probably been beneficial for the collector of orchestral recordings, but there are a number of drawbacks when it comes to opera recordings. While the members of a symphony orchestra don't even *breathe* loudly (or they're not supposed to), live opera recordings are often marred by stage sounds such as the slamming of doors and the thumping of feet on the boards. And when the opera includes a ballet, it's almost pointless to bother recording it live. Furthermore, while audiences in Britain and North America tend to be polite and quiet, some recent live recordings that Sony made at La Scala are frequently interrupted by applause and cheering.

Worst of all, when an opera is per-



Members of the cast of London Records' 1973 set of Puccini's *La Bohème* — including Mirella Freni, Luciano Pavarotti, and Nicolai Ghiaurov — listen to a playback with the conductor, Herbert von Karajan (center), and the producer, Ray Minshull.

formed onstage, there are routinely cuts in the score — sometimes a lot of them. Although Wagner and Mozart are mostly immune, there are entire scenes of Rossini and Donizetti and even Verdi that are almost never performed. In the "olden days," just twenty years ago, when the musicians went into the studio they recorded the full score. That is no longer always the case. More and more now, the major labels are programming their new opera recordings by studying the performing schedules of the singers and conductors they have signed and then taping whatever looks promising. If La Scala or Covent Garden is performing a cut score, then that's what gets recorded.

The primary reason for all this, as you might guess, is economic. Opera recordings are far and away the most expensive kind of recording to produce, and as the schedules of the big-name singers and conductors become ever more crowded, it is increasingly difficult to carve out a couple of weeks to record a complete opera — not to mention finding the money to do it. For the modern collector, the up side (such as it is) of a live opera recording may be that the

alternative is to have no new recording at all, particularly when it comes to marginal repertoire. The realities of the music industry may have reached the point where there just won't be any more big, expensive studio recordings of the grand operas of Rossini and Massenet, much less those of Spontini and Auber. And rather than complaining that the big labels are only releasing live recordings of such repertoire, we may soon be saying, "Thank you very much!"

There are glimmers of hope — mostly from the small, independent labels. Little Naxos has recorded a dis-

"Live recording instantly makes an occasion of any concert."

— MICHAEL TILSON THOMAS



DONALD DRETZ/SONY CLASSICAL

"In the studio environment you can feel very safe." — YO-YO MA

tinguished series of studio-produced operas: its set of Rossini's *Tancredi* was one of the best opera recordings of last year. And Harmonia Mundi has recorded an impressive catalog of Baroque operas in the studio with Nicholas McGegan and with William Christie (who is now on Erato).

Yet for the present and the foreseeable future, when you hear a new recording and get that feeling that you're really there — maybe you were! □

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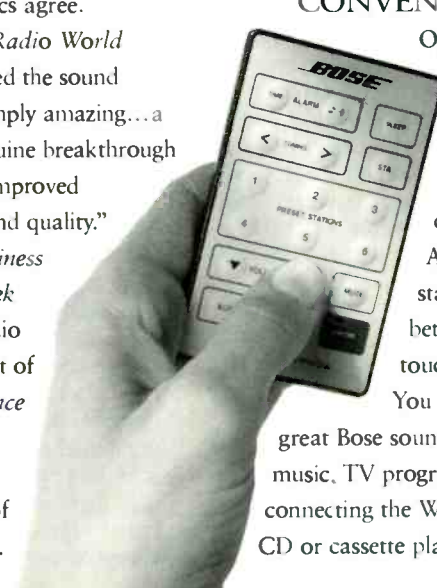
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Choosing A

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CASS

Just shy of a century ago — on June 2, 1897, for those who relish such trivia — Samuel Clemens (a.k.a. Mark Twain) sent a cable from London to the unsuspecting and no doubt embarrassed Associated Press in New York, “The reports of my death are greatly exaggerated.” I can’t say how many times I’ve heard, also prematurely, that the analog cassette was dead, too.

Well, it ain’t happened yet! Like the Eveready Bunny, the lowly cassette just keeps chuggin’ along, so don’t feel foolish if you’re considering upgrading an existing cassette deck — or buying your first one. Before rushing out to buy a new cassette deck, however, it pays to think through what you want it for and the level of performance you expect from it.

As with most audio gear, cassette decks vary in proficiency, and the quality you get more or less parallels the price you pay. If all you want from a home deck is to make dubs of other cassettes or CD’s to use in a portable or to play in the car, buying the best deck in the store is probably unnecessary. On the other hand, if audiophile sound quality is your aim, today’s analog cassette tapes and decks can deliver some mighty fine sound. With a good tape, carefully set recording levels, and an effective noise-reduction system, a top-of-the-line deck can deliver sound that many people find hard to distinguish from that of a CD. What, then, should you look for?

Cassette recorders are usually dif-



Sony's TC-KA2ES (\$550) is a three-head deck with a three-motor, dual-capstan transport, Dolby S, B, and C and HX Pro, and sixteen-segment peak-level metering.

ferentiated by the number of heads, motors, and capstans they use, by the noise-reduction systems they offer, and by their single-well or dual-well (“dubbing”) configurations. There are other distinguishing features too. For example, does the deck have provisions for matching it to different types of blank tape? Are any special editing features offered? How sophisticated are the tape counter and level metering, and does the deck have program-search functions? Some of these attributes can affect sound quality, others operational convenience.

Head Games

The devices that actually record signals on tape or play them back are called magnetic heads. Obviously, these are key elements in determining the deck’s operation and audio performance. In common two-head decks, the first head encountered by the tape is used to erase any signal on it prior

to recording, while the second is a combination record/play (R/P) head that can perform either function depending on which is selected. Three-head decks have separate recording and playback gaps that can be used simultaneously to monitor the recorded signal from the tape as it’s being made, as opposed to just monitoring the input as you would with a two-head deck. The recording and playback gaps can be placed in the same housing — a so-called sandwich head — or they can be physically independent, as with discrete three-head decks.

In addition to their monitoring capabilities, three-head decks frequently deliver better performance than two-head decks because each head can be optimized. The size of the gap in a combination R/P head — that is, the minuscule break in the magnetic structure that actually records or reads the taped signal — must naturally be a compromise between the rather wide



ETTE DECK

space ideal for recording and the very narrow one needed for playback. Having optimized gaps for each purpose usually allows a three-head deck to achieve more extended treble response and better dynamic range than two-head decks (especially with metal tape). Since treble response and dynamic range are the Achilles' heels of the cassette format, a three-head deck can be worth the extra money if you are after the best sound you can get.

Transport Basics

The tape transport moves the tape past the heads and also plays an important role in determining sound quality. The tape must flow smoothly by the heads, and it must also move at the correct speed and be guided with exquisite precision so that the left and right tracks occupy their designated locations on the tape and are exactly parallel to the tape edge. Any inaccuracy in tape speed changes the pitch of the sound; short-term variations in tape speed cause the pitch to warble. The resulting wow and flutter is especially annoying on recordings of piano and other instruments that have a sustained sound character, such as the flute. Inaccuracies in track alignment give rise to so-called azimuth error, which substantially reduces treble response. In fact, azimuth alignment is so critical that a few three-head decks have controls for matching the playback head gap with the actual recording.

Clearly, a topnotch tape deck requires a precision transport mecha-

nism. The main elements that determine speed stability are the capstan (or capstans) and the drive motors. A capstan is simply a rotating post against which the tape is pressed by the pinch-roller, a small rubber wheel. The rotational speed of the capstan, its surface finish, and its bearing quality all determine how uniformly the tape flows, as does the number of capstans

used. In a single-capstan transport, one capstan pulls the tape from the supply reel past the heads. But in a dual-capstan, or closed-loop, transport, two capstans are used, one on either side of the heads. This arrangement tends to reduce wow and flutter by isolating the tape while it passes the heads from any perturbations caused by rotation of the supply reel.



A one-touch CD-record function in Kenwood's KX-W6080 dubbing deck (\$230) scans a CD and sets levels automatically when used with a compatible Kenwood CD player.



The DRM-650S from Denon (\$349) features Dolby S at an affordable price. Other attributes include music-search and memory-stop functions to help locate selections.



JVC's TD-V662BK (\$360) offers three heads with high-purity copper windings, a dual-capstan drive system, and an ultra-high bias signal for improved clarity.

A dual-capstan mechanism is considerably more complex than a single-capstan drive, and if it is not well designed, it can lead to more problems than it solves. Another transport problem that comes up, usually with inexpensive decks, is that the takeup reel is often driven by the same motor that powers the capstan. I strongly recommend the type of transport that uses independent motors for the capstan and reel drives. Such designs usually benefit from far lower wow and flutter.

Noise Reduction

Without help from an effective noise-reduction (NR) system, the analog cassette is too "hissy" to qualify as a high-fidelity medium. To rectify this shortcoming, Dolby Laboratories has developed a series of NR systems for the cassette called Dolby B, Dolby C, and Dolby S. At least one Dolby NR system is found on virtually all consumer cassette decks today.

In general, Dolby NR works by boosting quiet sounds during recording, especially in the treble, and restoring the proper balance during playback. Technically speaking, the signal's dynamic range is compressed just prior to recording and expanded when the recording is played back. During the compression phase, soft musical passages are made louder. Dur-

ing expansion, the quiet passages are reduced in level by an equal amount, so the dynamic range on playback is effectively the same as that of the original input signal. But the expansion also causes low-level recording noise introduced after compression to be pushed further down in level relative to the music signal.

in the treble. Dolby C, which came next, promises up to 20 dB of quieting, mainly in the treble but to some extent at lower frequencies, too. Unfortunately, it is more sensitive than the other Dolby NR systems to the problems with tape-to-deck mismatching described below. Dolby S, the newest system, was developed to overcome some of the problems of Dolby C while pushing the noise down even further and increasing the treble headroom of the cassette medium (see "Recording with Dolby S" on page 116).

All the Dolby NR systems are susceptible, to some degree, to tape-to-deck compatibility problems because the dynamic expansion during playback is controlled entirely by the level and spectral content of the signal that comes off the tape. Any frequency-response errors that occur in the record/playback process are exaggerated by the playback decoder, and the more



Among the many virtues of Nakamichi's three-head DR-1 (\$930) are user-adjustable bias and azimuth for fine-tuning performance and gold-plated inputs and outputs.

In all the Dolby NR systems, the amount of compression and expansion — and, therefore, the degree of noise reduction — depends on the level and frequency content of the music. The three Dolby systems differ in how they analyze the spectral content and the degree to which they boost and cut. Dolby B, the company's first consumer NR system, pushes the noise down by as much as 10 dB, but only

effective the system is against noise, the more the response errors are magnified. Furthermore, if the signal level on the tape is incorrect, the playback decoder "mistracks," which causes level-sensitive response aberrations.

Frequency-response errors in the record/play process can be introduced by azimuth misalignment as well as recording equalizations or bias levels that don't match the characteristics of the tape. (Bias is an ultrasonic signal applied to the head along with the audio signal to reduce distortion during recording.) The main cause of mistracking is improperly matched tape sensitivity — that is, using a tape that carries more or less magnetic flux at any given recording level than the tape for which the deck was adjusted.

As you can see, tape-to-deck matching is critically important to obtain optimum results with Dolby noise reduction. Some decks have bias-trim or record-sensitivity controls to modify the factory settings for the particular tape



The Yamaha KX-690 (\$599) has Dolby S and B. Also on board are auto tape-type selection, manual bias fine-tuning, and a CD-tape synchro-record function.

you're using. With some of these decks you make the adjustment by ear. Others have internal test-signal generators so that you can guide your adjustments by the meter readings. On still other decks, the whole procedure is performed automatically. In each case, a three-head configuration facilitates the adjustment process.

Dolby B, as the least aggressive of the Dolby NR systems, suffers least from tape mismatches, although the sound will be noticeably better when the tape is well matched to the deck than when it is not. Dolby C is quite sensitive to tape matching, and many audiophiles prefer to forgo its benefits unless they can match the tape precisely and are assured that azimuth alignment is sufficiently well controlled in the recording and playback decks to mitigate high-frequency losses. Dolby S, on the other hand, suffers much less from tape-to-deck matching problems than Dolby C, not only because it uses a more sophisticated compression/expansion algorithm but also because manufacturers of Dolby S decks must include tape-matching facilities and hold the azimuth alignment within a tighter tolerance.

Extras, Extras

Yet another special circuit, called Dolby HX Pro, is found on a great number of cassette recorders these days. Actually, HX Pro was developed by Bang & Olufsen, which licensed the system to Dolby Laboratories on the (undoubtedly correct) assumption that Dolby would be better able to promote it. It is not a noise-reduction circuit but rather a system for increasing the treble headroom of recordings.

HX Pro operates by dynamically controlling the level of the recording bias based on the treble content of the music. Since higher levels of treble energy can be carried on a tape if the bias is reduced slightly from its nominal setting, HX Pro turns down the bias during high-frequency peaks to enhance treble dynamic range. The system functions only during recording, so tapes produced with HX Pro can be played on any deck regardless of whether it's equipped with HX Pro.

Of course, with dynamic range always at such a premium in the cassette format, it's important that the recording level be adjusted to "fit the window" as closely as possible. If the level is set too high, loud passages will overload the tape, causing distortion and dull sound; if it's set too low, the

CASSETTE DECK CHECKLIST



Understanding the Dolby NR alphabet and knowing the difference between a "dual-capstan" and a "dual-well" transport is critical when you're shopping for a new deck. Here are a few key terms and features you're likely to encounter:

❑ **Automatic fader.** An electronic circuit that raises or lowers recording level smoothly over a few seconds to create a graceful transition between songs or tape sides.

❑ **Automatic/manual tape calibration.** Recording bias and sensitivity fine-tuning controls, together with internal test-signal generators, to facilitate proper matching of the tape with the deck either manually (via the deck's metering system) or automatically; required on Dolby S-equipped decks.

❑ **Automatic tape-type selection.** A common feature that automatically selects bias and equalization for the type of tape — Type I ("normal"), Type II ("chrome"), or Type IV ("metal") — by checking the keyways molded into the cassette shell; can be confused by old cassettes that lack proper identification. Unless the feature is defeatable, it precludes the use of Type I equalization with Type II and IV tapes (to augment treble headroom) or Type II equalization with Type I tape (to reduce noise). On balance, however, it's a desirable feature (required on Dolby S-equipped decks) that helps prevent tape-to-deck mismatching.

