

Stereo Review

OCTOBER 1996 US \$3.50 • CANADA \$4.50 • UK £2.20

Ready for DVD

DIGITAL HIGH TECH

DVD Promises a Revolution in Home Theater, Music, and the PC

DVD UPDATE

Gee Whiz Players Are Set to Go, but When?

COMPUTER SPEAKER TESTS

10 Speaker Systems Go For the Multimedia Gold

TESTED: Kenwood Home Theater

more!

MR. DAVID S. BUCHANAN
1100 OSMOOR WOODS PKY
LOUISVILLE KY 40222-5569
MAY 97
#BCH11C00098 1#430492
1J





The most convincing argument for a home theater *is right in*

You've waited in the rain, paid your seven bucks, bought your real buttery-flavor popcorn and snagged the best seat in the house. When somebody decides to sit in the second best seat in the house. You know, of course, the solution is to create the ultimate theater in your home. And as anyone will tell you, a truly moving theater experience is built around sound as much as the picture. But not just any sound. Parasound. You see, we've built our company around the notion that a person shouldn't have to spend a fortune to hear the finest that technology has to offer. And now that we've applied that principle to home theater, the cinematic experience will never be the same. Hear audio that's well above the crowd and head to your nearest Parasound dealer or authorized custom installer. And let someone else deal with the spud with the big head.



P/SP-1500 THX PROCESSOR/PREAMP

Astonishing sound unleashed with simple on-screen operation. It's ready for our Dolby AC-3 decoder today so it won't be obsolete tomorrow.



HCA-1206 6 CHANNEL THX AMPLIFIER

Designed by John Curl with a total of 1200 watts on six channels, it's the most powerful THX-certified amplifier made. Sensitive enough to move your soul, powerful enough to move your foundation.



PARASOUND

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THX is a registered trademark of Lucasfilm, Ltd.

front of you.

Announcing The Greatest Our Lowest Prices Ever On

This is the biggest and best sale event in our history. Between now and October 29th, 1996, you can save \$40 to \$150 on our most popular speaker models.

Cambridge SoundWorks manufactures critically acclaimed speakers and music systems designed by Audio Hall of Fame member Henry Kloss (founder of AR, KLH and Advent). 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." *Audio* magazine says we may have "the best value in the world."

And during our sale, "the best value in the world" is even better.

Ensemble®

Ensemble is our best speaker subwoofer/satellite system. We think it competes with audiophile speakers selling for over \$1,000 a pair. Yet its unique four-piece design literally disappears in your room.

Our dual subwoofer *Ensemble* outperforms expensive speakers because of its great room placement flexibility.
Reg. \$599.99
SALE: \$449.99

\$449⁹⁹

Reg. \$599⁹⁹
Save \$150

Ensemble consists of two compact, two-way satellite speakers and two slim-line (4 1/2" thick) subwoofer cabinets enclosing 8" woofers. Because the bass produced by the subwoofers is non-directional, you can put them in out-of-the-way places...even behind or under furniture. Then place the satellite speakers to create a realistic stereo image. *High Performance Review* describes *Ensemble* by saying "...stereo imaging is phenomenally sharp...the dynamics are stunning...some of the speakers I'm comparing it to cost \$1900 to \$2800." White or charcoal grey.
Reg. \$599.99 SALE PRICE: \$449.99



Reg. \$499⁹⁹
Save \$120

Ensemble II is our best value in a high-performance speaker system. Its satellite speakers are identical to *Ensemble's*. Reg. \$499.99 SALE: \$379.99

Ensemble II

Ensemble II is our best value high-performance speaker system. It uses the same satellites as *Ensemble*, but with a single subwoofer cabinet that holds two 6 1/2" woofers in an acoustic suspension enclosure. Because 90% of the music is reproduced by the satellites, *Ensemble II* sounds much like *Ensemble*. *Stereo Review* says "Ensemble II can be compared only with much larger speakers at substantially higher prices."

Available in white or charcoal grey.
Reg. \$499.99
SALE PRICE: \$379.99

Ensemble III brings high-performance sound into even very small rooms. It uses genuine two-way satellite speakers.
Reg. \$349.99
SALE: \$299.99



\$299⁹⁹

Reg. \$349⁹⁹
Save \$50

Ensemble III

Ensemble III was designed to bring big sound into smaller rooms. It has two small, two-way satellites and a subwoofer cabinet that encloses a single 6 1/2" woofer with two voice coils. *Ensemble III* maintains the smooth, natural tonal balance of our more expensive systems, but without the same deep bass extension. *Stereo Review* says it "sounds first rate in every respect."
Reg. \$349.99 SALE PRICE: \$299.99

Model Six

Our *Model Six* is a two-way, acoustic suspension bookshelf speaker system. It continues a long tradition of high quality



\$99⁹⁹

Reg. \$129⁹⁹
Save \$30

Our *Model Six* bookshelf speaker is available in three finishes. Reg. \$129.99 ea. SALE: \$99.99 ea.

two-way speakers by Henry Kloss that includes the Acoustic Research AR-1, the KLH *Model Six* and the Advent Loudspeaker. *Model Six* is a serious speaker for serious listeners. It has natural, accurate sound, wide frequency range and high power handling.

Stereo Review says it has "an 'all there' sound quality that belies its amazingly low price... *Model Six* is an exceptional value." *Model Six* uses much higher quality components than most speakers in its price range. And its cabinet is visually appealing, with a subtly rounded bull-nose frame, grey grille and convincing simulated wood finishes of oak, teak and black ash. Reg. \$129.99 ea. SALE PRICE: \$99.99 ea.

The Outdoor

Our all-weather speaker is called *The Outdoor*. It has the natural, accurate, wide-range sound that Henry Kloss



\$299⁹⁹

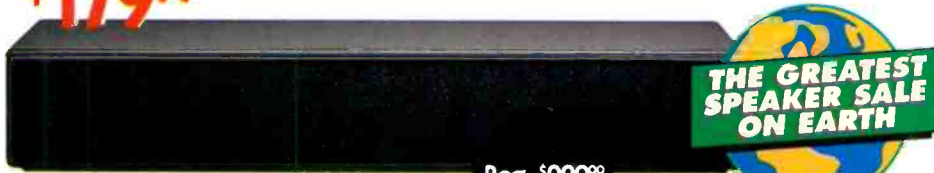
Reg. \$349⁹⁹
Save \$50

The Outdoor

Speaker Sale On Earth. Our Best-Selling Speakers.

\$179⁹⁹

Center Channel Plus



Reg. \$229⁹⁹
Save \$50

Powered Subwoofers

The *Powered Subwoofer* by Cambridge SoundWorks uses a heavy-duty 12" woofer housed in an acoustic suspension cabinet with a 140-watt amplifier and a built-in electronic crossover. *Stereo Review* said it provides "deep powerful bass...31.5 Hz bass output was obtainable at a room-shaking level... it opens the way to having a 'killer' system for an affordable price."

Reg. \$699.99 **SALE PRICE: \$599.99**

Our *Slave Subwoofer* connects to the *Powered Subwoofer*, doubling the bass output. It uses the same size woofer and cabinet as the *Powered Subwoofer*.

Reg. \$299.99 **SALE PRICE: \$229.99**

The new *Powered Subwoofer II* uses a 120-watt amplifier with a custom designed 8" woofer. Reg. \$399.99 **SALE PRICE: \$339.99**



\$99⁹⁹

Reg. \$159⁹⁹
Save \$50

Center Channel designs are known for. We don't know of any all-weather speaker that sounds better.

Free-standing (shown opposite page).

Reg. \$299.99 pr. **SALE PRICE: \$239.99 pr**

In-wall version. Reg. \$349.99 pr

SALE PRICE: \$269.99 pr

Surround Speakers

Cambridge SoundWorks makes two "dipole radiator" surround sound speakers. Dolby Laboratories recommends dipole radiator speakers for use as surround speakers. *The Surround* has high power



\$599⁹⁹

THE GREATEST SPEAKER SALE ON EARTH

Reg. \$699⁹⁹
Save \$100

Slave Subwoofer

Powered Subwoofer

Powered Subwoofer II

Factory-Direct Savings

Our speakers are available only directly from Cambridge SoundWorks, and through cost-efficient **Best Buy** stores.* Order them, then listen in your own home. If you aren't satisfied, return them within 30 days for a full refund.

Don't Delay - Sale Prices good Thru October 29th, 1996.

BEST BUY

*Actual prices may vary by store.

Center Channel Speakers

Get our lowest prices ever on our two best-selling speakers designed specifically for use as center channel speakers in home theater systems. Both are magnetically shielded so they can be placed near a TV or computer monitor. *Center Channel* is identical to an *Ensemble* satellite (but with magnetic shielding).

Reg. \$159.99

SALE PRICE: \$99.99

Center Channel Plus uses an ultra-low, ultra-wide design that is ideal

\$199⁹⁹

THE GREATEST SPEAKER SALE ON EARTH



Reg. \$249⁹⁹
Save \$50

The Surround II

\$319⁹⁹



The Surround

Reg. \$399⁹⁹
Save \$80

handling capacity and is often selected for "high end" surround sound systems. Reg. \$399.99 pr.

SALE PRICE: \$319.99 pr

The smaller

The Surround II

is arguably the

country's best value in a dipole radiator speaker. Reg. \$249.99 pr

SALE PRICE: \$199.99 pr

for placement above (or, with optional support stand, below) a TV monitor. It is, we believe, one of the finest center channel speakers available. Reg. \$229.99 **SALE PRICE: \$179.99**

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CIRCLE NO. 6 ON READER SERVICE CARD

"AC/DC
Back in Black,
Track 2!"

0-25 FEET
Aroused by booming bass frequencies, giant river salamanders cling to the legs of wading villagers.

1000-2,500 FEET
The dead are awakened, amazed by sound clarity, then return to their original, dead state.

1-250 MILES
Earth's tectonic plates shift during prolonged drum solos.

Hell's heating system frequently disrupted.
(Deceased politicians rejoice.)



GROUND LEVEL

Driver turns on Pioneer car stereo system featuring a 2 Ω high-current amplifier with built-in crossover and Variable Bass Boost. Beverages on dashboard are blasted onto the laps of jammin' passengers.

50-100 FEET
Earthworms feel ground shaking above and fear it's the mythical Great Bird of the Apocalypse.

1,000-2,500 FEET
Rhythmic pumping causes diamonds to form into the shape of guitar picks.

3,000 FEET
Jimmy Hoffa

1-250 MILES
Great sound audible in coal shafts. Unknowing miners suspect ghosts or dinosaurs trapped below.

AT THE EARTH'S CORE
The crisp, cookie center begins to crumble.



Award-winning Bose® Lifestyle® systems have been hailed as true audio breakthroughs.

With the Lifestyle® 12 home theater system, our goal was to develop the best sounding, easiest to use home theater system ever. One that was optimized for both movie soundtracks and music.

You won't believe the simplicity.

The system is completely integrated. Every element is designed to work in harmony with the others – precisely, efficiently, simply.

And although the technology is advanced, it's where it belongs – on the inside. Outside, a single, elegant music center houses a built-in CD player and AM/FM tuner. It replaces an entire rack of conventional equipment.

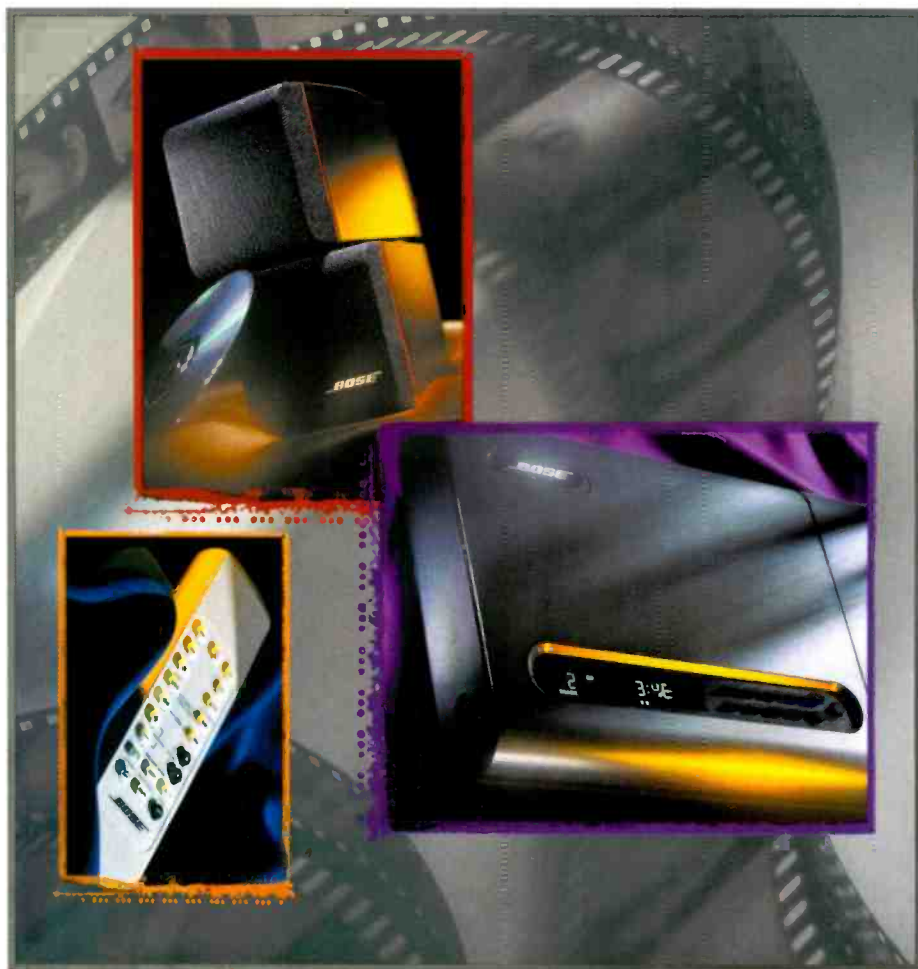
The remote works through walls so you control everything from anywhere inside, or outside, the house.

You won't believe the sound.

The secret to the critically-acclaimed performance is Acoustimass® speaker technology.

Five tiny cube speakers are all you see. They blend right into your decor, almost invisibly, while the Acoustimass module hides out of view behind or under furniture. We believe this advanced technology delivers noticeably purer, more lifelike sound than conventional designs.

If you're not already listening to Acoustimass speakers, you're just not hearing everything you could.



Step up to a new experience in home theater.

[Your eyes won't believe your ears.]

You won't believe it until you hear it.

Thirty seconds with this system and you'll understand why *Home Theater Technology* said, "...everything is included and carefully thought out.... The performance is awesome..."

Call for names of selected Bose dealers where you can hear the Lifestyle® 12 home theater system. Experience the difference Bose technology makes.

For a FREE booklet call
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The Lifestyle® 12 home theater system. The new audio standard for movies and music.

BOSE
Better sound through research®



Stereo Review®

INCORPORATING HIGH FIDELITY®

October 1996

RCA's RC5200P, Toshiba's SD-1006, and Sony's prototype are among the DVD players that are in the works for a market debut once copyright issues are resolved. See pages 66 and 75 for details.

Photograph by Dave Slagle

LETTERS 12

NEW PRODUCTS 17

AUDIO Q&A 28

SIGNALS 32

TECHNICAL TALK 33

POPULAR MUSIC 102

CLASSICAL MUSIC 114

TIME DELAY 132

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8 Bulletin

Get ready for the audio computer, a new audiophile CD label, and Hootie hatred

24 Peripherals

Where the World Wide Web meets *Seinfeld*
BY GREGG TARR

35 Equipment Test Reports

Kenwood KC-Z1 Stage 3 home-theater controller, page 35

Klipsch Rebel KSS-3 subwoofer/satellite speaker system, page 42

Lineaem Extreme speaker, page 44

Magneplanar MMG speaker, page 52

Energy C-2 speaker, page 59

B-I-C Venturi V-504 speaker, page 62

66 Are You Ready for DVD?

Politics aside, the super-hot DVD is coming your way sooner or later
BY KEN C. POHLMANN

75 DVD's First Act

Innovative DVD players are waiting in the wings
BY JOSEPH PALENCHAR

81 Inside Dolby Digital

An introduction to the surround-sound system formerly known as AC-3
BY DAVID RANADA

86 Multimedia Speaker Showdown

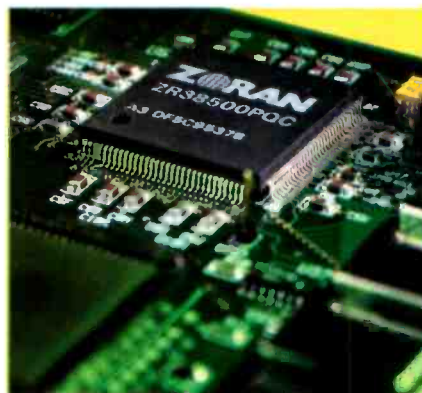
Comparison tests of ten speaker systems for your personal computer
BY TOM NOUSAINE

97 Best Recordings of the Month

Beck's "Odelay," Tchaikovsky's opera *Iolanta*, "The 'X' Field" by Rodney Jones, and Rautavaara's *Angel of Light* and *Annunciations*



▲ Page 35



▲ Page 81



▲ Page 86

▼ Page 97



BULLETIN

BY BOB ANKOSKO & WILLIAM LIVINGSTONE

DON'T GIVE A HOOTIE?

The success of Hootie and the Blowfish has inspired some resentment, if not sales resistance. Hootie detractors have been hoping that Alanis Morissette's debut album, "Jagged Little Pill," will outsell Hootie's debut, "Cracked Rear View." Not yet. Sales figures indicate 11 million for "Jagged" and 14 million for "Cracked." Hootie's image may be helped by the group's \$10,000 endowment of a music scholarship at the State University of New York at Stony Brook. The band had voided tickets for the first ten rows at two Long Island shows, thwarting a scalping scheme that initially withheld those seats from the public. Face-value refunds were offered for the tickets, but only a fourth were claimed, resulting in the \$10,000 profit/endowment. With nearly 400 nullified tickets still out there, we're wondering what's worth more — a genuine scalped Hootie ticket or a Monkee lunchbox?

D.I.Y. SPEAKER

The large photographs and type in Gene Healy's *The Audiophile Loudspeaker Anyone Can Build* (softbound, 163 pages) make it easy to follow a project to construct a pair of two-way ported speakers measuring 19½ inches tall. The book is available for \$22.95 plus \$3.50 for shipping and handling (\$4.95 in Canada) from the Boston Post Publishing Co., P.O. Box 1175, Madison, CT 06443.

QUAD CLASSICS

Quad is commemorating its 60th anniversary with the Diamond Jubilee Quad II mono tube amp, a reissue of the Quad II sold from 1953 to 1968. The company will produce only 600 pairs of the Diamond Jubilee, which boasts a 22k-gold faceplate and circuitry that's described as faithful to the original. Price: \$10,000 a pair. Quad is

also "reintroducing" the legendary ESL-63 electrostatic speaker to the U.S. market, priced at \$6,000 a pair. Quad is distributed by Mission North America; telephone, 1-800-838-7955.

A/V DIGEST

From the *muy macho* world of car stereo: Bill Proud's Cerwin-Vega-sponsored Ford Ranger set a world record for sound-pressure level by pounding out 160.5 dB at the dB Drags in Boise, Idaho. . . . More than 600 FM stations in the U.S. can now transmit Radio Data System (RDS) text messages and automatic traffic reports, thanks in large part to a market-seeding campaign launched last year by the Consumer Electronics Manufacturers Association. Home components with RDS are made by Denon, Onkyo, and B&O, while car gear is available from Denon, Delco, Audiovox, and Pioneer. . . . Speakers designed by audio pioneer Roy Allison under the RDL Acoustics name will now be built and marketed by Cambridge SoundWorks. The first model to be produced under the new alliance is the F-1 MII, priced at \$599 a pair.

THE BOOKSHELF

Craig Rosen's *The Billboard Book of Number One Albums* (Billboard, \$21.95) tells "the inside story" behind the top-selling albums from 1956 to 1995. . . . *Please Kill Me* (Grove Press, \$23) by Legs McNeil and Gillian McCain is "the uncensored oral history of punk." . . . Amadeus Press has published the *BBC Music Magazine Top 1,000 CD's Guide* (softbound, \$12.95), offering advice on the best classical discs. . . . David Hajdu's *Lush Life: A Biography of Billy Strayhorn* (Farrar Straus Giroux, \$27.50) tells the story of the pianist/composer known for his work with Duke Ellington. . . . Colin Escott, an authority on early country, rockabilly,



GET READY FOR THE AUDIO COMPUTER

In the wonderful world of audio/video, to upgrade is to replace a sometimes beloved piece of gear with a spiffy and technologically hip new model. Wouldn't it be nice if you could simply pop a card in the back of your A/V receiver to add, say, Dolby Digital (AC-3) capability? Well, a new generation of high-end gear is on the horizon that provides the same level of upgrade flexibility as your home computer.

Theta Digital's Casablanca Music & Cinema Controller is described as "an open-architecture component" that accepts nine plug-in cards to provide a variety of analog and digital inputs and outputs, switching capabilities, and signal processing modes, including Dolby Pro Logic and AC-3. Price: \$4,300 to \$11,000, depending on configuration. Late this year, Meridian hopes to bring to market its Reference Digital Surround Controller 861, which accepts up to sixteen plug-in cards. The system's main controller card uses a flash memory bank into which new software programs can be downloaded.

and rock-and-roll, is the author of *Tattooed on Their Tongues: A Journey Through the Backrooms of American Music* (Schirmer Books, \$25). Profiled are such unheralded figures as Jimmy Swan and Tommy Tucker, as well as the stars Marty Stuart and Dwight Yoakam. And in the four-part "How to Start a Record Company," Escott details the beginnings of four independent labels: Decca, King, Starday, and Hi.

JAZZ FOR AUDIOPHILES

JVC has started a series of XRCD (Extended Resolution CD) recordings intended to deliver "higher fidelity and improved audio quality" without special playback equipment. The first ten XRCD's (plus a sampler) offer an eclectic mix of jazz styles, including such artists as Bill Holman, Carmen Lundy, Ernie Watts, Tom Coster, Tiger Okoshi, Oscar Castro-Neves, and Spirit Traveler. □

ILLUSTRATION BY MIKE LEE

Audiophiles are getting into metal.

▶ **Micro Reference Series**

Big theater sound from small, sculpted satellites.

Compact Reference Series

Incredible sound from compact speakers.

Lynnfield VR Series

Audiophile sound with the full impact of Dolby® Digital.

Boston Acoustics THX® System

Dubbing studio quality sound.



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

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



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

BostonAcoustics

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Stereo Review

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or the Studio/100

“Extraordinary... Bravo Paradigm!”

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on the Studio/80, CC-450, ADP-450

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the highest standard of technological design
excellence, and deliver breathtaking
high-end sonic performance!**

With years of design expertise and a state-of-the-art in-house R&D facility, Paradigm engineers and acousticians set out to build the world's finest speakers, regardless of cost! The result is Paradigm Reference...electrifying and eminently satisfying high-end speaker systems that bring you closer than ever to the live event!

And, while this stunning performance heightens the sheer enjoyment of music, it is equally important for the best in home theater sound, especially now with the arrival of digital AC-3.

We invite you to visit your nearest Authorized Paradigm Reference Dealer and experience this astonishing new reference standard in music and home theater sound for yourself!



Studio/20 Studio/60 Studio/80 Studio/100 Esprit/BP Bipolar Eclipse/BP Bipolar LCR-450 Left/Center/Right CC-450 Center Channel ADP-450 Surround

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CIRCLE NO. 45 ON READER SERVICE CARD

Stereo Review

CHESKY RECORDS

Are Proud To Present Their GOLD Stereo And Surround Sound Set-Up Disc

Stereo Review and Chesky Records have designed this disc to help you improve every aspect of your stereo system and entertainment center's performance. Featuring demonstrations developed by Chesky's own recording engineers with special test signals developed by Stereo Review's Technical Editor, David Ranada. This **GOLD CD** offers a host of useful tests (some recorded in Dolby Pro-logic), and includes a sampling of Chesky's best new Pop, Jazz, World Music, and Classical recordings.



The Stereo Review/Chesky Records **GOLD** Stereo And Surround Sound Set-Up Disc includes selections from the following Chesky artists—

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Paquito D'Rivera
Badi Assad
The Westminster Choir
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LETTERS

More Computer Speakers

I see you printed the same letter on computer speakers from Carl Valle in both your July and August issues. I have a suggestion: Why don't you print it again this month, and for once we'd have a legitimate use of the phrase, "It's déjà vu all over again"?

RICHARD COLE
Des Moines, IA

Oops! Sorry about that! But see page 86 for our comparison test of ten — count 'em, ten! — computer speaker systems.

MiniDisc Anxiety

I am considering purchasing a MiniDisc player during the upcoming holiday season, but a few things about the format trouble me. First, I will be using the analog inputs but I have heard (and read) that these inputs cause more noise and distortion than a direct digital input. Exactly how much more noise can I expect? Will my recordings have noise similar to tape hiss? Also, will the ATRAC perceptual coding technique delete the (inaudible) surround information in Dolby-encoded CD's?

Second, I have been told that, because of lack of consumer interest, the format may not survive another year. Is this true? Will I be able to get blank MD's two years from now? I would really hate to see such an incredible format disappear. PATRICK MARAJ
Bronx, NY

MiniDisc recordings are dramatically quieter than any analog tape whether made through the analog or digital inputs. If you use a good MD home deck, you'll be hard pressed to detect any difference at all between a digital-source MD and an analog-source MD of the same program. As for dubbing Dolby-encoded CD's to MD, Dolby Labs tells us there should be no problem.

Your question about the longevity of MD is harder to answer. Though the format is hugely popular in Japan, it hasn't caught on yet here, in part because of the reluctance of some record companies and music stores to release and stock prerecorded MD's. But Sony — MD's biggest booster — continues to promote it aggressively and recently began offering a \$600 "bundle" that includes a home deck, a portable player, and a couple of blank MD's. Sharp has also just introduced a new \$700 home deck. Whether or not MD survives long-term, however, there's no denying its benefits today, which include the ability to mix your own digital recordings and play them at home, in a car, or in portable gear.

Three-Bean Salad?

I think I have isolated the subtle distinction between ultra high-end gear and what real

people can afford. If you play CD's through solid-state electronics, you will be able to hear ZZ Top's drummer break wind. If you play vinyl through tube equipment, you can determine the variety of legume he ingested that precipitated the intestinal upheaval.

ED HEATH
Lexington, IN

Noise Filter

In response to Jack Harvanek's letter in August "Audio Q&A" concerning high-frequency noise on CD reissues, the dbx professional Model 296, available from professional audio and musical-instrument dealers, includes a variable low-pass filter that "slides" upward to allow music through and "slides" to a lower turnover point to filter out hiss when there is no music in the upper frequencies. It is designed to reduce hiss only, not pops and clicks. A high- and low-frequency enhancer is included to help restore the sound quality. GARY MARSHANK
dbx representative
Los Angeles, CA

Whither DCC?

Where can I find blank and prerecorded Digital Compact Cassette (DCC) tapes? I got a great deal on a home player/recorder, a portable player, and ten tapes. Unfortunately, I can't find a store that has any idea what DCC is, and there are no tapes anywhere. Should I sell my DCC equipment, or is there hope on the horizon?

KYLE EUGENE GRAVES
Detroit, MI

Demand for the DCC format appears to be waning. Marantz still carries DCC decks in its line, but Philips, Technics, and Radio Shack have all dropped them. Radio Shack says it will continue to sell 60- and 75-minute Scotch/3M blank DCC's on special order (catalog Nos. 44977 and 44978, respectively). You might also ask TDK (1-800-835-8273), Maxell (201-794-5900), and BASF (1-800-225-3326) if any retailers in your area still carry their DCC blanks. As for prerecorded DCC's, the format's failure to take off led to its rapid disappearance from record stores.

The Ragged Edge

Dennis Eichenberg's article "The Ragged Edge" in June neglected to mention speaker reconing as an option for readers faced with decayed foam surrounds. Reconing — the replacement of all the moving parts in a speaker basket, not just the foam — is not only an additional option but the best course of action. It is a cost-effective method of repairing a woofer (or sometimes midrange) damaged by foam rot or something else while restoring the speaker's original sweet

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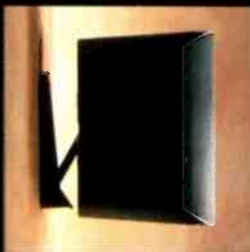
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sound. Reconing vs. refoaming is like re-treading a tire vs. purchasing a new one. Not many drivers prefer retreads.

We also take issue with the method of refoaming Mr. Eichenberg described. Since refoaming reattaches the foam to the cone, we find it imperative to use shim stock to lock up the voice-coil assembly during a refoaming repair. Without it, centering a foam perfectly on a cone and frame while also allowing the voice coil to travel freely is a matter of luck. GLENN AND CATHY SATIN
The Speaker Exchange
Tampa, FL

Dennis Eichenberg replies: The article stated that many factors contribute to the degradation of speaker sound quality but focused specifically on the common problem of foam-surround deterioration. Reconing is certainly a viable option when the damage is greater than just the surround. But refoaming, if done properly, can provide excellent results and certainly warrants consideration.

I did emphasize the importance of centering the cone during the repair process as well as the need to follow the specific instructions provided in the replacement kit. And I did note the availability of voice-coil alignment shims.

DVD and HDTV

I've been told that DVD's cannot be used to store HDTV signals. Does that mean we'll all have to use a separate medium for playing and recording high-definition TV programs? If so, shouldn't this deficiency be corrected before DVD's come into mass production?

JEFF MAYERS
Reseda, CA

You're correct that first-generation DVD's won't accommodate high-definition television, which calls for greater capacity and a faster bit rate than are currently practical. But the DVD standard does provide for HDTV as technology allows. A consumer DVD machine capable of HDTV playback or recording probably won't be seen until the end of the decade, when blue lasers become cheap.

Corrections

August "Technical Talk" inaccurately compared the power draw of a 2-ohm speaker load from a constant-voltage source with an 8-ohm load. It would draw *four* times as much power, not sixteen times as much.