❑ **Autoreverse transport.** A tape transport that can play both sides of a cassette without the user's having to turn it over. The transport has two capstans and two pinch-rollers, used one pair at a time, to provide motion in either direction. More common among automobile decks than home decks, this feature should not be confused with dual-capstan transports (see below). Autoreverse decks can have problems with azimuth alignment when the tape is played in the "reverse" direction.

❑ **Azimuth-adjustment control.** Found on a few three-head decks, this control provides a means to adjust the playback head's azimuth to match that of the tracks recorded on the tape, insuring optimum performance.

❑ **Bias-trim control.** Adjusts the bias level during recording to correspond to the requirements of a given tape formulation. Used correctly, it can improve treble-response uniformity and help obtain the best results from Dolby NR systems.

❑ **Dolby HX Pro.** Not a noise-reduction system but a circuit that augments treble dynamic range during recording. Some audiophiles believe that it is unnecessary and could exacerbate Dolby NR tracking problems.

❑ **Dolby noise reduction (Dolby NR)** A series of cassette noise-reduction circuits developed by Dolby Laboratories and commonly available on consumer cassette decks. Dolby B is a bare minimum for achieving decent sound

quality. Dolby C, introduced later, is commonly available but is more sensitive than Dolby B or S to problems with tape-to-deck mismatching. Dolby S, a relatively new circuit, can provide sound quality that rivals the CD.

❑ **Dual-capstan or closed-loop transport.** A separate capstan and pinch-roller on either side of the heads isolates the tape passing the heads from speed perturbations caused by variations in tape-reel tension; should result in reduced wow and flutter.

❑ **Dual-well "dubbing" deck.** A deck that combines a cassette player and a cassette recorder/player in the same enclosure; often designed to permit the copying of cassettes at faster-than-normal speed.

❑ **Independent capstan and reel-drive motors.** Decks in which separate motors are used to drive the capstan and the tape reels; should result in reduced wow and flutter. Servo-controlled capstan motors have better speed accuracy than governor-controlled motors.

❑ **Play-trim.** A control that allows high-frequency EQ to be applied to the playback signal prior to Dolby NR decoding to compensate for treble losses caused by azimuth misalignment.

❑ **Program search.** Going by a variety of names, including "music search," this feature allows automatic location of the beginning of specific program segments, or the next segment, by fast-winding the tape (in either direction) until a blank section is reached. It seeks to emulate the track-skip facilities on most CD players, but it can be confused by quiet music passages.

❑ **Recording-level indicators.** In today's decks, usually an array of lights activated by an electronic level-sensing circuit. Look for an adequate number of independent segments (many indicators light three or more segments simultaneously) and fine gradations near the 0-dB mark. A "peak-hold" function is common and valuable for setting levels.

❑ **Record mute.** Common feature that mutes the record head and inserts a blank of several seconds, usually to facilitate a program-search function.

❑ **Recording-sensitivity control.** A control to adjust the recording current for each tape to insure proper Dolby NR tracking; proper use can improve overall response uniformity.

❑ **Three-head/two-head format.** Refers to the number of magnetic tape heads provided. Three-head decks use separate heads for erase, record, and play functions, which permits off-the-tape monitoring while recording, better treble response, improved dynamic range, and easier calibration of tape bias and sensitivity. Two-head decks combine the record and play function in one head; while usually not as good (or as expensive) as three-head decks, they are adequate for most people and can deliver excellent performance if well designed. — E.J.F.

recording will be needlessly noisy. Here is where good recording-level indicators come into play. Look for a large number of individual segments and fine gradations in the region around the 0-dB mark to help you set the level more accurately. Meters that hold the peak level momentarily also aid in making adjustments. Beware of decks that adjust the recording level automatically; they're fine for speech but raise havoc with musical dynamics.

Beyond these more critical features, keep an eye out for other available options. Automatic faders that raise and lower recording level over a time frame of a few seconds can be nice to begin and end recordings smoothly, but they're certainly not necessary. Record-mute controls, meanwhile, function in different manners depending on the deck. Some kill the recording for as long as they're pressed; with others, one tap causes the program to mute



Teac's three-head V-2030S (\$650) boasts Dolby S, B, and C and HX Pro, bias and sensitivity calibration with a test tone, and sixteen-segment peak-level metering.

and inserts a blank of a few seconds to help program-search systems identify the start of the new selection. I should note, however, that program-search systems are often confused by pianissimo passages in classical music and are far from infallible.

Finally, a word about dual-well dubbing decks. These are great for copy-

ing cassettes, but you can't expect to get a tape player plus a recorder/player, which is what a dual-well deck really is, along with topnotch high-speed copying facilities without paying plenty for them. Although there is no technical reason why a first-rate dubbing system cannot be made, most dual-well decks today aren't up to the standard set by good single-well machines. Better quality may be found in the new dual-well decks featuring Dolby S because of Dolby Laboratories' tighter standards for granting a Dolby S license. Additional transport-quality standards recently imposed for all decks using Dolby B, C, or S may also lead to some improvements. But, by and large, if you're looking for fine sound and solid, reliable mechanics, you'll get more for your money with a single-well model. □



The CT-W704RS from Pioneer (\$365), one of a handful of high-speed dubbing decks with Dolby S noise reduction, offers autoreverse record/play for both its transports.

RECORDING WITH DOLBY S

Dolby S noise reduction was rather slow off the block, certainly as compared with Dolby B and Dolby C NR. Yet Dolby S is as much of an improvement over Dolby B and C as Dolby B was over the "nothing" that existed when it was introduced. Dolby S offers up to 24 dB of noise reduction in the middle and high frequencies and up to 10 dB in the low frequencies, with far fewer audible artifacts than Dolby C and a simultaneous improvement in treble headroom. Furthermore, Dolby Laboratories' more stringent minimum licensing requirements for recorders incorporating Dolby S than for decks with only Dolby B or C insures a higher level of performance whether or not Dolby S NR is used.

Expect to pay more for a Dolby S-equipped deck. The performance that Dolby Laboratories dictates is more expensive to attain. Decks featuring Dolby S must meet very specific standards for extended high-frequency response, head height and alignment accuracy, overload margins in the electronics, and wow and flutter. Be aware, too, that Dolby Labs permits several classes of Dolby S decks and that the performance requirements for three-head machines exceed those demanded of less expensive two-head decks. Nonetheless, the price of Dolby S decks has fallen dramatically over the past several

years thanks to development of a less expensive integrated circuit that combines all of a deck's noise-reduction functions in one chip.

Recording with Dolby S NR is the same as recording with any Dolby NR system except that you should take advantage of the tape-calibration facilities built into all Dolby S recorders to match each tape to the deck prior to recording. You may find, too, that you can raise the recording level slightly when using Dolby S since the system increases the tape's treble headroom. But don't push it too far; Dolby S does far more to drive down the noise floor than it does to raise the overload ceiling.

Is a Dolby S cassette as good as a CD? With the Dolby S signal-to-noise ratio of the best decks hovering around 80 dB with a high-quality cassette, one tape manufacturer felt comfortable enough to put its money on the line in a sweepstakes that challenged listeners to tell the difference. Their accountants were not unpleasantly surprised. More often than not, I can distinguish between a Dolby S copy and the original CD, but then, I know what to listen for. I've been in demos, however, where listeners preferred the sound of Dolby S cassettes to that of CD's! 'Nuff said?

—E.J.F.



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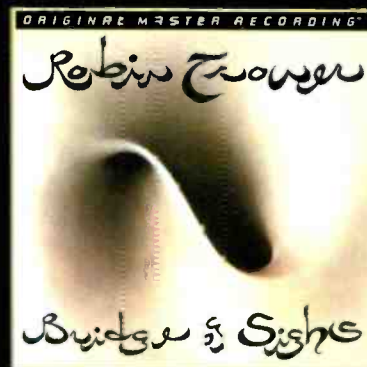
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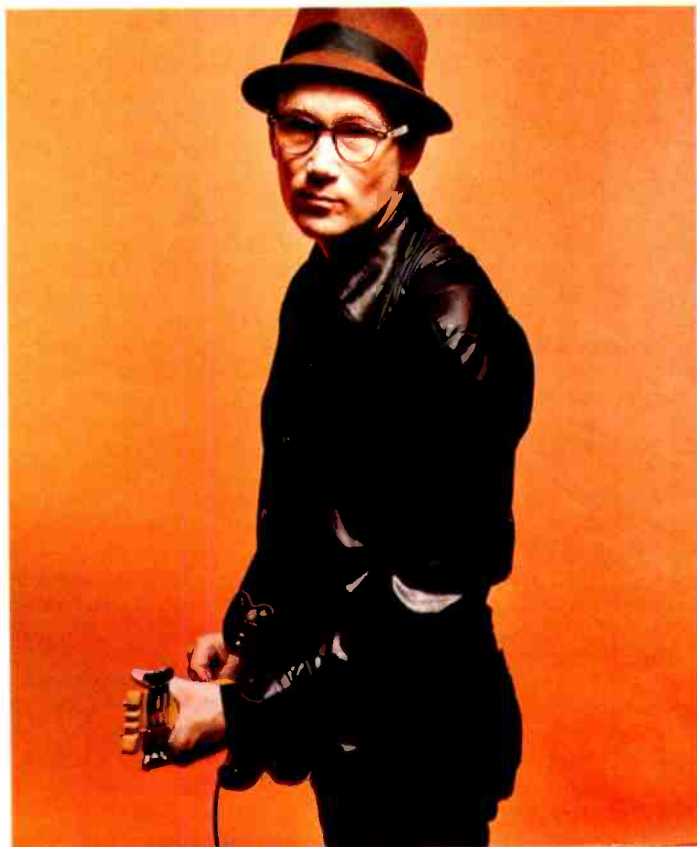


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BEST OF THE MONTH

**STEREO REVIEW'S
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Tom Schierantz/RAZOR & TIE

Crenshaw's Return to the Pop Lab

An unabashed delight, "Miracle of Science" is the album Marshall Crenshaw should have made after his first one. Not to unduly knock his work following that glorious 1982 debut, but he never seemed able to recapture the retro-cool casualness, the songwriting consistency, and the sweet personality of "Marshall Cren-

shaw" — until now. Maybe it has something to do with the pressure being off: He's on an independent label now, and he's too old to worry about having to be The Next Big Thing, so he can simply kick back and make the kind of music he wants. Whatever the reason, "Miracle of Science" is a modest masterwork.

Crenshaw's forte is dreamy pop in a

supple rockabilly chassis. He dives right in with the tart acoustic strumming and winsome vocals of *What Do You Dream Of?*, which announces that the "old" Marshall Crenshaw is back. The album was made in Nashville, where such kindred spirits as Bill Lloyd and Brad Jones (guitar and bass, respectively) helped out and Crenshaw self-produced. His material here is high-caliber, including emotionally resonant tunes like *Laughter*, a sad remembrance that drapes the listener in dolorous harmonies and plangent guitar, and *Starless Summer Sky*, an instant classic of lovey-dovey grandeur. He even rips off a honey of an instrumental (*Theme from "Flaregun"*) that isn't mere filler.

In addition to the seven originals, there are some inspired covers. *Who Stole That Train* is a rockabilly obscurity given a spirited treatment by Crenshaw and company, who trade sharp solos. *Twenty-five Forty-one* initially seems an odd choice; after all, it's a specific account of one band's rise and fall, written by Hüsker Dü drummer Grant Hart. But Crenshaw plays up its wistful pop melody and jangly texture, and in his hands the song takes on a universal note, becoming the story of Everyband. Slightly less successful is his recasting of *The "In" Crowd* (a 1965 hit for both Dobie Gray and the Ramsey Lewis Trio), which just doesn't mesh with the rest of the album.

That quibble aside, "Miracle of Science" is everything it ought to be: eleven-plus tracks of pure, to-the-point pop by an artist who has found his second wind.

Parke Puterbaugh

MARSHALL CRENSHAW:

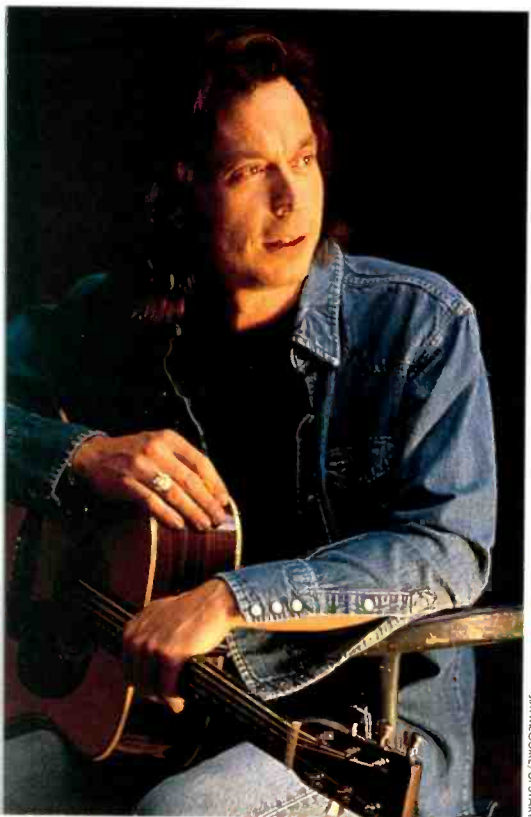
Miracle of Science.

(Soundbite): *What Do You Dream Of?*; *Who Stole That Train*; *Laughter*; *Twenty-five Forty-one*; *Starless Summer Sky*; *Only an Hour Ago*; *A Wondrous Place*; *The "In" Crowd*; *Theme from "Flaregun"*; *Seven Miles an Hour*; *There and Back Again*. RAZOR & TIE 2823 (43 min).

The Largely Amazing Jim Lauderdale

Singer/songwriter Jim Lauderdale would doubtless be a huge star right now if it weren't for just one glitch: His brilliant, hard-driving songs don't fit into any category. *Where the Sidewalk Ends* and *King of Broken Hearts* were edgy country tunes covered by mainstream Nashville performers, but most of the other songs on his previous three major-label releases are much more eclectic — too rock for country, too country for rock, and too cerebral for radio.

BEST OF THE MONTH



JIM McGUIRE/UPSTART

Lauderdale: waiting for the solo

Lauderdale is currently recording a straight-ahead country album for RCA. But before that, he went into a Nashville studio to make "Persimmons," and the songs that came bubbling up are no less than extraordinary. Again, they don't follow a format — except maybe Largely Amazing Country-Rock-Soul Hybrid. Lauderdale isn't a great vocalist, but, like Marty Stuart, what he lacks in color he makes up for in juke-joint energy and an obvious passion for performing.

Life by Numbers, the album's first cut, is a good example, as Lauderdale describes a woman he met in the middle of a hurricane. With primo guitarist Kenny Vaughn behind him, he launches into a swirling storm of his own, caught up in a whirlwind of conflicting emotions and a hell-bent-for-leather beat. "I'd like to explain, but here comes the solo," he says breathlessly, just before the break.

Love, and all its attending heaven and hell, is the album's theme, from the Fifties-style rocker *Do You Like It* to the R&B-ish *Tears So Strong*, a propulsive Claptonesque piece that sighs, "I'll never see her again or breathe her fire." Lauderdale can be as pop as John Lennon (*Am I Only*

Dreaming This, which is punctuated by what sounds like percolating coffee) or as deep-dish country as it gets these days (*Some Things Are Too Good to Last*, a pretty duet with Emmylou Harris). Then there's the blues. In *Optimistic Messenger*, where Lauderdale sings, "You could have promised anything / And I wish you would," he's as sinewy as a moss-covered tree in the bayou.

Filled with one irresistible rhythm after another, "Persimmons" isn't as bitter-sweet as its title would suggest. With its sly references to rock and country classics and the constant joy of its instru-

mental filigree, it'll have you grinning. Is it rock, or is it country? It's Jim Lauderdale. That's enough, and then some.

Alanna Nash

JIM LAUDERDALE: Persimmons.

Life by Numbers: Do You Like It; And That's a Lot; Am I Only Dreaming This; Don't Leave Your Light Low; Seems Like You're Gonna Take Me Back; I Thought We Had a Deal; Tears So Strong; Please Pardon Me; Some Things Are Too Good to Last; Nobody's Perfect; Had a Little Time; That's Not Right Babe; Optimistic Messenger; Jupiter's Rising.
UPSTART 035 (45 min).

Formidable Romantic Piano Variations from Jean-Yves Thibaudet

Jean-Yves Thibaudet has given us dazzling performances of piano music by Rachmaninoff, Liszt, and Ravel, but on his new London CD we find him tackling the high-Romantic German repertory, with major sets of variations by Brahms and Schumann. Brahms's two books of variations on Paganini's famous caprice add up to one of the all-time knuckle-busters in the piano literature. It takes an enormously wide-ranging musicianship to get beneath the surface of the quieter, less showy numbers, and Thibaudet shows himself more than equal to the challenge. His readings of the finale of Book I and of Nos. 1, 3, 4, 5, 10, 11, and 14 in Book II are especially choice.

As a sort of intermezzo, he gives us a charmingly lightfingered and unmannered reading of Schumann's familiar Op. 18 *Arabesque* before embarking on his Symphonic Etudes, a set that exhibits an even greater imaginative variety than the Brahms. To the dozen variations in the standard edition, Thibaudet adds as appendix the five deleted from the first publication. This makes for an interesting comparison with Evgeny Kissin's 1990 Carnegie Hall debut recital on RCA, where he includes the posthumous variations at various points within the main body of the work. Kissin searches out the underlying fantasy in each variation, but Thibaudet conveys more of an underlying sense of unity.

Besides the sterling pianism, I particularly like this CD's intelligent programming, and the recorded sound from London's Henry Wood Hall is very good indeed.

David Hall

BRAHMS: Paganini Variations. SCHUMANN: Arabesque, Op. 18; Symphonic Etudes.

Jean-Yves Thibaudet (piano). LONDON 444 338 (65 min).



JULIAN BARTON/LONDON RECORDS

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BEST OF THE MONTH

Scotland's James MacMillan: Sublime Cheek

It all started six years ago at the Proms, London's enormously influential summer music festival. One sultry night, sandwiched between Beethoven's Symphony No. 4 and the Sibelius Violin Concerto, there was a new work by an unknown Scottish composer, James MacMillan. *The Confession of Isobel Gowdie*, as it was called, a jagged, emotionally charged tone poem, astounded the Proms audience, which gave the equally astounded 29-year-old composer a rapturous ovation. That same year, MacMillan wrote a piano concerto for Peter Donahoe, to which he gave the enigmatic title *The Berserking*. Donahoe's recording of it leads off the new RCA Victor disc of works by this exciting young composer.

Most of MacMillan's recorded works until now have been reflections of his devout Christian faith, but the four collected here, for all their sublime moments, are thoroughly secular and down to earth. MacMillan is one contemporary composer who has a deep need to communicate, and he does so with direct and disarming eloquence. That's not to say that these works are Neoromantic "easy listening." Far from it: MacMillan is an extraordinarily versatile composer, with a wide palette of effects at his disposal.



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The Berserking, despite the vaguely psychedelic ring of the title, is a conventional fast-slow-fast three-movement concerto. The piano, played with power and precision by Donahoe, is pitted against the orchestra in the outer movements and sings a plaintive lament with Celtic, folkish overtones, accompanied by clangorous percussion, in the slow movement. MacMillan says that he was inspired to write *The Berserking* after his favorite soccer team, Glasgow Celtic, "turned in a characteristically passionate, frenzied, but ultimately futile" performance. (The title derives from the berserkers, elite cadres of medieval Viking and Celtic warriors who worked themselves into a frenzy with mead and magic mushrooms before going into battle.)

Unlike too many contemporary composers, MacMillan has a sense of humor. Two years ago he was awarded a highly prestigious commission by the British telephone company to write a piece celebrating the nation's orchestral life to be performed by the fourteen top orchestras in the U.K. — making it probably the most widely heard new work of British music in a generation. British Telecom got more than it bargained for: *Britannia* is a cheeky satirical fantasia that mixes quotations from such venerable icons as *God Save the Queen* and Elgar's *Cockaigne Overture* with a Cockney drinking song called *Knees Up Mother Brown*.

Sowetan Spring reveals yet another side of MacMillan's personality, his deeply held political convictions. The piece represents his spontaneous, joyous reaction to Nelson Mandela's release from prison in 1990 (an unusually productive year for this highly prolific composer). The CD concludes with his lovely, wildly inventive *Sinfonietta*, which, like so many of his works, veers with sure-footed agility from explosive, brassy dynamism to jaunty good humor to passages of introspective lyricism. The Royal Scottish National Orchestra, led by Markus Stenz in *The Berserking* and by the composer in the shorter works, gives gutsy, committed performances, vividly recorded by the RCA engineers. *Jamie James*

MACMILLAN: *The Berserking; Sowetan Spring; Britannia; Sinfonietta.* Peter Donahoe (piano); Royal Scottish National Orchestra, Markus Stenz and James MacMillan cond. RCA VICTOR 68328 (77 min).

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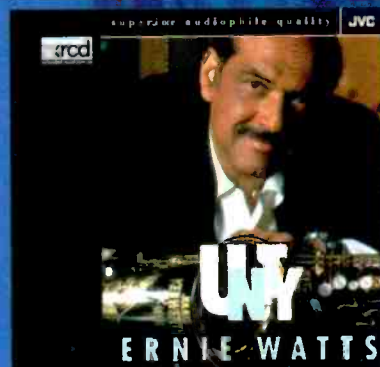


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AMY ALLISON: The Maudlin Years.

KOCH 7911 (43 min).

Performance: Enchanting

Recording: Spiffed-up home recording

Anyone familiar with jazz-blues singer/pianist Mose Allison might expect that his musician daughter wouldn't be a run-of-the-mill troubadour. But the uninitiated will doubtless be surprised, because on "The Maudlin Years" Amy Allison writes and sings country music with a Long Island accent and a wispy, nasal wail. And not just any country music, but highly original, left-brain stuff stocked with urban references to a comically miserable life. If Gilda Radner's Lisa Lupner had been a singer/songwriter, she'd have been Amy Allison.

Blessed with backing musicians who play as if they've never heard a formulaic Nashville recording (particularly Rob Meador on acoustic guitar, Simon Heathcote on lead guitar and melodica, and Steve Lewis on lap steel guitar), Allison moves through thirteen serious and seriocomic vignettes, beginning with *Cheaters World*, a nymphomaniac's lament, and segueing into *Hate at*



First Sight, a nobody's-laughing look at interracial teen romance. From there, the "maudlin" material of the title takes over, as she recounts the sad adventures of a good girl gone bad and the men who took her there. In *This Misery*, for example, her sweetheart deserts her after only two nights. What's a girl to do? Think of death and self-mutilation, of course: "That night on the balcony if he'd only had the courage to

push me / Then I would be spared this misery," and "Tell him that I'm sorry but I've broken all the dishes / And tell him that I cut myself and needed seven stitches."

Allison knows how to craft a soulful country melody (*The Whiskey Makes You Sweeter*), a fine Appalachian tune (*My World Ain't So Blue*), and a hillbilly lament (*Walking to the End of the World*). She may be a tad theatrical, but think about it — you think Reba ain't? If you're looking for a dose of street-smart humor with your country music, Amy Allison's your gal. Gilda would have loved her. **A.N.**

JOHN CALE: Walking on Locusts.

RYKODISC 1395 (50 min).

Performance: Back to form

Recording: Nuanced

There's good news for the silent majority of John Cale fans, the ones who love his peak albums but couldn't sort through his spotty, challenging output of the past decade and a half. "Walking on Locusts" is an overdue keeper, a lovely and cerebral pop album in the vein of the 1973 classic "Paris 1919" and 1992's "Wrong Way Up," his overlooked collaboration with Brian Eno that remains the best thing either one has done in ten years. "Walking on Locusts" is not far behind: Not only is it rich, melodic, and artfully arranged, it's one of the few uplifting albums Cale has made.

Listening to his more esoteric records (including his last solo disc, "Words for the Dying"), it has been easy to forget that Cale has a warm streak and a sense of humor. Both come up front for this album. On the wittier side, *Crazy Egypt* finds him doing an impeccable imitation of David Byrne (who co-wrote the song and contributes guitar to it), while *Indistinct Notion of Cool* shows Cale playing the cranky elder statesman. Even his singing voice has regained the choirboy quality of old, here best used in *Tell Me Why*, whose big gospel chorus is nicely undermined by the closing, left-field instrumental break.

"Walking on Locusts" has a loose-knit travelogue theme, visiting the Louisiana swamps in *Dancing Undercover*, Madrid in *Secret Corrida*, and Paris in *Circus*. As a concept album dealing with sophisticated romance in exotic settings, it's among the best of its kind since... well, Frank Sinatra's "Come Fly with Me." **B.M.**

THE CONNELLS:

Weird Food & Devastation.

TVT 9010 (48 min).

Performance: Edgier than usual

Recording: Good

These days, North Carolina rock is defined by the scruffy Chapel Hill sound, but the state's real legacy is probably closer to the brooding power pop of the Connells and antecedents like Let's Active and the dB's. Such stuff never survived the onset of postmodernism — after which most everything started sounding like a train wreck, and melody practically became a four-letter word. Yet the Connells persevered, making fine albums whose strengths lay in their restraint and intelligence. Finally, the band was rewarded with a European hit, the wistful '74-'75, and now comes the provocatively titled sixth disc, "Weird Food & Devastation," showing off a few new wrinkles.



Most notably, the songwriting is spread around, making for the liveliest, most extroverted Connells album yet. Singer Doug McMillan had a hand in six tracks, including the bouncy *Fifth Fret*, with its slashing Neil Young-style guitars. Even drummer Peele Wimberly antes up a number, *Any*, whose affecting melody is among the record's highlights. Guitarist and chief writer Mike Connell keeps things anchored with several songs that hew to the band's fundamentals — wonderful, filigreed entries like *Start* and *Maybe* that have a Celtic sturdiness and a stately reserve — yet he also ventures off with quirky tunes like *Adjective Song* and *Friendly Time*. The only thing missing is a few more originals from George Huntley, the generally more prolific rhythm guitarist, whose bolting rocker *Let It Go* is a fastball from a band that doesn't typically throw such heat. "Weird Food & Devastation" should please old Connells fans and win over some new ones. **P.P.**

WILLY DeVILLE: Loup Garou.

DISCOVERY 77040 (55 min).

Performance: Exceptional

Recording: Very good

In "Loup Garou," Willy DeVille reaches his zenith as singer, songwriter, and disciple of soul. The album, like DeVille himself, is equal parts New Orleans and New

POPULAR MUSIC

York, spiced up here and there with musical touches of Ireland and Mexico, and it's confident and consistent from start to finish.

What's most impressive is the sure hand of the writing, which derives from the fertile marriage of soul and street promulgated by such old-school writers as Doc Pomus and Leiber & Stoller. Whereas DeVille previously seemed an acolyte, he is now an equal, based on stellar compositions like *When You're Away from Me, You'll Never Know*, and *Heart of a Fool*. Any of them would have caused hearts to swoon and tough guys to fall on bended knee in the heyday of Drifters-style rhythm-and-blues.

When he's not extolling the glory of love, DeVille indulges in a little street scenery, such as the scuffed-up tenement shuffle of *Runnin' Through the Jungle (Shootin' the Blues)* or the hilarious boogie-tempo serenade to a low-rent paramour and her kin, *White Trash Girl*. Brenda Lee duets on *You'll Never Know*, sounding amazingly like Ronnie Spector. DeVille sings the lilting, *baion*-flavored *Still (I Love You Still)* twice, in English and Spanish (it's *Asi Te Amo* the second time). The opening track, *No Such Pain as Love*, is a damn near perfect exemplar of his openhearted, melting-pot approach to music, with Cajun fiddles, swooping bass, and richly textured 12-string guitar meeting lyrics and vocals that recall the sober clarity of country music and the deep longing of classic R&B.

"Loup Garou" may not be trendy, but time is on Willy DeVille's side: This is music of such conviction and quality that it will endure. *P.P.*

ROBYN HITCHCOCK: *Moss Elixir*.

WARNER BROS. 46302 (49 min).

Performance: Lovely

Recording: Filled with subtleties

Every couple of years or so, a new Robyn Hitchcock album gets proclaimed as the one that will finally win him the long-deserved wider audience. With the release of "Moss Elixir" — his first disc for Warner Bros. and a turn to a lush, acoustic sound — it's that time again. While the album



Hitchcock: heart (not shown) on sleeve

lacks the loud-pop outbursts of Hitchcock's work with the Soft Boys and the Egyptians, this mostly solo effort is so packed with appealing vocals and finely crafted songs that nobody's likely to feel shortchanged.