Because of an editing error, Richard Freed's review in August of a recording of concertos by MacDowell and Liszt by André Watts incorrectly stated the pianist's age. Mr. Watts turned fifty this past June. □

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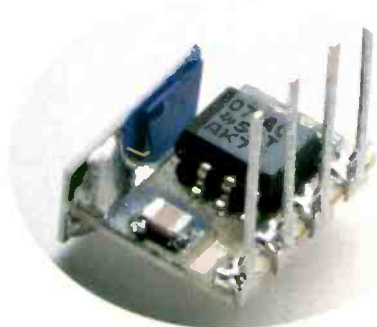
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NEW PRODUCTS

▼ DENON

Denon's AVR-5600 A/V receiver features Dolby Digital (AC-3) and Pro Logic decoding as well as THX 5.1 certification and a total of ten surround modes for movies and music. Five discrete amplifiers deliver 130 watts each to the main, center, and surround speakers; a preamp output is

provided for an externally powered subwoofer. The AM/FM tuner has forty station presets and RDS data reception, and a programmable remote control is included. Price: \$2,800. Denon Electronics, Dept. SR, 222 New Rd., Parsippany, NJ 07054.

• Circle 120 on reader service card



▼ McIntOSH

McIntosh's MA6400 integrated amplifier combines a remote-controlled preamp with a direct-coupled stereo amplifier rated to deliver 100 watts per channel into 4 ohms. One of the seven high-level input connections can be switched to function as a phono-level input. Two tape-

monitor and two tape-copy switches are also provided, as are pre-out/main-in jacks. All switching of the audio signal is done with quiet "logic-driven" relays. Price: \$3,000. McIntosh, Dept SR, 2 Chambers St., Binghamton, NY 13903.

• Circle 122 on reader service card



▲ TANDBERG

After a hiatus, Tandberg of Norway has returned to the U.S. market with its 4000 Series components: from the top, the TCP-4035 CD player with 18-bit D/A converters (\$1,495), the TPT 4031 tuner with Class A audio circuitry (\$1,595), the TCA 4038

wide-bandwidth preamplifier (\$1,095), and the TPA 4036 high-current stereo power amp, rated for 100 watts per channel into 8 ohms (\$1,595). Tandberg, Jason Scott Distributing, Dept. SR, 8816 Patton Rd., Wyndmoor, PA 19038.

• Circle 121 on reader service card



▲ ATLANTIC TECHNOLOGY

Atlantic Technology has upgraded its System 250 home-theater system to the System 250.1. Changes include larger magnet structures, redesigned crossovers, and heavier, 3/4-inch cabinets for the Model 251.1 LR main speakers and 253.1 C center speaker. The 254.1 SR dipole surround speakers

now have a new baffle and, for extended response, two 4-inch woofers each instead of one. The system also includes the 262 PBM 150-watt powered subwoofer. Price: \$1,736. Atlantic Technology, Dept. SR, 343 Vanderbilt Ave., Norwood, MA 02062.

• Circle 123 on reader service card

NEW PRODUCTS

VANDERSTEEN ▶

Vandersteen's Model 1C tower speaker improves on its predecessor, the Model 1B, with a tightened driver grouping that's said to allow the 1-inch metal tweeter and 8-inch polycone woofer to act more like a point source. The Model 1C also has a new crossover for better phase integrity, but it retains the minimum-diffraction baffle used in the Model 1B. The 36-inch-tall speaker, wrapped in a black grille cloth, is rated for a frequency response of 38 Hz to 22.5 kHz ± 3 dB, an impedance of 6.8 ohms, and a sensitivity of 90 dB. Price: \$715 a pair; matching adjustable base, \$85 a pair. Vandersteen Audio, Dept. SR, 116 W. Fourth St., Hanford, CA 93230.

• Circle 124 on reader service card



▲ FISHER

Fisher's PCD-6900 portable CD player pushes shock protection to the limit with a 20-second Opti-Trac III memory buffer. Other features of the compact, 1-inch-thick player include a three-position equalization switch (to boost bass, ambience, or both), a line output for playback on home

systems, programmed- and repeat-play modes, a back-lit LCD readout, and an accessories package with headphones, car adaptor kit, rechargeable battery, and AC adaptor. Price: \$200. Fisher, Dept. SR, 21350 Lassen St., Chatsworth, CA 91311.

• Circle 125 on reader service card



▲ MISSION

The Mission 75AS powered subwoofer, with a 120-watt amp and two 8-inch drivers, is rated to 27 Hz (-6 dB). A variable crossover and a phase switch are included. The 17 x 24 x 10-inch cabinet is in black ash (shown), rosewood, or primavera wood veneer. Price: \$1,400. Mission, Dept. SR, 400 Matheson Blvd. E., Unit 31, Mississauga, Ontario L4Z 1N8.

• Circle 127 on reader service card

▼ AUDIO MAGIC

The conductor in the Dragon interconnect from Audio Magic has an oxygen-free copper core clad in high-purity silver (70 percent of the conductor). Teflon insulates the conductors, and a PVC jacket protects the cable. Price: 1 meter, \$39; 1½ meters, \$44. Audio Magic, Dept. SR, 456 S. Potomac Way, Aurora, CO 80012.

• Circle 126 on reader service card



▲ SONY

The Sony CDP-CX270 200-CD changer has a video output and graphical interface that lets users scroll through disc titles and tracks on any TV with a composite-video input. Data can be entered by attaching a PC-compatible keyboard to the changer. You can designate up to eight groups of music by genre or

listener name, sequence playback of up to thirty-two tracks, skip tracks you *don't* want to hear with Delete Track memory, and select random- or repeat-play options. A Master Control feature allows the CX270 to operate a second 200-CD Sony changer. Price: \$1,000. Sony Electronics, Dept. SR, 1 Sony Dr., Park Ridge, NJ 07656.

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NEW PRODUCTS



▲ AMC

AMC's CVT 3030a integrated tube amplifier delivers 30 watts per channel in Class A operation. Labeled inputs include phono, DAT, CD tuner, video, and aux; there's one tape loop. Modular construction allows the phono section to be replaced with an

on-board digital-to-analog converter. Other features include gold-plated speaker terminals, a tone-control bypass switch, and a headphone jack. Price: \$1,000. AMC/Weltronics, Dept. SR, P.O. Box 80584, San Marino, CA 91108.

• Circle 128 on reader service card



▲ INFINITY

The Sigma is billed as Infinity's best one-piece speaker. Each 58 1/4-inch-tall tower contains two planar tweeters (firing front and rear), one planar midrange, one 6 1/2-inch injection-molded-graphite (IMG) "midbass coupler,"

and one 12-inch IMG woofer. Response is given as 30 Hz to 42 kHz ± 2 dB, sensitivity as 87 dB. Price: \$10,000 a pair. Infinity Systems, Dept. SR, 20630 Nordhoff St., Chatsworth, CA 91311.

• Circle 131 on reader service card



◀ UNIVERSAL

Universal's One For All 5 remote control comes with a pushbutton "finder" transmitter that activates an alarm on the remote. The transmitter has a range of 60 feet and operates through walls and ceilings. As the name suggests, the One For All 5 can learn commands for up to five components. It includes a Menu button for stepping through on-screen TV and VCR menus, a TV/VCR button, and a sleep button with its own timer for TV's that don't already have the function. Price: \$25. Universal Electronics, Dept. SR, 1864 Enterprise Pkwy. W., Twinsburg, OH 44087.

• Circle 129 on reader service card

▼ NHT

The NHT SuperOne bookshelf speaker, with a 6 1/2-inch video-shielded woofer and a 1-inch soft-dome tweeter in an acoustic-suspension cabinet, has a rated response of 57 Hz to 25 kHz ± 3 dB. Sensitivity is given as 86 dB, impedance as 8 ohms, and power handling as 150 watts. The 11 2/3-inch-tall box has a high-gloss black or white laminated finish. Price: \$350 a pair. Now Hear This, Dept. SR, 535 Getty Ct., Benicia, CA 94510.

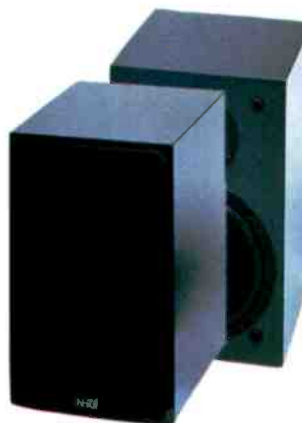
• Circle 130 on reader service card



▲ OEM SYSTEMS

The SS-84-G Sound Scape outdoor speaker from OEM Systems is designed for ground or planter installations where only the top 5 inches of the speaker are exposed. Each stereo speaker contains an 8-inch dual-voice-coil woofer and four piezoelectric tweeters (two per channel) to create 360-degree dispersion. The ABS enclosure is said to resist long-term exposure to the elements. Power handling is rated as 100 watts; impedance, 8 ohms. Price: \$249 each. OEM Systems, Dept. SR, 740 Freeport Blvd., Suite 106, Sparks, NV 89431.

• Circle 132 on reader service card



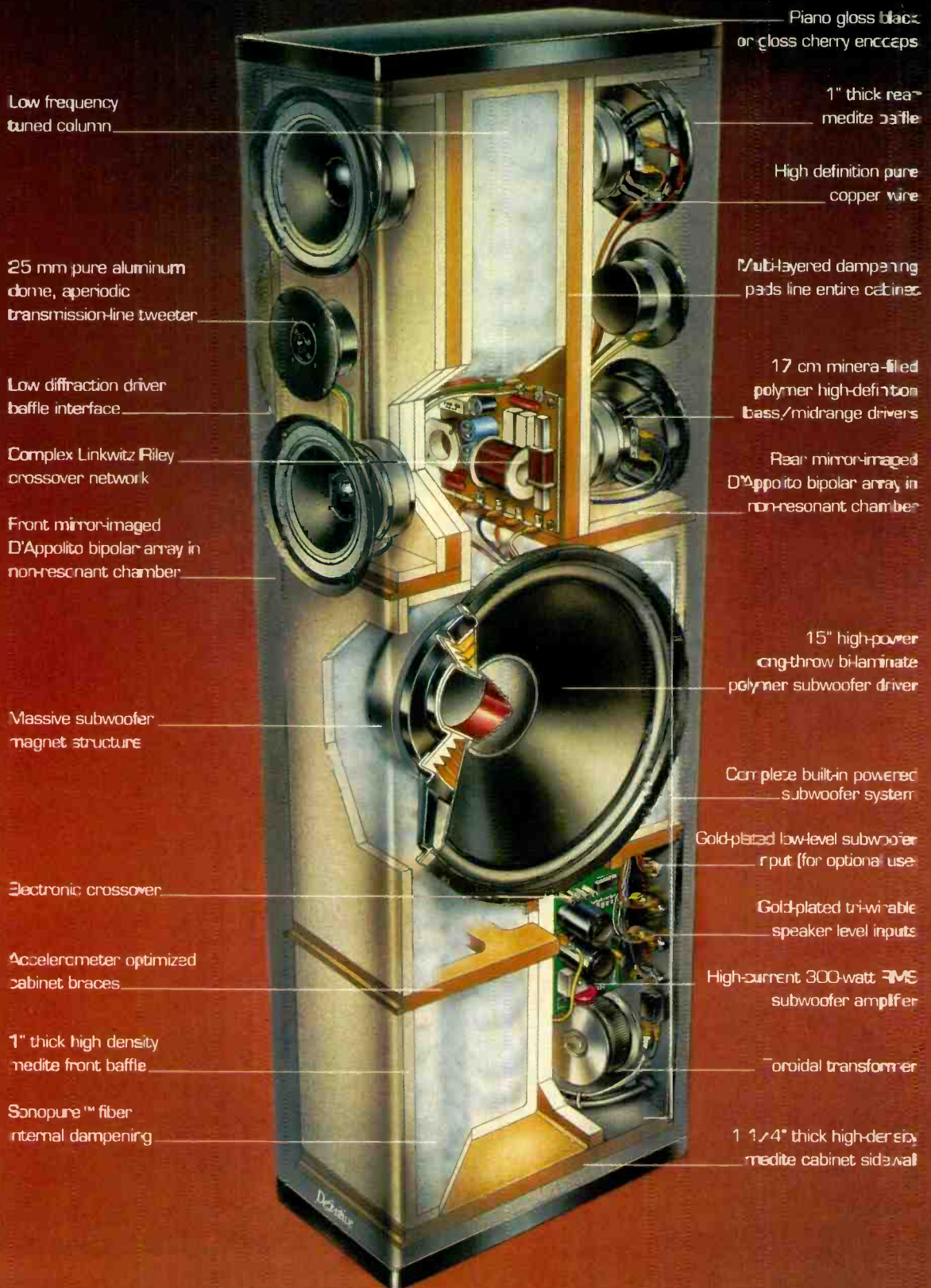
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—Julian Hirsch, Stereo Review

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—Brent Butterworth, Home Theater

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The Ultimate Home Theater

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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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PERIPHERALS

PRODUCTS AND TRENDS THAT
GO BEYOND MAINSTREAM AUDIO/VIDEO

The Web Meets *Seinfeld*

BY GREG TARR

“Convergence” is the hottest buzzword in consumer electronics right now. As you read this, teams of consumer-electronics manufacturers and computer companies are feverishly working on getting the comfortable old TV in your family room to do double duty as a personal computer, or something in between the two. This melding of technologies, it is said, will lead to future television “systems” that can answer your video telephone, control your home theater, play video games, balance your check book, or cruise the World Wide Web as easily as they can tune in *Seinfeld* reruns.

So far the manufacturers have approached the convergence issue from two basic directions. The first is the PC/TV approach, which combines a high-performance big-screen television monitor with a high-performance PC capable of doing whatever a regular PC can do and then some. This approach works particularly well for families looking to shift the kids’ multimedia use to the family room while freeing up an existing home PC.

The second approach is to offer a specialized, affordable information appliance for World Wide Web browsing, e-mail, and other light computing tasks. Emphasis is placed on ease of use, with most functions requiring little beyond pressing a few buttons on a remote control. The thinking here is that many Americans have an interest in exploring the Internet and using e-mail but still don’t own a PC, either because they can’t afford one or because they find them intimidating to use.

PC/TV to You, Too

Some traditional consumer-electronics manufacturers have vowed to get into the PC/TV act as soon

as next year. Philips, for example, is working on a full-scale PC/TV system along with Web browser add-on boxes and other digital devices to be sold under a new combined Philips Magnavox brand name. Thomson Consumer Electronics has joined with computer maker Compaq to produce both big-screen PC/TV’s and television Web browsers, most of which are expected to sell under the RCA and Compaq brands.

For now, full-blown PC/TV’s are available from mail-order computer maker Gateway 2000, whose Destination models were reviewed here in August, and startup Silicon Valley PC/TV maker NetTV, which sells a WorldVision line. Gateway is selling the Destination system with a 31-inch Mitsubishi-made television monitor configured as a VGA display with 800 x 600 resolution. The system offers both a wireless remote and a wireless keyboard to control PC and television functions. You can watch TV programs while cruising the Web in a separate inset window, and both pictures are said to look sharp — unlike tradi-

tional NTSC TV’s, which have trouble reproducing computer graphics without picture-enhancing software.

Like any multimedia computer today, the Destination also has stereo audio outputs for feeding TV or CD-ROM sound to a stereo or home-theater system. Prices range from \$3,499 to \$4,699.

Taking a similar approach, NetTV is selling WorldVision PC/TV’s with either 29-inch (27-inch viewable) or 37-inch (35-inch viewable) Thomson-built picture tubes that support SVGA resolution of 800 x 600. The 29-inch WorldVision 2900 series is priced at \$2,995 to \$4,200.

The monitors included with the WorldVision PC/TV’s have both computer and video inputs so that, unlike the Gateway Destination, you can watch TV without booting up the computer as long as you have a VCR or cable-box tuner. The guts of the computer are packaged in a slim, black VCR-like case designed to fit in a stereo cabinet. As with the Destination, both television programming and computer applications can appear on the screen simultaneously.

Web Browsing Made Easy

The momentum building for PC/TV’s may soon be eclipsed by a new breed of TV-based Web browser systems that shrink equipment prices to \$599 or less by scaling down system memory and the microprocessor.

The first of these systems, from Philips and Sony, are expected to reach store shelves this fall. Both are designed to access a new online Internet support service operated by WebTV Networks. WebTV also wrote the specifications for the browser-box platform, meaning that if you buy a WebTV box you must take the WebTV service. The flat monthly fee was not set by our press time, but it was expected to be between \$10 and \$20 a month, including e-mail boxes for up to five users.

Connection to the Internet with a WebTV browser requires nothing more than a push of a button on the supplied wireless remote control. The box then connects your TV, through a telephone line and modem, to a WebTV home page that serves as the interface for finding Web sites. WebTV provides links to 300 preselected “hot” sites categorized under 12 topical directories such as Sports, Finance, and Kid’s Clubhouse, or



Zenith will offer two NetVision Web-browsing TV’s this fall, including this 27-inch model.

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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PERIPHERALS

users can access the Excite NetSearch engine to locate other sites by subject or Web address. The system is compatible with all the popular standards used by Web site developers.

The WebTV browser can be customized for fast access to favorite sites, and enhancements to the browser's internal software are downloaded automatically into flash ROM. A port on the box allows connection of optional adaptors and peripherals.

Although most of the new Web browsers use algorithms to enhance text and graphics on a conventional TV display, WebTV images appear especially clean, the result of a proprietary technology called TVLens. The browsers deliver professional-quality (D1-classification) video output and CD-quality 44.1-kHz, 16-bit stereo audio that can be fed to a stereo system for playback of RealAudio, MPEG-2, or MIDI audio files downloaded from cyberspace.

The WebTV reference profile calls for a 33.6-kbps modem (the fastest available for standard phone lines) and a 112-MHz, 64-bit RISC processor. For conducting online transactions, the WebTV spec also allows for a "Smart Card" slot that accepts the new bank and credit cards equipped with integrated circuits (IC's).

Philips Magnavox WebTV, as Philips's browser is called, was scheduled to hit stores this month at a suggested retail price of \$329, complete with a wireless handheld remote control for navigating the system and generating e-mail messages, though just one character at a time. To simplify that process, a jack for an IBM-compatible keyboard is provided on the compact gray box, and a wireless infrared keyboard will be available for \$60 to \$70.

The browser has a standard phone jack for hooking up your telephone line, along with composite-video, S-video, and stereo audio outputs. A Smart Card slot facilitates transactions, and there's an e-mail message light. Other planned options include a printer port and an RF adaptor for use with TV's that lack a video input. Viewing Web images alongside the TV picture requires the use of a TV with a picture-in-picture (PIP) feature.

Sony's INT-W100 WebTV browser was also scheduled to be available in

October at a price comparable to that of the Philips Magnavox model. Along with the basic WebTV features described by the platform specifications, it will offer a small footprint (11 1/8 x 2 x 8 1/4 inches) and a universal trackball remote control with a ten-digit keypad that will allow easier access to TV channels and, eventually, Web sites.

Beyond WebTV, ViewCall America has written specifications for a \$300 set-top TV box that provides Internet access via its installed Web-browsing software, called WEBster. The interface offers easy Web navigation and e-mail service. Users control functions with on-screen icons and a trackball remote. An infrared wireless keyboard will be available for under \$100.

The specifications for the system include a 28.8-kbps modem, a high-performance RISC microprocessor, and 4 MB of RAM. The system requires a TV set with a PIP function to display Web sites alongside television

**The momentum building for
PC/TV's may soon
be eclipsed by the new TV-
based Web browsers.**

programs. ViewCall expects its first browsers to be out this fall.

Another company taking the set-top-box approach is Curtis Mathes, which plans to deliver two UniView Internet access devices this fall. UniView features e-mail, paperless faxing, Web surfing, game playing, conference phone calling, and a personal phone directory and memo center. It also incorporates an electronic on-screen TV program guide and allows for electronic pen input for drawing and handwriting fax messages. Also, unlike many other TV Web browsers, UniView boxes will allow users to watch TV and browse the Internet simultaneously without requiring a PIP-enabled TV.

The basic UniView browser, set to be priced at \$399, will have a 14.4-kbps modem and 1 MB of flash memory and will only be capable of displaying text downloaded from Web sites. The step-up model, to be priced at \$499, will offer a 33.6-kbps modem and 2 MB of flash memory for full

graphics capability. Curtis Mathes also plans to introduce UniView TV's soon.

Bandai Digital Entertainment plans to offer this fall the first version of the Pippin. Called Pippin@World, it is essentially a stripped-down Macintosh computer, priced at \$599, that's configured to display on a television monitor. Designed as a hybrid CD-ROM player and television Web browser, it uses a PowerPC 603 processor and a 4x CD-ROM drive that will play specially encoded Mac software discs. Pippin@World will include 6 MB of RAM, although 2 MB are used for the video display. It ships with a wired, boomerang-shaped controller. Bandai is working with PSInet to provide unlimited Internet access for an expected \$25 a month.

Big-Screen Browsers

Mitsubishi, Hitachi, and Sharp have all announced plans, with few specifics, to offer televisions incorporating Web-browsing circuitry late this year or next year. But Zenith, in collaboration with software developer Diba, is set to introduce two Internet-enabled television sets this fall.

The NetVision browsing system will be found in a 27-inch Zenith set priced at \$1,099 and a 35-inch set under the company's new Inteq brand at \$3,499. Both feature 0.55-mm dot-pitch tubes with resolution enhanced for text and graphics by Diba software.

The platform includes a Motorola-derivative CPU that is comparable to a 66-MHz Intel 486. Both sets include an RS-232 port for printer connection, a Universal Serial Bus (USB) connection for future peripherals, a 28.8-kbps modem, and 8 MB of RAM. Functions are controlled with on-screen icons and a trackball remote. An optional wireless keyboard will be available for composing e-mail.

Super Web Boy?

Still others getting into the Web browser act include video-game makers Sega and Nintendo. In November, Sega will offer its Net Link Web browser as a \$199 add-on to the Saturn CD game system. Sega's archival Nintendo plans to have a similar add-on for its forthcoming N64 game system but has not yet released details.

Greg Tarr reports on TV and video for This Week in Consumer Electronics.

“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

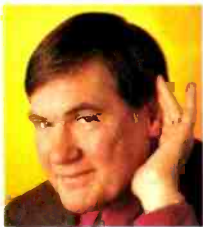
Combine the BP6B, 8B, 10B or 30 with our matching centers, bipolar surrounds and optional PowerField subwoofers for the most lifelike, spectacular “you are there” music and home theater available. All are completely Dolby Digital AC-3* ready.

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AUDIO Q & A

IAN G. MASTERS

Preamp-Free Surround

Q I am interested in building a surround-sound system that I can easily upgrade to Dolby Digital (AC-3) in the future. Other than an audio/video source, I intend to have no other inputs (no CD or tuner), so I would like to limit the system to just a Pro Logic decoder and several power amplifiers. Would it be necessary to add a preamplifier to this setup other than for tone control?

FRANK STELLATO
Guilford, CT

A There's no real need for a separate pre-amplifier in such a setup as long as you have the proper sort of control over signal level. Otherwise, unless your power amplifiers have input-level controls, there is a danger that you might feed them a signal high enough to damage your speakers. That really depends on your Pro Logic processor: Some models "remember" the level settings last used, in which case there should be no problem. A few, however, automatically reset to a default level when first powered up, ignoring whatever setting may have been in use when they were turned off. The default level may be fine, or it may be too high. Investigate before you choose a processor.

Extra Amps

Q My system consists of four pairs of stereo speakers plus four smaller speakers. The main speakers are driven by the primary power amplifier plus a second amplifier fed from the tape outputs of the main preamplifier. The four smaller speakers are driven by a second outboard amplifier, also using the signal from the tape outputs. Is this setup likely to cause any harm to my main components?

RODNEY HEDRICK
Phoenix, AZ

A Wow! Either that means you have speakers in every conceivable corner of your house, or you have a listening room with enough acoustic power to implode a bowling ball. Either way, powering twelve speakers with three stereo amplifiers does run the risk of presenting some very low impedances to the amplifiers, depending on exactly how things are wired up. As long as the amps are reasonably able to cope with low loads, however, and as long as the speakers themselves have reasonably high impedances, you're probably okay running two pairs in parallel per amplifier.

As for feeding the auxiliary amplifiers from the tape-monitor jacks, that should pose no problem. It means that you can't vary the overall volume of your extended system with the level control on your pre-

amplifier. But if you can do that on the external amps themselves, it may not matter.

Second Sub

Q My powered subwoofer is fed from the line-level subwoofer output of my receiver, which has an internal low-pass filter. I would like to add a second sub, but the receiver has only one sub output. Can I just put a "Y" connector on the output and feed it to both subs, or is there a better way?

ROBERT G. FRITZ
North East, MD

A No, yours is a perfectly reasonable way to set them up. The extra drain on the line-level output will be tiny; even if you can hear a drop in level, which I doubt, it can be corrected easily by tweaking the subwoofer output-level control on your receiver or the level knob on the powered sub itself.

Although it doesn't apply in your case — you have a low-pass filter in the circuit before the subwoofer output — there are systems in which the filtering is done at the powered sub. Usually, the sub's built-in crossover has a high-pass output that is fed back to the receiver's main-in jacks or to an ancillary amp for a pair of satellite speakers. To add a second sub in that case, you can use "Y" cords to feed both powered subs with the same full-range stereo signal from the receiver's pre-out jacks. But you'll need to run only one set of high-pass outputs back to the receiver or amplifier that powers the satellites. In any event, care should be taken when running two subs to set their crossover points at the same frequency.

Increasing Power

Q My listening room is large — almost 600 square feet, with 13-foot ceilings — and I am currently using speakers with a nominal impedance of 4 ohms and a sensitivity of 90 dB. My amplifier is rated at 225 watts into 4 ohms, and I'm contemplating increasing that to 375 or 400 watts, depending on which new amp I buy. Would that represent a significant upgrade or just a waste of money?

SERGE BOUFFARD
Nicolet, Quebec

A I doubt that either a 150- or 175-watt power increase would be worthwhile in terms of increased output. First, even though your room is larger than most, you should have little trouble filling it with sound using the quite sensitive speakers you have and the power available from your current amplifier. In any case, the upgrade you are contemplating would less than double

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Authorized Dealers

- AK: Alaska Audio; Juneau; Pyramid; Anchorage.
- AL: Cohen's Electronics; Montgomery; Kincaid's TV; Tuscaloosa; Likis Audio; Birmingham.
- AR: Custom Audio Video; Little Rock.
- AZ: Jerry's Audio Video; Phoenix; Tucson.
- CA: Access to Music; Larkspur; Accurate A/V; S. Lake Tahoe; Audio Concepts; Long Beach; San Gabriel Bay Area Audio; San Jose; Boote Camera; Fresno; Christopher Hansen; West LA; Coast Satellite; Abasco; Santa Maria; Creative Stereo; Santa Barbara; Ventura; David Rutledge Audio; Palm Desert; DB Audio; Berkeley; Digitek; Justin; Dow Stereo Video; San Diego & Suburbs; La Jolla; El Cajon; Chula Vista; Escondido; Larson's; Hedding; Leo's Home Theater; Visalia; Monterey Stereo; Monterey; Pacific Coast A/V; Newport Beach; Paradigm; Sacramento; Performance Audio; San Francisco; SpeakerCraft; Riverside; Systems Design; Redondo Beach; Videotek; Westminster; Westchester TV; Bakersfield; Wilson Home Theater; Woodland Hills.
- CO: Audio Visions; Grand Junction; Litan Up; Denver; Boulder; Colorado Springs; Soundtrak; Denver & Suburbs; Boulder; Ft. Collins; Colorado Springs.
- CT: Al Franklin's; Greenwich; Carlson's Audio Video; Danbury; Roberts Audio Video; New London.
- DC & Suburbs: Myer-Emco.
- DE: Sound Studio; Newark; Wilmington.
- FL: Absolute Sound; Winter Park; Audio Advisors; West Palm Beach; Audio Center; Deerfield Beach; Audio Video Store; Tallahassee; The Audiohouse; Vero Beach; Cooper for Stereo; Clearwater; Hoyt Stereo; Jacksonville; Palm Audio; Destin; Sensuous Sound; Tampa; Sound Components; Coral Gables; Sound Ideas; Gainesville; Sound Insight; R. Pierce Stereo; Daytona Beach; Stuart A/V; Stuart.
- GA: Audio Warehouse; Savannah; Ken's Stereo Jol.; Macon; Laser Disc Enterprises; Atlanta; Merril TV; Columbus; Stereo Connections; Valosta; Stereo Festival; Atlanta.
- HI: Audio Center; Honolulu; Waipahu.
- IA: Audio King; Cedar Rapids; Des Moines; Archer Audio Video; R. Dodge Audio Video; Logie; Des Moines; Audio Visions; Sioux City; Camera Corner; Champaign; Hawkeye A/V; Iowa City; Waterloo.
- ID: Ultimate Electronics; Boise; Wise Buy; Idaho Falls.
- IL: United Audio Centers; Chicago & Suburbs; Camera Corner; Bloomington; Cars & Stereo; Rockford; Good Vibes; Champaign; Jon's Home Ctr.; Quincy; Sound Forum; Crystal Lake; Select Sound; Naperville; Sundown A/V; Springfield.
- IN: Classic Stereo; Ft. Wayne; Mishawaka; Good Vibes; Lafayette; Kings Great Buys; Evansville; Ovation Audio; Clarksville; Indianapolis.
- KS: Accent Sound; Overland Park; Advance Audio; Wichita; Audio Junction; Junction City; Manhattan.
- KY: Ovation Audio; Lexington; Louisville.
- LA: Alterman Audio; New Orleans; Metairie; Lala Charles Music; Lake Charles; Sound Advice; Baton Rouge; Wright's Sound Gallery; Shreveport.
- MA: Cookin'; Chestnut Hill; Saugus; Goodwinds Audio; Boston; Shrewsbury; Nantucket Sound; Myrnes; Pittsfield Radio; Pittsfield.
- MD: Gramophone; Baltimore; Ellicott City; Myer-Emco; Gaithersburg; Beltsville; Rockville; Soundscape; Baltimore.
- ME: Cookin'; Portland.
- MI: Pecar's; Detroit; Roy; Classical Jazz; Holland; Classic Stereo; Kalamazoo; Grand Rapids; Stereo Center; FRAV; Flint; Court St.; Listening Room; Midland; Saginaw.
- MN: Audio King; Minneapolis & Suburbs; Rochester; St. Cloud; Audio Designs; Winona.
- MO: Independence; A/V; Independence; Reference Audio; Sedalia; Sound Central; St. Louis.
- MS: Ideal Acoustics; Starkville; McLelland TV; Hattiesburg; Playars A/V; Ridgeland.
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- NC: Audio Video Systems; Charlotte; Audio Visions; Wilmington; Now Audio Video; Durham; Greensboro; Raleigh; Winston Salem; Audio Ltr; Wilmington; Tri City Elect.; Concord.
- NE: Custom Electronics; Omaha; Lincoln.
- NH: Cookin'; Nashua; Manchester; Newington; Salem; S. Nashua.
- NJ: Hal's Stereo; Trenton; Monmouth Stereo; Shrewsbury; Wood Wares; Northfield; Woodbridge Stereo; West Caldwell; Woodbridge.
- NM: Ultimate Elect.; Albuquerque; Sound Ideas; Albuquerque.
- NY: Ultimate Elect.; Las Vegas; Upper Ear; Las Vegas.
- NY: Audio Breakthroughs; Manhasset; Audio Dan; Lake Grove; Audio Expressions; Newburgh; Audio Junction; Watertown; Clark Music; Albany; Syracuse; Stereo Exchange; Manhattan; Nanuet; Hart Elect.; Vestal; Innovative Audio; Buffalo; Listening Room; Scarsdale; Rowe Camera; Rochester; Sound Hill; Mt. Kisco; Sweater Shop; Armonk; Buffalo.
- OH: Audio Craft; Akron; Cleveland; Mayfield Hts.; Westlake; Audio Etc.; Dayton; Classic Stereo; Lima; Paragon Sound; Toledo; Threshold Audio; Heath.
- OK: Ultimate Electronics; Tulsa; K Labs; Premium Audio; 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; GNT Stereo; Lancaster; Hart Elect.; Blakely; Kingston; Hi Fi House; Abington; Groomall; Camp Hill; Harrisburg; Listening Post; Pittsburgh; Palmer Audio; Allentown; Pro Audio; Bloomsburg; Stereo Shoppe; Selinsgrove; Williamsport; Stereoland; Natrona Heights.
- The StereoShop; Greensburg; Studio One; Erie.
- RI: Stereo Discount; Providence.
- SC: A/V Design; Charleston; Custom Theater & Audio; Myrtle Beach; Upstairs 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; Brent A/V; Seagraves.
- VA: Sound Systems; Ashburn; Bjom's; San Antonio; High Fidelity; Austin; Mystical Clear; Dallas; Marilyn Electronics; Ft. Worth; Sound Quest; El Paso; Sound Systems; Amarillo; Sound Town; Texarkana.
- UT: Alpine Elect.; Provo; AudioWorks; Salt Lake City; Crazy Bob's; St. George; Slicker Bros.; Logan; Ullinella Elect.; Layton; Murray; Orm, Salt Lake City.
- VA: Myer-Emco; Falls Church; Tyson's Corner; Fairfax; Audio Connection; Virginia Beach; Audiotechnics; Roanoke; Home Media Store; Richmond; Stereo Type; Charlottesville.
- VT: Audio Video Authority; S. Burlington.
- WA: Aspen Sound; Spokane; Delimitive Audio; Bellevue; Seattle; Evergreen Audio; Silverdale; Pacific Sight & Sound; Wenatchee; Tin Ear; Kennewick; W. VA: Sound Post; Princeton.
- WI: Audio Emporium; Milwaukee; Absolute Sound & Vision; Sheboygan; Hi-Fi Heaven; Appleton; Green Bay; Sound World; Wausau.
- Puerto Rico: Precision Audio; P.R. Pedras.
- Canada: A & B Sound; Calgary; Edmonton; Kelowna; Vancouver & Suburbs; Victoria; Advance Electronics; Winnipeg; Bay Bloor Radio; Toronto; Centre Audio; Chatsworth; Trois Rivières; CORA; Quebec City; Digital Dynamics; Clearbrook; Great West Audio; London; Kabecor; Montreal; Lipton Jr.; New Market; Ontario; Peak Audio; Bellevue.
- Sound Room; Vancouver; Street Land; Windsor; Trable Claf; Ottawa.
- Mexico: Contact Grupo Volumen; Mexico City.