Hitchcock's reputation as a lyrical oddball has always been exaggerated; if you paid attention, there was a recognizable romantic/cynical streak beneath his idiosyncratic imagery. But this time Hitchcock's heart is more obviously on his sleeve, whether he's taking stock of his life (*Speed of Things*) or simply celebrating a crush (*Heliotrope*). More surprising is a new-found topical streak: *Devil's Radio* fires darts at a broadcaster called "Limbo," and *A Happy Bird Is a Filthy Bird* includes some of the more pointed glances at the American psyche that anyone's taken lately ("Look at the massacre on cable / But you know that it can't happen here / We're all too busy watching massacres on cable / Oh yeah").

The tunes range from Beatlesque (*Alright Yeah*) to trad-folk (*Speed of Things*). A violin often stands in for electric guitar, giving a more stately feel. And in the production numbers *Beautiful Queen* and *De-Chirico Street*, Hitchcock finds a shade of psychedelia that's both classic and very much his own. *B.M.*

GEORGE JONES: *I Lived to Tell It All*.

MCA 11478 (32 min).

Performance: Classic

Recording: Close

George Jones swears he hasn't had a drink in years. Yet to hear his latest album, you'd think it was the early Eighties again and ol' George was country music's "national drunk and drug addict," as he describes himself in his new autobiography, because fully half the ten cuts deal with drinking or bars. On the surface, that may seem like self-parody (*Honky Tonk Song* even reprises his famous real-life trip to the liquor store on a riding lawn mower), but since Jones loves to sing this material and reportedly picked the entire program himself, it's good news for fans. He hasn't sung this great in a decade, especially in the poignant *Hundred Proof Memories* and the double-entendre novelty song *The Lone Ranger*. With *Billy B. Bad*, a bodacious spoof of the music industry's marketing of Hot Studs of the Month, and the moving cover *It Ain't Gonna Worry My Mind*, Jones proves he's still the definition of country soul and silliness and, at 64, still the ultimate hillbilly interpreter. "I Lived to Tell It All" is a must-have for anyone with even a passing interest in the genre. *A.N.*

PAUL KELLY: *Live at the Continental and the Esplanade*.

VANGUARD 79493 (62 min).

Performance: Top drawer

Recording: Front row

I know it's a cliché to say that a great live recording makes you think the performer is in the same room with you, but this album is so immediate — excuse me while I catch that guitar pick. Paul Kelly, like John Hiatt and Richard Thompson, is a first-rate songwriter who has never connected with a



Jones: the definition of country soul

mass audience. He certainly connects with the small audiences here (taped over three nights in 1994 and '95), and the touring bands punch harder and swing more easily than the players on his recent studio albums. Especially good are sharp guitarist Randy Jacobs (*Dumb Things*) and eloquent keyboardist Bruce Haymes (*Somebody's Forgetting Somebody*, *Somebody's Letting Somebody Down* and *Darling It Hurts*). And the career-spanning material makes it clear that Kelly has achieved, yes, a damn fine career, one that can embrace both the country flavors of *To Her Door* and the rock chords of the new *Pouring Petrol on a Burning Man*. "I'm a climber, I'm a miner, I'm a diver for her," Kelly sings in *She's Rare*. It's a pity he's so rare to most record collections. Make yours an exception. *K.R.*

DEAN MARTIN: *The Capitol Years*.

CAPITOL 98409 (two CD's, 110 min).

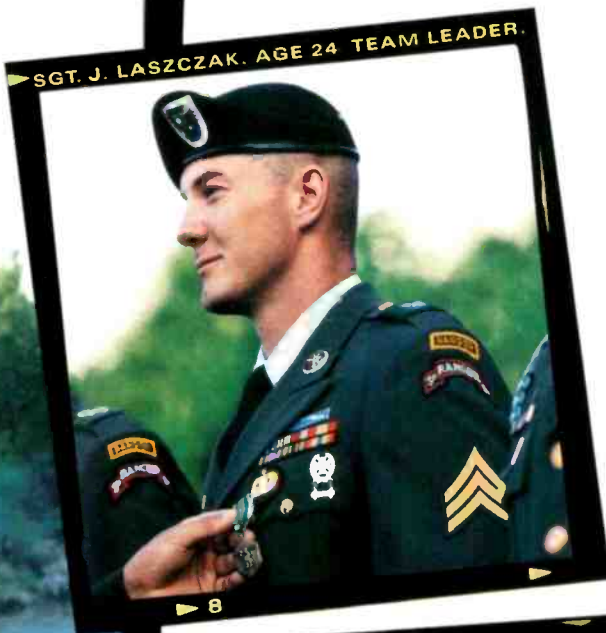
Performance: That's amore, pallie!

Recording: Bella!

Before Dean Martin, post-Crosby pop singers could be relaxed, but Martin took that stance to new heights of alcoholic inouciance. Chastising others for "singing serious," he had a sense of humor that was an even greater asset than his pleasing baritone and Neapolitan good looks. He was almost a parody of the song stylists of his era; where his fellow Rat Packers, particularly board chairman Frank Sinatra, were born to celebrate the works of Cole Porter and George Gershwin, Martin made magic with the most ephemeral of novelties. He especially succeeded with the genuinely "pseudo": pseudo-Italian songs (like *That's Amore*) and pseudo-cowboy music (a string of Rodeo Drive Nashville hits).

In fact, Martin may be the only singer in the pop pantheon who is actually best served by his hits (the junkier, the better) rather than by show tunes — which is why "The Capitol Years" works so well. All of his biggies from 1949 to 1962 are here, as well as excerpts from his "concept" albums. There are also samples of his faux-European songs and lie-jazz dates, plus a duet with Nat "King" Cole ("oh, cocktails!")

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and, best of all, the first in-person examples of Martin at his *live-liest* ever to legally reach the public. We're not likely to see a more definitive Dean double set. Memories are made of this. *W.F.*

TOM PETTY AND THE HEARTBREAKERS: *Songs and Music from the Motion Picture "She's the One."* WARNER BROS. 46285 (52 min).

Performance: Good, but frustrating
Recording: Sparkling

Here's yet another Tom Petty album that would be satisfying if it weren't so obvious that he can do better. As a songwriter, he has become something of a born-again slacker: Instead of the anthemic stretch of oldies like *The Waiting* and *Refugee*, he now favors a lazy, backporch feel. A master of the likable throwaway, Petty hasn't written anything classic for years.

That scenario doesn't change for his soundtrack to *She's the One*, which comes across like a regular Heartbreakers album save for a couple of reprises and instrumentals. In addition to *Walls (Circus)*, a tailor-made single with the obligatory Byrdsy 12-string, there are a few slow-grind rockers, a couple of pretty country-folk numbers, and a pair of borderline novelties — the Beck song *Asshole* and Petty's own *Zero from Outer Space*, the kind of teen-rebellion song that only a well-adjusted adult could write. Lyrically, nothing gets any deeper than "Even walls fall down" or "California ain't like any other place." The grabbiest song by far is another cover, Lucinda Williams's *Change the Locks*, and it's neither an original choice (half the bar bands in Texas already play it) nor a substantial re-imagining. The Heartbreakers cook at low heat throughout, never getting a full-fledged rocker to tear into, but Rick Rubin does contribute a wonderfully spacious, live-sounding production. It's enough to keep diehard fans busy until Petty finally decides to get serious again. *B.M.*

SAM PHILLIPS: *Omnipop (It's Only a Flesh Wound, Lambchop).* VIRGIN 41860 (42 min).

Performance: Arty
Recording: Okay

Sam Phillips doesn't wear anything on her sleeve. That would be too obvious. She prefers to wrap her songs in several layers of protection: irony, metaphor, distance, surrealism. Listening to her material is like private detection: Somewhere in there is the key to an emotional crime. Follow the clues and you might arrive at a solution. Then again, you might find that it's all been a very clever joke — on you.

Some of the connections are straightforward. *Help Yourself* is about a woman who is being consumed by a man. This idea is transformed into a literal act: "I laid down on the table / You pulled up a chair." Other allusions are twistier. Consider the last verse of *Slapstick Heart*: "Lost my balance, fell like rain / I half expected you to do the same / But you cried an ocean and broke my fall / That's when I knew I couldn't swim at all." Then there's the song-as-

punchline, namely the 48-second *Compulsive Gambler*, about a guy who goes out each night to satisfy his greatest urge: "She would undress / Make him nervous / But he would rather lay a bet." Badda-boom.

But seriously, Phillips takes nearly everything seriously. So seriously that it can creep you out. That impression is furthered by the arrangements, which can be very moody with their Doppler synths, tick-tick-ticking rim shots, and screechy guitars. If it weren't for Phillips's wordplayfulness and sharp-as-a-razor voice, the weirdness could be too much. There is a human being lurking behind all the artifice of "Omnipop." She may not be easy to find, but Sam Phillips makes it worth the trouble. *R.G.*

LeANN RIMES: *Blue.*

MCG/CURB 77821 (35 min).

Performance: Knockout vocals, but . . .
Recording: Very good

Thirteen-year-old LeAnn Rimes set the country world on its ear with the hit single *Blue*, a Patsy Cline sound-alike replete with that singer's catch-and-soar vocal technique. The Bill Mack song was originally written for Cline, but she died before she could record it; even so, it's hard to imagine anyone who's more right for the

song than Rimes. Her performance is chill-bump good.

Now comes the album, recorded at Norman Petty Studios in Clovis, New Mexico, where Buddy Holly cut so many of his legendary hits. As with the single, Rimes's performances here are poised, controlled, and knowing far beyond her age. Her heavily nuanced soprano (free of the single's Cline mannerisms) recalls the great Brenda Lee at the same age in range, power, and emotion; also like Lee, Rimes has already found her own sound. The kid's a knockout.

But her record company, not content to let Wilbur C. Rimes (yes, Daddy) produce more than four of the eleven tracks, dragged in co-producers Johnny Mulhair and Chuck Howard for the rest. That was a mistake. The elder Rimes knew what material best suited his daughter, while the others brought her mostly mediocre filler and dressed it up in the most pedestrian way. Two exceptions: *Talk to Me*, a pounding rhythm number that LeAnn had a hand in writing, and a nearly camp duet with septuagenarian Eddy Arnold in *Cattle Call*.

LeAnn Rimes could be country's greatest teen singer since Tanya Tucker — or just a memorable flame-out. The next album should tell the tale. *A.N.*

THE V-ROYS: BIG NOISE FROM KNOXVILLE

Wearing suits and ties, they look like your average fraternity brothers on Parents' Weekend. They've given their debut album a title, "Just Add Ice," that sounds like glossy cocktail music. And they're from Knoxville, Tennessee, not heretofore known as a hotbed of progressive music. But look again, because the V-Roys are something else. In fact, they're protégés of Steve Earle, who co-produced the album, and they're the first act on his new label. And what they do is write and play a style of music that you might be tempted to call rock-and-roll country grunge, a guitar-driven and distortion-loving brand of roots rock that's delivered with a pants-on-fire urgency and the occasional country (or even English) accent. If all of this makes the V-Roys the ultimate fusion band, so be it.

The opening track, *Guess I Know I'm Right*, blends garage rock and strains of the Beatles with guitar riffs that recall a spy-movie theme from the Sixties. *What She's Found* starts out as a polite Scottish bagpipe ditty but soon turns into blistering American rock. Elsewhere, you'll discover Latin-tinged sex pop (*Lie I Believe*), a John Lennon-ish primal scream (*Kick Me Around*), an acoustic

feel-good boogie (*Cold Beer Hello*), and midtempo country (*Pounding Heart*). There's also a hint of punk in the nervous *Cry*, as well as a touch of the Yardbirds in *Wind Down*, a rave-up built on hollered, mechanically altered vocals. The V-Roys can turn on the attitude, not to mention the memorable line. In *No Regrets*, the most sardonic cut here, a soon-to-be-dumped girlfriend is

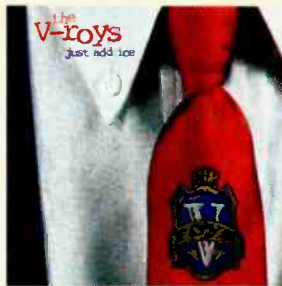
informed that "in the time that it takes to crush this cigarette / I will forget all about you." And when the tables are turned in the bittersweet ballad *Goodnight Loser*, the now-forgotten boyfriend feels some very real pain of his own: "When you dance with him / I see losers win / And the losers

aren't who they're supposed to be."

For birthing the V-Roys, chalk up another distinction for Knoxville — "the home," as Steve Earle notes, "of James Agee and Quentin Tarantino, and the last place anyone saw Hank Williams alive." Chances are, all three of those guys would dig the heck out of this band.

Alanna Nash

THE V-ROYS: *Just Add Ice.*
E-SQUARED 1050 (38 min).



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POPULAR MUSIC

SCREAMING TREES: *Dust*.

EPIC 64178 (44 min).

Performance: Strong

Recording: Good

The kinetic rock of Screaming Trees is equal parts classic (recalling bluesy thumpers like Led Zeppelin, Cream, and Bad Company) and indie (a genre this veteran Washington State band helped create in the cauldron of Seattle and environs). If 1992's "Sweet Oblivion" was their breakthrough, then "Dust" finds them refining

their métier to perfection on an album that is as self-contained as it is explosive. Edgy baritone vocalist Mark Lanegan sounds like he could detonate at any moment — but doesn't. Brawny guitar-playing brothers Gary Lee and Van Conner sound like cannons waiting to fire — but don't. In the midst of this tug of war between power and portent, Screaming Trees explore Middle Eastern modes and throw in all manner of musical exotica: sitar, mellotron, cello, and, from drummer Barrett Martin, various per-

cussion instruments, such as tabla and conga. In its inspiration and arrangements, the band has set the wayback machine to a musical epoch bounded by "Disraeli Gears" and "Houses of the Holy." Yet these informed derivations have turned up something relevant for the Nineties, as demonstrated by the hypnotic, potent songcraft of *All I Know* and *Witness*. *P.P.*

TEXAS TORNADOS: *4 Aces*.

REPRISE 46197 (43 min).