“Definitive’s Subwoofers Guarantee Ultimate Bass In Your Home!”

Our award-winning \$699 PF 15 subwoofer has a 15" woofer, 200-watt RMS amp and earth-shaking 17 Hz response that will supercharge your system.

“Shook the Concrete Floor” — *Stereo Review*

When Definitive set out to build the world’s finest sounding subwoofers, our goal was the perfect synergy of powerful, earth-shaking bass for home theater and a refined and expressive musicality.

First, we developed PowerField Technology for superior high-power coupling and unexcelled transient detail. Next, we engineered beautiful rock solid monocoque cabinets which house our high-power, high-current amplifiers, fully adjustable electronic crossovers and massive 12", 15" or 18" drivers. The result is the absolute ultimate in subwoofer performance, awesome bass which thunders down below 15 Hz, yet retains complete musical accuracy for your total enjoyment.



Definitive's subwoofers combine explosive power with refined musicality to achieve the absolute ultimate in bass performance.

Ultimate Bass for Your System

Discover the unmatched musical performance and explosive power of Definitive’s PowerField subwoofers for yourself. Brent Butterworth of Home Theater called them “Godzilla-esque,” and England’s *Home Cinema Choice* raved, “...full and effortless with an astounding low extension; so tight, controlled and room-shaking was this bass!”

Super Subwoofers from \$549

Four extraordinary Definitive AC-3* ready powered subs are now available: the PF 1800 (500 watts, 18" at \$1599), PF 1500 (250 watts, 15" at \$995), PF 15 (200 watts, 15" at \$699) and PF 12 (125 watts RMS, 12" at \$549). Hear them today!

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your power, and that would mean a just-audible increase of less than 3 dB.

Disturbing Bass

Q I plan to buy a subwoofer for my surround-sound system, but my current speakers already disturb the neighbors. Will replacing my woofers with a subwoofer help, or will that just make the sound too bassy?

DARIUS C. CUTTS
Maplewood, MO

A Now let me get this straight: Your neighbors are already complaining about the explosions and such emanating from your home-theater system, but you want to add extra bass to really blow them away? No, that can't be it. Maybe you feel that by substituting the output of a subwoofer for the bass output of your present speakers you might achieve a different quality of bass that, while still satisfying, would be less disturbing outside your listening room. Sorry. Bass is bass, and if you have enough, it doesn't really matter what's producing it.

It does matter where that device is, however, and if you have to crank your regular speakers to a level that rattles the neighbors' teeth, it may well be that the acoustic peculiarities of your listening area put your chair in a room mode that sharply attenuates the bass. If you try to overcome that by turning things up, the result is a position without that attenuation may well be unbearable —

and that position could easily be on the other side of your wall, in your neighbor's living room. If that's the case, simply experimenting with the position of your present speakers may solve the problem (I'd suggest enlisting your neighbor's help, if it isn't too late). Failing that, a subwoofer would be a reasonable solution, but you will still have to do some careful experimentation with position. As for making your sound "too bassy," that's a matter of setting the level so it's balanced with the rest of the system.

Distorted LP's

Q When playing tapes or CD's, my stereo system works well. I have an older turntable that I wanted to connect to my receiver, but when I did, it seemed to overpower the system. The only way I could listen to it was with the volume at minimum and the subwoofer turned off, and even then the sound was still pretty terrible. I'd really like to listen to my old records. Can you offer any suggestions?

MARYANN O'GORMAN
Kingston, PA

A You don't say just how old your record-playing equipment is, but if it's old enough (or was inexpensive enough when you bought it), it may use a ceramic or crystal phono cartridge rather than the more advanced moving-magnet sort.

The phono inputs of most receivers are designed for moving-magnet cartridges,

which have much lower signal levels than other components such as tape or CD players. To compensate, an extra stage of amplification is added for the phono input to raise the level to that of the other sources. At the same time, the phono preamplifier applies equalization that boosts bass and cuts treble to offset the similar but inverse equalization applied when a record was made.

A ceramic or crystal cartridge has a much higher output — about the same as that of your non-phono components — and has a natural response characteristic that approximates the equalization circuitry in your phono input. If you plug a turntable using such a cartridge into a regular phono input, it causes the phono circuits to overload and will certainly sound much too loud and excruciatingly distorted. In addition, there will be double bass boost, naturally by the cartridge itself and again by the equalization circuits. One solution is to connect the record-playing equipment to a high-level input, such as aux, or a second tape-monitor input, rather than the phono jacks. Another option is to buy a modern cartridge, assuming your turntable can handle one, or a new turntable and cartridge combination.

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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John Swier,
AVSVO Magazine, April 1996



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SIGNALS

KEN C. POHLMANN

You Want Mustard On That?

Anyone who really values high-fidelity music reproduction is rightly concerned about the integrity of his playback system. The joys and frustrations of buying new equipment, upgrading old equipment, and tweaking are well known to every audiophile. That perfection is unobtainable, that there always remains something else to be improved, is one of the reasons the pursuit is so fascinating. As important as your playback system is, however, in reality it is a relatively minor factor in determining the quality of the sound you listen to. Suppose that you are hiking in the mountains and you come upon a cold, bubbling stream. You take a drinking cup from your pack and dip it into the stream for a drink. How important is your cup's size, shape, design, and cost in determining the quality of the water you're drinking? The same question can be asked about the equipment you use for music playback.

Okay — I'm exaggerating a little bit. Of course, the type of playback system is very important. Anyone who can't hear the difference between a rack system and a sophisticated home-theater system should consult his family physician. But no matter how good your playback system is, it cannot be better than the sound of the recording itself. In that respect, it is the quality of all the recording, editing, mastering, and duplicating processes that largely determines what finally leaves your loudspeakers. The problem is that while you have complete control of the quality of your playback gear (within budgetary constraints), you have no control at all over the other 90 percent of the gear that is upstream of your tape or disc. Moreover, though you may have set up your hardware expertly, there is no assurance that a high level of professionalism was exhibited in all of the steps prior to playback.

The recording/reproduction chain is fabulously complicated. Most consumers have little notion of just how many variables are at play. The type of equipment may range from state-of-the-art to a state of anarchy. To begin with, virtually every music recording employs a mixing console, both to record individual tracks and to remix the tracks into a stereo master.

Most mixing consoles are a collection of hundreds or thousands of tiny operational amplifiers, and it does the audio signal no good to pass through them. Indeed, many consoles are infamous for the coloration they add to audio signals. What is perhaps the most widely used professional mixing console, costing much more than your house, is openly condemned for the audible distortion it adds, but engineers like to use it anyway because of its flexible operation. Other, cheaper consoles are even worse.

Another example: One of the world's most widely used digital tape recorders uses analog stages with the exact same parts that you'll find in a cheap clock radio. Moreover, the designers carelessly overlooked the fact that the digital outputs are 180 degrees out of phase with the analog outputs.

Similarly, the technicians and engineers along the signal chain may range in

**A recording is something
like a hot dog. A lot
of elements go into it, and
you're better off not
knowing about all of them.**

expertise from consummate professional to clueless goofball. In either case, one false move, by anyone anywhere in the chain, can condemn a recording to sonic mediocrity or worse.

For instance, it's easy to pass an audio signal through a mixing console. But only experienced engineers understand the ramifications of setting gains and losses in a console signal path. Recording engineer John Eargle (a consummate professional) points out a common pitfall in his book *Handbook of Recording Engineering*: A console that is operated properly may provide a dynamic range of 88 dB from input to output. If the input fader is set 10 dB too high, however, the submaster must be set 10 dB lower to compensate, which reduces the throughput dynamic range to 78 dB. That 10-dB loss

can never be recovered, and the elevated noise floor is forever preserved on the final recording.

The signal chain is not a single, unbroken process; instead, it is a series of hand-offs from one step to another. A conscientious recording engineer may work tirelessly to find exactly the right tonal balance, and then some laggard in a CD pressing plant may nonchalantly decide to crank up the treble. Conversely, even the best pressing plant can only faithfully replicate the garbage on the tape mailed in from some garage studio. Between the recording engineer and the pressing plant is the editing engineer. Most recordings today are made of hundreds of little bits of music edited together on a digital workstation. Music is almost never recorded continuously. One famous ensemble breaks its tracks into chunks of four or five bars of music and records the chunks one at a time, resting between each one. Then the chunks are edited together to form a complete recording.

Anyway, as the music data is moved into and off the workstation, and as it is copied and pasted, clicked and dragged, snipped and tucked, cloned and pitch-shifted, there are thousands of ways to add noise, distortion, or outright musical errors. The point is, a music recording is something like a hot dog: A lot of different elements go into it, and you're better off not knowing about all of them.

Given the complexity of the recording chain, it may seem miraculous that anything at all listenable reaches our loudspeakers at home. The fact that some recordings sound absolutely gorgeous is a tribute to some of the dedicated professionals out there. For example, Tom Jung is well known for his perfectionist approach to recording. His studio technique, microphones, processing and editing electronics, and storage media are without compromise. As a result, his recordings on the DMP label represent the straightest possible path from studio microphone to home loudspeaker. Unfortunately, Jung and his small group of perfectionist colleagues are in a minority. The simple truth is that the music business is more about business than about music. The bottom line counts, and in the rush to get product out the door, the subtleties of sonics are often overlooked. If there's any extra money to spend on a recording, most record labels would rather use it for advertising and promotion instead of some technical improvement.

I'm sorry. I didn't mean to bum you out. I was just trying to point out a few unpleasant realities of the upstream recording chain. Actually, this is a preface to a description of some great new recording technology that will dramatically improve the signal chain. But I've used up my word quota for the month. The good news will have to wait. □



TECHNICAL TALK

JULIAN HIRSCH

What I *Can't* Tell You About A Component

From time to time I receive letters from readers asking for information on such matters as the reliability or durability of an audio component, or where a specific product can be repaired. Other frequent questions concern the choice of a specific component, such as "Should I buy this receiver or that one?"

Likewise, a reader will often write in to tell of his experience, good or bad, with a product totally unknown to me, suggesting that we review it. Occasionally the developer or manufacturer of a new product offers to send it in for test.

In general, I cannot respond to these queries, as much as I'd like to. Most readers don't realize that I do not choose the components to be reviewed in *STEREO REVIEW*. Although I may have suggestions, the choice is up to the editors, and my role is to test and evaluate the performance and merits (or weaknesses) of the selected components. Sometimes I have never seen a component to be reviewed before it arrives at my door, and on a few occasions I have never even heard of it. If I know of some worthy component from a previously unknown source, I may mention it to the editors, but they make the final call.

Various criteria go into determining what gets tested and what doesn't. For example, over the years, I have received some criticism for giving only positive reviews. Although that is not entirely true, the vast majority of my published reports are indeed favorable. The reasons should be obvious. Products for review are often selected on the basis of their feature content, state-of-the-art circuitry, or their performance at a press demonstration indicating that they are likely to be of interest to our readers. We don't review "junk" components or products that are obviously unsuitable.

Among those products we do test, there is only so much we can tell you about them. Let's look at service life and reliability, for example. We have only two options for judging product reliability: 1) Use it regularly and monitor its performance for an extended period, such as six

months or a year, or 2) consider the reputation and track record of its manufacturer and assume that the test sample is typical of the product.

The first option is obviously impractical, requiring the regular or continuous operation of perhaps dozens of components and systems. That kind of testing could only be done by the manufacturer (and a fairly large one at that) or by an organization like Consumer's Union, although by the time any useful reliability data could be generated, the product would probably be obsolete.

The second option (testing one sample), though perhaps not ideal, is the only practical one. Most established companies, in my experience, turn out honestly

We don't review "junk" components or products that are obviously unsuitable for our readers.

rated and reliable products. The few that don't are not likely to be around too long. The fact is, most of today's audio components are vastly superior to their predecessors in reliability, performance, and value.

Incidentally, for years we have requested that review samples be tested by the manufacturer for compliance with the company's own specifications and that we receive a copy of the test results. Such pretesting can be a major help in identifying a defective sample so that we don't waste a lot of time on useless measurements. A very small number of companies (probably less than 10 percent) comply with this request, but most components we test easily meet or surpass their ratings nonetheless.

What about customer service? Most consumer-electronics manufacturers of any size try to satisfy their customers, or they would soon be out of business. But evaluation of such factors is simply be-

yond the scope of my role as an equipment reviewer.

What I *can* comment on are a component's performance aspects, but even that must be taken in context. Simply put, the complete disclosure of product performance based on objective measurements is impossible! Even if we could measure every detail of a product's electrical and acoustical performance, much of the data would not be very meaningful to a reader of the report.

I assume that for most people who are interested in acquiring or upgrading a hi-fi system, the bottom line is the sound they expect to enjoy. Now, we can measure the acoustic output of a loudspeaker (the only part of a music system that makes a sound). Unfortunately, that measurement may have only the most tenuous relationship to the sound *you* will hear from it in *your* listening room. Whatever I, or anyone else, can tell you about the sound we hear or measure from a loudspeaker, no matter how accurate and objective it might be, cannot be used to predict what it will sound like in your own system except in the most general way.

Yes, the performance of a loudspeaker can be measured in a number of repeatable and objective ways. And with experience one can often extract quite a bit of information from such data that will help to distinguish one speaker from another, or even to rate different speakers with respect to their "value" as defined by the reviewer. But with thousands of speaker models currently on the market, we are a long way from being able to compare them all in every respect. I can't imagine how it might be done without actually hearing them side by side in the same environment, and even that would be a flawed and uncertain proposition.

In closing, then, I enjoy receiving mail from readers, especially when it contains constructive criticism or suggestions. Mail sent to *STEREO REVIEW* is forwarded to me regularly. If a stamped, self-addressed envelope is included, I endeavor to answer all letters. I cannot, however, respond to queries about the incredible amplifier, loudspeaker, or you name it that has been developed or sold in your area and whose exceptional performance and value you feel far surpass those of the better-known brand names. Maybe such marvels do exist, but I tend to wonder why the talent that created them is so secretive. At any rate, none of these unappreciated wonders has yet, to my knowledge, emerged into the light of day.

Likewise, I cannot answer questions such as "Should I buy a Brand X or Brand Y receiver?" (or any component, for that matter). While we can advise you generally, that decision must ultimately be between you and your ears, where neither I nor the magazine's editors would presume to interfere. □

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

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TEST REPORTS



JOCK P. LEUNG

Kenwood KC-Z1 Stage 3 Home Theater Controller

DAVID RANADA • TECHNICAL EDITOR

Just a glance at Kenwood's KC-Z1 Stage 3 Home Theater Controller, a tuner/preamplifier and more, will tell you that it is special. In contrast to the typical black, slab-sided audio/video component, it is finished in dark gray and its mostly bare front panel is sculpted with gentle undulations. Each button in the row of input selectors glows a vivid blue when touched, and there are four tiny, bright red and green indicator lights at the lower right. The small central volume control is flush-mounted. As an example of industrial design, the front panel of the KC-Z1 is simply gorgeous.

A glance will also tell the audio enthusiast that there aren't enough buttons and knobs on the front panel to perform the functions of an A/V preamplifier, much less one that performs Dolby Digital (AC-3) decoding, Home THX signal processing, and Dolby Pro Logic decoding, all executed digitally.

The key to the KC-Z1's operation is shown at the top of our picture: a remote control of unusual design and remarkable abilities. Kenwood's name for it, "TouchPanel," gives part of the secret away. Most of its surface is covered by a touch-sensitive display screen such as you might find in an automated teller machine. The display itself is of the back-lit liquid-crystal variety found in laptop computers. Together they offer at least as many controls as the most button-packed infrared handset. But here those controls are logically organized into different

display screens, each with its own set of clearly labeled touch-control "buttons." Using the TouchPanel is very much like using an automated teller machine or a computer with a menu-based operating system (Macintosh or Windows); it will be almost intuitive to users familiar with either.

The TouchPanel's versatility doesn't stop with controlling the KC-Z1's operation. It is programmable and can be used to operate many other types and brands of infrared-controlled components. Infrared commands for hundreds of A/V components are already stored in the KC-Z1, and a set is recalled for active duty by TouchPanel operations that associate the commands for a particular component — say, a CD player — with the TouchPanel control display for that type of component. Once this relationship has been established, pressing the play "button" on the TouchPanel's CD control display will cause the KC-Z1 "mother ship" to transmit the appropriate memorized infrared command. The command emerges through a supplied infrared repeater, a small device that attaches through a long, thin cord to a repeater output on the KC-Z1's rear panel. You position the repeater where it can be "seen" by the outboard component you wish to con-

DIMENSIONS: 17 $\frac{3}{4}$ inches wide, 6 $\frac{1}{4}$ inches high, 17 $\frac{3}{4}$ inches deep (without TouchPanel)

WEIGHT: 27 pounds

PRICE: \$2,800

MANUFACTURER: Kenwood, Dept. SR,
P.O. Box 22745, Long Beach, CA 90801;
telephone, 1-800-453-6966

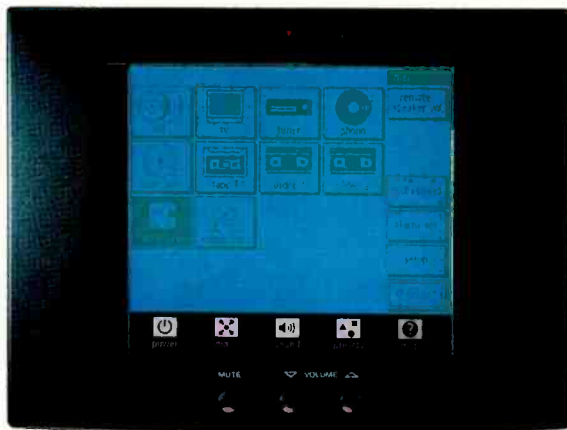
TEST REPORTS

trol. The preamp has three identical repeater outputs in case you need to spread that many around to control your system.

Types of components that can be controlled include CD and laserdisc players, analog tape decks, MiniDisc machines, VCR's, televisions, satellite receivers, and cable boxes. Unfortunately, there are no stored commands for DAT decks, and the KC-Z1 is unable to memorize externally supplied infrared commands. Also, not all commands for all components are supported, just the main ones.

Communications between the TouchPanel and the mother ship are two-way: The TouchPanel issues commands, and the KC-Z1 intermittently updates the TouchPanel on its operating status in case you've changed something using the front-panel controls. There are only four of those besides the input selectors: an on/stand-by switch, the continuously rotating volume knob, a mute button, and a Page button. Pushing Page causes the TouchPanel to emit a beep that helps you find it if it has wandered under the couch cushions. Even if the TouchPanel has made its way into a nearby room, the Page feature as well as the TouchPanel commands will still work, for they both operate via 900-MHz radio links. Kenwood claims an approximately 100-foot range for the TouchPanel, which obviously doesn't have to be in the same room as the KC-Z1 to work, much less pointed in any particular direction.

Further innovation is found in the TouchPanel's power source: a rechargeable nickel/metal-hydride battery of a type commonly used in portable computers (Duracell DR-17). You get two with the KC-Z1 so that one can be recharging — in a charging station hidden behind a slide-up door at the bottom right of the KC-Z1's front panel — while the other is being used in the TouchPanel. Kenwood claims 4 to 5 hours of continuous TouchPanel operation per charge. That can be greatly extended if you reset the panel back-lighting so it isn't always on. Each battery has a life expectancy of around 250 charge/discharge cycles. If you are caught with no charged batteries, you can still fully operate the KC-Z1 by docking the remote onto the front



while charging a battery in the battery compartment. The TouchPanel attaches to the center of the KC-Z1's front panel and is held in place by the small triangular latch visible in the photo on page 35.

Oh, yes, the KC-Z1 is an advanced audio/video preamp, too! Its rear panel contains A/V connections for two VCR's, a laserdisc player, a cable box or satellite TV tuner, and signals from a TV set. There's a single TV-monitor video output and a front-panel A/V input hidden behind a slide-up door on the lower left, next to the master power button. Both composite-video and S-video jacks are supplied for all video connections. There are rear-panel audio connections for a CD player, two analog tape decks, a MiniDisc recorder (also usable for a DAT or DCC recorder), and a turntable with a moving-magnet cartridge. The setup manual mistakenly says that a DVD player, if these *ever* come out, should connect to the CD inputs. Actually, it should connect to the laserdisc inputs, or else you won't get any video.

Several of the inputs are also provided with optical and coaxial digital audio S/PDIF connections: the MiniDisc recorder, the CD player, the cable/satellite box, and the laserdisc player. The latter two digital connections will also handle Dolby Digital (AC-3) S/PDIF signals, but there is also an AC-3 RF input for laserdisc players equipped with the appropriate outputs. For those sources with more than one type of output, the KC-Z1 will automatically select one set of signals, in this order: 1) AC-3 RF, 2) digital coaxial, 3) digital optical, 4) analog. The selection can be overridden.

Line-level audio outputs are provided for front left/right, center, surround left/right, and subwoofer, plus an auxiliary stereo feed for a second room

(which can come only from analog source signals). There is also a DB-25 connector for hooking up the Kenwood Stage 3 power amplifier or another THX-type multichannel amp as well as antenna hookups (F-connector for FM, spring clips for AM) and three switched AC convenience outlets.

In our lab tests, except for the solidly average tuner section (with typically abysmal AM frequency response), the KC-Z1 did very well indeed. Considering the amount of digital and radio-frequency "hash" that

must be bouncing around the interior, it was amazing to find such low noise levels from phono to CD (in source-direct mode from the analog inputs) and in all operating modes from stereo through Dolby Pro Logic/THX to Dolby Digital. In fact, except for some very low-level hiss from the phono input, the lack of any audible background noise at normal playback volumes was one of the most outstanding sonic characteristics of the KC-Z1. In the Dolby Pro Logic/THX modes, the high channel separations and low noise levels we measured show the advantages of the digital processing employed. Surprisingly, the surround-channel noise calibration was way off the THX spec, though we were told by Lucasfilm that this is a problem with the version of the Zoran AC-3 chip used to perform Dolby Pro Logic decoding. This degree of miscalibration may be audible with some soundtracks.

The Dolby Digital results were among the best we have measured since we obtained a Dolby AC-3 test disc. That disc's frequency sweeps, by the way, are too rapid for our test equipment to keep up with, which is why our measured Dolby Digital frequency responses all stop short of 20 kHz. The subwoofer output conformed to THX specs (80-Hz low-pass crossover on the subwoofer output, 80-Hz high-pass filtering on the main outputs).

The number of digital inputs in the KC-Z1 encouraged us to measure the preamp as if it were a CD player, testing the abilities of its internal digital-to-analog (D/A) converters using the array of special CD player tests we've developed. The results are grouped together at the end of the Stereo Performance section of the measurements. They were generally fine except for the linearity and related excess-noise

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TEST REPORTS

tests, which showed only average performance. This is the first component we've found with a negative excess-noise figure (EN16 without signal), which is just as "bad" as a positive result, the ideal being 0 dB. We weren't able to reliably hear audible effects from these behaviors with specially designed test signals, but we're dealing in any case with phenomena that occur right at the hearing threshold. They weren't audible with music.

The KC-Z1 sounded just fine with music and with standard movie soundtracks, but it delivered simply spectacular performance with Dolby Digital recordings. For the first time we could listen to the effects of THX processing on AC-3 signals. THX re-equalization produced the most obvious difference, reducing the harshness of some overly

bright mixes, such as in *True Lies*. It's a useful adjunct to Dolby Digital decoding, but it makes less of a difference than it does with Dolby Surround soundtracks.

Kenwood has learned much from the nearly disastrous mistakes made by other companies that have attempted some sort of computer-like remote-control system. Other systems usually rely on an on-screen display, forcing you to turn on the TV to figure out what your system is doing. The TouchPanel's integral display makes use of a TV monitor to show system status unnecessary. The KC-Z1, therefore, includes no on-screen display, keeping your movies free of annoying video graffiti at all times.

One competing remote-control system has an egg-shaped radio-frequen-

cy remote with a seemingly elegant single button. But that system not only requires your TV to be on, it forces you to enter an on-screen menu system just to perform the fundamental operations of volume control and muting. In the KC-Z1, the three "real" buttons on the TouchPanel are used for volume control (up/down) and muting, and these always take precedence over other TouchPanel controls.

Like much else in the KC-Z1, that is the way it should be. The TouchPanel makes the KC-Z1 the easiest home-theater product to set up and use that we have yet encountered. The circuitry makes it one of the best sounding. In all, the KC-Z1 is an outstanding design in terms of looks, performance, convenience, and versatility: an extraordinary achievement. □

MEASUREMENTS

DOLBY DIGITAL (AC-3) PERFORMANCE

All data obtained with AC-3 signals from Dolby AC-3 test disc; no-subwoofer speaker configuration, output volume at 0-dB setting.

FREQUENCY RESPONSE (see text)

front left	20 Hz to 18.7 kHz +0.17, -0.13 dB
front right	20 Hz to 17.1 kHz +0.25, -0.1 dB
center	20 Hz to 18.1 kHz +0.18, -0 dB
surround left	20 Hz to 17.1 kHz +0.11, -0.27 dB
surround right	20 Hz to 18.6 kHz +0.15, -0.15 dB

NOISE (A-wtd)

front left/right	-85.1/-85.1 dB
center	-85.2 dB
surround left/right	-85.6/-85.3 dB

DISTORTION (THD+N, 1 kHz, -20-dBFS* input)
worst case (right front) 0.037%

CHANNEL SEPARATION (0-dBFS* input)
worst case (left out, right driven) >73 dB

* decibels referred to digital full-scale

DOLBY PRO LOGIC PERFORMANCE

Except where noted, all data for analog input signals; no-subwoofer speaker configuration, output volume at 0-dB setting.

FREQUENCY RESPONSE

("large" center-speaker setting)

left, right	20 Hz to 20 kHz +0.1, -0.15 dB
center	20 Hz to 20 kHz +0, -0.22 dB
surround	20 Hz to 7.02 kHz +0, -3 dB

DIGITAL INPUT NOISE (A-wtd)

front left/right	-80.8/-81 dB
center	-79.75 dB
surround left/right	-82.2/82.3 dB

DIGITAL INPUT DISTORTION (THD+N, 1 kHz)

left, right	0.04%
center	0.05%
surround	0.11%

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

left, right (re 2-volt input)	+0.2 dB
center (re 1.4-volt input)	+3.2 dB
surround (re 1.4-volt input)	+3.2 dB

SURROUND-CHANNEL NOISE-REDUCTION CALIBRATION ERROR

re Dolby level (247 mV/-15 dBFS*)	+1 dB
re THX level (141.4 mV/-23 dBFS*)	+6 dB

CHANNEL SEPARATION (worst case)
center out, left driven >57 dB

THX RE-EQUALIZATION ERROR
worst case -0.25 dB at 4 kHz

THX SURROUND-EQUALIZATION ERROR
worst case +0.8 dB at 1.6 kHz

* decibels referred to digital full-scale

STEREO PERFORMANCE

Except where noted, all data for analog input signals.

OUTPUT AT CLIPPING (1 kHz)
analog inputs (volume at +16 dB) 9.9 volts
digital inputs (volume at +15 dB) 8.1 volts

DISTORTION (1 kHz, 0.5-volt output)
analog inputs (0.5-volt input) 0.010%
digital inputs (-12 dBFS* input) 0.017%

SENSITIVITY (for 0.5-volt output)
CD/laserdisc 99.7 mV
phono 1.3 mV

INPUT-OVERLOAD LEVEL (re 2-volt input)
CD/laserdisc (source-direct mode) 10.3 dB

NOISE (re 0.5-volt output)
CD (500 mV input) -95.6 dB
phono (5 mV input) -75.9 dB
digital (-12 dBFS* dithered input) -90.7 dB

RIAA PHONO-EQUALIZATION ERROR
(20 Hz to 20 kHz) ±0.16 dB

ANALOG INPUT FREQUENCY RESPONSE
source-direct 20 Hz to 20 kHz +0, -0.29 dB

TONE-CONTROL RANGE
100 Hz +10.7, -11 dB
10 kHz +10.6, -10.8 dB

DIGITAL INPUT LINEARITY ERROR
-90 dBFS* -3 dB

DIGITAL INPUT DISTORTION
re 0/-20 dBFS* 0.029/0.024%

DIGITAL INPUT EXCESS NOISE (without/with signal)

EN16	-6.4/+2.7 dB
EN20	+14.7/+15.2 dB

DIGITAL INPUT NOISE
(0-dBFS*, 2-volt output, A-wtd)
de-emphasis off -102.4 dB
de-emphasis on -104.9 dB

DIGITAL INPUT FREQUENCY RESPONSE
(20 Hz to 20 kHz range)
de-emphasis off +0.2, -0.12 dB
de-emphasis on +0.15, -0.48 dB

* decibels referred to digital full-scale

TUNER SECTION

All data for FM only except frequency response.

SENSITIVITY (50-dB quieting)
mono 13 dBf
stereo 23 dBf

NOISE (at 65 dBf)
mono -75 dB
stereo (mostly pilot-carrier leakage) -38 dB

DISTORTION (THD+N at 65 dBf)
mono 0.77%
stereo (including pilot-carrier leakage) 1%

CAPTURE RATIO (at 65 dBf) 1 dB

AM REJECTION 51 dB

SELECTIVITY
alternate-channel 62 dB
adjacent-channel 11 dB

PILOT-CARRIER LEAKAGE
19 and 38 kHz -33 dB

HUM -80 dB

CHANNEL SEPARATION
100 Hz 41 dB
1 kHz 57 dB
10 kHz 38 dB

FREQUENCY RESPONSE
FM 30 Hz to 15 kHz +0.5, -2 dB
AM 100 Hz to 3 kHz +0, -6 dB

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When the first 40-inch direct-view television was introduced in 1993, we envisioned bringing our Diamond Vision® stadium-sized screen into your living room. Mitsubishi is proud to introduce its complete family of 40-inch televisions.

The Mitsubishi giant 40-inch sets deliver the highest possible picture quality with a screen size rivaling that of a big screen projection television.

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Stereo Review



“Much Better Than
The Other Systems
We’ve Tried – At Half
The Price Of Many!”

Home Theater
magazine



This Powerful Home Theater System With 5 Satellites, Subwoofer & Pioneer® Dolby® Pro Logic® Receiver Will Change How You Watch TV Forever!

It's The Country's Best Value In Surround Sound—
Save \$120 Right Now At Cambridge SoundWorks & Best Buy.

You Can Spend Less. But You'll Get Less.

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.

But do yourself a favor, and listen before you leap. Most systems in this price range don't approach this one's performance.

The Pioneer VSX305 Receiver.

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.
- Discrete output amplifier design for a clean, undistorted sound.
- Dolby Surround Pro Logic, and simulated surround for non-Dolby sources.
- 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, KLH & 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.

Pioneer VSX305 Dolby Pro Logic Receiver and Ensemble IV Home Theater System.

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TEST REPORTS



BOOK P. LEUNG

Klipsch Rebel KSS-3 Sub/Sat Speaker System

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

The Klipsch Rebel KSS-3 is a three-piece speaker system consisting of a pair of KSS-2 satellites and a K-RSW powered subwoofer. Each of the satellites, which have sealed plastic enclosures, is a small two-way speaker with a 4-inch woofer crossing over to a 1-inch dome tweeter at 2.1 kHz. The tweeter, which is loaded by a relatively shallow horn section, is mounted about 1¼ inches in front of the woofer and slightly above it. Each satellite has a nominal impedance rating of 8 ohms

DIMENSIONS

KSS-2 satellites: 5¾ inches wide, 5¼ inches deep, 8½ inches high
K-RSW subwoofer: 9 inches wide, 21½ inches deep, 15 inches high

WEIGHT

KSS-2 satellites: 4 pounds
K-RSW subwoofer: 31 pounds

FINISH: black

PRICE: \$749

MANUFACTURER: Klipsch, Dept. SR, 8900 Keystone Crossing, Suite 1200, Indianapolis, IN 46240; telephone, 1-800-554-7724

and a rated frequency response of 115 Hz to 20 kHz.

The satellites can be mounted on shelves or stands, or they can be installed on wall brackets with the slots and threaded inserts on their rear panels. The input terminals are spring-loaded insulated clips that accept stripped wire ends.

The K-RSW subwoofer is rather large and heavy compared with the bass modules in some other three-piece systems we have tested. It is a band-pass system containing a single 6½-inch cone driver and an amplifier rated at 50 watts into a nominal 4-ohm impedance. The acoustic output of the K-RSW exits through two ports on one end of the enclosure.

On the other end of the bass module are its controls and signal connectors. Two sets of spring-clip connectors accept speaker-level outputs (via stripped wires) from a receiver or integrated amplifier and pass them on to the satellite speakers. The mono sum of the stereo signals is channeled to the subwoofer's power amplifier. Two pairs of line-level RCA-jack connectors pro-

vide similar interconnections for systems with separate preamplifiers and power amplifiers.

Two knobs on the K-RSW's control panel permit continuous adjustment of its output level and low-pass cutoff frequency. The low-pass control is calibrated at seven points from 40 to 140 Hz, and the level control is calibrated from 1 to 11! There is also a phase-reversing slide switch, which may in some cases allow a closer phase match (at the listening position) between the outputs of the subwoofer and the satellites. Finally, the K-RSW has a power switch with auto and off settings. In auto mode, which is recommended, subwoofer power is turned on automatically by the presence of a signal.

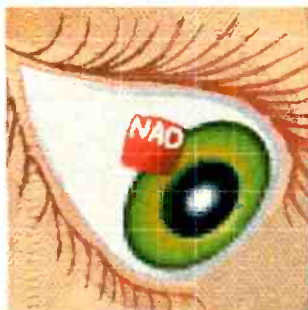
We measured the satellites and the subwoofer separately. The satellites were placed on 26-inch stands, about 8 feet apart and 3 feet in front of the wall behind them, and their room response was measured with the microphone about 12 feet from the left speaker. The averaged measurement for the two channels was ±5 dB from 100 Hz to 20 kHz. The MLS quasi-anechoic response (at 2 and 3 meters) was ±3 dB from about 400 Hz to 20 kHz. The satellites' horizontal directivity over a ±45-degree angle was typical of 1-inch drivers, with the high-frequency output falling off by about 6 dB between 3 and 20 kHz.

We measured the output of the subwoofer with the microphone located between and close to its two ports, using low-pass frequency settings from 40 to 100 Hz. The low-pass adjustment had a relatively minor effect on the actual bass frequency response relative to the midrange and high-frequency levels, which were strongly affected by the level setting.

Since these two controls essentially determine the low-frequency performance of the system, we spent considerable time in experimenting and lis-

Back panel of the Klipsch K-RSW powered subwoofer





218 THX stereo power amplifier

worth looking into

The NAD 218 THX stereo power amplifier is one of the most sophisticated hi fi components we have ever produced. Yet for all its brilliant features and astonishing levels of performance, it remains true to the NAD "no nonsense" design philosophy.



The very first feature you'll notice is the weight of the 218 THX, due partly to the heavy construction of the chassis and front panel, designed for rack mounting, (its advanced specification on makes the 218 THX ideal for professional studio use). But the increase in weight is largely due to the massive Hölmgren toroidal mains transformer.



WHY SO LARGE AND WHY HOLMGREN?

Apart from being the ideal design for the huge amounts of power it is likely to handle, the Hölmgren offers other advantages:

A conventional transformer can be affected by AC mains to produce hum or even buzzing, whereas a Hölmgren transformer isn't. Plus, a Hölmgren transformer because of its unique design, will not affect other adjacent components.

A feature which doesn't add much to the weight of the 218 THX but certainly adds to the weight of its performance is the bank of eight capacitors, rather than a single pair. This is a comparatively low cost benefit which makes a better power



supply because several smaller capacitors have a faster recovery time and have less equivalent series inductance and resistance than a single pair.

The 218 THX incorporates fully balanced XLR inputs, allowing the use of long runs of cable between pre and power stages, without the risk of

interference. This thoughtful yet simple feature offers the opportunity to set your system up more flexibly and of course it's a benefit for bridging two 218 THX's for mono and locating them nearer your speakers.

The circuitry includes left and right channel PCB's, offering lots of benefits. They include less complicated PCB's meaning extra

reliability, more separation of circuits, so like the Hölmgren transformer, less interference going out or coming in. All this, plus lower build cost too,

means more savings again towards the specification of better components.

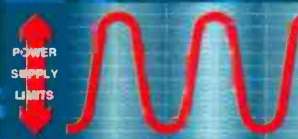
Any amp which is overdriven, (unlikely on the 218 THX because it is so powerful) can produce distortion or 'clipping'. The NAD Soft Clipping circuit gently transforms the waveform, rounding

off the peaks, preventing "dynamic overload" and heading off damage to your ears and your speakers, without losing the sense of musical drama.

Hard Clipping



Soft Clipping



There are other more hidden features, too which provide specific benefits. Typically, the 218 THX incorporates extensive protection circuitry. This prevents damage from accidental overload or misuse which can lead to overheating or circuit failure.

Finally for those for whom the letters THX are somewhat of a mystery, let us briefly explain.

George Lucas, creator of the 'Star Wars' epics, went to extraordinary lengths to ensure that the sound quality of his films exceeded anything Hollywood had

previously produced and he laid down exacting specifications covering distortion, noise, power etc. to encourage manufacturers to develop products which will reproduce his sound tracks to the standard they deserve.

NAD was first with a power amplifier which met these challenging standards and won the right to carry the THX badge. The 218 THX continues this principle of quality first.

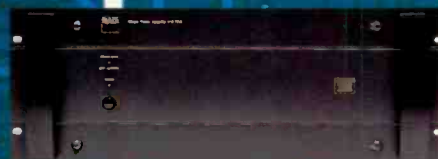


So what do you get for your not substantial investment at the end of the day?

A thoughtfully designed, utterly reliable, acoustically stunning 2 x 200 watts, bridgeable to a more than you'll ever need 700 watts mono, with more headroom than your window frames will thank you for, which could even change the way you perceive music.

But with all this capability none of it is a fashion statement. The 218 THX is designed, not designed. Every feature of the 218 THX enhances performance and reliability.

That's why our slogan "pure and simple" is as relevant today for equipment as advanced as the 218 THX as it was when NAD was created more than 20 years ago.



NAD pure and simple.

TEST REPORTS

tening. It was soon apparent that the controls required only a light touch to realize the system's full performance. And, since in most cases the adjustment must be done by ear, we'd recommend having at hand some program sources with deep bass content.

The manufacturer points out that the KSS-3 system covers nearly the entire audible frequency range between 40 Hz and 20 kHz, and that it is capable of providing more bass output than typical pairs of traditional loudspeakers in the same general price/size range. This claim is probably accurate, but only if the adjustments of the low-pass and level controls are made carefully. It's helpful for powered subwoofers to have a degree of flexibility to achieve the best possible performance in a variety of listening rooms. But in our room, at least, the KRSW's controls could easily be set to deliver an overpowering, muddy or boomy bass — the antithesis of the system's intended performance.

After what I considered proper setup adjustment, I listened to some recordings whose bass credentials were impeccable. The results were all that could have been wished, with powerful and natural bass down to about 40 Hz and a very good, balanced overall sound from the satellites, including an excellent stereo stage.

When it became obvious that the Klipsch system was indeed all that it was claimed to be, I was curious to check it out against a different but comparably priced loudspeaker that happened to be in the lab, which I combined with my favorite subwoofer (by itself it costs roughly as much as the entire Klipsch KSS-3 system).

Just about the only respect in which the Klipsch KSS-3 did not match up to this one-time "reference" system was in its bass extension. The KSS-3 is rated down to 40 Hz, and it does a fine job down to there and a bit lower. But if you are seeking that almost sub-audible, tactile "skin massage" you can get from speakers that perform down to near 20 Hz, you will have to look (listen?) elsewhere.

As a final note, Klipsch also offers the KSS-1 magnetically shielded center-channel speaker (\$199) and a pair of KSS-2 satellites supplied with wall brackets for surround-speaker placement (\$299). If the KSS-1 and the KSS-2 surrounds are added to the KSS-3 sub/sat system, the six should make a potent suite of home-theater speakers. □



Linaeum Extreme Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

All five of the loudspeakers made by Linaeum share a unique feature, the proprietary "True Line Source" tweeter after which the small Portland, Oregon-based company is named (*linaea* is Latin for line). Invented in the early 1980's by Paul Paddock, who founded Linaeum and today is its head of research, the unconventional design, which is claimed to provide exceptionally low distortion and high-detail resolution, uses a miniature etched "voice-coil" circuit held between a pair of pliable co-polymer diaphragms. The thin plastic diaphragms are suspended in a magnetic structure that allows them to flex when an audio signal is applied to the voice coil. According to the manufacturer, the soft, pliable diaphragms make the tweeter inherently free of breakup within its rated frequency range.

Although it is difficult to appreciate the structural simplicity of the Linaeum design from a brief verbal description, its operation becomes clear when you see (and hear) it in action. The Linaeum tweeter is manufactured in monopole (conventional forward-radiating) and dipole (bidirectional) versions. Linaeum also licenses its tweet-

er to other speaker manufacturers, such as Radio Shack, whose Optimus Pro LX5 (reviewed here in May 1995) uses the dipole version.

The new Linaeum Extreme, despite its rather unusual name, is a relatively small, light, and inexpensive speaker. Its monopole tweeter crosses over to a (nominal) 7-inch woofer at 3 kHz, with a 6-dB-per-octave slope. The manufacturer's ratings include a frequency range of 60 Hz to 30 kHz, sensitivity of 90 dB sound-pressure level (SPL) with a 2.83-volt input, and impedance of 4 ohms.

The system enclosure, finished in black woodgrain vinyl, is vented with a 1 1/8-inch-diameter port in the rear. The input connectors are gold-plated binding posts recessed into the rear of

DIMENSIONS: 14 inches high, 8 inches wide, 10 1/8 inches deep (with grille)

WEIGHT: 11 pounds

FINISH: black woodgrain vinyl, removable black cloth grille

PRICE: \$379 a pair

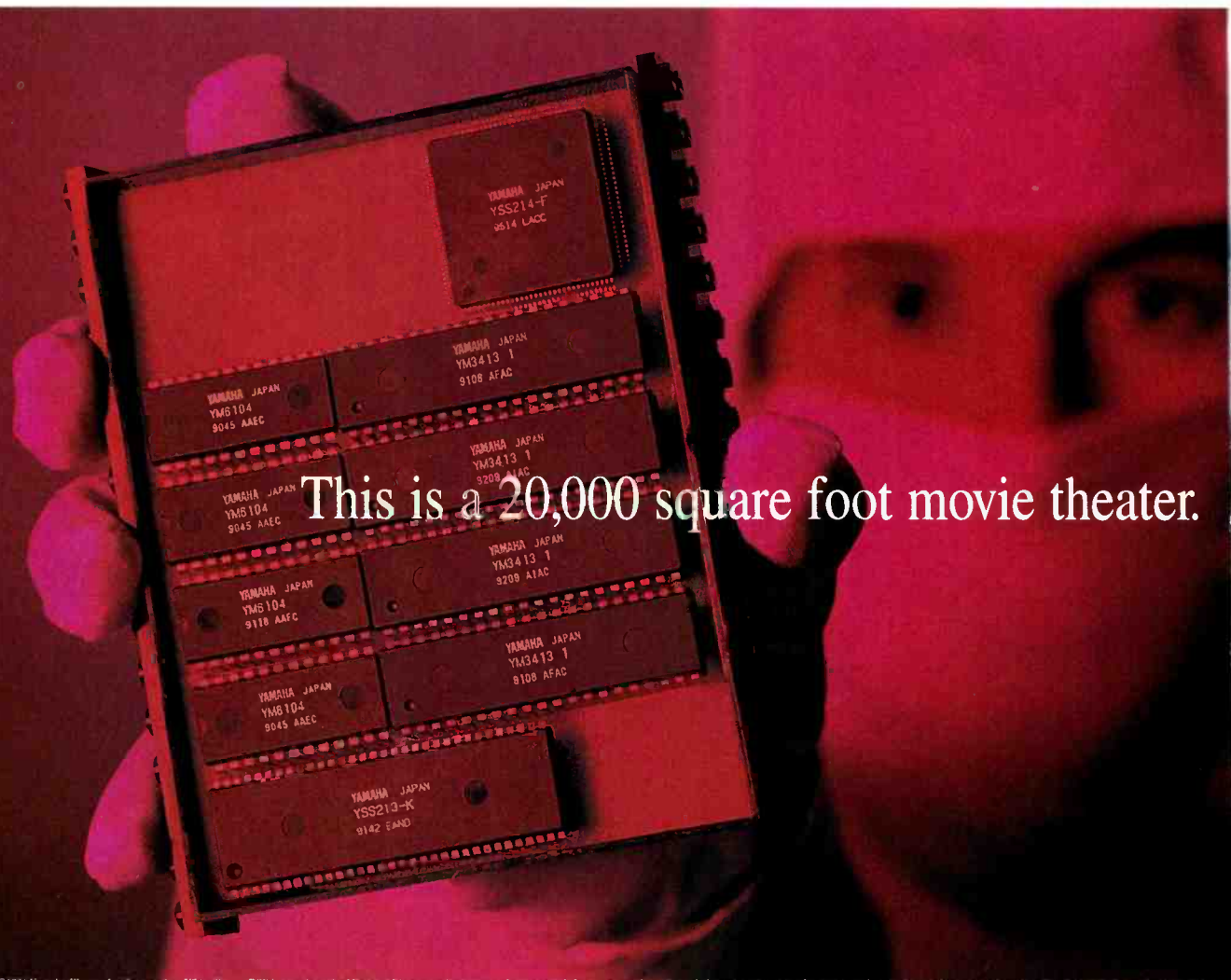
MANUFACTURER: Linaeum, Dept. SR, 820 S.E. Division Place, Portland, OR 97202; telephone, 503-235-1870



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11 mg. "tar", 0.8 mg. nicotine av. per cigarette by FTC method.

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This is a 20,000 square foot movie theater.

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The Theater

The DSP-A3090 lets you choose from 30 sound field modes. From L.A.'s Roxy and New York's Cellar Club, to churches and concert halls around the world. Seven-channel amplification sends 80 watts to each of the main, center and rear speakers, plus 25 watts to both front effects speakers. Analog, video and S-video, plus RF, coaxial and optical digital inputs link you to today's and tomorrow's Dolby Surround AC-3 components.

We did leave out a few hundred seats, some plush carpet and the kid screaming in the 13th row. But what we've given you instead is something no home theater owner has ever heard before. • The theater. • It's the expansive acoustic environment that gives a trip to the movies its sense of grandeur. And until recently, it just wasn't possible from a sound system designed to coexist with a sofa, an easy chair and a pair of potted plants. • But that was before decades of Yamaha experience in sound field measuring and processing, custom integrated circuit design and audio microchip fabrication culminated in the new DSP-A3090 Digital Sound Field Processor. Introducing unique technology that creates the unmistakable sensation of a first-run theater's acoustic spaciousness. Combined with the unparalleled accuracy and



And this is where you park.

dynamic range of Dolby® Surround AC-3.™ Every director has something specific in mind when mixing a film's soundtrack for the big screen. And the A3090's proprietary Yamaha processing techniques maintain the depth, richness and realism of that vision. While also preserving the directional relationships of every sound. So whether it's a musical score, or *T. rex's* roar, hear it exactly how, and where, the director intended. • That's Tri-Field processing. And it's made possible by the latest generation of Yamaha Cinema DSP. The technology that's kept us at the forefront of home theater for more than a decade. • Audition the DSP-A3090 for yourself. • Call YAMAHA for the dealer nearest you. Or visit us on www.yamaha.com • Then drive off carrying a new home theater. • With the easiest parking in town.



The Technology

The sophisticated micro-circuitry that makes our new Cinema DSP possible is designed and produced exclusively by Yamaha. Our microprocessors apply the vast library of sound field data we've amassed creating products for audio professionals, both on the stage and in the studio. And they're manufactured with the advanced processes we've perfected through years of experience fabricating our own custom chips.

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YAMAHA

TEST REPORTS

the cabinet. Although they accept single banana plugs or wires, their spacing is too wide for dual banana plugs. A removable black grille protects the drivers.

The averaged and smoothed room response of the left and right speakers was flat within ± 3 dB from 60 Hz to 14 kHz, consistent with the manufacturer's rating (the higher frequencies are subject to unpredictable absorption by room boundaries). MLS (quasi-anechoic) frequency-response measurements at distances of 1, 2, and 3 meters produced virtually identical results. In each case there was a notch of about 8 dB at 3 kHz, the crossover frequency. The response at higher frequencies was also identical at all three distances, within about 4 dB overall from 4 to 11 kHz, and falling off by about 6 dB from there to 20 kHz.

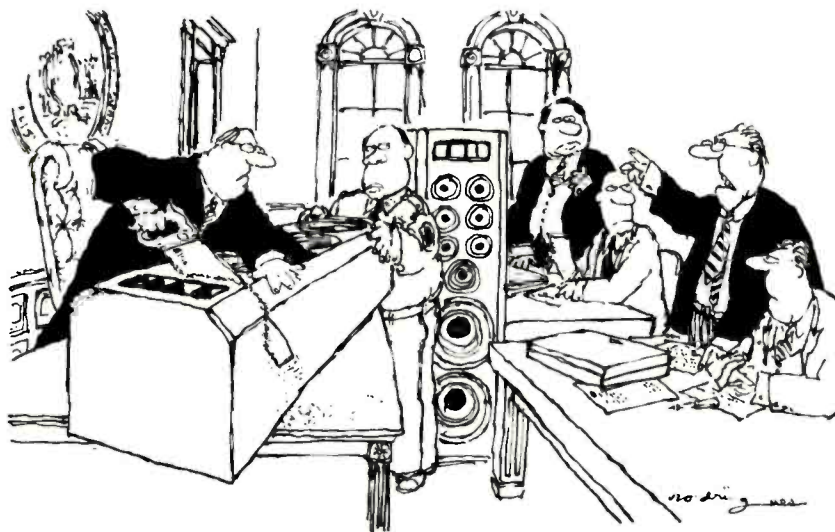
The close-miked woofer distortion at 2.83 volts input (equivalent to the rated 90-dB SPL output) was typically about 0.5 percent between 150 Hz and 3 kHz. It rose to 1 percent at 100 Hz and 3 percent at the rated 60-Hz lower limit. Distortion was still only 10 percent at 30 Hz, although the output level was too low to be useful at that frequency. This is very good performance for a speaker of the Extreme's size and price.

The manufacturer's literature states that the Linaeum tweeter has no resonant frequencies in the high-frequency spectrum and that its impedance has no shift of magnitude or phase at its crossover point. Although we did not remove the tweeter or attempt to mea-

sure its impedance alone, the system's measured impedance characteristic was fairly conventional. Impedance was 5 ohms in the 30- to 60-Hz range and from 100 to 400 Hz. The curve had three distinct peaks: 12 ohms at 23 Hz, 15 ohms at 85 Hz, and 32 ohms at 3 kHz (the crossover point). The phase angle of the impedance was relatively uniform, however, remaining between ± 45 degrees over the full audio range.

Listening tests showed that the 3-kHz crossover notch was inaudible with any of the music programs we played through the Linaeum speakers. That was not surprising given the narrow bandwidth of the notch (a fraction of an octave). The overall sound of the system was excellent with any music that did not have prominent deep bass, which includes most pop recordings. Even with bass-heavy music, there would be no reason to notice the absence of the lower octaves unless you knew they were supposed to be there.

In evaluating a small, relatively inexpensive speaker, it is necessary to maintain a rational perspective; judged by inappropriate standards, all such speakers would seem disappointing. The Linaeum Extreme is a very good speaker in its class, with no significant audible (or unexpected) idiosyncrasies that we could find. Its frequency response, clarity, smoothness, and balance are everything they should be at its price. Coupled with a good subwoofer, the Linaeum speakers sounded very close to some of the best speakers we have tested recently. □



"Your honor, since my client is obliged to accept a 'Solomon-like' decision of the disposition of the late John Campbell's speakers, he feels that in all fairness the cut should be made between the midrange and the woofer"

"THIS SYSTEM EMBARRASSES MANY HOME THEATER SPEAKER COMBOS COSTING SEVERAL TIMES ITS PRICE"

Cory Greenberg Home Theater Technology, Volume 2, No. 7



\$1,576*

gets you this stunning

home theater system consisting of:

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Spectacular performance from Paradigm...

the number one choice for critical listeners!

6

Consecutive years Rated #1 for price/value in Inside Track

7

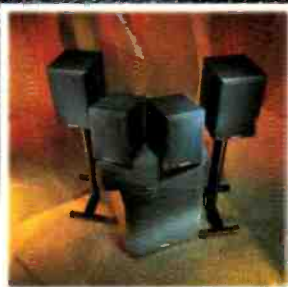
Product of the Year Awards in the past year

16

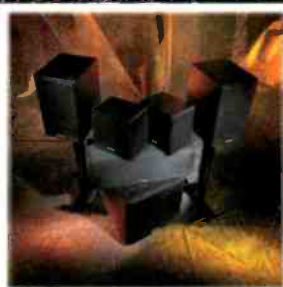
Critic's Choice Awards in the past year

80

Awards since 1990



Atom, CC-50, Mikro, PDR-10[†] \$796*



Titan, CC-150, ADP-100, PDR-10[†] \$1,086*



950Mk3, CC-300, ADP-150, PS-1000[†] \$1,996*

Paradigm's state-of-the-art R&D and superior component technology produces speakers that offer the *ultimate* in high performance sound for both music and home theater. And, when it comes to value, Paradigm is second to none! Visit your nearest AUTHORIZED PARADIGM DEALER and listen to any of these sensational systems today!

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* Inside Track Annual Dealer Survey. † Manufacturer's FMV retail price. ‡ All systems shown include a powered subwoofer. Website: www.paradigm.ca

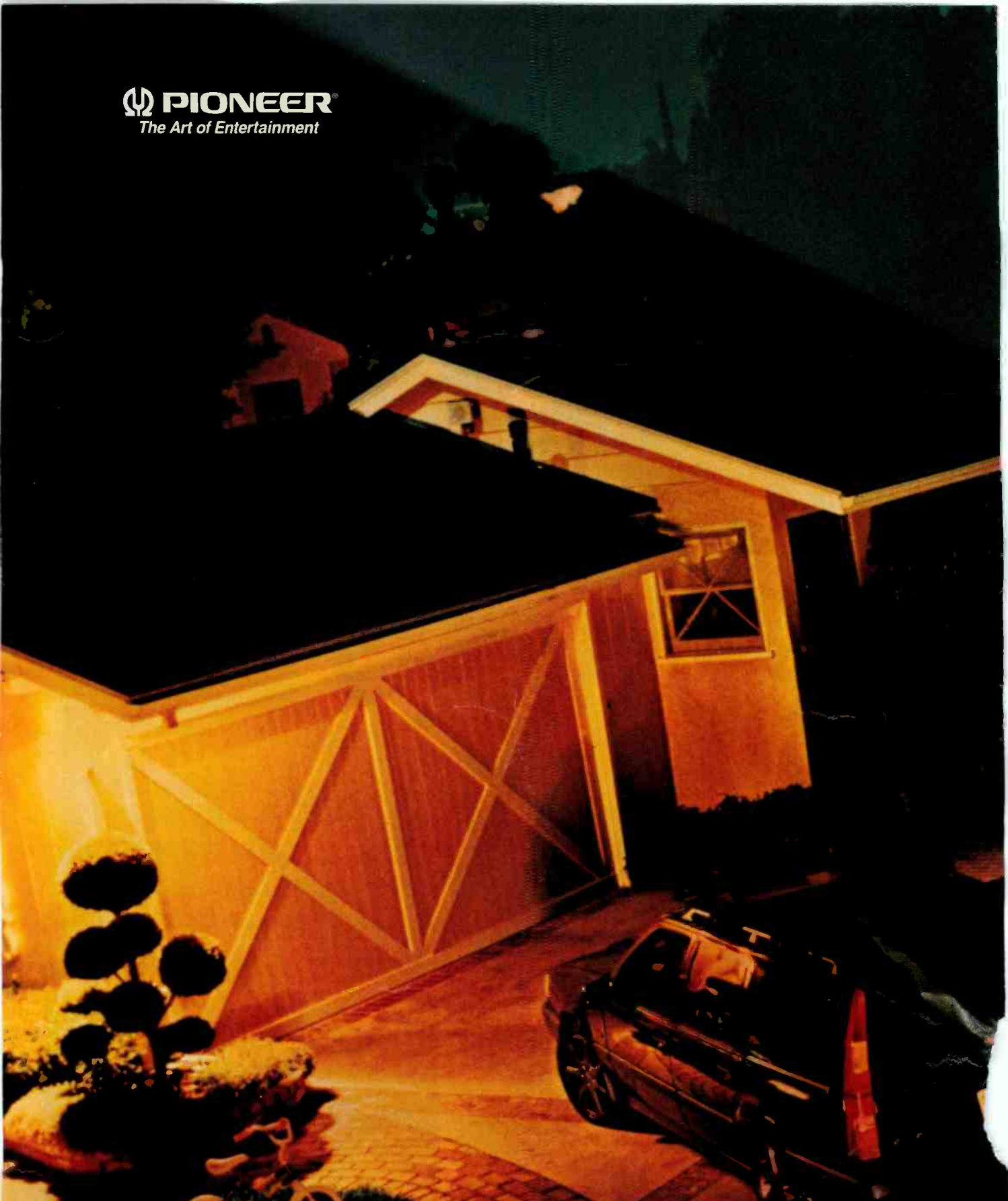
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THE ULTIMATE IN HIGH-PERFORMANCE SOUND™

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The Art of Entertainment



POLICE INCIDENT REPORT: Officers responded to call from concerned citizen regarding shocking sounds and deep bass vibrations emanating from house next door. Further investigation revealed source of sound to be occupant's state-of-the-art Pioneer® Advanced HomeTheater System. After questioning, officers learned that Dolby® Digital (AC-3™) technology provides stunning sound reproduction with 6 independent digital channels. Supercharged audio and video performance

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DEAR POLICE,
DO NOT BE ALARMED.
THE SOUNDS YOU ARE
HEARING ARE FROM
MY PIONEER ADVANCED
HOME THEATER SYSTEM.
P.S. PLEASE SHUT
OFF THE LIGHT.



was traced to Pioneer LaserDisc player. Cinema Wide System projection monitor identified as source of razor-sharp visuals. Officers concluded Pioneer Advanced HomeTheater System equal to or better than movie theater experience. Officers decided to confiscate the system as evidence and place it in precinct break room until further notice. END OF REPORT. Call 1-800-PIONEER for a dealer near you. Pioneer Advanced HomeTheater. You're surrounded.