Performance: Sparkling

Recording: Muy bueno

The Texas Tornados had wound down to a summer shower when they took a break four years ago. And though they were missed, it was really only for their first album and their enormous potential. Now these "4 Aces" — guitarist/singer Doug Sahm and keyboardist/vocalist Augie Meyers (of the Sir Douglas Quintet), singer Freddy Fender, and accordionist Flaco Jimenez — are back with a perfect showcase for their blend of Texas rock-and-roll and Mexican love songs and dances.

Sahm starts things off with the rambunctious cantina singalong *Little Bit Is Better Than Nada*, which hangs its hopes on the line "Sometimes you want the whole enchilada" and goes on to attempt a "mini epic" about a girl, some bad guys, and the Federales. It doesn't really work as a story song, but it goes down great as camp. *Tell Me*, a Sahm number with Joe "King" Carrasco, trots out a horn section for the bridge and kicks up a full head of dust before high-tailing it out of town. And *Rosalita* sparkles with beautifully played instrumental flourishes, especially from Jimenez's sprightly squeeze box. The record reaches an emotional high point with Chris Gaffney's *The Garden*, about bleak life in the barrio. But the album shines brightest with Fender's Latin songs of hopeless yet undying love, especially *In My Mind*. Never has his tenor shimmered with so much passion.

More mainstream pop than country or Latin, "4 Aces" is also a marvelous marriage of rock, soul, Tex-Mex, and sideways excursions into uncharted territory. An unexpected and most welcome return. *A.N.*

THROWING MUSES: *Limbo*.

THROWING MUSIC/RYKODISC 10354

(47 min; enhanced CD).

Performance: Title tells it

Recording: A clean garage

You're Kristin Hersh, and after putting your pre-alternative heart into nine records, the last seven for Sire — and after watching stepsister Tanya Donelly leave your band and outdraw you immediately with a skinny Belly — you get dropped by your label. What do you do, Kristin, *what* do you do? You take your band, Throwing Muses, and start your own label, Throwing Music. And you confront your in-betweenness on an album called "Limbo."

If this material seems a little samey, it's partly because it follows last year's "University," the band's strongest album in some time. Also, a few too many of the new songs lock into the loping-rocker mode that

WIRELESS "Miracle"

(Home Theater Magazine, July 1996)

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Hersh has favored of late. But tracks like *Shark* show the Muses still adept at thrashing about, while the disarming acoustic figure in *Freelander* points to their finesse. And Hersh can still turn a tight phrase: "Why do I like you? / Cause I do / Why do I like you? / Cause I'd kill to be you," that "kill" in her endearing tug of a voice.

The ECD's multimedia program is just a live video of *Ruthie's Knocking*. Nothing special — but you're Kristin Hersh and you *keep at it*, because that's what you do. *K.R.*

WEEN: 12 Golden Country Greats.

ELEKTRA 61909 (34 min).

Performance: Uproarious
Recording: Very good

This album is either a hoot or a horror. It is the former if you value crassness, cheesiness, and cleverness in close proximity (which I do). It is the latter if the idea of a pair of alternative-music absurdists lampooning country music is not your cup of brew. It took nervy genius for Gene and Dean Ween to go to Nashville, recruit the best sessionmen money can buy (Charlie McCoy, Buddy Spicher, and Hargus "Pig" Robbins among them), and record an album that savages the genre's clichés without letting on there's a joke in progress. That is, until you hit the explicitly vulgar songs, of which I count three. Owing to such profane twang-fests as *Piss Up a Rope*, "12 Golden Country Greats" is possibly the only country album in history that carries a "Parental Advisory" sticker.



Where to begin to sing the praises of mock-C&W performance art that matches the dignified Jordanaires with a Ween crooning about drugs ("I'm flying in a frame of my mind that time cannot erase")? A ditty harmonica/dobro intro straight out of Homer and Jethro leads into *Japanese Cowboy*, with lyrics posing all sorts of incongruities ("Like a Japanese cowboy / Or a brother on skates"). In *Powder Blue*, several of the illustrious musicians are introduced before brief solos, with the last guest being . . . Muhammad Ali?! "12 Golden Country Greats" reaches its peak (or nadir) with *Help Me Scrape the Mucus Off My Brain*, a heartfelt plea for whiskey.

The Ween-ers push the envelope too far in *Mister Richard Smoker*, a ragtime number that indulges in blatant homophobia. Also, a disc that offers only ten short tunes (not the promised dozen) is a bit of a gyp. But maybe that's part of the joke, since ten short tunes is all you ever get from certain punch-the-clock country artists. No matter, I laughed so hard I can't wait for "12 More Golden Country Greats." *P.P.*

STEVE WYNN: Melting in the Dark.

ZERO HOUR 1160 (44 min).

Performance: Dark victory
Recording: Guitar-driven

A lot of Dream Syndicate fans are still mad at former frontman Steve Wynn for never making another record just like that band's 1982 debut, "The Days of Wine and Roses." Wynn has made a stack of fine solo and group albums since then, but this time he has finally done something that should please the diehards. While "Melting in the Dark" doesn't really sound like the Dream Syndicate — mainly because it lacks long, psychedelic jams — it's as dark and edgy as the old outfit at its peak, and the guitar sound is even better.

Wynn's backup for this album is Come, a fine Boston band with three records of moody blues-rock to its credit. Sometimes Wynn ventures into Come's territory, as in the ominous title track, and sometimes he lures the group into his: *Shelley's Blues, Pt. 2*, whose title refers to the Mike Nesmith oldie *Some of Shelley's Blues*, is the one outright pop song, with Thalia Zedek doing uncharacteristically sweet backup vocals. Usually, Wynn and Co. find common ground, mixing the band's twisted-roots approach with his songwriting smarts. Wynn's best material customarily deals with severely messed-up characters, and the songs here are no exception: *Why* could be the Ramones on a self-destructive bender, while *For All I Care* can only be described as a nihilistic tango. And *The Way You Punish Me*, with a great garage-rock hook, wins this month's award for Messiest Relationship Celebrated in a Rock Song. *B.M.*

ZZ TOP: Rhythmenn.

RCA 66956 (54 min).

Performance: Coming back to life
Recording: Nice and raw

The second ZZ Top album since the multimillion-dollar signing with RCA, "Rhythmenn" is also the band's second consecutive album with the advance hype of "ZZ Top gets back to its blues roots." But this time it's not a false alarm: Instead of programming their sequencers to make guitar sounds, as they did for 1993's "Antenna," the guys finally got together in the studio and played real instruments, maybe even at the same time. I still hear some tell-tale drum-machine blips, notably in the title track and *Black Fly*, but most of the rhythms sound too left-field and funky for synthesizers to have dreamed up.

As a matter of fact, the live-band sound and chunky blooze-rock riffs make this the best ZZ album in at least a decade. Billy Gibbons still plays gritty, unpredictable guitar solos, and Frank Beard remains one of rock's loopyest drummers — no wonder he had to be benched for the synth records. The blues was always ZZ's best card, and it's about time they played it again. The only problem here is with the songwriting: Nothing quite matches the moronic beauty of *Jesus Just Left Chicago* or *Beer Drinkers and Hell Raisers*, though a few songs come close — especially *Bang Bang*, whose immortal chorus is "She bang-banged my



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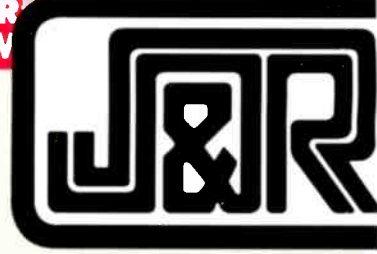
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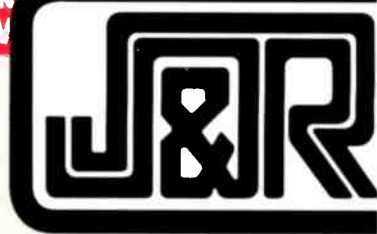
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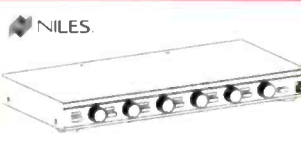
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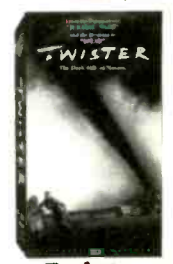
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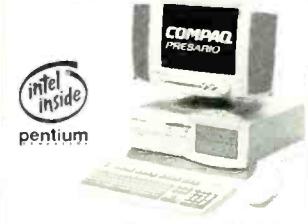
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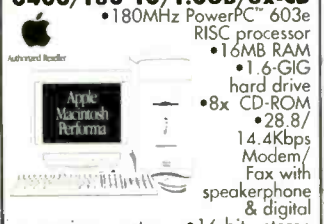
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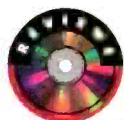
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JAMES BLAND/RCA

ZZ Top: the hairs apparent

shang-a-lang." Also missing is the pre-punk brevity of the band's peak albums. The big hit *Tush* clocked in at two minutes flat — before the Ramones even existed — but everything on "Rhythmeen" is at least twice that long. *B.M.*



JAZZ

CHARLIE BYRD/HERB ELLIS/MUNDELL LOWE:

The Return of the Great Guitars.

CONCORD 4715 (59 min).

Performance: Mellow
Recording: Very good

You may remember the Great Guitars from the early Seventies, when the group consisted of Charlie Byrd, Herb Ellis, and Barney Kessel. Since then, Kessel has suffered a stroke, but septuagenarians Byrd and Ellis are still going strong. For this new edition, Mundell Lowe (now 74) has been added, along with "special guest" Larry Coryell, who at 53 is practically a youngster. The rhythm section is bassist John Goldsby and drummer Tim Horner, both of whom know how to gently propel a front line as delicate as the Great Guitars. Check out the stunning dialogue between Byrd's acoustic and Coryell's electric in *My Funny Valentine*, and be prepared for some intense swing when all four guitarists trade the light fantastic in Charlie Christian's *Seven Come Eleven*. Music doesn't get more soothing than this, a series of gentle romps that will have you tapping your digits and — if you have a few years on you — reminiscing something awful. *C.A.*

URI CAINE: Toys.

JMT/VERVE 697 124 100 (70 min).

Performance: Stimulating
Recording: Fine

Polygram has pulled the plug on the JMT label, so this second release by pianist Uri Caine figures to be an instant cutout. It deserves a kinder fate. I think of "Toys" as a companion album of sorts to Don Byron's "Music for Six Musicians." Caine makes similarly uncléhd use of

Latin motifs, and Byron himself is on hand for a few tracks, including a tense, funky duet with Caine in Herbie Hancock's *Cantaloupe Island* (one of four Hancock classics boldly reconceived here, amid Caine's structurally playful originals). The other soloists heard to fine advantage are tenor saxophonist Gary Thomas, who builds to a slow boil in Hancock's *The Prisoner*, and trumpeter Dave Douglas, whose name on a CD has practically become a guarantee of contemporary jazz at its most daring and intelligent — and his solos here are a tad looser than on his own releases. *F.D.*

NNENNA FREELON: Shaking Free.

CONCORD 4714 (58 min).

Performance: Gracious eloquence
Recording: Excellent

Atrue heir to the tradition of Billie Holiday, Carmen McRae, and Ella Fitzgerald, Nnenna Freelon makes her Concord debut — after three under-promoted albums on Columbia — with "Shaking Free," a title that speaks volumes. Accompanied throughout by pianist Bill Anschell and a rhythm section, with guitarist Scott Sawyer on five tracks and saxophonist Rickey Woodard on three, Freelon breezes through a diverse program that includes three originals, three standards by Johnny Mercer, and tunes by Dizzy Gillespie, Stevie Wonder, and Duke Ellington. Her voice has the silken, free-flowing quality of young Sarah Vaughan's, and Freelon has something few other young jazz vocalists can claim: good taste. *C.A.*

ILLINOIS JACQUET: The Complete Illinois Jacquet Sessions, 1945-50.

MOSAIC 165 (four CD's, 223 min).

Performance: History that doesn't hurt a bit
Recording: Good

You could argue that all of postwar R&B was an attempt to prolong the pandemonium stirred up by tenor saxophonist Illinois Jacquet's artful screams on his 1944 recording of *Flying Home* with Lionel Hampton. You could also argue that the best little jump bands of the late Forties, including Jacquet's, captured all the excitement of the big bands at a time when they were becoming economically unfeasible. You'll find proof of both claims on this collection of Jacquet's complete recordings as a leader in the years just after World War II — another indispensable Mosaic boxed set you didn't know you needed until it appeared.

Wynonie Harris, Fats Navarro, and a very young Miles Davis are among the other performers briefly featured, and the arrangers include Jimmy Mundy and Tadd Dameron. But Jacquet has the spotlight pretty much to himself, and his solos on any number of relaxed medium tempos show that he was never just a screamer. About his only weakness as a fledgling improviser was his somewhat florid approach to ballads — a trait he shared with most big-toned tenor saxophonists of the period, including Coleman Hawkins (the founder of the school). But Jacquet's best work of this period has a slippery logic to it that also suggests the influence of Lester Young, and that can be pretty irresistible.

Fifty years later, Jacquet is still at the top of his game. A riddle posed by this set is why his current powerhouse big band hasn't been recorded since 1987. Record labels, do your duty! The folks at Mosaic have once again done theirs in fine fashion. (Available by mail order only from Mosaic; phone, 203-327-7111.) *F.D.*



RAHSAAN ROLAND KIRK: (I, Eye, Aye).

RHINO 72453 (49 min).

Performance: The one and only
Recording: Good

Because Rahsaan Roland Kirk was a serious musician who was not unaware of the sideshow absurdity of a blind man playing three horns at once (not to mention nose flute), he was best appreciated live. This never-before-released set from the 1972 Montreux Jazz Festival is no "Bright Moments," but it does capture much of Kirk's quirky power. Which isn't to say that it doesn't have its flaws: Kirk preaches the jazz gospel a bit too much in his spoken introductions, his rhythm section excels at nothing but staying out of his way, and he holds some notes so long you wish he had never discovered circular breathing. Still, there has never been anyone else quite like him, and such lapses in taste as he allows himself here somehow come across as evidence of his unique genius. *F.D.*

GERRY MULLIGAN: The Complete Pacific Jazz Recordings of the

Gerry Mulligan Quartet, with Chet Baker.

PACIFIC JAZZ 7243 (four CD's, 282 min).