TEST REPORTS



BOOK P. LEUNG

Magneplanar MMG Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

In the great majority of loudspeakers the audio signal creates a varying magnetic field that interacts with a fixed magnetic field in the speaker. The interaction of the two fields creates a force proportional to the signal amplitude, which moves a voice coil that is attached to a cone (usually made of paper or plastic). The cone's movement in turn creates a sound wave that is propagated through the air to our ears.

This seemingly Rube Goldberg-like sequence of events, which has been the mainstay of audio devices from telephones to tweeters for over a century, is not the only way to create sound. Anything that can move air can do that job, as demonstrated by the extraordi-

nary variety of loudspeakers, headphones, bells, whistles, and musical instruments.

Readers of *STEREO REVIEW* may be aware of the existence of planar speakers, most of which are driven by

DIMENSIONS: 48 inches high, 14½ inches wide, 1¼ inches deep (excluding feet)

WEIGHT: 16 pounds

FINISH: natural or black solid-oak trim with off-white, gray, or black fabric grille

PRICE: \$500 a pair (factory-direct only)

MANUFACTURER: Magnepan, Dept. SR, 1645 Ninth St., White Bear Lake, MN 55110; telephone, 1-800-474-1646

electrostatic forces. Although such speakers are capable of excellent sonic performance because of their fast response to transients and their considerable radiating surface, they tend to be large and expensive. In addition, electrostatic speakers of a practical size and relatively moderate cost may not provide adequate performance at the lower frequencies; they must often be used with cone woofers to achieve good bass response.

There is another alternative, however — the planar *magnetic* speaker. Surprisingly, to my knowledge there is only one maker of full-range planar-magnetic speakers, Minneapolis-based Magnepan. This company's broad line of Magneplanar speakers has been a part of the audio scene for many years, and many discerning audiophiles swear by them.

Unlike electrostatic speakers that depend on a separate cone driver for the bass register, all Magneplanar speakers are considered full-range planar systems, though some of them do go lower than others. Also unlike electrostatics, Magneplanars do not have to be connected to a power outlet.

The Magneplanar MMG is the smallest and least expensive model in Magnepan's line. It is sold factory-direct (U.S. and Canada only) and comes with a sixty-day money-back guarantee. Buyers can also apply the entire purchase price to an upgrade if they replace it with one of several larger models within four months.

The MMG's slender rectangular panel, only 4 feet high and ¾ inch thick, looks more like a small floor-standing screen than a speaker. The panel is supported by inconspicuous steel feet that normally tilt it slightly back, but the angle can be changed to an upright setting if desired.

At the bottom of the panel's rear surface are the input terminals, which accept stripped wires, lugs, and single or dual banana plugs. A second pair of terminals, normally joined by a jumper, lets you reduce the tweeter level by 1 to 4 dB by inserting a 1- or 2-ohm resistor (supplied). According to the manufacturer, the combination of certain bright pop or rock recordings and a "hard" or reflective listening room can sometimes result in an excessively brilliant high end, which can be tamed by using one of the supplied resistors. There is also a fuse that protects the tweeter from excessive signal levels.

The MMG is a dipole radiator, with

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TEST REPORTS

equal outputs (in opposite phase) from the front and back of the panel. It is actually a two-way system, with separate treble and mid/bass planar drivers. As with all Magneplanar speakers, each driver consists of a number of long, aluminum conducting elements that extend most of the vertical length of the system and through which the signal current passes. The tweeter consists of quasi-ribbon elements 1/4 inches wide, and the rest are round wires. The supporting structure, meanwhile, contains a number of small magnets, and the interaction between the signal current and the magnetic flux produces a front-rear movement of the planar diaphragm (0.5-millimeter Mylar) attached to the conducting elements.

Most speakers are designed to give their best performance when placed several feet from the wall behind them (and generally several feet from the side walls as well). We use that placement for any speaker not specifically

The Magneplanar MMG sounded balanced and natural no matter where in the room I listened from.

designed to be placed against a wall, and it is a fundamental requirement for dipolar and bipolar speakers, including all the Magneplanar models. As Magneplanar recommends, we also angled the speakers slightly in toward the center line of the room with the tweeter elements of the mirror-image pair on the inside.

The MMG has a relatively low sensitivity rating of 86 dB, and we measured an 85-dB sound-pressure level at 1 meter from the speaker with an input of 2.83 volts. The speaker's impedance characteristic was unusual, being essentially resistive over most of the audio range. A resistive load is easiest for any amplifier to drive (it is normally used for amplifier tests). Impedance measured about 5 ohms from 20 to over 100 Hz, reached a maximum of just under 14 ohms at 750 Hz, and dropped to between 3 and 4 ohms from 3 to 20 kHz.

The averaged room response for the two speakers was within ± 3 dB from about 60 Hz to 15 kHz and down 6 dB at 20 kHz. The MLS quasi-anechoic

response at 2 and 3 meters was ± 4 dB from 300 Hz to 20 kHz. Bass distortion at 1 meter with a 2.83-volt input ranged from 0.2 percent at 500 Hz to 5 percent at 100 Hz and 9 percent at 80 Hz. We consider the manufacturer's low-frequency limit of 50 Hz to be realistic.

Testing and listening to the Magneplanar MMG was a pleasant and instructive experience. It had the basic virtues of any good planar speaker: not only freedom from the colorations typical of cone drivers but also a refreshing absence of the colorations typical of *any* speaker operating in a box enclosure. Honk, boom, tubbiness and the like are not attributes of planars in general, and they were delightfully absent from the MMG. After all, how could you get a box resonance without a box?

Another characteristic of a full-range planar speaker like the MMG is that it can be listened to from any distance, from a foot or two away to a position on the other side of the room, without any significant change in the subjective volume level or tonal balance. I found the MMG's sonic naturalness undiminished no matter where I listened from, though of course the degree of stereo effect varied with the location.

Like other Magneplanar speakers, the MMG had distinctive imaging and spatial qualities. While it is less likely to create the pinpoint localization characteristic of good cone drivers, it produced a clean and effortless sound.

Frankly, those characteristics are pretty much what I would have expected from almost any good planar speaker. What I would *not* have expected is a system price tag of just \$500 a pair, or such a compact and unobtrusive package as the MMG. Although it has relatively low sensitivity and won't generate room-shaking levels or hit the very lowest bass notes, it should satisfy many listeners willing to trade off deep bass and high volume for its other strengths. It could also be matched with a good subwoofer with excellent results. In any case, the speaker gave no indication of fragility, and, as we learned during some enthusiastic listening, the fuse protecting its tweeter is very effective!

Like other planar speakers, the Magneplanar MMG fills the room with sound without calling attention to itself. Though not exactly invisible, it is certainly an above-average speaker at a bargain price. □

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TEST REPORTS



Energy C-2 Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

Energy's Connoisseur speaker series consists of five models, ranging from the compact two-way C-1 to the floor-standing three-way C-8. Each of them uses a single 1-inch aluminum-dome tweeter and one or two 5½-, 6½-, or 8-inch woofers in a vented enclosure.

The two-way C-2 is one up from the smallest and least expensive speaker in the line. Our test samples were finished in a piano-like glossy black; high-gloss rosewood (see photo) is also available. Four gold-plated terminals are recessed into the C-2's rear panel — two for the woofer and two for the tweeter. They are paralleled by gold-plated jumper straps, which can be easily removed for biwired or bi-amplified operation.

The injection-molded woofer cone is made of a polypropylene material with embedded aluminum flecks that give it a metallic appearance. According to the manufacturer, this construction results in an extremely high stiffness-to-weight ratio compared with more conventional cone materials.

The C-2 has a unique front-panel structure, which Energy calls Spherex. Removing the grille reveals that the entire front of the cabinet is covered by a contoured gray panel with a vel-

vet-like feel (though it's obviously solid). The panel is divided roughly into thirds, with the tweeter at the top, the woofer in the middle, and the bass port in the bottom third. Energy says that the rigid but nonresonant Spherex panel provides complete mechanical isolation between woofer and tweeter, resulting in improved spaciousness, imaging, and detail. "Interloc" bracing is used within the cabinet to minimize resonances and the resulting sound coloration.

Energy suggests placing the C-2's on stands positioned at least a foot away from any room boundary, and we followed that recommendation, using a pair of very sturdy 22-inch iron stands (not a part of the C-2 system) that were provided for our tests.

The C-2's measured room response,

DIMENSIONS: 9¾ inches wide, 17¾ inches high, 9¾ inches deep

WEIGHT: 18¾ pounds

FINISH: glossy black or rosewood

PRICE: \$600 a pair

MANUFACTURER: Energy Loudspeakers, Dept. SR, Audio Products International, 3641 McNicoll Ave., Scarborough, Ontario M1X 1G5; telephone, 416-321-1800

averaged for the left and right speakers, was exceptionally uniform, varying less than ± 3 dB from 60 Hz to 20 kHz. The close-miked woofer response, including the contribution of the port, was within ± 6 dB from 30 Hz to 1.8 kHz (the tweeter's nominal crossover frequency).

Impressive as that measurement was, it was eclipsed by an MLS quasi-anechoic response that was flat within ± 1.25 dB from the lower measurement limit of 300 Hz up to 20 kHz except for a slight resonant peak at 17 kHz, which boosted the response 2 dB before it returned to the average 0-dB level at 20 kHz.

That is outstanding performance for any speaker, let alone one in the price range of the C-2. Does it have a corresponding effect on the audible quality of the speaker's sound? Stay tuned . . .

The nominal impedance of the C-2 is 6 ohms. Our measurements confirmed the validity of the rating, although the impedance dipped slightly at 30 and 180 Hz, reaching a minimum of around 4 ohms. The maximum impedance was between 15 and 18 ohms, and at most frequencies it was between 6 and 8 ohms. Most amplifiers won't have a problem driving this speaker.

The system's horizontal dispersion was excellent, with only about a 5-dB drop in output in the octave above 10 kHz at 45 degrees off the forward axis. In other words, the highs don't disappear when you move off center. The off-axis response also roughened somewhat, with a noticeable dip in the crossover region. The rated sensitivity of the C-2 was 88 dB sound-pressure level (SPL) at 1 meter with a random-noise input of 2.83 volts (1 watt into 8 ohms). Our measurement of 87 dB essentially confirmed this specification.

We measured distortion at our standard 90-dB SPL, which the speaker attained with a 4-volt drive level. Distortion was inaudibly low throughout the speaker's frequency range down to around 100 Hz, where it reached the 1-percent level. Below 100 Hz distortion increased rather rapidly, though it only hovered around audibility with test tones and was never audible as such with music. Measured distortion also increased rapidly as the drive level was raised. While this performance is good for a speaker of the C-2's size, the C-2 would obviously be better off in smaller listening rooms where it won't have to be pushed hard to produce loud volumes with music.

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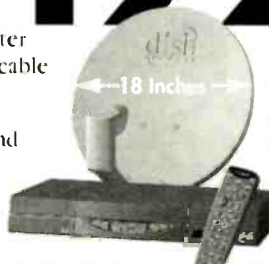
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On the other hand, the speaker's measured performance at higher frequencies suggests that it would sound excellent if supplemented with a powered subwoofer. To obtain any distortion-lowering benefit from such a hookup, you must use a powered subwoofer with built-in high-pass loopback filtering and somehow hook this filtering into the system-amplifier chain (some high-end amplifiers already contain such filtering). Ideal for such hookups are amplifiers and receivers with pre-out/main-in connections. The high-pass filtering will remove the low bass from the signals feeding the C-2 and shunt it to the subwoofer, which will greatly reduce the C-2's distortion contribution, increase its power-handling capability, and extend the system amplifier's headroom. When we tried such a hookup, we found it had all the benefits we expected.

Following our usual practice, we listened to the C-2 speakers daily (without a subwoofer) for a couple of weeks before making any measure-

The Energy C-2 speaker
consistently delivered
clean, well-balanced sound
with no audible
performance anomalies.

ments so that we could become familiar with their sound quality and its pluses and minuses. Our impression was overwhelmingly positive. I found the Energy C-2 to be one of the more appealing speakers I have used.

With a variety of recordings and FM broadcasts, the C-2 consistently delivered clean, well-balanced sound, with none of the audible anomalies that can detract from a speaker's performance (tubbiness, shrillness, and so forth).

These desirable qualities have not been achieved at the price of bass response — quite the contrary! The bass was solid and strong when required, without being boomy. By the same token, without a hint of harshness, the highs produced by the C-2 extended to the limits of human hearing. The C-2 had the flattest measured on-axis response I have yet found in a conventional full-range speaker. All of this comes in a handsome and affordable package, too.



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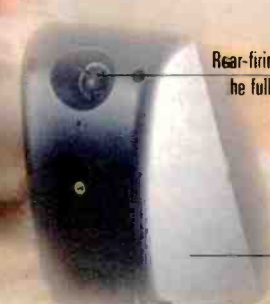
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by identical black cloth grilles, which are retained by rubber fittings and easily removable. The entire cabinet, whose front side edges are beveled, is finished in an attractive oak-grain vinyl veneer (black is also available). The dual binding-post connectors, recessed into the rear of the cabinet, accept single or dual banana plugs, wires, or lugs. The V-504 comes with spikes, but their use is optional and they can be removed.

At the bottom of the rear panel is a single port serving both woofers. Although the opening is 3 inches in diameter, the effective internal diameter of the bass duct is reduced by a patented plastic structure that is said to create a venturi effect, keeping the air pressure in the bass-reproducer system constant. According to the manufacturer, the audible benefit of this feature is reduced distortion in the low bass. In any case, the insertion of a venturi tube in the bass duct path presumably creates a more desirable acoustic load for the woofers.

Following B-I-C's recommendations, we placed the V-504 speakers at the front of the room, about 8 feet apart, 3 to 4 feet from the wall behind them, and 3 to 4 feet from the side walls. Although the ultimate sound of any speaker is influenced by room boundaries, placement is especially important for a bipolar (or dipolar) speaker. Because a substantial portion of its output is reflected from the wall behind it before reaching the listener, the distance from that wall affects the spaciousness of the overall sound. Fortunately, although the reflected sound is important, it is only a part of the total output of the system, which will function well as long as the speakers are at least 8 inches in front of the wall. We did not use the V-504's optional spikes for our tests.

We measured the room response of the two speakers with the microphone about 12 feet in front of the left speaker. The responses of the left and right speakers, which were quite similar, had the unavoidable fluctuations resulting from the speakers' interactions with the room boundaries, but their average was an unusually uniform ± 5 dB from 20 Hz to 20 kHz.

The close-miked bass response of the system, with the microphone close to the woofer cone, was flat within ± 4 dB from 60 Hz to 3 kHz. The contribution of the port extended down to 20 Hz, although its magnitude was obviously reduced. A better indication of

B·I·C V-504 Speaker

JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES

The V-504 bipolar speaker system, from B-I-C America, is a recent addition to the company's Venturi Series. Like its slightly larger companion, the V-604, it is a two-way, ported system designed in the popular columnar format.

The V-504 contains two identical speaker groups, each consisting of a 5-inch cone woofer and a 3/4-inch dome tweeter crossing over at 5 kHz. The two sets of drivers are located near the top of the cabinet, one facing front and the other to the rear. Since the V-504 is bipolar, its driver sets operate in phase,

unlike a *dipolar* speaker, which is similar in basic design but has two groups of drivers operating in opposite phase.

Both groups of drivers are covered

DIMENSIONS: 7 inches wide, 35 3/4 inches high, 13 inches deep

WEIGHT: 32 pounds

FINISH: oak or black wood-grain vinyl

PRICE: \$550 a pair

MANUFACTURER: B-I-C America, Dept. SF, 887-B Hampshire Rd., Stow, OH 44224; telephone, 330-928-2011

the system's bass performance came from measuring its bass distortion at the input level (2.83 volts) that produced a 90-dB sound-pressure level (SPL) at 1 meter. The distortion was about 1 percent or slightly less from 150 Hz to 1 kHz and fell to 0.6 percent at 3 kHz. It rose to 2 percent at 80 Hz and was only 5 percent at 35 Hz. That's excellent performance for any speaker, especially considering the V-504's size and driver complement.

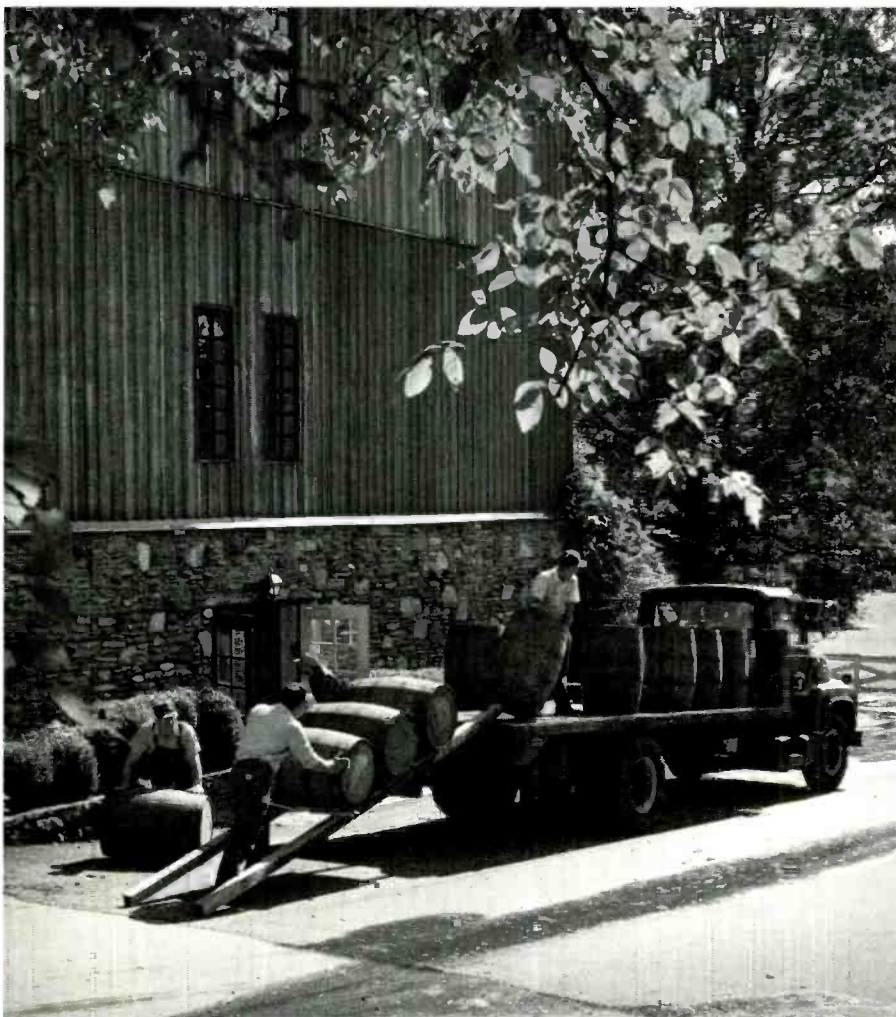
The nominal impedance of the V-504 is 6 ohms. Its measured impedance was about 3.5 ohms from 20 to 30 Hz and from 150 to 300 Hz, with impedance peaks of 5.5 ohms at 25 Hz and 12 ohms at 75 Hz, and it rose steadily to the maximum of 30 ohms at 4 kHz before dropping to 5 ohms at

**The B-I-C V-504 produced
the spacious sound
quality typical of bipolar
speakers as well
as clean, deep bass.**

20 kHz. Although there were very few frequencies at which the impedance actually was 6 ohms, that appears to be a reasonable rating.

Listening tests of the V-504 were generally consistent with our measurements. Not only did the system produce the airy, spacious quality typical of bipolar speakers, but its freedom from coloration was evident when playing a variety of music.

Although the B-I-C V-504 is a relatively compact tower speaker, it produced clean, deep, and non-boomy bass when that was called for. Playing the subwoofer evaluation track of the Delos "Surround Spectacular" test CD (DE3179), which spans the range from 160 to 20 Hz in a 1-minute sweep, confirmed that the speakers delivered a palpable fundamental bass output down to the 30-Hz region or below. That performance is *not* typical of speakers of similar size and driver complement that we have tested. Best of all, the bass was not plagued by the tubbiness or muddiness that can occur when the low-bass output of a small driver is extended beyond its reasonable limits. All in all, the B-I-C V-504 is an impressive speaker for its size and price. □



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PREMIER

Are You Ready For...

According to its proponents, the DVD will be the greatest consumer product ever invented. It will be the engine that propels the doctrine of "convergence" into households and businesses around the world. The entertainment and computer industries will be merged as digital audio, video, and multimedia are given a fast storage medium with massive capacity. The CD will be a mere ripple in the pond compared to the tidal wave of changes engendered by the DVD.

According to its detractors, the DVD will be a dud. It will be doomed to a short and tormented life filled with corporate hesitation, consumer confusion, format incompatibility, copyright and copying controversy, and governmental legislation. The CD succeeded because all parties understood and were in agreement with its applications. The DVD will drown in its own all-things-to-all-people hype and end up as a costly boondoggle.

The truth probably lies somewhere

between these opposing views. The DVD format is a technological invention of impressive dimensions, but the vast number of potential applications for that technology will surely create some market confusion. Just how much remains to be seen.

DVD Basics

The compact disc revolutionized the music business, so it's not surprising that its success encouraged electronics manufacturers to seek a similar revolution in video. They dreamed of a small optical disc, encoded with both digital video and audio, that could hold an entire motion picture. Numerous manufacturers pursued the dream, but early in 1995 two technologies emerged: Toshiba's Digital Video Disc and the Sony/Philips MultiMedia Compact Disc. The formats were similar but incompatible, and throughout the year the two sides, under pressure from the computer industry in particular, sought a single standard. The rec-

onciliation was achieved in September 1995, and in December the unified DVC format was announced.

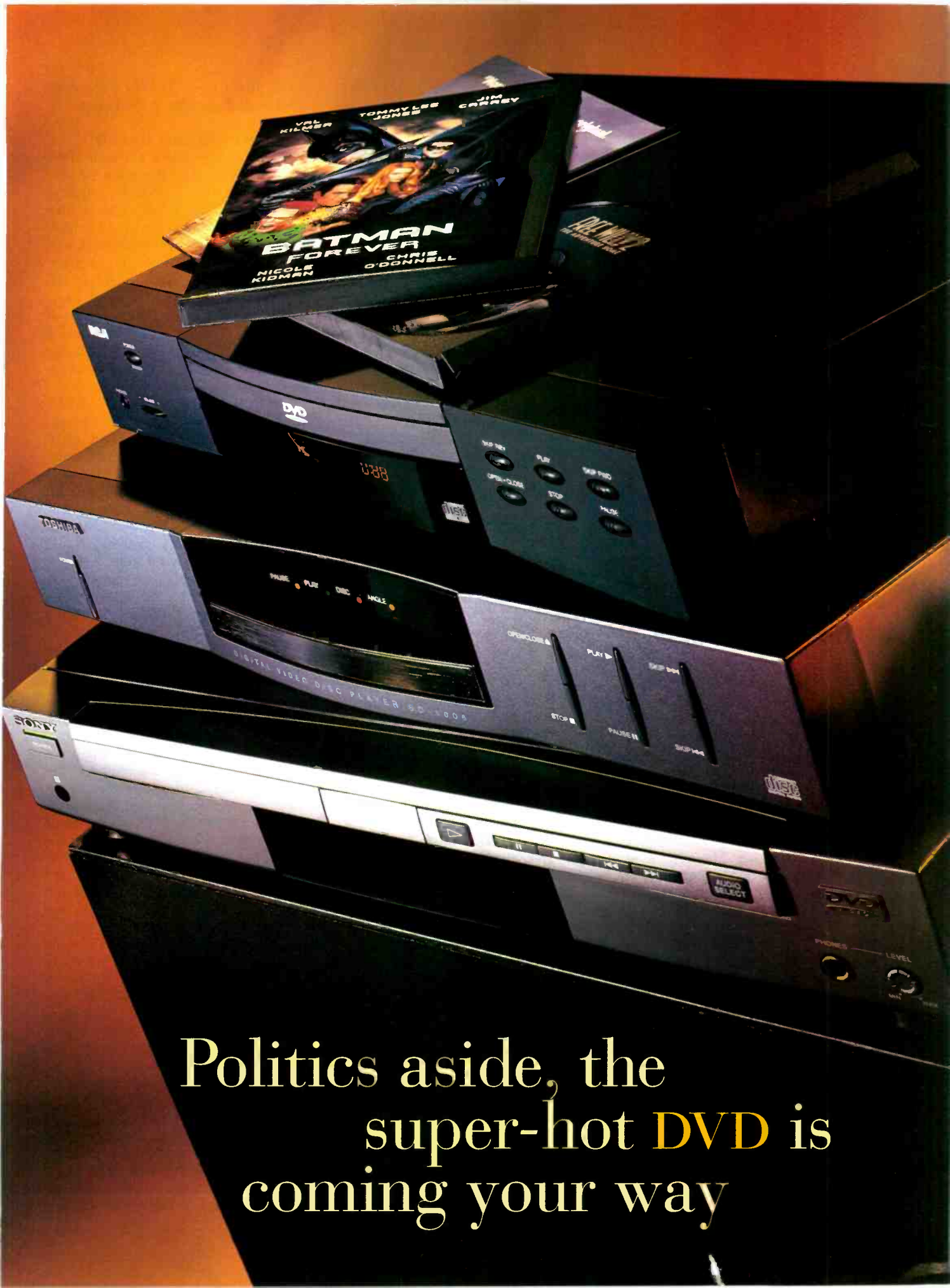
One DVD disc can hold a full-length movie in digital video with multiple 5.1-channel digital soundtracks. Alternatively, a DVD can hold many hours of high-fidelity music or several gigabytes (GB) of computer data. Because the scope of its applications far exceeds digital video, the unified format was originally dubbed Digital Versatile Disc, though the name was weakly received, and today the format is simply referred to by its initials. Whatever the jargon, DVD's mission will be to challenge the CD in both the music and computer software markets and VHS tape in the video market — and ultimately to replace these formats, two of the world's most widely used technologies.

At first glance, a DVD disc looks a lot like a CD. In fact, it has the same diameter (120 millimeters, or about 5 inches), the same thickness (1.2 mm).

PHOTO BY DAVE SANCHEZ

DVD?

by Ken C. Pohlmann



Politics aside, the
super-hot DVD is
coming your way

DVD

and the same brilliantly shiny surface. But closer physical examination shows that where a CD uses a single polycarbonate substrate, a DVD actually has two 0.6-mm substrates bonded together. In a regular "single-layer" DVD, one substrate holds the data layer, and the other is blank.

There are other differences as well. For example, data tracks on a DVD are a mere 0.74 micrometer (μm) apart, compared with 1.6 μm apart on a CD. Moreover, the pits and lands that store the binary data can be as short as 0.4 to 0.44 μm (depending on the disc type), compared with 0.83 μm on a CD. These small dimensions are possible because the laser beam used to read DVD's has a wavelength of 635 to 650 nanometers, versus the 780

the gold, semi-reflective layer first. Depending on where it's focused, the beam can be made to bounce off this layer, in which case its data will be read, or to pass through the gold layer to the aluminum layer beyond. The laser can quickly switch from one layer to another, and a buffer memory makes the transition indiscernible.

Applying this concept to a two-sided disc will allow future DVD's to hold up to 17 gigabytes of data. In addition, the DVD standard also calls for a smaller disc that's 8 centimeters, or approximately 3 inches, in diameter and can hold either 1.4 or 2.6 GB. To make the most of this complex disc real estate and to protect the data, the DVD system employs a new channel-modulation code called 8/16 modulation

layer discs (see "DVD's First Act" by Joseph Palenchar in this issue).

The Eyes and Ears Have It

Anyone who ponders a 5-inch DVD and a 12-inch laserdisc side by side can't help but wonder how they squeeze the same Hollywood blockbuster that fills two or more sides of a laserdisc onto such a small DVD disc. Although the 4.7-GB capacity of a DVD is impressive, it does not completely answer this question. A full-length movie may comprise over 300 gigabytes of data; a DVD would hold less than 2 minutes of it. Therefore, the DVD also requires a powerful data-reduction algorithm.

The DVD standard uses the MPEG-2 data-compression algorithm to encode its video program. This algorithm, developed by the Motion Picture Experts Group, analyzes the digital video signal based on psychovisual models of how viewers perceive images. Image information that is deemed redundant from frame to frame, would not be perceived by the human eye, or would be only marginally perceived is then removed from the signal before the movie is stored on the disc. During playback, an MPEG-2 decoder in the DVD player uses encoded data to reconstitute the video signal. Using this method, as much as 95 percent of the uncompressed digital video data can be withheld from the disc without causing significant degradation of the picture.

Because some pictures are more difficult to encode than others, the MPEG-2 standard allows for a variable bit rate. To optimize disc space, simple pictures, such as static frames or low-motion sequences, are given a low bit rate, while complex pictures, such as high-motion sequences, are given a high bit rate. DVD's maximum output bit rate for video, audio, and auxiliary data is 10.08 million bits, or megabits, per second (Mbps), while the average bit rate is 4.692 Mbps. In contrast, the CD has a fixed bit rate of just 1.41 Mbps. When all is said and done, a single-layer DVD can store up to 133 minutes of high-quality digital video with several multichannel digital audio soundtracks. That's enough to accommodate over 90 percent of all feature films, and longer movies can be put on dual-layer discs.

The MPEG-2 algorithm is widely used for a variety of applications, including professional video equipment and digital satellite television transmission, where it delivers outstanding



RCA's RC5500P DVD player (\$599 to \$649) will have a built-in Dolby Digital (AC-3) decoder. The less expensive RC5200P (\$499 to \$549) is pictured on the previous page.

nanometers for a standard CD laser. All of these factors add up to a huge storage capacity. A single-layer DVD holds 4.7 GB of data, about seven times the capacity of a CD.

Moreover, the DVD standard allows data to be placed on two layers, one embedded beneath the other, to allow storage of up to 8.5 GB of data. These "dual-layer" discs are cleverly constructed by first molding a 0.6-mm substrate and metalizing the data-layer surface with opaque aluminum, similar to a regular CD. A second substrate is then molded, and its data layer is coated with a gold "semi-reflective" layer that is somewhat transparent. Finally, the two substrates are bonded together. An alternative method calls for coating the first substrate with a semi-liquid layer of "photopolymer" resin. The extra data pits are pressed into the resin with a mold, then the layer is hardened with UV light and metalized.

Either way, the beauty of a dual-layer DVD is that *both* layers can be read from just *one* side of the disc simply by refocusing the reading laser. When the beam hits the DVD, it encounters

(replacing the CD's EFM code) and a new error-correction code called RS-PC (replacing the CD's CIRC code).

DVD hardware will come in a variety of guises. Most home DVD players will be used in a home-theater system for playing movies stored on DVD's, just as today's laserdisc players do. And like laserdisc players, DVD players are expected to play audio CDs, though DVD's, at least in their first incarnations, will not be playable on conventional CD players (see "Hail the Son of CD" on the last page of this article). It's important to note here that, though virtually all DVD players will be able to play CD's, hardware manufacturers are not required to include this feature.

DVD-ROM drives, meanwhile, will be connected to personal computers and function much the way today's CD-ROM drives do. The DVD-ROM drives are expected to play DVD movie discs and CD-ROM's. (It is possible, however, that some older CD-ROM's will not be playable on the new drives.) Existing CD-ROM drives will not play DVD's. All first-generation DVD players and drives are expected to play both single- and dual-

picture quality. In fact, DVD will use a higher bit rate than is currently used in satellite TV applications, so its picture should look even better. And DVD's picture will improve over time: The MPEG-2 algorithm is specifically engineered so that refinements can be made to the encoding process while retaining complete compatibility with existing decoders. The look of video software titles will get better and better, with the improvements visible on all current and future DVD players.

Of course, even the best algorithm can be wasted in the hands of the wrong engineer. Just as the sound quality of a music CD depends largely on the skills and talents of the technicians in the recording studio, DVD picture quality is ultimately determined by the care and expertise of the picture encoding — a multipass process that requires both engineering and artistic know-how. Encoding studios charge up to \$100 per minute for MPEG-2 coding, and only the best studios can do a truly outstanding job. In other words, some DVD titles will look great, but others may not.

Assuming you start with good software, some high-end DVD players will also allow an additional boost in picture quality by offering a component-video output. This format, used in professional video recorders, provides higher resolution by avoiding the carrier frequencies used in composite-video signals. But with either component- or composite-video output, most critics find that the digital picture quality of DVD rivals or surpasses the picture from the analog laserdisc.

To match its video capabilities, the audio portion of the DVD standard offers similarly high signal quality and tremendous flexibility. Compared with digital video, digital audio requires only a small amount of storage capacity. Thus, DVD movie recordings can carry *three* independent 5.1-channel

Toshiba's least expensive DVD player will be the SD-1006 (\$599).

soundtracks comprising five main channels plus a subwoofer channel.

The DVD standard recognizes two different 5.1-channel formats: Dolby Digital (formerly known as AC-3) and MPEG-2 surround sound. Titles released in the U.S. will generally use Dolby Digital, and those released in Europe will use MPEG-2 audio coding. Both systems have an output bit rate of 384,000 bits, or 384 kilobits, per second (kbps) and provide excellent sound. A two-channel surround soundtrack compatible with Dolby Pro Logic decoders can also be derived by the DVD player from the Dolby Digital 5.1 bitstream. In total, the DVD standard allows a movie disc's audio capacity to be broken into eight data streams containing Dolby Digital or conventional PCM audio, allowing, for example, soundtracks in multiple languages.

The DVD standard also throws in a number of other special features. There is a parental lock-out function to prevent little Jimmy from watching an R-rated movie. Movies could even be coded to play different versions, skipping potentially offensive scenes and plugging in alternate camera angles and dialogue tracks according to the lock-out level. Similarly, a title could be released with both a theatrical and director's cut of the film on the same disc. DVD also supports both normal (4:3) and widescreen (16:9) aspect ratios. Of course, these features are options, and implementation is left to the film studios. Chapter division and forward and reverse scanning, features that are familiar to laserdisc afi-

cionados, are supported in the DVD standard as well.

The Politics of DVD

Without question, DVD picture and sound quality are superb. Nothing in today's world is simple, however. Case in point: At this writing, no one knows exactly how DVD will ultimately be presented to consumers. Indeed, the political questions surrounding DVD are probably more complex than the technological issues that had to be surmounted to make it a reality.

The economics of the movie-rental business is being redefined as direct satellite pay-per-view comes to millions of homes. The question is, how will DVD movies fit into this new environment? One camp argues that consumers will want to buy and own DVD's, so DVD releases should be sold cheaply, for \$20 or so. The opposing view argues that DVD movies should be priced high and rented to consumers through the traditional system used for videocassettes.

For example, a typical movie videocassette today sells for \$60; that price factors in the studio's "share" of profits from rentals. Most film-industry profits come from a relatively few successful movies, and studios charge more for the most desirable ones. Will this be the model followed for DVD? Or will the studios try to turn consumers into DVD collectors with low-priced blockbusters, as some are now leaning toward?

Copy protection is another burning issue for DVD. The format's extremely high quality makes it eminently tempting to copy movies. Consumer-electronics manufacturers, movie studios, and computer concerns are thus cooking up the Video Home Recording Act for forwarding to Congress. Some movie companies have flatly stated that they will not release DVD titles until this law is in place.

As a consequence of the legislation, it is expected that something called the Copy Generation Management System (CGMS) will block digital dubbing of DVD's, while a version of the



Sony plans to participate in the launch of DVD but at press time had not announced product or pricing information. A prototype Sony DVD player is shown here.

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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

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Tower III



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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.**

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Because it has even more cone area.

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Tower II

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,

"Selling direct allows Cambridge SoundWorks to price speakers hundreds of dollars below the competition." - *Inc. magazine*

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.

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Tower II by Henry Kloss™

Tower II is a three-way system that is substantially larger than *Tower III*. It features two 8" woofers with polypropylene cones and rubber surrounds, a 5 1/4" midrange driver with polypropylene cone and rubber surround, and a 1" soft-dome fabric tweeter. A flared low-frequency vent is located at the lower rear of the enclosure.

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 long-throw drivers is enough to handle the most demanding of video soundtracks, while their dispersion is broad enough to include all listening positions. In the most elaborate home theater



CenterStage

systems, two *CenterStage* units can be used vertically (one to each side of the TV) for optimum dispersion – and an audio focus perfectly centered on the picture. It is finished in black vinyl. Factory-direct price: **\$349.**

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DVD

Macrovision technology now used to hamper videocassette copying will prevent analog dubbing. In other words, through a combination of federal law and copy-guard technology, you will not be able to make a copy — analog or digital — of any DVD movie. Ironically, this makes digital satellite broadcasts even more attractive, because those MPEG-2 digital transmissions can be recorded on analog VHS cassettes or perhaps even on future digital D-VHS recorders. Another note: Under the current law (which was heavily lobbied for by the recording industry), American consumers are allowed to make one direct

copy at a time of the digital data on their CD's, and, in fact, we pay extra taxes and tariffs to the recording industry for that right. Is it now fair to change the rules for DVD?

Recordability raises other issues as well. Movie studios are clearly uncomfortable with the idea of consumer-electronics manufacturers selling DVD recorders that will allow you to make your own DVD discs. But the computer industry very much desires recordability. For now, at least, it's a moot point. Whereas MPEG-2 decoders are relatively simple, the encoders certainly are not. These are sophisticated circuits, and it will be

many years before DVD recorders even begin to approach consumer affordability. And that raises another tough question. Consumers are used to the utility of their VCR's, and the vast majority are probably satisfied with VCR picture and sound quality. Will the mass market buy into a new format that cannot record, regardless of how good it looks and sounds?

Wait — there's more. Hollywood uses an ingenious release schedule to maximize film profits. As you've probably noticed, films released in the U.S. only appear on tape, laserdisc, cable, or satellite *after* the theatrical run is over. Then the same films are theatrically released in Europe and other foreign markets. Since the Europeans use the PAL television system, which is incompatible with the NTSC system in the U.S. any video sold here is useless in Europe. Until new films are released on PAL media, Europeans can see them only in theaters.

This timetable would be upset if DVD's were released in a worldwide compatible format — easy to implement for a digital disc. Consumers in Britain, for example, might buy (or rent) U.S.-released DVD's instead of going to the theater. The answer, to some, is to build incompatibility into DVD; flags would be inserted into the data stream so that a U.S. player would only play discs intended for the U.S. market. Will DVD sales suffer from this contrived incompatibility?

Because of these many unanswered questions, no one can predict how successful DVD will be. At best, it will eclipse the CD, CD-ROM, and VHS markets, creating a new universal carrier for all types of digital data and entertainment. At worst, it will probably ride on the coattails of CD, slowly finding an audience as its greater utility comes to be appreciated. In that case, DVD would end up as a small-diameter laserdisc, successfully occupying an obscure niche market.

One thing is certain, though. From a technology standpoint, DVD is a worthy successor to CD and absolutely embarrasses the sadly obsolete VHS medium. The opportunity to enjoy movies via high-quality digital video and multichannel audio, on a single 5-inch disc, will win DVD many admirers. Whether its enthusiasts number in the millions, or the hundreds of millions, will ultimately depend not on the technology, but on the businessmen, politicians, and fickle consumers who now control its fate. □

The first DVD products to hit the market will be DVD movie players and DVD movie discs. In the minds of its corporate fathers, this is DVD's target market. But the availability of a storage space that is seven times as great as that of a regular CD is an appetizing prospect for the music industry, too. Relieved of the need to accommodate video data, a DVD could hold up to 9 hours of stereo music. The question is, exactly what kind of music format is most appropriate for such a disc?

Several music-only DVD proposals have been advanced. Most of them argue for a quantization word length and sampling frequency that exceed the CD standard's 16 bits and 44.1 kHz, and they also call for surround-sound playback. For example, one group of audio industry professionals calling itself the Acoustic Renaissance for Audio has proposed the High-Quality Audio Disc (HQAD). This format would dictate a word length of up to 24 bits and a sampling frequency of 96 kHz. The HQAD would support 5.1-channel sound using PCM coding with "lossless" data compression, in which data is efficiently packed on the disc without throwing any away. In addition to high-density audio tracks, the HQAD would also contain regular CD tracks on the outermost layer so that these tracks could be played on existing CD players. This eliminates the need for record stores to carry dual inventory — something they would welcome. With this sort of implementation, a multichannel HQAD would have a playing time similar to that of a CD.

Other manufacturers, such as Sony with its Direct Stream Digital (DSD) format, have argued against using good old PCM coding and instead maintain that a bitstream (or 1-bit) coding method would provide higher fidelity. In some ways, this coding method is appealing because of its relative simplicity. Using bitstream, audio data could be coded with 1-bit words at a very high sampling rate, yielding an audio bandwidth of 100 kHz and a dynamic range of 120 dB. A PCM channel with similar sound quality uses only about one-quarter as much storage capacity, however, so bitstream coding is relatively inefficient. Consequently, it would be difficult for a bitstream audio

Hail the SON of CD

DVD to store all the information required for surround-sound channels, even on a double-layer disc. In addition, bitstream coding may be more sensitive to jitter problems.

One question that remains to be answered is whether DVD movie players will be able to play music-only DVD's. The answer is a definite "maybe." Because no one knows yet what the specifications of the audio DVD will be, it's impossible to know whether it will be compatible with DVD movie players or whether it will require the engineering of special DVD audio players. Currently, the Japan Audio Society is evaluating proposals for DVD audio and will make a recommendation to the DVD corporate forces. They will ultimately decide on an audio-only format and include it in the overall DVD standard. The current impetus is to get DVD movies into the consumer market as quickly as possible, so the audio DVD is of secondary concern. But sooner or later we'll get our first glimpse of this son of CD. — K.C.P.

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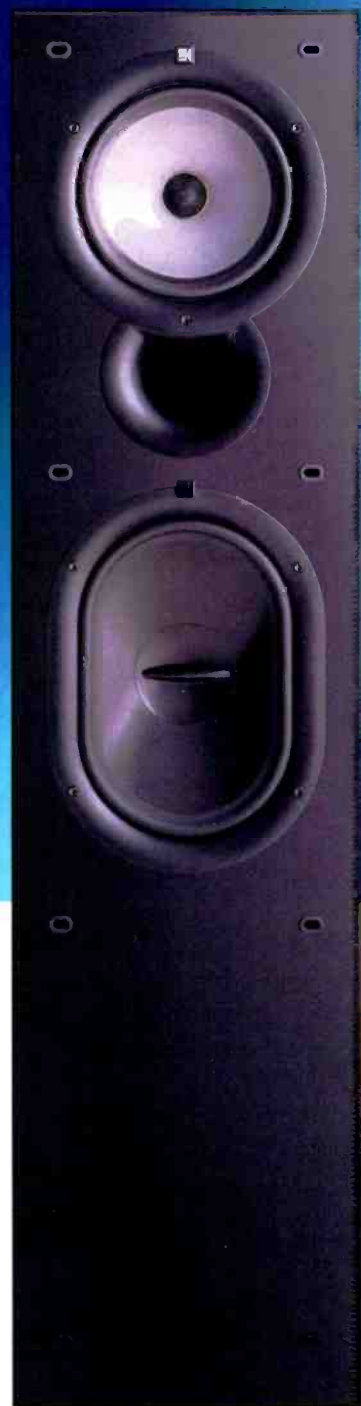
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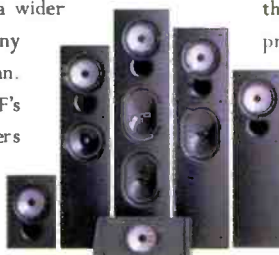
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With the new Q Series, the competition has been decisively out-classed. The difference is clear.

Q
SERIES



The experience
of sound

DVD's First Act

by Joseph Palenchar

Innovative DVD players are waiting in the wings

If DVD performs as advertised, few home-theater enthusiasts will think twice about making room for a DVD player in their audio/video cabinets. The new video format will dazzle their eyes with high-resolution images that are almost as sharp as film studio masters, delight their ears with six discrete channels of Dolby Digital (AC-3) surround sound, and deliver remarkable options for picture aspect ratio and other parameters.

But with so many impressive qualities written into the DVD standard, some enthusiasts might legitimately wonder if there's any reason, other than discounts or retail promotions, to favor one model of player over another. Rest assured, however, that not all DVD players will be created equal.

For example, eight manufacturers have publicly pledged to participate in DVD's U.S. launch, but among them only Toshiba and Samsung have announced plans to offer models with "component-video" outputs that push picture quality to the extreme. When mated with a compatible high-end video display, these outputs take a dramatic step toward taming dot crawl, moiré effects, and other artifacts com-

mon to sets using the North American NTSC TV standard.

Thomson Consumer Electronics (maker of RCA and ProScan gear) and Panasonic will also contribute to DVD's diversity by building Dolby Digital surround decoders into selected models. If linked to A/V receivers or other components with the required inputs, the players will deliver five discrete full-range audio channels and a low-frequency effects channel without requiring the purchase of a separate Dolby Digital decoder.

Pioneer, meanwhile, expects to give people something to talk about when, in a nod to consumers who already own substantial laserdisc libraries, the company delivers a pair of DVD players that can also play back 12-inch laserdiscs. Pioneer reckons that it'll be some time before the selection of DVD discs rivals the 8,500-title catalog of laserdiscs, giving these machines additional appeal.

Most of the DVD players due from Pioneer, RCA, Toshiba, Panasonic, and Samsung will cost from \$499 to \$699 after retailers' discounts, although Pioneer's top model is expected to sell for around \$1,599. Philips

and Sony have also pledged to participate in DVD's launch, though at our press time they hadn't announced price or product details because of continuing uncertainty over the timing of DVD's debut (see "Waiting for DVD" on the next page). Zenith, which says it will also be among the first DVD manufacturers, had not released detailed information about the two models it has announced, the DVD2000 (about \$499 after discounts) and the Inteq IQ2100 (about \$599 after discounts). Other manufacturers who have shown DVD prototypes at trade shows include Fisher, Onkyo, Goldstar, and Denon, which has previewed a unit it developed with Hitachi.

All the players announced thus far share some basic attributes. In terms of picture quality, all of them — given an adequate display monitor — will achieve 480 horizontal lines of video resolution, exceeding both the 240-line resolution of a VHS VCR and the already crisp 425-line image put out by laserdisc players. They will play both single- and dual-layer DVD's, and, though it is not a mandatory feature for DVD players, all the new machines will also play existing music CD's. They will offer line-level stereo audio outputs, composite-video and S-video outputs (to increase brightness and enhance color separation), and a Dolby Digital bitstream output to feed an outboard Dolby Digital decoder.

Parental-control functions will be standard on all DVD players as long as discs are encoded by the movie studios for this feature, as will be interac-

DVD

tive capabilities that might allow, for example, multiple endings or camera angles for a movie or access to extensive filmographies or other encoded information. Similarly, chapter and track breaks for navigating movies and music recordings will be accessible with search controls found on all DVD players.

Also standard for all players, but dependent on the disc content, will be the ability to select up to thirty-two different subtitle tracks, eight different audio dialogue tracks, and multiple aspect ratios. A movie encoded in its original widescreen version, for example, could be switched between cropped 4:3 pan-and-scan mode (in which scenes are reframed to fit the TV screen), 4:3 letterbox, and a true 16:9 widescreen format that delivers a full-screen picture to a 16:9 monitor without the distortion and loss of resolution found when 4:3 letterbox pictures are digitally expanded to fill the screen. Both the widescreen and pan-and-scan versions of a film could be

Launch Update

Waiting for DVD

While DVD has broad support among consumer-electronics manufacturers, the movie community, and personal-computer makers, the format's launch date has hinged on the progress of copyright negotiations among the three groups as well as licensing discussions among the ten or so companies that hold patents on DVD technology. While the licensing issues should be resolved in a timely fashion, at press time the copyright talks were dragging on.

protection legislation that would, along with its DVD provisions, also bar consumers from making copies of digitally delivered pay-per-view programming and permit only one copy of a digital premium-cable program.

At press time, the hardware and software communities were also working out the details of a regional-coding scheme sought by the movie studios to gain greater control over distribution. Regional coding would prevent discs intended for sale in one part of the world from being played back on DVD players sold in another. The solution would ease studios' concerns that DVD movie discs intended for sale in the U.S. would find their way to a foreign market before or during the film's theatrical release there, knocking box-office sales for a loop.

As of this writing, however, there was only preliminary consensus among the three industries on which of several proposed encryption systems should be used for DVD, and Congress had gone into recess, making it doubtful that a new copyright act could be placed on the books in 1996. Even if an agreement is reached, it's questionable whether the movie industry would participate in a launch this year without a copyright law in place.

Regardless of whether the rollout occurs this year or next, it's not clear just how many titles will be available for DVD's launch. Once the industries are in accord on an encryption technology, the studios should begin digitizing selected films for discs, which are expected to carry suggested retail prices of up to about \$24.95. If the discussions wrap up quickly, companies such as Panasonic, RCA, Toshiba, and Philips have said they're prepared to deliver players this fall. But that wouldn't give the studios much lead time to deliver many discs to coincide with the hardware



Panasonic's DVD-A300 player will have an on-board Dolby Digital (AC-3) decoder, a jog shuttle, microphone and echo controls for karaoke discs, and a universal remote.

stored on separate layers or sides of a DVD, though a dynamic pan-and-scan capability that will also be found in every DVD player means that a pan-and-scan version could be generated by the player itself if the widescreen version is encoded on the disc along with pan-and-scan instructions.

Beyond these common features, DVD manufacturers plan to offer the usual bells and whistles and a few extras to boot. For example, RCA will introduce the RC5200P (\$499 to \$549 after discounts), which will be compatible not only with audio CD's but also with VHS-quality Video CD's. It will have a bright fluorescent display, a dedicated remote control, a front headphone jack with volume control, and programmable playback, which can identify a disc when it's inserted and automatically play back chapters

and several electronics companies were backing away from earlier pronouncements of a late-1996 rollout. Many feared they would have to delay the launch until sometime in the first half of 1997.

Negotiators have been debating various encryption systems and other technologies that would enable studios to prevent the copying of movies from DVD discs to analog videotapes or to future digital media such as digital videotape and recordable DVD's. Without a copy-protection system in place, the studios fear that video pirates will flood the market with high-quality copies duplicated illegally from pristine DVD's.

Terms of an eventual agreement are expected to be written into proposed digital-video copy-

introductions — certainly not the 250 titles that the hardware companies had originally counted on to usher in the DVD era.

And even after the format's debut, it's not certain how quickly new movie titles will make their way into stores. Only two companies, Warner and Columbia/Tri-Star Home Video, have publicly acknowledged plans to ship discs to coincide with DVD's launch. Other software companies, including Turner Domestic and MCA/Universal Home Video, have declined to comment on their plans until the copyright issues are resolved. And home-video studios and labels such as Disney, Fox, LIVE, and Paramount have made it clear that they won't release DVD movies until a market has been established. Depending on your definition of an "established market," that could be a long time.

Despite the reluctance of some software companies to commit, though, consumer-electronics manufacturers remain confident. Panasonic, in particular, has announced that it expects 1,000 DVD titles to be released annually in the U.S. and that annual sales will exceed 400 million discs by the year 2000.

No matter which studios participate in the initial launch, Warner Home Video executives expect the first DVD's to include a diverse mix of movie genres — classics, family entertainment, comedies, and action/adventure — drawn from both new releases and popular movies already available on tape. For its own initial releases, Warner is hinting at the blockbuster *Twister* and is considering movie collections in which a different film might appear on each layer of a dual-layer disc or on each side of a two-sided disc.

Whichever movies accompany players to the DVD debut ball, however, don't expect the first discs to take advantage of all of the format's most intriguing capabilities. As Warner executives explain it, a limited number of facilities for encoding movies will force studios to concentrate initially on cranking out as many titles as they can as quickly as they can. Until production capabilities expand, studios will have little time to add elaborate options to many discs.

On the other hand, many of DVD's unique features will appear in the initial wave of movies. Warner

expects "a great many" of the first discs to deliver Dolby Digital 5.1-channel soundtracks as well as two-channel audio encoded in conventional Dolby Surround for those who haven't yet traded up to Dolby Digital decoders. Some of the first discs will also contain soundtracks in more than one language, subtitles in multiple languages, and the laserdisc's familiar menu-and-chapter structure. Some might also carry a digital code reflecting a movie's MPAA rating to allow a degree of parental control. Future discs might contain a version that could be automatically edited by the player for different ratings.

For movie buffs, one of the format's most desirable options is multiple aspect ratios. Warner expects the initial round of releases to include a handful of discs with this option, some featuring the 4:3 pan-and-scan version on one data layer and the 4:3 letterbox and 16:9 widescreen versions on either a second layer or the flip side. A few of the first discs may also take advantage of DVD's dynamic pan-and-scan feature, which "fits" multiple versions on a single disc mastered with a widescreen picture. Warner admitted, however, that some movie directors will balk at dynamic pan-and-scan because it limits their creative control over the final composition of a 4:3 frame.

Although DVD allows for interactive movies, which would give viewers the freedom to choose plot lines or camera angles, movie studios don't expect to offer them early on — if at all. But if these interactive movies do become available, rest assured that even the lowest-priced DVD players, as a condition for wearing the DVD logo, will deliver them to your TV. — J.P.

in the user's preferred order. The feature is intended mainly for customizing the sequence of songs on music videos.

RCA's more expensive RC5500P (\$599 to \$649 after discounts), on the other hand, will feature an on-board Dolby Digital decoder and digital-to-analog converters to funnel Dolby Digital 5.1-channel soundtracks to an A/V receiver's line inputs. Several new receivers from Denon, Marantz, Technics, and Yamaha, for example, come equipped with the required five or six line-level inputs, as will RCA's RV3798 Dolby Pro Logic A/V receiver (\$499 to \$549 after discounts), which the company plans to introduce to accompany the RC5500P player. With Dolby Digital receivers currently starting around \$1,200, the RC5500P/RV3798 combo is billed as a slightly less costly alternative to buying a DVD player without a decoder plus a Dolby Digital receiver.

The RC5500P will also have a universal remote control, a front-panel shuttle control for precise control of forward and reverse functions, and digital processing for cleaner search, freeze-frame, slow-motion, and frame-advance special effects. Thomson's ProScan PS8600P, which is expected to cost from \$649 to \$699 after discounts, will offer the same features as the RCA RC5500P but adds back-lighting to the remote, gold-plated line-output jacks, and a package of 5-foot-long A/V and S-video Monster Cables.

Pioneer will contribute to the DVD mix with a trio of players, including the industry's first two laserdisc-compatible DVD players: the DVL-700, expected to be on store shelves at about \$999, and the Elite series DVL-90, expected to cost about \$1,599. Key laserdisc features will include two-



Laserdisc collectors won't be left out in the cold with Pioneer's DVL-700 (about \$999 in stores), which will play 12-inch LD's along with 5-inch DVD's and music CD's.

DVD

sided playback, an RF output to deliver a laserdisc's Dolby Digital soundtracks to a decoder, and digital field memory, which delivers crisp freeze-frame and other special effects with extended-play CLV laserdiscs. For convenience, laserdiscs will load through one tray, DVD's and CD's through a second tray.

Pioneer's third announced DVD player, the \$599 DV-500, won't play laserdiscs but will share a host of other features with its companions. These include "condition" memory, which recognizes an individual disc, remembers the way you like to watch it, and automatically selects the right aspect ratio, language, rating version, and so on. A Cinema/Animation mode will optimize picture settings to punch up the color in animated programs and enhance black tint for improved detail and clarity in movies. To enhance picture quality further, Pioneer's threesome will also use 9-bit digital-to-analog (D/A) video converters, exceeding the required 8-bit minimum, and the company's 20-bit Hi-Bit D/A converter for DVD, laserdisc, and CD audio playback.

To the basic DVD and LD features of the DVL-700, the Elite DVL-90 will add a variety of video/audiophile features, including Pioneer's proprietary digital video noise-reduction system to improve color accuracy and minimize picture flicker. It will also have Legato Link digital audio processing, which is said to eliminate the high-frequency "ringing" that can occur on some audio CD's and digital laserdisc soundtracks and to reconstitute high frequencies (20 kHz and up) lost in the CD recording process. Pioneer will finish off the Elite model with a copper-plated chassis said to reject RF noise, rosewood side panels, and a high-gloss black finish.

Delivering on DVD's full potential is the rationale behind the inclusion of



Zenith is expected to offer two DVD players: the DVD2000 shown here (about \$499 in stores) and the IQ2100 (about \$599) under its high-end Inteq brand.

a "component video" output in one of Toshiba's two DVD players. DVD movies will be mastered on discs in "color-difference" form, a type of video signal that breaks down the picture information into three separate components carried on different channels. Players with conventional video outputs will mix down the color-difference channels either to one bandwidth-limited composite-video signal conforming to broadcasting's NTSC transmission standard or to a two-channel S-video output, both of which sacrifice significant color detail compared with the color-difference signal.

But Toshiba's top-of-the-line SD-3006 DVD player (\$699 suggested retail) will intercept the video signal before it's converted and spit out the three channels of information through a component-video output that can deliver a highly detailed picture with superior color purity on monitors or signal processors that have an appropriate interface. Most data-grade video projectors, "line-doubler" video processors, and two new Toshiba rear-projection 16:9 widescreen TV's (with 40- and 56-inch screens) have the requisite inputs to take advantage of this innovation.

Other SD-3006 features will include standard composite-video and S-video outputs, a fluorescent display, and a universal remote control. For \$100 less, Toshiba will offer the SD-1006 (\$599 suggested retail), which will

lack a component-video output, substitute LED function indicators for the SD-3006's more detailed fluorescent display, and come with a dedicated DVD remote.

Samsung will court the high-end audio/video enthusiast with the DVD-760U, which the company hopes to see priced at \$699 after retail discounts. Like Toshiba's top model, it will deliver color-difference signals to high-end video gear, but it will also matrix that signal into RGB form, another type of component-video signal in which each primary color has its own circuit path. This additional option will make the DVD-760U compatible with high-resolution RGB projectors and monitors.

Samsung's model will also play back Video CD's and CD+G discs, usually used for karaoke, and come with a fluorescent display, a universal remote, and a stylish anodized-aluminum front panel. A high-mass, low-vibration steel chassis will help stabilize the laser mechanism so that it reads digital data from a disc as accurately as possible.