Performance: Excellent
Recording: Fine transfers

Of all the wondrous sounds invented by jazz musicians over the past eight or nine decades, there are some that will forever remain pivotal to the music's history. One such sound was created almost by accident in 1952, when the quartet of saxophonist Gerry Mulligan was booked into a club whose piano had been removed from the premises. Mulligan had not established himself enough to call the shots (despite having participated in the Miles Davis "Birth of the Cool" sessions three years earlier), so he adjusted the lineup of his group accordingly, bringing in trumpeter Chet Baker. The result was stunning, with Mulligan and Baker engaging in cool contrapuntal dialogue atop a solid rhythmic base. Word of mouth — and recordings like *Bernie's Tune*, *Frenesi*, *Soft Shoe*, and *Walkin' Shoes* — soon put the Gerry Mulligan Quartet on the international map and made household names of the two horn players.

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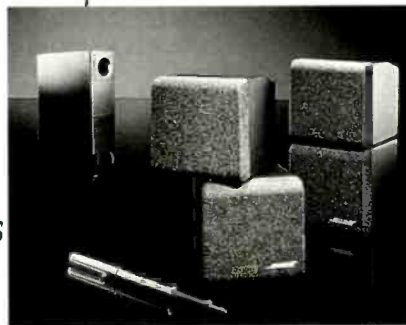


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QUICK FIXES



STEVE ALLEN: *On the Air!* The Classic Comedy of Steve Allen.

VARÈSE SARABANDE 5703 (77 min). Allen, along with Ernie Kovacs, was TV's original comic genius, so I'd like to be able to report that this collection of tube bits is consistently sidesplitting. Unfortunately, though some of it is in fact hilarious (personal fave: a 1957 Letters to the Editor sketch), there's far too much stuff from the Eighties and Nineties — not exactly classic, and certainly not what this fan was looking for. S.S.

VICTOR DeLORENZO: *Pancake Day.* ALMO SOUNDS 80009 (49 min).

There are times in *Blind* when DeLorenzo recalls the Five of another drummer, Dave Clark. Vic (of the Violent Femmes) nicely mixes influences old and new in dirty guitars, fun funk, Beach/Beatle bingo, and some long, stretchy things. As another Dave would say, "It's a festival!" K.R.

FARM DOGS: *Last Stand in Open Country.*

DISCOVERY 77046 (54 min). Elton John lyricist Bernie Taupin, two guys from Rod Stewart's band, and ex-Buckingham Dennis Tufano combine for a (mostly) acoustic folkie album that's tuneful, smart, and exquisitely arranged. Old Fart supergroup? Geriatric Uncle Tupelo? Whatever — it's a welcome surprise. S.S.



FIJI MARINERS FEATURING COL. BRUCE HAMPTON: *Fiji.*

CAPRICORN 532 459 (38 min). The name is the wildest thing about this project — essentially a duo comprising vocalist Hampton and keyboardist Dr. Dan Matrazzo — which tends toward swaggering Southern rock and swinging jazz-blues

of the Jimmy Smith school. Musically accomplished, "Fiji" ultimately lacks Hampton's active engagement as a sorcerer/Sherpa who leads willing ears into offbeat and unpredictable worlds. P.P.

FOLK SCAT.

NOMAD 50310 (48 min). Folk Scat is a Bulgarian *a cappella* quintet, and what I hear is Le Mystère des Voix Swingle. Quite entertaining. K.R.

I CHING: *Of the Marsh and the Moon.* CHESKY 0144 (52 min).

It's not as casually hip as you'd expect from some of the English song titles (*Young Girl's Heart*, *Jasmine Flower*) and the band's eyewear (sunglasses all), but this is a pleasant mingling of traditional Oriental instruments and modern percussion samples, from a Chinese trio and a synth-playing Westerner. And Chesky's "Natural Surround Sound" works wonders with just two speakers. K.R.

TOM PERON/BUD SPENGLER QUARTET: *Dedication.*

MONARCH 1010 (59 min). You don't have to be an experienced jazz fan to enjoy the beguiling San Francisco sound of this recital by trumpeter Peron with drummer Spengler's quartet. They improvise collectively (and delightfully) in Peron originals and such standards as *Witchcraft*, *Angel Eyes*, and *Laura*. Easy on the ears. William Livingstone

SOUL COUGHING: *Irresistible Bliss.* SLASH/WARNER BROS. 46175 (42 min).

M. Doughty too Wordy Rapping for you? Just gyrate to the excellent grooves, especially the Combo Platter that is *Collapse*, which sounds like the Secret Agent Man has infiltrated your local danceteria. K.R.

WU MAN & ENSEMBLE: *Chinese Traditional & Contemporary Music.*

NIMBUS 5477 (63 min). With artful plucking, bowing, and strumming, the pipa virtuoso Wu Man and string players in her ensemble make their exotic instruments sound like a mellow guitar, an astringent zither, a demented banjo, or an impressionistic harp. These combine beautifully with the sounds of shawms and flutes in an excellent program that falls gratefully on Western ears. W.L.

HARVEST SONG.

ELLIPSIS ARTS 4040 (65 min). Drawn from five continents, this program of attractive music about harvesting crops emphasizes the way humanity is unified by its common dependence on agriculture. West African bluesman Ali Farka Toure is the best-known performer; many others are anonymous. Standouts for me are the pretty selections from Peru, China, Ireland, and Brazil. The CD-size, 64-page book that encases the disc is informative and easy to read. W.L.

bound album that contains discographical details and an informative, eloquent essay by Ted Gioia (as he points out, there is a certain irony in the fact that New Yorker Mulligan and Oklahoman Baker defined the essence of West Coast jazz). The set goes well beyond the promise of its title: Besides the classic 1952-53 quartet sessions, it includes early trio sides, the 1957 Mulligan-Baker reunion dates, some 1953 quintet tracks on which Lee Konitz joins the front line, and superb 1957 sides with singer Annie Ross. These performances sound as fresh today as when I first admired them, almost a half century ago. They reflect a partnership made in heaven — where, perhaps, it continues to this day. C.A.

HORACE SILVER: *The Hardbop Grandpop.*

IMPULSE! 192 (63 min).
Performance: A groove recaptured
Recording: Excellent

No sense beating around the bush: "The Hardbop Grandpop" is pianist Horace Silver's best album since his uniformly excellent Blue Notes of the Fifties and Sixties. Here are ten new typically unpretentious Silver compositions, by turns witty and hypnotic. Not surprisingly, the all-star band — trombonist Steve Turre, tenor saxophonist Michael Brecker, trumpeter Claudio Roditi, baritone saxophonist Ronnie Cuber, bassist Ron Carter, and drummer Lewis Nash — isn't as tight as the working units Silver led on Blue Note, but almost without exception the solos sparkle. Maybe it's because everybody here grew up playing along with Silver's records; they know his music better than they know their own. It's enough to restore your faith in hard bop. Then again, Silver is the man who practically invented the genre. It was others who made the formula sound formulaic. F.D.

Collection

LUSH LIFE — THE BILLY STRAYHORN SONGBOOK.

VERVE 9908 (69 min).
Performance: From fine to excellent
Recording: Mostly good

To celebrate (cash in on) David Hajdu's new biography of Duke Ellington arranger Billy Strayhorn, Verve has released a CD featuring fifteen Strayhorn compositions in performances by an engaging variety of artists. Compiled by Hajdu from material in Polygram's vault, the set offers a good cross-section, starting with Strayhorn's best-known ballad, *Lush Life* (sung by Sarah Vaughan), and ending with the more widely known *Take the "A" Train* (played by a Jazz at the Philharmonic group with solos by Roy Eldridge, Coleman Hawkins, Benny Carter, Don Byas, and Jo Jones). In between are instrumental performances by, among others, Art Farmer, Cecil Taylor, Dizzy Gillespie, Stan Getz, Johnny Hodges, Oscar Peterson, and Ben Webster, as well as vocals by Ella Fitzgerald and Billy Eckstine. Strayhorn himself plays some piano. I recommend both book and CD. 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



BACH: Complete Cantatas, Volume 1 (BWV 4, 21, 31, 71, 106, 131, 150, 185, 196).

Barbara Schlick (soprano), Kai Wessel (alto), Guy de Mey (tenor), Klaus Mertens (bass); Amsterdam Baroque Choir and Orchestra. Ton Koopman cond. ERATO 98536 (three CD's, 198 min).

**Performance: Very fine
Recording: Clear and resonant**

The recording industry is a roosting-place for a lot of empty hyperbole, but when Erato claims that this is "one of the most ambitious recording projects in history," they really aren't stretching the truth. The Dutch Baroque specialist Ton Koopman has begun a complete set of the sacred and secular cantatas of J. S. Bach, a project that will ultimately fill sixty-six compact discs. It's the first time this Everest of the repertoire has been assaulted by a single conductor. (Erato's sister label, Teldec, was the last to record a complete set, but there the conducting duties were divided between Nikolaus Harnoncourt and Gustav Leonhardt.) One nice feature of Koopman's set is that all the recordings will be made in the same space, the Waalse Kerk in Amsterdam, which will give the cycle a sonic unity.

He's off to a fine start with this set of Bach's very first efforts in the cantata form: spirited, amazingly sophisticated little masterpieces written while the composer was still in his early twenties. Some of his most famous cantatas are included, from the exquisitely moving No. 4, *Christ lag in Todesbanden* ("Christ lay in the bonds of death"),

to the ebullient exaltation of No. 131, *Aus der Tiefe rufe ich, Herr, zu dir* ("From the deep, Lord, I call to Thee"). The soloists, veterans of Koopman's previous Bach recordings, are accomplished artists who sing with admirable clarity and conviction. The orchestra plays with more assurance than most comparable period-instrument ensembles, though also with all the verve and inner spring you could want.

Some of Koopman's decisions will be controversial, particularly his very high pitch, though he promises to return to standard Baroque pitch when he comes to

Bach's Leipzig period, when most of the cantatas were composed. The chorus sings with a lovely, melded tone that is almost a little too suave; while there may be nothing objectionable from a musicological point of view about using female sopranos, I sometimes found myself missing the haunting, golden treble of a boys choir. *J.J.*

BEETHOVEN: Piano Concertos No. 3 and No. 4.

Mitsuko Uchida (piano); Royal Concertgebouw Orchestra, Kurt Sanderling cond. PHILIPS 446 082 (72 min).

**Performance: Fourth better
Recording: Ditto**

Mitsuko Uchida could not have asked for more distinguished associates in the Beethoven concertos than Amsterdam's famous orchestra and the conductor whose



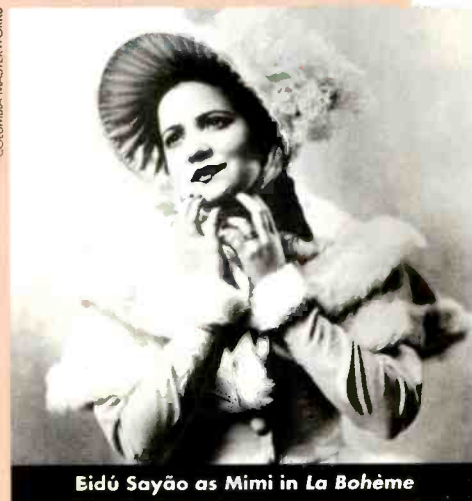
old monophonic recordings of these works with Emil Gilels and the Leningrad Philharmonic are still treasured by many collectors. And there could not have been a happier beginning for such an undertaking than the Concerto No. 4, in G Major, whose lyric character suits Uchida's personal style perhaps more gratefully than the more

Masterworks Heritage

Sony Classical has launched the Masterworks Heritage CD series, reissues of treasured recordings from the catalog Sony inherited from Columbia and CBS Masterworks, dating from the stereo era back to the turn of the century. Many of the recordings in the series will be appearing on CD for the first time. The restoration process includes digital noise reduction (vital for the oldest recordings, which were made around 1900) as well as Sony's Super Bit Mapping 20-bit mastering technology for "high-definition" sound.

The series will feature the nation's finest orchestras — from New York, Boston, Philadelphia, Cleveland, Chicago, Minneapolis, and Pittsburgh — and a dazzling roster of conductors, instrumental soloists, and singers. The first ten discs, released in September, include performances by the conductors Eugene Ormandy, Fritz Reiner, and Leopold Stokowski, the pianist Claudio Arrau, the organist E. Power Biggs, the violinist Zino Francescatti, and the sopranos Eleanor Steber and Bidú

COLUMBIA MASTERWORKS



Sayão. The second release of ten discs, scheduled for this month, will include a Metropolitan Opera production of Puccini's *La Bohème* with Sayão and Richard Tucker. *William Livingstone*

CLASSICAL MUSIC

demonstrative or heroic gestures of the other works in the cycle. This point is registered, in fact, in her performance of the Concerto No. 3, in C Minor, both of whose outer movements have a rather bland feel about them despite occasional urgings from the conductor, serving as little more than a perfunctory frame for the poetically realized slow movement, in which the pianist has the stage pretty much to herself. The overall effect is — well, little more than merely pretty.

The Fourth Concerto, recorded live (and happily as free of mood-breaking applause as of other audience noises), is altogether more persuasive. Here there is no want of

FROM ARLEN TO ARDEN

Soprano Sylvia McNair's discography on Philips Classics is at the same time distinguished and somewhat unusual. Rather than standard opera roles and aria albums, it is made up mostly of Mozart Masses, Handel oratorios, and Purcell songs (her Purcell album "The Echoing Air" was a 1996 Grammy winner). Per-

NICK BRIGGS/PHILIPS CLASSICS



Soprano Sylvia McNair

haps more surprising are her songbook albums with André Previn devoted to Jerome Kern and, more recently, Harold Arlen ("Come Rain or Come Shine"). Only Gluck's *Orfeo ed Eurydice* and Mozart's *Il Re Pastore* have represented opera.

But if not the bread-and-butter roles, opera is still part of this versatile singer's world. McNair's latest recording, to be released this month, is Britten's *A Midsummer Night's Dream*, with the London Symphony Orchestra conducted by Colin Davis, in which she enchants the Forest of Arden in the role of Titania.

animation. Uchida's stunning technique is unleashed, and she revels in the opportunities for display and the bright-eyed exchanges with various orchestral soloists and choirs as well as the more inward moments. The strings in the slow movement are elegant and clarifying, with a bit of tongue-in-cheek regarding their gruff role; if the final movement is a little less rumbustious than in other performances, it is nonetheless spirited in a way that is not the least bit earthbound, and there is some downright delicious wind playing in it.

Sonically, too, the live Fourth is the more impressive item here, with the added warmth of a filled hall. Enthusiasm for this one performance, though, is inevitably modified by the practical thought that there are other accounts of this work that are no less fetching and come with similarly persuasive discmates. *R.F.*

BERLIOZ: *Symphonie Fantastique*. ROUGET DE LISLE (arr. Berlioz): *La Marseillaise*.

Plácido Domingo (tenor); Chicago Symphony Chorus and Orchestra, Daniel Barenboim cond. TELDEC 98800 (62 min).

Performance: Tidy
Recording: Richly vivid

Some seventy-five years ago, H. G. Wells wrote that the *Marseillaise* "still warms the blood like wine." And still more in Berlioz's fiery arrangement — usually. In place of the traditional alternation of male and female singers in the solo passages, Plácido Domingo takes them all here, but the piece still doesn't quite strike fire; the performance is tidy and a tad perfunctory. So, too, is the *Symphonie Fantastique* that follows it on the disc.

In his two earlier recordings of the big work — with the Orchestre de Paris on Deutsche Grammophon in the late 1970's and the Berlin Philharmonic on a still current Sony disc — Daniel Barenboim seemed to have thought very deeply about the familiar score without quite coming to a satisfying conclusion. Now, a dozen years since the Berlin sessions, he has achieved a somewhat more cohesive realization without really altering his basic approach. Some gratuitous mannerisms have been eliminated, and some of the phrasing is more fluid than before, but once again Barenboim, apparently seeking to stress the work's inner drama and the subtleties beneath the brilliant surface, tends to suppress the visceral tension and excitement that are its essence. It just doesn't come off convincingly despite superb playing from the orchestra and a live recording that doesn't miss a trick in respect to sumptuousness or definition. *R.F.*

BRAHMS: *Symphonies Nos. 3 and 4*.

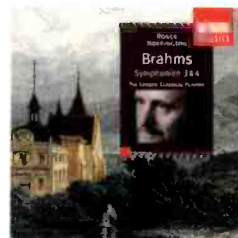
London Classical Players, Roger Norrington cond. EMI 56118 (73 min).

Performance: Revelatory
Recording: Very good

In his notes for this highly intelligent, beautifully played recording, Roger Norrington looks back on the recent history of the early-music movement. "Now, arriving at Brahms," he reflects, "we are examining,

and hoping to re-illuminate, music written in my own grandmother's lifetime," fearlessly dating himself. Then he asks, "Is it a valid enterprise?" Not surprisingly, he concludes that it is, and these performances make it easy to agree with him.

Brahms himself vehemently protested against being categorized as a Romantic and considered himself to be the last composer of the Classical school. Norrington's



lithe, lean interpretations bring out his affinities with Beethoven and even Haydn, sounding almost like chamber music to ears accustomed to hearing this music played at slower tempos by much larger forces. Indeed, some of Norrington's tempos seem brisk to the point of excess; the triumphant horn theme that introduces the second movement of the Fourth Symphony comes tripping along at a pace that seems anything but *andante*, *moderato* or otherwise.

Some listeners will still prefer the richer, graver performances by big orchestras with modern instruments, and the best Brahms interpreters have always attempted to avoid Wagnerian bloat. Yet Norrington is a formidable musician, and this is a meticulously prepared, cleanly recorded set that will challenge you to open your ears. *J.J.*

KERNIS: *Colored Field; Still Movement with Hymn*.

Pamela Frank (violin); Paul Neubauer (viola); Carter Brey (cello); Christopher O'Riley (piano); Julie Ann Giacobassi (English horn). San Francisco Symphony, Alasdair Neale cond. ARGO 448 174 (71 min).

Performance: Good
Recording: Good

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minutes) combining hymn-like elements from the Christian and Jewish traditions.

Colored Field is, oddly enough, a concerto for English horn, commissioned by the San Francisco Symphony for the soloist here, Julie Ann Giacobassi. It is a very dramatic, not to say melodramatic, work full of incident, wonderful invention, and bombast; ultimately it rambles. *Still Movement with Hymn*, for piano quartet, tempts Kernis to flex his instrumental muscles much less. These meditations without bombast hold

my attention and compel my belief and my sympathy in a much more deeply felt manner. Good performances, good recording throughout, and (whatever my reservations) all the usual kudos to our English friends at Argo, who fearlessly record new American music. *E.S.*

LEHÁR: The Czarevitch.

Nancy Gustafson (Sonia), Jerry Hadley (Czarevitch), Naomi Itami (Mascha), Lynton Atkinson (Ivan), Jeffrey Carl (Grand Duke):

English Chamber Orchestra, Richard Bonyngé cond. TELARC 80395 (78 min).

LEHÁR: The Land of Smiles.

Nancy Gustafson (Lisa), Jerry Hadley (Sou-Chong), Naomi Itami (Mi), Lynton Atkinson (Gustl); English Chamber Orchestra, Richard Bonyngé cond. TELARC 80419 (79 min).

Performances: Laudable
Recordings: Excellent

With the exception of the indestructible *Merry Widow*, the operettas of Franz Lehár are hardly ever performed in this country. Thus, grateful acknowledgement is due Telarc for releasing these two sterling operettas, *The Czarevitch* (1927) and *The Land of Smiles* (1929), in English — in itself a novelty. Both are rich and passionate works. Lehár was an inspired melodist who created throbbing and sensuous music for singers, encased in colorful orchestral harmonies redolent of many lands, in these instances Russia and China, respectively.

Richard Bonyngé imparts a knowing and sympathetic direction to both operettas, wisely retaining the original orchestrations ("modern" updates rarely work), and the outstanding English Chamber Orchestra plays them brilliantly. Jerry Hadley glories in the seductive melodies originally conceived for the immortal tenor Richard Tauber, and soprano Nancy Gustafson partners him well in several duets that are among the highlights. It is a tradition in continental operettas (going back to Mozart and beyond) to contrast the romantic leads with a pair of playful, light-spirited characters, and Naomi Itami and Lynton Atkinson ably fill their roles. *The Land of Smiles* is the stronger of the two scores, but *The Czarevitch*, too, has its beguiling moments.

The English lyrics — by Adam Carstairs and Jerry Hadley — fit the music smoothly, and they are, for the most part, clearly enunciated. There is no question that these operettas are very much dated in terms of their stories; nonetheless, I hope the recordings will meet with wide acceptance, leading to more to follow. In Lehár, the music, not the play, is the thing! *G.J.*

MAW: Sonata Nocturna; Life Studies.

Raphael Wallfisch (cello); English String Orchestra, William Boughton cond. NIMBUS 5471 (65 min).

Performance: Very good
Recording: Glowing

Like his vast orchestral *Odyssey*, Nicholas Maw's *Life Studies*, a succession of eight introspective sections that he composed a little more than twenty years ago for fifteen solo strings, is as unremittingly serious as it is beautifully crafted, and as urgently and effectively communicative. Maw has said little about the significance of the title beyond noting that the eight sections are "drawn from life." He has given none of them anything more than a tempo marking by way of heading, though he has advised that the second one, which cites Chopin, alludes to a recollection of his father playing one of the preludes.

In addition to Chopin, allusions to or near-echoes of various other composers

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may suggest themselves: a vaguely Sibelian impression in the brooding opening, the sound of Schoenberg's *Transfigured Night* in a subsequent section, a flash of Strauss's *Metamorphosen* in another. But these are fleeting likenesses rather than pointed ones, and I mention them here only by way of indicating the powerful level of the more generalized evocative intensity Maw achieves in a language no less personal to him than Sibelius's and Schoenberg's were to them. The work builds to a compellingly affirmative resolution that requires no pictorial or programmatic associations for its impact to register.

Preceding *Life Studies* on the disc is the première recording of the *Sonata Notturna* for cello and strings, composed in 1985. It is more concise, a single extended movement in four sections (Intrada — Canto — Cadenza — Capriccio), with the cello appearing as a sort of free-wheeling protagonist challenging in various moods the prevailing dark persona of the string orchestra. Raphael Wallfisch gives an eloquent, committed account of the solo part. Both works were recorded, in glowing sonics, at the end of a celebration of Maw's sixtieth birthday in Britain last November. Everyone involved in the project can be proud of it, and anyone who listens to the disc is bound to be touched by it. *R.F.*

PÄRT: Symphony No. 3; Frates.
KANCHELI: Symphony No. 3.

London Philharmonic, Franz Welser-Möst cond. EMI 55619 (55 min).

Performance: Melodious, persuasive
Recording: Extreme

The parallels between the lives and works of Arvo Pärt and Giya Kancheli are remarkable. Both were born in 1935 at outer edges of the Soviet Union — Pärt in Tallinn, Estonia, and Kancheli in Tbilisi, Georgia — and both now live in Berlin. The ma-



gor creators of Eastern European so-called mystical minimalism, both write large-scale contemplative works that can be either religious or mystical. Musically, however, they are quite different.

Pärt's work is fundamentally nondramatic; his musical universe is truly monotheistic. The Third Symphony (1971) is a three-movement work, but all the movements are alike in their evocation of medieval music in a way that is both modern and timeless: the music is slow, repetitious, endlessly beautiful, but utterly without dialogue or drama. In *Frates* ("Brothers") there is contrast, but only between a tiny percussion marker and a melodic cell in the strings that is repeated and rotated over and over.

Kancheli's Third Symphony, on the other hand, is built entirely on a huge contrast of soft and loud: folk evocation vs. loud Stravinskian dissonance, war vs. peace, good vs. evil, violence vs. reconciliation — you pick the meaning. It is a never-ending contest, and there is the sense that the music could be of any length or that you can listen to as much or as little of it as you wish. If nothing else, it has its own profile.

The very persuasive performances here, with the London Philharmonic conducted by Franz Welser-Möst, were recorded with that huge dynamic range that the CD medium can deliver. There is actually a notice in the liner notes to the effect that the ultra-soft opening of the Kancheli might tempt you to turn up the volume high enough so that the outburst that follows could damage your playback equipment. Nothing is said about damage to your ear drums, mental equilibrium, or household harmony, all equally (and perhaps even more seriously) fracturable. *E.S.*

SCHUBERT (arr. Mahler): String Quartet No. 14 ("Death and the Maiden").

MAHLER: Symphony No. 5, Adagio.
Mito Chamber Orchestra. SONY 61970 (49 min).

Performance: Good Schubert
Recording: Very good

The Mito Chamber Orchestra, founded in 1990, and comprising twenty-one players who perform without a conductor, appears to be Japan's answer to the highly successful Orpheus Chamber Orchestra here in the U.S. On this debut CD the Mito ensemble gives us a gutsy and passionate account, culminating in an immensely dramatic finale, of Mahler's arrangement of the most famous of the Schubert string quartets, No. 14, in D Minor (known as "Death and the Maiden" because of variations on the song of that name in its slow movement). The full-bodied recorded sound benefits the performance.

On the downside, I don't find the performance of the famous adagio from Mahler's Fifth Symphony very convincing with just twenty-one strings, nor am I happy with the CD's short playing time. The competitive recordings of the quartet on RCA Victor, Bis, and Chandos have more apt and generous couplings. *D.H.*

SIBELIUS: Violin Concerto; Karelia Suite; Belshazzar's Feast, Suite.

Pekka Kuusisto (violin): Helsinki Philharmonic, Leif Segerstam cond. ONDINE 878 (65 min).

Performance: Persuasive
Recording: First-rate

Pekka Kuusisto, now 20 years old, won last year's Sibelius Violin Competition in Helsinki, also receiving a special prize for the best performance of the Sibelius concerto. No one hearing this recording is likely to be at all surprised by that. His view of the work is an expansive one, and that accords with the general predilections of the conductor, Leif Segerstam; their interpretive bond is well nigh seamless. After all, realizing the dark colors and flickering lights of this concerto is more to the point

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than sheer drive — though there is no real deficiency in that respect. The firm rhythm in the final movement and the richness and purity of Kuusisto's tone throughout provide the underpinning for both excitement and long-lasting satisfaction.

The two orchestral suites are by no means mere fillers. Segerstam and his well-honed orchestra take the *Karelia* Suite seriously enough to revise many a listener's estimation of it, without distorting its essentially modest proportions or straightforward content, and they make a still stronger case for the enchanting suite from Sibelius's incidental music for the drama *Belshazzar's*

Feast. Sound quality and documentation, as usual with Ondine, are first-rate. *R.F.*

VILLA-LOBOS: String Quartets Nos. 3, 8, and 14.

Cuarteto Latinoamericana. DORIAN 90220 (66 min).

Performance: Intense conviction
Recording: Warm and tropical

Villa-Lobos, one of the most prodigious-ly fertile of twentieth-century composers, wrote seventeen string quartets over a period of a little more than forty years. The three here, written in 1916, 1944, and 1957, respectively, use the Classical model,

with fast opening and closing movements surrounding the expected slow movement and scherzo. Initially it is those middle movements that make the strongest impression: the scherzos with their suggestions of traditional Brazilian rhythm and melody and the deeply felt and rather dramatic slow movements. The outer sections, serious and more structured, are disappointing at first because of their lack of exoticism, but a second listening reveals qualities of imagination and dramatic plotting. These are perhaps strongest in No. 14, the latest quartet here and the most impressive overall.

A major factor in the success of this disc is the playing of the Mexico-based Cuarteto Latinoamericano, a first-rate organization. They take to both the Classicism and the passionate modernism of this music with conviction and intensity. *E.S.*

MODERN MELODRAMA

The tradition of combining spoken word with music is very ancient (the old name for this form is "melodrama"), but it has been given a new twist by modern technology. Probably the best-known modern practitioner of this somewhat arcane art is Steve Reich, though he is far from the only experimenter in this field.

Michael Daugherty and Scott Johnson used radio broadcasts of J. Edgar Hoover and the journalist I. F. Stone, respectively, to make their respective pieces for a new Nonesuch CD by the Kronos Quartet titled "Howl, U.S.A.," and on Johnson's own Point Music CD, "Rock Paper Scissors," a work entitled *Convertible Debts, Volume 1* uses the taped phone voices of people calling him and asking for favors! The mixture of spoken recordings with a musical score is cleverly managed by



both composers, but especially by Johnson, who extracts his musical rhythms and even pitches from the musicality of speech. Almost as impressive is Lee Hyla's *Howl* on the Kronos CD, which is really Allen Ginsburg's poem *Howl* read by Ginsburg himself in a powerful manner that provides a lot of the strong music of the piece.