Panasonic's DVD duo, which were not priced at press time, will include the DVD-A100 and DVD-A300. Both will play back Video CD's and offer S-video outputs, but if you opt for the A300, you'll get built-in Dolby Digital decoding, a front-panel shuttle control, and a universal joystick remote control in place of a dedicated DVD remote. Two basic karaoke features include a microphone input and digital echo control.



Samsung's DVD-760U DVD player will have a switchable component-video output for either color-difference or RGB signals and a stylish anodized-aluminum front panel.

In the future, competition will undoubtedly force DVD equipment makers to do more to differentiate their products than simply building in a Dolby Digital decoder or a component-video output. Technological breakthroughs such as DVD tend to level the playing field for all manufacturers, but they also give innovative companies the opportunity to surprise us with their ingenuity. Stay tuned. □

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INSIDE DOLBY DIGITAL

UNDO THE COVER of any home-theater component containing a Dolby Digital surround-sound decoder, and somewhere inside you're likely to find a scene resembling the photo at the lower right. It shows a Dolby Digital decoder integrated-circuit chip embedded in its natural environment, a circuit board. The chip itself is a relatively plain-looking device, in this case the first Dolby Digital decoder chip, made by Zoran. From the outside, it resembles many of the chips you'd find if you opened up a personal computer. That's because a Dolby Digital decoder chip is a digital computer, preprogrammed to execute the complex mathematical operations that will be the foundation of the next few generations of home-theater audio equipment.

Why Dolby Digital?

In order to answer that question, we have first to clear up a little terminological disorder. If you've been reading *STEREO REVIEW* steadily over the past couple of years, you will probably already have heard of Dolby Digital, but you may know it as AC-3. Dolby Laboratories, in an effort to reduce consumer confusion, is now limiting the use of the term "AC-3" to the special audio-encoding method used by the Dolby Digital system. "Dolby Digital," on the other hand, refers to an array of Dolby-developed systems, all incorporating AC-3 processing, ranging from theatrical film prints to home video — laserdisc and the upcoming, eagerly awaited DVD digital videodisc and beyond.

Although Dolby Digital is now poised to enter the home-theater mainstream via DVD, the system owes its existence to a technology that also has yet to reach consumers: high-definition television (HDTV). More than ten years ago, the first proposed HDTV

An introduction to the surround-sound system formerly known as AC-3

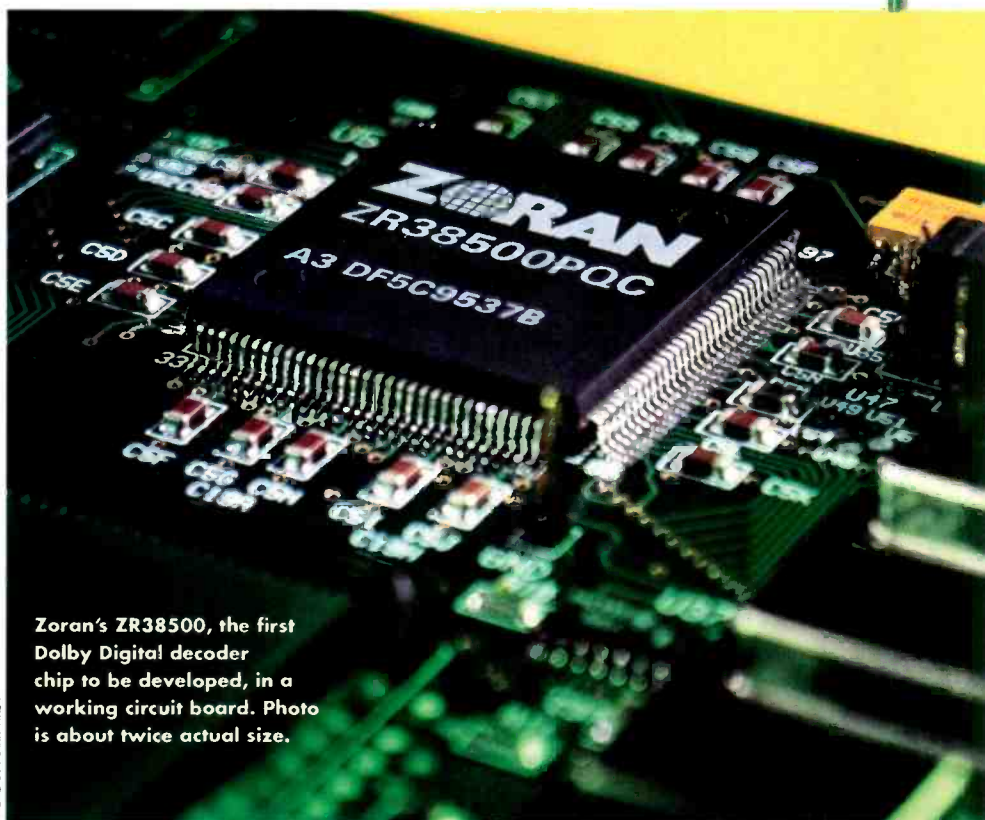
BY DAVID RANADA

systems utilized analog picture transmission coupled with some form of matrixed multichannel digital audio transmission. Matrixing refers to the process by which additional channels — in the case of movie soundtracks,

the center and surround channels — are encoded into a two-channel recording. Dolby Surround is a very popular matrixed multichannel system, but as a potential sound carrier in a leading-edge video technology it leaves a lot to be desired, even if its signals are encoded digitally as they are on Dolby Surround laserdiscs.

Dolby Pro Logic decoding of Dolby Surround recordings, as spectacular as it can sound under optimum conditions, has at least the following significant shortcomings:

- Channel separation is limited by the mathematics of the encoding process, and it is necessary to use sound-steering circuitry (Pro Logic) to en-



Zoran's ZR38500, the first Dolby Digital decoder chip to be developed, in a working circuit board. Photo is about twice actual size.

PHOTO BY MARK VICEK

hance apparent separation. But steering actually prevents certain types of effects that filmmakers might want to achieve, such as having dialogue in the center channel and music *at the same level* in the front left and right speakers. Dolby Pro Logic playback would steer both the music and the dialogue to the center.

- The surround channel is mono even though it is played over two speakers in a normal home-theater set-up. In a theater with multiple surround speakers the mono nature of a sur-

round signal is not immediately apparent, but in a home setting it is hard to get a theaterlike sense of envelopment from the surround channel unless special means are used to scramble the mono-ness of the signal, such as the "decorrelation" used in Home THX equipment. In any case, movie soundtracks with stereo surround channels (called "split surrounds" by Hollywood) are now the norm, and they are not playable in that form with a four-channel matrixed system.

round signal is not immediately apparent, but in a home setting it is hard to get a theaterlike sense of envelopment from the surround channel unless special means are used to scramble the mono-ness of the signal, such as the "decorrelation" used in Home THX equipment. In any case, movie soundtracks with stereo surround channels (called "split surrounds" by Hollywood) are now the norm, and they are not playable in that form with a four-channel matrixed system.

- The surround channel's frequency response is deliberately restricted during Dolby Surround encoding, with

the bass rolled off below 100 Hz and the treble cut off sharply above 7 kHz. These long-recognized problems are inherent in the Dolby Surround/Dolby Pro Logic system and stem ultimately from the limitations of the optical film soundtracks for which the system was developed.

Fortunately, by 1990 the basic HDTV scheme had moved to an all-digital one for both pictures and *discrete* multichannel audio, where every channel is recorded as a separate signal. The key to the technical success

movie to be sold in many countries. Advanced home-theater enthusiasts have already seen the advantage of a reduced bit rate with Dolby Digital laserdiscs. With the sacrifice of only one of the two FM-audio sound channels, such discs can carry a mono FM-audio soundtrack, a digital Dolby Surround matrixed multichannel soundtrack, and a "5.1-channel" Dolby Digital soundtrack.

Time for another explanation. The "5" in "5.1-channel" refers to the five discrete main channels: front left, center, and right and surround left and right (that's right, stereo surrounds). The ".1" refers to a separate audio signal commonly known in the trade as the LFE (low-frequency effects) channel. It contains only very low-frequency signals and is used in movie soundtracks to carry such things as high-level explosions, reproduced in theaters by subwoofers. Since the LFE channel covers a frequency range originally limited to about one octave of the ten-octave range of human hearing, it is referred to as a point-one channel. The nomenclature is somewhat confusing, since for the most part a circuit designer actually has to cope with six different signals traveling six discrete signal paths. In any case, Dolby Digital is a multichannel system in which the signals are recorded discretely, with no channel derived from combinations of the others. To manage this Dolby Digital uses AC-3.

AC-3 Processing

AC-3 is Dolby Labs' name for its multichannel *coder*, or system of reducing digital audio data rates. Surprisingly, considering the confusion of "5.1" the terminology is quite logical: "AC" stands for "audio coder," and the "3" indicates Dolby's third coder design. The task the encoder portion of an audio coder like AC-3 must perform is difficult: It must reduce the number of bits needed to carry six high-fidelity digital audio signals to a manageable amount. The 3-D pie charts in Figure 1 show what AC-3 accomplishes.

The towering pie on the left represents the amount of data per second that is fed into an AC-3 encoder by a typical surround-sound soundtrack. Its height represents a 4,608,000-bit-per-second combined data rate (six channels × 16 bits per sample × 48,000

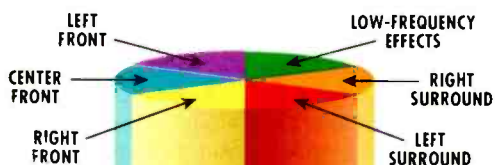
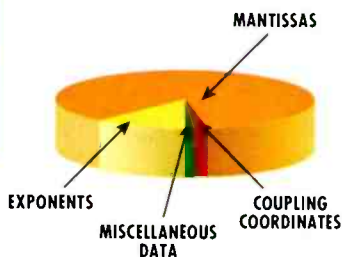


Figure 1. Relative data rates of a six-channel digital audio soundtrack (left) and the same soundtrack after AC-3 encoding (below). AC-3 transforms the nature of the encoded data.



of an all-digital HDTV system remains the huge reduction in the amount of video and audio data necessary to provide superior picture and sound quality. In the HDTV world, a lower *bit rate* leads to a signal that is easier to transmit, receive, and decode and thus, what is most important to broadcasters, a signal that takes less space on the airwaves or over cable, maximizing the possible number of HDTV channels. For new digital media, such as DVD, a lower audio bit rate means that a DVD recording has space for several multichannel soundtracks, enabling one pressing of a

samples per second). On the right is the pie representing the result, the encoded AC-3 signal, with a data rate of 384,000 bits per second, or *one-twelfth* the original bit rate! The dramatic difference in before and after data rates suggests that AC-3 processing is a rather complex operation. It has to be, for it must preserve high audio quality by keeping the unavoidable deleterious effects of data-rate reduction inaudible during playback by hiding them underneath the signals that are preserved.

One gauge of the complexity of AC-3 is the amount of computer programming, as measured in lines of program text, used to command the operation of the encoder and decoder. If you wanted to write your own AC-3 encoder program, you would need to generate around 14,000 lines of programming in the C computer language. A decoder would require around 7,000 lines of C programming. AC-3 cannot be reverse-engineered over a weekend by a couple of computer hackers.

Even if it could be, you couldn't run a home-made AC-3 decoder program on a home PC. An AC-3 decoder program is so math-intensive that a top-of-the-line 166-MHz Pentium PC could not keep up without devoting nearly its full attention to the task. Right now, the hard part of AC-3 decoder design is getting the program to run in a low-cost mass-produced chip, not a general-purpose microprocessor like a Pentium, which alone may cost several hundred dollars. Motorola is only the second chip maker to accomplish this feat, and the results are shown in the photomicrograph on this page of Motorola's DSP56009 AC-3 decoder chip. Its circuitry is programmed to perform all the core AC-3 calculations and more at a maximum rate of 40.5 million operations per second.

With that amount of processing involved, we couldn't fully explain the actions of AC-3 if we devoted an entire issue to it. It gets real complicated real quick. That's because AC-3 encoding produces a radical metamor-

phosis of the audio data. Six streams of binary numbers describing six audio waveforms are transformed into a single data stream describing the moment-to-moment *spectrum* (frequency content) of the original signals. The reverse transformation occurs during AC-3 decoding. Referring again to the data pie at the right in Figure 1, AC-3 describes the spectra in an exponential number system consisting of *mantissas* and *exponents*. For example, in the expression 3^2 (three squared), the 3 is the mantissa and the 2 is the exponent.

Bits are assigned to record these mantissas and exponents, with each number receiving the minimum num-

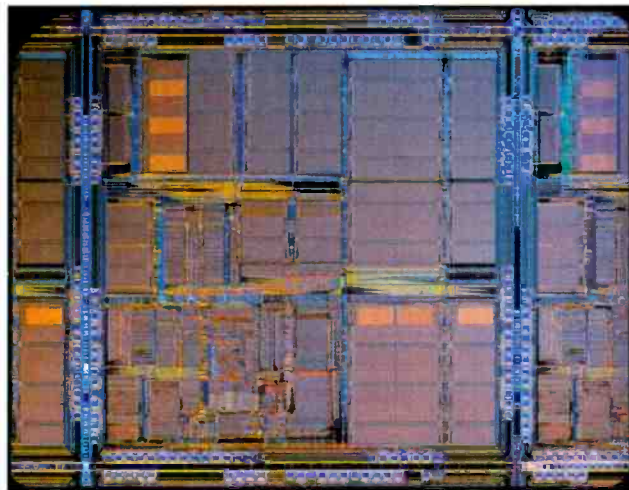
help you begin to understand some of the important new features Dolby Digital is bringing to market.

New Features

The introduction of a new audio signal format always presents an occasion for the introduction of new features to improve performance or convenience. Just consider what the audio CD's cueing data made possible: programmed playback, rapid and accurate cueing, repeat modes, preview modes and so forth. That the advent of Dolby Digital presents a golden opportunity for similar innovations was not lost on Dolby Labs. In fact, a Dolby Digital playback device can contain quite a number of such features.

- **Bass management.** The most important new feature, at least in deluxe Dolby Digital components, is the required bass-management circuitry. The most elaborate of these circuits perform high-pass filtering on the five main channels and low-pass crossover filtering on a subwoofer/LFE output. Such filtering is necessary because of the huge amount of low frequencies a Dolby Digital recording generates, especially in the LFE channel. Bass-management circuits allow you to shunt the lowest frequencies from all of the channels to the speaker(s) that can best handle them, which is normally a separate subwoofer.

- **Center delay.** In an ideal home-theater speaker system, signals emitted from all of the speakers simultaneously would also reach the listener at the same time. Dolby calls this effect "coincident arrival," and it provides for the sharpest and most stable sonic images. But the vagaries of speaker placement have made coincident arrival unattainable with most home-theater systems utilizing typical Dolby Pro Logic decoders, and it would also be expensive to achieve using add-on circuits. Besides, Dolby Pro Logic playback actually *requires* a relatively long delay line for the surround-channel speakers so that their output reaches the listener after that from the front speakers.



Motorola's DSP56009 Dolby Digital decoder chip, greatly enlarged. Most of the large featureless areas at the top and right side are digital memory (RAM or ROM). The actual processing takes place in the lower-left quadrant.

ber of bits deemed necessary by a bit-allocation program for accurate reproduction. Bits are drawn as necessary from a common "bit pool." When the going gets tough and the coder starts to run out of bits to encode individual channel spectra, the high-frequency demands of pairs of channels are coupled together since, as a Dolby engineering paper puts it, "the ear is not able to independently detect the direction of two high-frequency signals which are very closely spaced in frequency." These data are recorded as *coupling coordinates*.

As we said: real complicated, real quick. Far less complicated is a chart showing the signal flow in a Dolby Digital component containing an AC-3 decoder chip (Figure 2), which will

The all-digital nature of AC-3, however, allows for the simple incorporation of digital delay lines into the decoder programming so that all signals can be time-aligned for coincident arrival. A typical Dolby Digital system accomplishes this by providing delay settings for the center channel (for those setups where the center speaker is closer to the listener than the front left/right speakers) as well as adjustable surround-channel delays.

- **Dialogue normalization.** Included among the miscellaneous data in an AC-3 data stream is information describing the average dialogue level of the program. This information can be used by an AC-3 decoder to keep the dialogue at a constant volume even though it may be embedded in different programs of widely varying overall dynamic range. That is not too important now, when most Dolby Digital programming originates in Hollywood and its well-controlled studio operations. In the future, however, dialogue normalization will become more important as other media using Dolby Digital technology come on line, such as HDTV and DVD-ROM.

- **Dynamic-range control.** The AC-3 encoding process also discovers enough about the contents of the audio signals to produce two auxiliary data streams within an AC-3 signal (part of the miscellaneous-data portion of the AC-3 signal pictured in Figure 2). These data streams can be used to automatically control the dynamic range of the output of an AC-3 decoder — to compress programs with very wide dynamic range, such as soundtracks from action/adventure movies, so that you can lower the overall playback volume while preserving the audibility of the softest passages. Reduced-level playback suits situations where you don't want to disturb other family members or the neighbors.

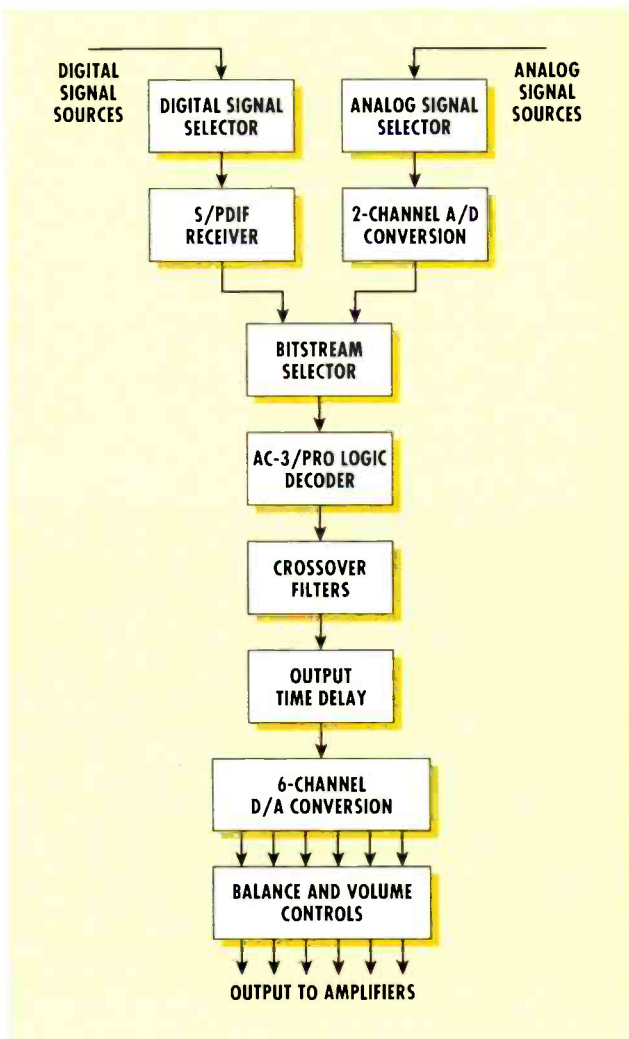


Figure 2. The signal flow in a typical Dolby Digital component. The four central steps can be performed by a single chip.

- **Down-mixing.** Listening to a Dolby Digital program over a system with fewer playback channels — such as playing a surround-sound soundtrack through headphones — requires a mix-down operation on the decoded multichannel signals. An AC-3 decoder can perform this operation, and there's even some provision, through yet another miscellaneous-data bit-stream, for the program's producer to control the mix-down process in terms of the relative contributions of the center and surround channels to a stereo or even mono mix.

- **Dolby Pro Logic compatibility.** In the early days of Dolby Digital, which will last for at least the next couple of years, much video programming will still come from older surround-sound

movies whose soundtracks were originally intended for the theatrical version of Dolby Pro Logic decoding that is known as Dolby Stereo. Most program suppliers will not take the time or trouble to entirely remix such material to provide a true 5.1-channel AC-3 signal; they may just encode it as a two-channel matrixed Dolby Surround soundtrack intended for Pro Logic decoding at home. Luckily, both AC-3 chips presently available are able to perform Dolby Pro Logic decoding and are used to do so in most of today's Dolby Digital decoders.

The opposite situation is taken care of, too. An AC-3 decoder can turn a 5.1-channel soundtrack into a pseudo-Dolby Surround signal for decoding by an existing Dolby Pro Logic system. This feature, an example of the down-mixing discussed above, will also be very significant over the near term as home decoding equipment moves from Dolby Pro Logic to Dolby Digital.

Of course, not all of these features will be available in every Dolby Digital component. Manufacturers have wide leeway as to how much versatility they can provide even while using the same AC-3 decoder chips. Some of the above features, in fact, are program-dependent: The recording must be encoded with the relevant data for the decoder to perform dialogue normalization, certain types of down-mixing, and dynamic-range control. And whether a recording carries such data is under the control of its producer. Most of those three features are available as part of any AC-3 decoder chip, but bass management can be performed either on-chip or with external circuits, depending on the overall product design. Each approach has its own advantages.

In a future issue we'll discuss the full rationale behind several of these new features and, for those that are adjustable, how to set them up. □

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This Lynnfield VR system includes our award-winning VR40 mains and VR12 center channel, plus our new VRS Pro surrounds and VR2000 350-watt powered subwoofer. (This system reproduces 21–20,000Hz \pm 3dB and an astounding 105dB at normal listening position.)

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MULTIMEDIA SPEAKER SHOWDOWN

COMPARISON TESTS | BY TOM NOUSAINE

Practically every home computer sold today is "multimedia-ready" — that is, it includes a sound card, a CD-ROM drive, and usually a couple of powered speakers. Unfortunately, whether you're blowing away thugs in *Doom II*, creating a masterpiece on CD-R, or simply playing a music CD while crunching some numbers, most of the speakers that come bundled with PC's sound about as good as a cheap clock radio. That's why a number of companies — many with names well known in home audio — now offer a variety of two- and three-piece powered computer-speaker packages at prices ranging from less than \$100 to well over \$500.

Naturally, as audio enthusiasts, we want to know how these special-application speakers sound. Is audiophile-level fidelity too much to expect from them while playing a CD or transferring a recording from digital tape to CD-R? Are the new games with advanced sound effects more thrilling with any of these speakers? To answer such questions, we asked ten major makers of computer speakers to send us their best-sounding systems for a hands-on showdown.

Of the ten systems we received, all are powered and have magnetically shielded satellite speakers. JBL, Advent, Bose, Altec Lansing, Yamaha, Atlantic Technology, and Cambridge SoundWorks sent three-piece combos comprising a pair of satellites and a "subwoofer." Micro Multimedia Labs

sent a four-piece system that adds an integrated amp/equalizer to the mix. And Labtec and Roland entered the fray with two-speaker systems.

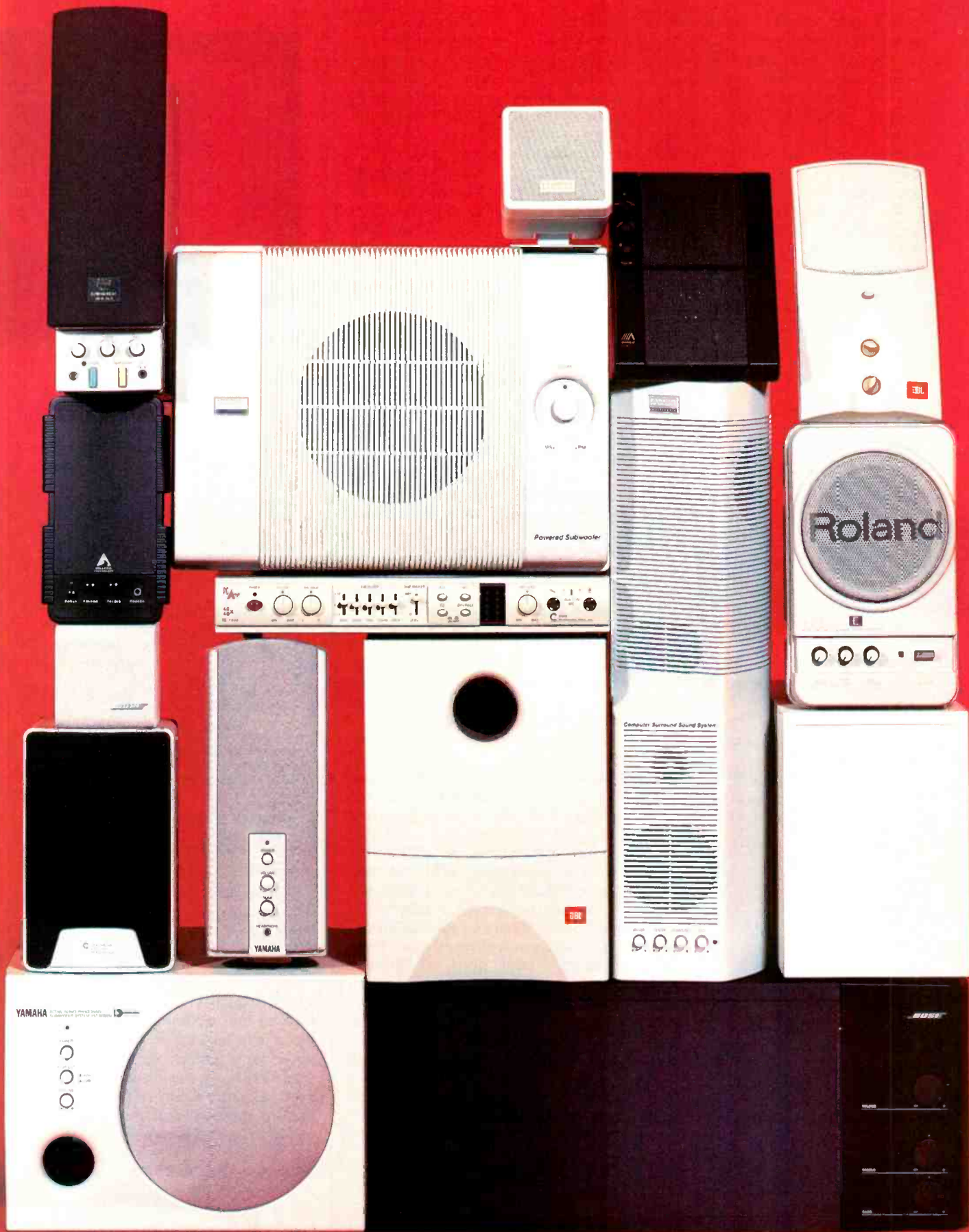
All but the Roland include all cables and connectors needed for hookup to a computer. Six systems have a second stereo input and five have headphone jacks that mute the main-speaker outputs when phones are plugged in (feature highlights appear with the individual photos starting on page 88).

Test Procedures

My evaluation comprised a few objective measurements followed by a subjective listening session. Each system was installed in a typical home-computer environment, with the satellite speakers placed on a computer table flanking a 15-inch monitor linked to an IBM PS-1 DX2. For the three-piece systems, I put the bass module on the floor under the table, as close to the wall as the supplied cable permitted.

I placed a microphone 21 inches from the satellites (at seated ear level) and used a DRA Labs MLSSA analyzer to measure: 1) full-system frequency response, 2) low-frequency extension with a limit of 10 percent distortion at selected third-octave frequencies, and 3) maximum "clean music" output. The last figure was obtained by calibrating the system to the highest gain setting that produced subjectively clear sound (no buzzing, rattling, or other audible signs of distress) and measuring the sound-pressure level (SPL) while the system





played a highly dynamic big-band recording. These measurements provided a reasonably good indication of the systems' relative dynamic capability.

For the listening sessions, I used a high-quality home CD player to insure a level playing field and that the source component did not limit overall sound quality. The test material included stereo, Dolby Surround-encoded, and Spatializer-encoded musical selections, which I played in the same order on each system. Using the common A through F grading scale, I rated each system in three key performance areas: 1) spectral balance and definition, the ability to play cleanly and re-

produce voices and instruments with a natural quality; 2) spatial rendition, or imaging, the ability to locate sounds accurately while conveying a natural sense of ambience; and 3) dynamics, or the ability to play loudly and softly without noise or distortion.

To insure that my subjective impressions were as consistent as possible, I used a pair of high-quality, two-way bookshelf speakers as an anchor. Output of the reference system was matched to within 0.5 dB of the system being tested, and both systems were connected to a switch box so that I could make instant comparisons.

I also listened to each system both through a Turtle Beach Tropez Plus high-performance sound card I installed in my IBM PC and through the standard sound card in my Texas Instruments TravelMate 4000 laptop in order to confirm my subjective impressions and to verify that each system could be driven adequately by a sound card. The cards' maximum outputs are 3.2 and 2.2 volts, respectively.

Advent Powered Partners AV370 System

The AV370 Powered Partners system (\$299) from Advent includes two wedge-shaped satellites and a bass module that's among the largest in the group. All of the controls — volume, bass/treble, and balance — are on the left speaker instead of the right, where most manufacturers put them.

Installing the AV370 was a simple matter of connecting a power cord from the bass module (which plugs into a wall outlet) to the left satellite and running three signal wires from the left speaker to the computer, the right speaker, and bass module. While the cables are fairly short, restricting bass-module placement in some instances, it was nice not having a bulky "wall wart" power supply for the satellites.

Frequency-response measurements revealed a large notch at 160 Hz, which tended to make the bass sound detached from the main presentation. There was a sizable notch at 6.6 kHz as well. Measurements also showed that the AV370's "bass/treble" knob is really a flexible bass control that provides a maximum cut of 12 dB (referred to 100 Hz) in its "treble" (pulled-out) position and a maximum boost of 10 dB in its "bass" position.

I found it hard to achieve an optimal spectral balance using the bass/treble control, which forced me to choose either honky horns or too much hiss and



Altec Lansing ACS500

DRIVER COMPLEMENT

SATELLITES (each): one 1 1/4 x 2 1/2-inch wide-range driver, two 3-inch midrange drivers, one 1/2-inch dome tweeter

BASS MODULE: 6 1/2-inch ported woofer

MANUFACTURER SPECIFICATIONS

SATELLITES: bandwidth, 250 Hz to 20 kHz; amplifier (in right speaker), 22.5 watts per channel

BASS MODULE: bandwidth, 35 to 250 Hz; amplifier, 40 watts at 0.8 percent distortion; crossover frequency, 250 Hz

KEY FEATURES

SATELLITE (right): Dolby Pro Logic decoder; master volume control; center, surround, and subwoofer level controls; two mini-jack stereo inputs (RCA adaptor cable supplied); left/right stereo, center, surround, and subwoofer mini-jack outputs

BASS MODULE: level control

FINISH: light-gray plastic

DIMENSIONS (W x H x D)

SATELLITES: 5 x 18 x 6 1/2 inches

BASS MODULE: 13 x 6 x 10 inches

WEIGHT

SATELLITES: 6 pounds (right),

4 pounds (left)

BASS MODULE: 10 pounds

WARRANTY: 1 year, limited

SYSTEM PRICE: \$399

MANUFACTURER: Altec Lansing, Dept. SR, P.O. Box 277, Millford, PA 18337-0277; telephone, 1-800-648-6663

sizzle. Spatially, the image was tightly focused but uncomfortably low, well below eye level. The AV370 system turned in a respectable 97.9 dB SPL without distress, though, and there was even a hint of infrasonic content. Pushed beyond that level, vocals turned fuzzy and the woofer rattled.