The inclusion of Harry Partch in this company is a brilliant stroke. Partch, who was born in 1901 and died in 1974, not only made his own original musical instruments but also invented a kind of *Sprechstimme* (speech-song) that was all his own. Ben Johnston, one of Partch's few true disciples, arranged Partch's settings of hobo graffiti for the Kronos Quartet, and Johnston performs the texts in a wonderfully deadpan latter-day version of Partch's American style.

Scott Johnson, half a century younger than Partch, is a guitarist as well as composer, and besides making extensive

use of spoken language in his work, he has also introduced elements of pop and rock into his new-music vocabulary. Both of those elements are present in *Convertible Debts*, which might be described as the apotheosis of the rhythms and melodies of everyday speech. A very lively and amusing work.

Its disc companion, *Rock/Paper/Scissors* — the title comes from a children's rhyme — is a purely instrumental five-movement work written for Johnson's own excellent not-quite-string quartet: violin, cello, guitar, and keyboards. He describes it as his "motorized mobile Romantic symphony, with one extra movement and 100 fewer musicians." The music is hardly conventionally Romantic, but it has strong vernacular elements treated

with high-level classical technique and a lot of inventiveness. Johnson's I. F. Stone piece is a high point of the Kronos album, and his own solo CD — melodrama, motorized mobile Romantic antics, and all — is a winner.

Eric Salzman

KRONOS QUARTET: Howl, U.S.A.

Daugherty: *Sing, Sing, J. Edgar Hoover*.
Partch: *Barstow: 8 Hitchhiker's Inscriptions from a Highway Railing at Barstow, California*. **Johnson:** *Cold War Suite from "How It Happens."* **Hyla:** *Howl*.
Ben Johnston, Allen Ginsberg (readers); Kronos String Quartet.
NONESUCH 79372 (57 min).

SCOTT JOHNSON: Convertible Debts, Volume 1; Rock/Paper/Scissors.

Philip Bush (keyboards); Erik Friedlander (cello); Scott Johnson (guitar); Mary Rowell (violin). POINT 454 053 (55 min).

Collections

THE ENCHANTED KINGDOM (Orchestral Music by Rimsky-Korsakov, Liadov, and Tcherepnin).

Russian National Orchestra. Mikhail Pletnev cond. DEUTSCHE GRAMMOPHON 447 084 (67 min).

Performance: Vivid
Recording: Bright and clear

The choicest items on this CD of Russian fairy tales by Rimsky-Korsakov and two of his pupils are the three brief tone poems by Anatol Liadov: *Baba-Yaga* and *Kikimora*, both evocative of grotesque creatures from Russian folklore, and the magically impressionistic *The Enchanted Lake*. Liadov may not have written much, but his best pieces are real gems, and Mikhail Pletnev and his crack Russian players come through with performances that make the settings and scenarios virtually palpable.

Nikolai Tcherepnin's *La Princesse Loizaine* (*The Distant Princess*) was written as a prelude for Edmond Rostand's play of the same name, and his *Le Royaume Enchanté* (*The Enchanted Kingdom*) was based in part on the same subject Stravinsky used for



The Firebird. Both are gorgeously orchestrated and highly atmospheric, the former looking backward to the lyricism of Borodin, the latter in its highly coloristic way picking up from late Rimsky-Korsakov.

Pletnev winds up the program with the oft-recorded suite from Rimsky's opera *Le Coq d'Or* (*The Golden Cockerel*), and the reading is extraordinary for its sharpness of detail and vividly delineated coloration. The final Wedding Procession is a real blockbuster in its evocation of terror and

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catastrophe. All told, this is a most satisfying collection, graced by the best sound I have heard from any of Pletnev's Deutsche Grammophon recordings. Highly recommended. *D.H.*

TEARS OF LISBON (Villancicos and Fados).

Beatriz da Conceição. António Rocha (vocals); José Manuel (guitar); José Antonio (viola); Huelgas Ensemble. Paul van Nevel cond. SONY 62256 (68 min).

Performance: Excellent
Recording: Good live take

Recorded live at a concert in the 1995 Flanders Festival, this CD stems from the idea of Paul van Nevel, director of the early-music Huelgas Ensemble, that the sixteenth-century Portuguese *villancico* and the twentieth-century Portuguese *fado* share an underlying sensibility. Musically they seem worlds apart — Renaissance polyphony vs. modern cabaret — but the sentiments of desire, yearning, unrequited love, and philosophical resignation are timeless.

The Huelgas Ensemble performs the anonymous *villancicos* in high style, alternating with the Lisbon *fadistas* every two or three cuts; in one case words by the *fado* singer António Rocha are sung by the Huelgas to a Renaissance score. This mixture is somewhat more ingenious in theory than in execution, a good concert idea perhaps, but only moderately successful as a recording. Ultimately the best thing would be to have a self-contained disc of the *villancicos* and another of *fados* — perhaps even one apiece by each of these excellent vocal artists. *E.S.*

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BOWLES: Pastorella, First Suite; Suite for Small Orchestra; Two-Piano Concerto; The Wind Remains; Secret Words.

Alan Feinberg, Leslie Stifelman (piano); Carl Halvorson (tenor); Lucy Schauer (mezzo-soprano); Kurt Ollmann (baritone); Eos Ensemble, Jonathan Sheffer cond. CATALYST 68409 (70 min).

The Concerto for Two Pianos and Orchestra is really a crafty collection of themes with no trace of development. Feinberg and Stifelman have a light but firm mastery of Paul Bowles's idiom, balancing a global range of musical influences with an ease that belies the work's rhythmic intricacy. Their only obstacle lies in the fairly dated orchestration. The disc scores highest with an atmospheric performance of the zarzuela *The Wind Remains*. In *Secret Words*, a suite of songs, baritone Kurt Ollmann's unerring interpretive sense is undermined by Jonathan Sheffer's often heavy-handed orchestrations. *Ken Smith*



KODALY: Hungarian Rondo; Summer Evening. SUK: Serenade for String Orchestra.

Orpheus Chamber Orchestra. DEUTSCHE GRAMMOPHON 447 109 (52 min). For all its rhapsodic lyricism and nature evocation, Kodaly's *Summer Evening* is cast in fully worked-out sonata form. The *Hungarian Rondo* is the real find here. Suk's youthful Serenade for Strings has long been a staple of the repertoire, its crowning glory the tender third-movement adagio. The Orpheus players take a tauter than usual pace in the opening two movements but do full justice to the adagio and finale. Flawless sonics throughout. *D.H.*

MAHLER: Symphony No. 4. WEBER: Im Sommerwind.

Inger Dam-Jensen (soprano); Royal Philharmonic, Jun-Ichi Hirokami cond. DENON 78832 (73 min). Jun-Ichi Hirokami's major previous recordings have been of contemporary Swedish and Japanese works, plus a Borodin anthology. His excursion into German late-Romanticism is a genuine success. The performance of Mahler's Fourth Symphony is sensitive, airy, and amply atmospher-

ic; soprano Inger-Dam Jensen's solo part in the finale is well done if on the cool side. Weber's romantic idyll, *Im Sommerwind*, gets a resplendent realization from a highly responsive Royal Philharmonic. The sound is just fine. *D.H.*



SCHUMANN: Symphony No. 3 ("Rhenish"). WEBER: Five Pieces for Orchestra, Op. 10. SCHOENBERG: Transfigured Night.

Frankfurt Radio Symphony, Eliahu Inbal cond. DENON 78822 (66 min). Eliahu Inbal and his Frankfurt orchestra give a splendidly warm reading of the "Rhenish" Symphony that has plenty of sweep and soaring lyricism and is free of the heavy-footedness that mars some performances. With it we get the string-orchestra version of Schoenberg's *Transfigured Night*, with ample hothouse ambience, and an elegant reading of Webern's brief but exquisite Five Pieces, Op. 10. All three works are also well recorded, but the program makes no sense as a whole. *D.H.*

R. STRAUSS: Sinfonia Domestica; Death and Transfiguration.

Bavarian Radio Symphony, Lorin Maazel cond. RCA VICTOR 68221 (74 min). Lorin Maazel continues to recertify his Straussian credentials with his fourth recording, this time in Dolby Surround, of *Death and Transfiguration* and his second of the *Sinfonia Domestica*. Neither work, nor the Munich orchestra itself, has ever sounded better. The *Domestica* is a special joy, with a beguiling sensuousness and all-around exhilaration in addition to its customary warmth of heart. *R.F.*

THE KING'S NOYSE: Stravaganze.

Andrew Lawrence-King (harp); the King's Noyse, David Douglass dir. HARMONIA MUNDI 907159 (79 min). Most of the music here reflects the big, soulful changes that swept over Italian music around 1600. Peri and Monteverdi, the founders of opera, are represented, and so is the eccentric Carlo Gesualdo; most of the other composers are obscure. The King's Noyse is a Renaissance or early Baroque band with two different-size violins, two different-size violas, a bass violin, and a singer, the vocally stunning Ellen Hargis. Also featured is the Baroque harp of Andrew Lawrence-King. The music is chosen and arranged with extravagant taste and skill and performed with the right amount of freedom and flair. *E.S.*

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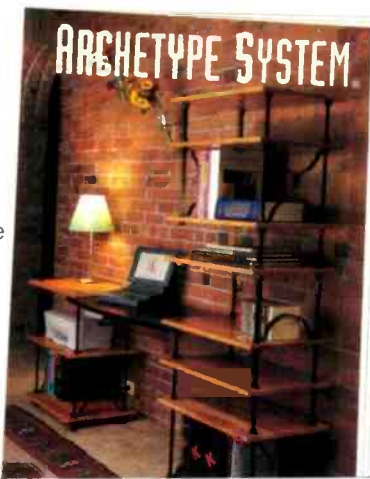
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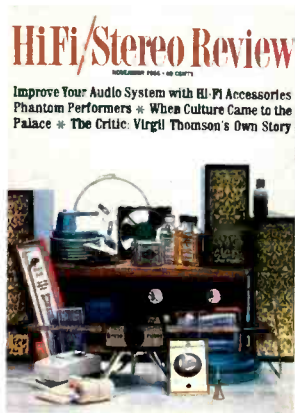
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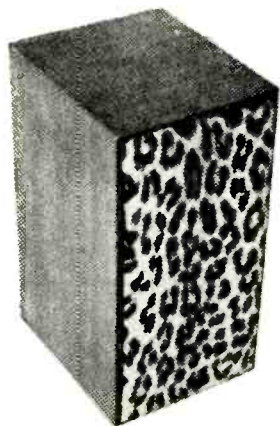
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TIME DELAY



30 YEARS AGO

The cover of the November 1966 issue displayed items recommended in "Audio Accessories: A Guide to the Many Inexpensive Gadgets, Gizmos, and Widgets That Can Bring Your Hi-Fi System Closer to Perfection," including Rotron's cooling fan and Elpa's Dust Bug. Meanwhile, "The Phantom Performers" divulged the pseudonyms of certain classical artists and ensembles; the Indianapolis Symphony,



Martel speaker, 1966

for example, had recorded as the Sussex Symphony Orchestra. And in "The Paper: A Critic's Tale," the paper was the New York *Herald Tribune* and the critic was composer Virgil Thomson. "I had entered music reviewing in a spirit of adventure," Thomson recalled in this excerpt from his autobiography. "I thought of myself as a species of knight-errant attacking dragons singlehandedly and rescuing musical virtue in distress."

Hirsch-Houck Laboratories tested the James B. Lansing (JBL, that is) SA-600 stereo amplifier and found it to be "worth every cent of its \$345 price." Among new products were KLH's Model Twelve speaker (\$275) and Martel's "Baby Grand" speaker (\$39.95), with optional leopard-pattern grille fabric.

Party on, dude! Reviewing "One Rainy Night" by the Mystic Moods Orchestra, Gene Lees declared, "You probably have enough mood music in your collection to take care of a dozen chicks."

20 YEARS AGO

For the November 1976 issue, technical editor Larry Klein and music editor James Goodfriend each evaluated a new RCA LP containing computer-treated acoustic recordings of Enrico Caruso. The verdict on this early example of digital signal processing: two thumbs up. New products included Garrard's GT55 (\$250), an automatic turntable with a



Cliff Richard, 1976

magnesium-alloy tonearm. And in test reports, Hirsch-Houck Labs examined the TX-6500 AM/FM tuner from Pioneer (\$175), calling it "a real beauty!"

"Vaudeville," an album of turn-of-the-century popular songs starring Joan Morris and William Bolcom, was a pick for Best of the Month. William Livingstone interviewed Mr. and Mrs. Bel Canto, better known as Joan Sutherland and Richard Bonyngé, and Noel Coppage profiled Linda Ronstadt, who slugged disco dancing as "subliminal, no-contact sex . . . on that weird sort of surface, green-slime level."



Short People Got No Reason to Live: Reviewing "I'm Nearly Famous" by British pop star Cliff Richard, Peter Keilly ventured that, to Americans, Richard probably seemed "pretty much of a mystery. But then try to explain Mickey Rooney to an Englishman."

10 YEARS AGO

"How to Buy an Amplifier" was a big topic of the November 1986 issue,

addressed in an article that considered both integrated amps and separates. Examples shown ranged from the RCA MSA-100 Dimensia integrated amp (\$299) to the Audio Research M300 mono power amp (\$4,900). In new products, we noted the PVA-1 audio/video signal processor from Parasound (\$600). And Julian Hirsch tested the Adcom GFA-555 power amp (\$680), an "affordably priced" unit that



appealed to high-end buyers — and "a superb amplifier by any objective standard."

"Analog to Digital" offered a list of terrific-sounding CD's recorded the old-fashioned way, including Leonard Bernstein's Mahler Third on CBS Masterworks and Sting's "The Dream of the Blue Turtles." Among selections for Best of the Month were an Angel disc of Mozart arias sung by Kathleen Battle and Van Morrison's "No Guru, No Method, No Teacher," hailed as a return to his "Astral Weeks" form.



Parasound A/V signal processor, 1986

White Pseudopods on Dope: Taking special note of a clip of Black Sabbath's *Paranoid* in the video collection "MTV Closet Classics," Louis Meredith wrote that lead singer Ozzy Osbourne "performs with all the abandon of a slug on Valium."

— Steve Simels



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