Altec Lansing ACS500

A built-in Dolby Pro Logic decoder and distinctive looks set Altec Lansing's ACS500 system (\$399) apart



Advent Powered Partners AV370

DRIVER COMPLEMENT

SATELLITES (each): 3-inch wide-range driver

BASS MODULE:

6 1/2-inch woofer in bandpass enclosure

MANUFACTURER SPECIFICATIONS

FREQUENCY RESPONSE:

50 Hz to 20 kHz \pm 3 dB

AMPLIFIER: 10 watts per channel (satellites), 30 watts (bass module)

KEY FEATURES

SATELLITE (left): volume, bass/treble, and balance controls

BASS MODULE: active high-pass crossover and mini-jack stereo input

FINISH

SATELLITES: black plastic

BASS MODULE: black vinyl

DIMENSIONS (W x H x D)

SATELLITES: 5 1/8 x 7 1/8 x 5 1/2 inches

BASS MODULE: 7 1/8 x 14 x 12 3/4 inches

WEIGHT

SATELLITES: 2 pounds each

BASS MODULE: 20 pounds

WARRANTY: 2 years, parts and labor

SYSTEM PRICE: \$299

MANUFACTURER: Advent, Dept. SR, 25 Tri-State International Office Center, Suite 400, Lincolnshire, IL 60069; telephone, 1-800-323-0707

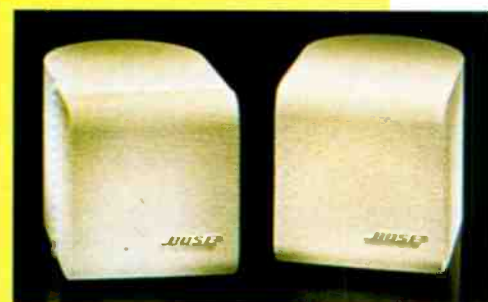
from the crowd. Inside each 18-inch-tall satellite is a primary driver complement comprising a 3-inch midrange and 1/2-inch tweeter, an inward-angled 1 1/4 x 2 1/2-inch wide-range speaker that handles the center-channel signal from surround-encoded programs, and an outward-angled 3-inch driver at the top of the enclosure that handles the surround signal. Of course, you'll need surround-encoded software to take advantage of the Dolby technology — still scarce on the CD-ROM front. In addition to a level knob on the bass module, there are controls for master volume and center, surround, and subwoofer level on the right speaker.

Installation was straightforward because a multipin DIN cable shuttles main, center, and surround signals to

the left satellite. Beyond that, you plug the bass module's power cord into a wall outlet and run a dual-connector power/signal cable from the module to the right tower and a wire from the tower to the computer. Setting levels for surround playback was easy thanks to a "noise" mode that circulates pink noise through all channels.

The ACS500's frequency response was flatter than that of any other speaker in the group, although its extreme treble output was limited. The "subwoofer" turned out to be the system's limiting factor: While it went down to 63 Hz with less than 10 percent distortion, output was a mere 78.8 dB SPL. Even at moderate levels, the plastic case of the bass module rattled and buzzed. As a result, maximum clean output for the system was restricted to 90.1 dB SPL — the lowest in the group.

Although the Altec system fell short on bass, it was head and shoulders above the competition in overall sound quality. Spectral balance was pleasing and natural — in fact, the ACS500 came closer to approximating the sonic qualities of the reference speakers than any of the other contenders. Spatial rendition was extraordinary. The system produced a wide soundstage with stereo sources, and it extended even further — especially in depth — with Dolby Surround-encoded material. Last but not least, the ACS500's sound plane was at eye level, right where it belongs.



Bose Acoustimass Multimedia System

DRIVER COMPLEMENT

SATELLITES (each): 2 1/2-inch wide-range driver
BASS MODULE: 5 1/4-inch woofer

MANUFACTURER SPECIFICATIONS

AMPLIFIER (in bass module): satellites, 20 watts per channel; bass, 50 watts

KEY FEATURES

BASS MODULE: volume, bass, and treble controls; two stereo pairs of RCA inputs (mini-plug adaptor cable supplied); active equalization, auto-on/off, auto-protection circuits

FINISH

SATELLITES: light-gray plastic, cloth grille
BASS MODULE: black vinyl and plastic

DIMENSIONS (W x H x D):

SATELLITES: 3 x 3 x 4 3/4 inches
BASS MODULE: 7 1/2 x 18 1/2 x 8 1/2 inches

WEIGHT

SATELLITES: 1 pound each
BASS MODULE: 19 pounds

WARRANTY: 1 year, limited

SYSTEM PRICE: \$599

MANUFACTURER: Bose, Dept. SR, The Mountain, Framingham, MA 01701-9168; telephone, 1-800-444-2673



Atlantic Technology M110/M105

DRIVER COMPLEMENT

M110 SATELLITES (each): 3-inch wide-range driver
M105 BASS TOASTER: 6 1/2-inch dual-voice-coil woofer

MANUFACTURER SPECIFICATIONS

SATELLITES: amplifier, 3 watts per channel
BASS MODULE: amplifier, 18 watts at 0.2% distortion

KEY FEATURES

SATELLITES: volume, bass, and treble controls and headphone mini-jack output on front panel, two mini-jack stereo inputs on rear panel, dynamic bass-equalization circuit
BASS MODULE: level control, 130/100-Hz crossover button

FINISH

SATELLITES: light-gray or black plastic, metal grille
BASS MODULE: light-gray or black plastic

DIMENSIONS (W x H x D):

SATELLITES: 4 x 7 x 4 1/4 inches
BASS MODULE: 7 x 6 1/2 x 10 1/4 inches

WEIGHT

SATELLITES: 1 3/4 pounds (right), 1 1/2 pounds (left)
BASS MODULE: 8 1/4 pounds

WARRANTY: 2 years, parts and labor

SYSTEM PRICE: \$199

MANUFACTURER: Atlantic Technology, Dept. SR, 343 Vanderbilt Ave., Norwood, MA 02062; telephone, 617-762-6300

Atlantic Technology M110/M105 System

The M110/M105 system (\$199) from Atlantic Technology is the least expensive three-piece package in the group and has one of the smallest bass modules. The M105 Bass Toaster sports a level control, a crossover switch that effectively reduces bass level by 5 dB below 130 Hz, a nice long AC power cord, and a built-in DC power source for the M110 satellites. The right speaker has a headphone jack, a volume knob, and a treble control that produced a 6-dB boost at 10 kHz and a 2-dB cut below 1 kHz when fully rotated.

Setup was uneventful. Once the Bass Toaster is plugged in, you run a DC cable from it to the right speaker (eliminating the need for an AC adaptor) and a Y-type signal wire from the

right speaker to the left speaker and the bass module.

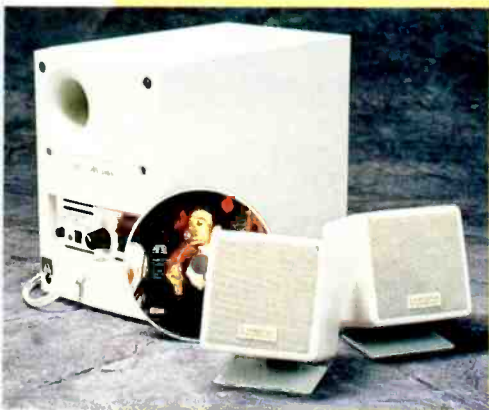
The Bass Toaster's cabinet buzzed severely when I pushed the system beyond moderately loud volumes. This fault reduced its dynamic capabilities and limited its clean output to the same low 90.1 dB SPL as the Altec Lansing, or nearly 8 dB lower than the group average. Bass response was also limited to 80 Hz at 10 percent distortion.

Spectrally, male and female vocals had a fuzzy, robot-like quality. The spatial presentation was tightly clustered in, or slightly below, the monitor area, and what little ambience there was had a recessed, cavernous quality.

Bose Acoustimass Multimedia System

At \$599, the Bose Acoustimass Multimedia System is the most expensive

package I tested. All operating controls — volume, bass, and treble — are located on the bass module, which is the group's biggest. The two very small cube satellite speakers are each wired directly to the bass module



Cambridge SoundWorks SoundWorks by Henry Kloss

DRIVER COMPLEMENT

SATELLITES (each): 2-inch wide-range driver
BASS MODULE: 4-inch woofer in bandpass enclosure

MANUFACTURER SPECIFICATIONS

SATELLITES: bandwidth, 150 Hz to 20 kHz; power (amplifier in bass module), 4.1 watts per channel at 1% distortion
BASS MODULE: bandwidth, 30 to 150 Hz; amplifier, 10.3 watts at 1% distortion

KEY FEATURES

SATELLITES: pedestals and wall-mounting hardware supplied
BASS MODULE: bass-level control, mini-jack stereo input (cable with in-line volume control supplied), 12-volt DC input for portable applications

FINISH

SATELLITES: off-white or black plastic; perforated metal grille
BASS MODULE: light beige or black vinyl

DIMENSIONS (W x H x D):

SATELLITES: 3¼-inch cubes
BASS MODULE: 5½ x 8 x 9½ inches

WEIGHT

SATELLITES: ½ pound each
BASS MODULE: 7¾ pounds

WARRANTY: 1 year, parts and labor

SYSTEM PRICE: \$220

MANUFACTURER: Cambridge SoundWorks, Dept. SR, 311 Needham St., Newton, MA 02164; telephone, 1-800-367-4434

(which contains all power amps) via a generous length of speaker cable. To complete the installation, you simply plug in the bass module's AC power cord and use the supplied RCA cables (and mini-plug adaptor) to get the signal from the computer's sound card to

the bass module. When you turn the power switch on, the system goes into a signal-sensing auto on/off mode. Of all the systems reviewed, I found the Bose system to be the most user-friendly in terms of setup.

The system sounded best with the bass and treble controls set to maximum, which boosted response 6 dB below 125 Hz and above 3 kHz. Spectral balance was fairly good. Male voices were clean but faintly hollow sounding, with a trace of spit, and female vocals sounded a little husky. Definition was quite good, with detail apparent even in heavily layered studio recordings of pop music.

Spatially, the Bose system was one of the better-performing packages. The soundstage was generally bound to the outer edges of the speakers, but there was a good sense of depth and the stage widened somewhat with Dolby Surround-encoded programs. The soundstage also remained at eye level for the most part, although male vocals occasionally wound up near the desktop.

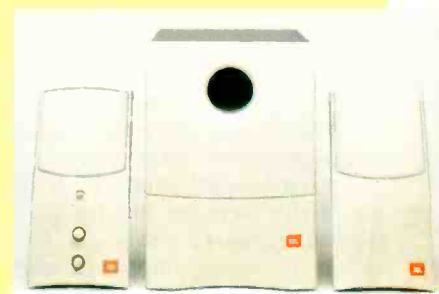
The Bose system also had excellent dynamics. It was the *only* system capable of reproducing an honest 40 Hz with less than 10 percent distortion (at 75.7 dB SPL). Credit goes to the robust bass cabinet and its proprietary Acoustimass design. In any event, the Multimedia system kicked butt with a maximum clean output of 104.4 dB SPL, the second highest in the group.

Cambridge SoundWorks SoundWorks by Henry Kloss

Like Bose, Cambridge SoundWorks puts all the electronics in the bass module of its SoundWorks system (\$220), which also includes a pair of tiny cube satellites. The satellites come with snap-on table stands, screws for wall mounting, and Velcro strips for attaching the cubes directly to the computer monitor. Even though most users will use sound-card software to adjust volume, Cambridge provides a thumb-dial volume control (with a Velcro strip) that's wired into the 12-foot cord running between the computer and bass module. The system's only other control is a bass-level knob on the back of the woofer module.

The SoundWorks was one of the easier systems to install. Once the signal wire/volume control is in place, you simply plug the bass module into a wall outlet and run a 12-foot wire to each satellite.

Up and running, the Soundworks



JBL Media Design/Media Sub System

DRIVER COMPLEMENT

MEDIA DESIGN SATELLITES

(each): 3-inch wide-range driver

MEDIA SUB BASS MODULE:

5¼-inch woofer in bandpass enclosure

MANUFACTURER SPECIFICATIONS

SATELLITES: bandwidth, 90 Hz to 20 kHz; amplifier (in right speaker), 4 watts per channel at 10% distortion

BASS MODULE: bandwidth, 40 to 180 Hz; amplifier, 25 watts at 10% distortion

KEY FEATURES

SATELLITES (right): volume and bass controls, mini-jack stereo input, mini-jack subwoofer and headphone outputs, active equalization circuit

BASS MODULE: level control, line-level mini-jack stereo output, active equalization and auto on/off circuits

FINISH

SATELLITES: beige plastic with cloth grille
BASS MODULE: medium-gray vinyl with beige plastic front panel

DIMENSIONS (W x H x D):

SATELLITES: 4¾ x 8¼ x 4¾ inches
BASS MODULE: 7¼ x 10¼ x 12 inches

WEIGHT

SATELLITES: 2 pounds (total)

BASS MODULE: 16 pounds

WARRANTY: 1 year, limited

PRICE: Media Design satellites, \$80 a pair; Media Sub bass module, \$150

MANUFACTURER: JBL, Dept. SR, 80 Crossways Park W., Woodbury, NY 11797; telephone, 1-800-336-4525

system went down to 63 Hz with an output level of 78.5 dB SPL and less than 10 percent distortion. But the treble turned screechy at moderately high levels, and the bass port grunted and squawked. Maximum output level without audible distress was only 91 dB, second-lowest in the group.

Spectral balance was hampered by a response notch at 200 Hz. Male vocals came across as harsh and colored, and female vocals sounded veiled and cloudy. The overall sound was overly warm and in-your-face; at times it was also fuzzy and lacking in detail. As for spatial rendition, the soundstage was

average in width but came up short in ambience and depth.

JBL Media Design/Media Sub System

JBL sells the components for this stylish-looking setup separately: The Media Sub goes for \$150, and the Media Design satellites are \$80 a pair. The right satellite contains power for both satellites as well as master volume and bass controls on its front panel and a headphone jack around back. The only other system control is a power-on/level knob on the bass module; in the knob's on position, the module goes into an auto on/off mode.

JBL's Media Design/Sub system was a snap to set up and use. In addition to running signal wires from the right satellite to the computer, left satellite, and bass module, you need to plug

in both the bass module *and* the right satellite (an AC adaptor is supplied).

In the bass department, the system played down to 63 Hz with less than 10 percent distortion, which was fairly typical of the three-piece systems in the group. Maximum clean output registered a respectable 99 dB SPL, a notch above the group average. Beyond that volume the satellites sounded strained and scratchy.

Spectrally, the JBL system sounded smooth yet somewhat rounded off at very high frequencies. Vocals were clean and sax was smooth, but the bass tended to thunder and drone at times. The sound was natural overall but light on detail. Spatially, the soundstage was mostly confined to a tight space in front of the listener.

Labtec LCS-3210 Speakers

At \$140, Labtec's LCS-3210 two-piece system is the least expensive package in the test group. It's also the only system to feature Spatializer 3D Stereo sound processing. A button on the right speaker engages the circuit, which is designed to create a surround-sound experience using a stereo source and only two speakers. Joining the Spatializer button on the right speaker are volume, bass, and treble controls as well as microphone and headphone jacks. To install the Labtecs, you plug the right speaker into a wall outlet using the supplied AC adaptor and run one signal wire to the computer and one between the speakers.

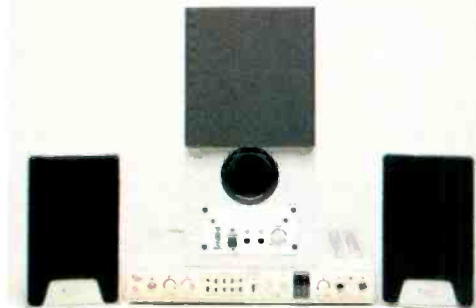
The Labtecs were simply unable to deliver any real bass — even with the bass control pegged. Although they were able to hit 96.2 dB SPL without audible overload, they could not play below 100 Hz (with less than 10 percent distortion) under any set of conditions. Beyond about 96 dB, the speakers produced splats and rattles that made them irritating to listen to.

On the spectral side, the system sounded dull, harsh, and muddled, with no significant output above 2.5 kHz. Things sounded considerably cleaner, however, with the Spatializer circuit switched in. Although the processing accentuated system hiss and added a dose of squeaky brightness, it did make vocals sound more natural. The Spatializer processing also significantly "opened" up the stage, at least in terms of width, giving the LCS-

3210's a spatial quality approaching that of the reference system.

Micro Multimedia Labs TC 1490-8SUB System

The four-piece TC 1490-8SUB system from Micro Multimedia Labs is essentially a compact stereo system designed to be used with a computer. It



Micro Multimedia Labs TC 1490-8SUB

DRIVER COMPLEMENT

SP508AD SATELLITES (each): 4-inch woofer, 1-inch dome tweeter
SP7001X BASS MODULE: 6-inch ported woofer

MANUFACTURER SPECIFICATIONS

SATELLITES: bandwidth, 150 Hz to 20 kHz
BASS MODULE: amplifier, 25 watts at 1% distortion; crossover point, 80 Hz
TC 1490/A INTEGRATED AMP: 40 watts per channel into 8 ohms from 20 Hz to 20 kHz at 1% distortion

KEY FEATURES

INTEGRATED AMP:

five-band graphic equalizer; built-in (defeatable) microphone; volume, balance, subwoofer level, and mic-gain (mixing) controls; ¼-inch microphone input and ¼-inch headphone output jacks on front panel; two stereo pairs of RCA line inputs on rear panel (mini-plug adaptor cable supplied)

BASS MODULE:

level control, crossover switch

FINISH

SATELLITES: light-gray plastic, black cloth grille

BASS MODULE: light-gray vinyl, dark-gray cloth grille

INTEGRATED AMP: beige plastic front panel

DIMENSIONS (W x H x D)

SATELLITES: 4½ x 6 x 5 inches

BASS MODULE: 6¼ x 12 x 10 inches

INTEGRATED AMP: 13 x 1½ x 11 inches

WEIGHT

SATELLITES: 8½ pounds (total).

BASS MODULE: 12½ pounds.

INTEGRATED AMP: 12½ pounds.

WARRANTY: 90 days

SYSTEM PRICE: \$240

MANUFACTURER: Micro Multimedia Labs, Dept. SR, 458 Main St., Reisterstown, MD 21136; telephone, 410-429-4300



Labtec LCS-3210

DRIVER COMPLEMENT

(each): 3¼-inch woofer in transmission-line enclosure, ¾-inch dome tweeter

MANUFACTURER SPECIFICATIONS

BANDWIDTH: 48 Hz to 20 kHz

AMPLIFIER (in right speaker): 11 watts per channel into 4 ohms at 10% distortion

KEY FEATURES

(in right speaker): defeatable Spatializer 3D ambience-enhancement circuit; volume, bass, and treble controls; mini-jack microphone input and headphone output on front panel; mini-jack stereo input and subwoofer output on rear panel

FINISH: light-beige plastic with dark-brown cloth grille

DIMENSIONS (W x H x D):

3½ x 11¾ x 9 inches

WEIGHT: 2½ pounds each

WARRANTY: 1 year, parts and labor

SYSTEM PRICE: \$140

MANUFACTURER: Labtec, Dept. SR, 3801 NE 109th Ave., Suite J, Vancouver, WA 98682; telephone, 360-896-2000

includes a pair of SP508AD satellite speakers, the TC 1490/A integrated amplifier, and the SP7001X powered bass module. Except for a level control and crossover switch on the bass module, all system controls are located on the amplifier. Front-panel features include volume and balance controls, a five-band equalizer with a separate slider for bass level, an internal microphone (with gain control) for use with voice-recognition systems, and 1/4-inch jacks for headphones and a microphone. The rear has standard RCA input and output jacks and push-type terminals for the satellites.

To install the system, you run the mini-plug-to-RCA adaptor cable from the computer to the amp, wire up the speakers, and run a cable from the amp's sub out to the bass module. The amp has a standard AC line cord, the sub a wall-mount power supply.



Roland MA-12C

DRIVER COMPLEMENT

(each speaker): 4-inch wide-range driver

MANUFACTURER SPECIFICATIONS

AMPLIFIER (one in each speaker): output, 10 watts

KEY FEATURES

(on each speaker): volume, low-boost, and high-boost controls; 1/4-inch microphone, instrument, and line input jacks (RCA adaptors supplied)

FINISH:

light-gray plastic with metal mesh grille

DIMENSIONS (W x H x D):

5 1/8 x 8 1/2 x 6 1/2 inches

WEIGHT: 5 1/2 pounds each

WARRANTY: 1 year parts, 90 days labor

SYSTEM PRICE: \$259

MANUFACTURER: Roland, Dept. SR, 7200 Dominion Circle, Los Angeles, CA 90040-3696; telephone, 213-685-5141

The equalizer provides approximately 12 dB of boost/cut action per band (60 and 250 Hz and 1, 3.5, and 12.5 kHz), but in reality you're restricted to a maximum boost of about 3 dB at 60 Hz because of the system's limited low-frequency response. The equalizer's usefulness is further limited by the wide bandwidth of most of the controls, about three octaves.

I found that setting the 60-Hz slider to its maximum position and moving the 3.5-kHz slider up about halfway provided the best octave-to-octave balance.

With the equalizer tweaked as noted, the system exhibited good spectral balance. Vocals were reasonably accurate, with only moderate colorations, but the boost at 3.5 kHz made percussion a touch jangly and accentuated hiss in the program material. Definition of instruments was decent.

The soundstage was narrowly confined to the width of the speakers and tended to droop somewhat below eye level. That can be distracting if you're listening to music that has no accompanying video.

When it came to dynamics, the Micro Multimedia system was the champion. The sturdy particleboard bass module was able to play very loudly without making rude noises. The system played down to 63 Hz with less than 10 percent distortion and registered a maximum clean output of 108.1 dB SPL — about 4 dB higher than the nearest competitor and 10 dB above the group average.

Roland MA-12C Speakers

From their tough "throw me down the stairs, I dare you" plastic cabinets to their 1/4-inch jacks to their thick power cords, Roland's MA-12C speakers look and feel *prooofessional*. (What'd you expect from a company that makes professional keyboards?) Each speaker in this two-piece set is a self-contained system with its own power amplifier and volume, bass, and treble controls.

Setting up the speakers is somewhat of a hassle because you need to lay your hands on a mini-plug-to-dual-RCA adaptor cable (available at Radio Shack) and then use the supplied phone-plug adaptors to get the signal into the speakers. Dealing with two thick power cords is also cumbersome.

Except for a trace of extra shine that



Yamaha YST System 45

DRIVER COMPLEMENT

YST-M15 SATELLITES

(each): 3-inch wide-range driver

YST-MSW10 BASS MODULE:

6 1/2-inch woofer

MANUFACTURER SPECIFICATIONS

SATELLITES: frequency response, 70 Hz to 20 kHz \pm 3 dB; amplifier (in right speaker), 10 watts per channel at 1 kHz into 4 ohms with 10% distortion

BASS MODULE: frequency response, 35 to 250 Hz \pm 10 dB; amplifier, 25 watts rms

KEY FEATURES

SATELLITES (right): Yamaha Active Servo Technology (YST) bass-enhancing circuit, front volume and tone controls and mini-jack headphone output, rear input-level control and two mini-jack stereo inputs
BASS MODULE: YST circuit, level control, high/low-cut crossover switch, auto on/off circuit

FINISH

SATELLITES: light-gray or black plastic, cloth grille

BASS MODULE: light-gray or black vinyl and plastic, cloth grille

DIMENSIONS (W x H x D)

SATELLITES: 3 3/4 x 9 3/4 x 6 1/8 inches

BASS MODULE: 11 x 8 x 10 1/4 inches

WEIGHT

SATELLITES: 2 1/4 pounds (right),

1 3/4 pounds (left)

BASS MODULE: 12 pounds

WARRANTY: 1 year, parts and labor

SYSTEM PRICE: \$250

MANUFACTURER: Yamaha, Dept. SR, P.O. Box 6600, Buena Park, CA 90622-6600; telephone, 714-522-9011

came across as excess sibilance on female vocals, the MA-12C's sounded fairly neutral. I found that setting the bass control (which provides about 5 dB boost or cut) to about 2 o'clock and leaving the treble control (which has a range of \pm 6 dB) in its flat setting produced a pleasing overall sound. The soundstage was at eye level and extended slightly beyond the edges of the speakers, but it had no real depth.

Even without a separate bass module, the Rolands played down to 80 Hz at 78 dB SPL with less than 10 percent distortion, only slightly below par for

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MEASUREMENTS AND LISTENING EVALUATION

	FREQUENCY RESPONSE	LOW-FREQUENCY EXTENSION (at 10% distortion)	MAXIMUM CLEAN OUTPUT (SPL)	SPECTRAL BALANCE AND DEFINITION	SPATIAL RENDITION	DYNAMICS
ADVENT POWERED PARTNERS AV370 SYSTEM	80 Hz to 20 kHz ±13.5 dB	63 Hz	97.9 dB	C-	C-	C+
ALTEC LANSING ACS500 SYSTEM	106 Hz to 12.5 kHz ±4.5 dB	63 Hz	90.1 dB	B+	B+	C-
ATLANTIC TECHNOLOGY M110/M105 SYSTEM	80 Hz to 20 kHz ±7.6 dB	80 Hz	90.1 dB	C-	C	D
BOSE ACOUSTIMASS MULTIMEDIA SYSTEM	50 Hz to 20 kHz ±10.8 dB	40 Hz	104.4 dB	B-	B-	B+
CAMBRIDGE SOUNDWORKS SOUNDWORKS BY HENRY KLOSS	80 Hz to 20 kHz ±9.8 dB	63 Hz	91 dB	C-	C	C-
JBL MEDIA DESIGN/MEDIA SUB SYSTEM	63 Hz to 15.5 kHz ±8.25 dB	63 Hz	99 dB	C	C	C+
LABTEC LCS-3210 SPEAKERS	100 Hz to 20 kHz ±8.5 dB	100 Hz	96.2 dB	C	B+	D
MICRO MULTIMEDIA LABS TC 1490-8SUB SYSTEM	92 Hz to 18.5 kHz ±11.2 dB	63 Hz	108.1 dB	B-	C	A-
ROLAND MA-12C SPEAKERS	115 Hz to 12.5 kHz ±8.8 dB	80 Hz	102.3 dB	B	C+	B
YAMAHA YST SYSTEM 45	70 Hz to 15.5 kHz ±7.2 dB	63 Hz	100.8 dB	B	C	B+

PERFORMANCE SIMILARITIES

In terms of performance, the speaker systems we tested exhibited a number of similarities. The measured response for all of the systems except the Altec Lansing had a double bump in the high-frequency range, which reflects (no pun intended) the effect of placing the satellites on a table. Typically, the first bump was at least 6 dB, centered around 2 kHz, and a little over an octave wide, and the second bump was about 6 dB, fell between 7 and 10 kHz, and spanned about an octave. Response below 1 kHz was often flat and smooth down to about 100 Hz, although some

models had a suckout between 100 and 200 Hz. These effects added coloration most noticeable on vocals and acoustic instruments.

All of the systems produced adequate volume. Even the weakest performer delivered 90 dB of clean SPL in its direct field. The better systems were generally able to belt out 100 dB SPL without audible strain as long as there was no deep bass in the program material.

With a few notable exceptions — the Altec Lansing, Bose, and Labtec systems — most of them were limited in spatial extension. Typically, the soundstage was confined to the speakers' outer edges, with little sense of depth. On the other hand, most delivered a tight center image that was more robust than the one produced by many home speakers. —T.N.

this course. And on the dynamics front, they performed very well. Although there was no real bass, the drivers were well controlled and able to play very loudly and cleanly, hitting a maximum SPL of 102.3 dB.

Yamaha YST System 45

In my book, Yamaha's YST System 45 is one of the group's better-looking packages. It combines a pair of YST-M15 satellites with the YST-MSW10 bass module. System controls include volume, tone, and headphone level on the right satellite and bass-level and a high/low-cut (150/100-Hz) crossover switch on the woofer module. Both components incorporate the Yamaha Active Servo Technology (YST) circuit, which is said to essentially "correct" woofer-cone movement on the fly to improve bass performance.

As with most of the systems re-

viewed here, setting up the Yamaha combo was uncomplicated. You run signal wires from the right satellite to the computer, left satellite, and bass module and plug the bass module and right satellite into an AC outlet. Like the Bose and JBL systems, the Yamaha features an auto on/off mode.

The MSW10 bass module played down to 63 Hz with less than 10 percent distortion — not bad for a small box. In terms of overall clean output, the system cranked out a healthy 100.8 dB SPL without buzzing or other audible distress. Subjectively, the bass was full, loud, and sounded great with rock-and-roll. In terms of bass character, the Yamaha was my favorite.

Spectral balance was quite good, too, although there was a slight nasal quality to male and female vocals, and ultra-high frequencies were a bit subdued. Definition was a little on the

coarse side but still acceptable. Spatially, the soundstage was a tad low but had decent width and some depth.

The Bottom Line

The computer speaker systems evaluated here provide a range of upgrade options at a variety of prices. They all play louder and sound better — way better in most cases — than the standard-issue speakers from computer manufacturers, but even the best of them still falls short of delivering audiophile-quality sound. Every three-piece system calls its bass module a "subwoofer," for instance, yet only one came close to producing even 50 Hz with authority. So if studio-quality fidelity is what you desire, look elsewhere. But if you simply want decent sound when you pop a music CD or a game CD-ROM in your drive, there's something here for you. □

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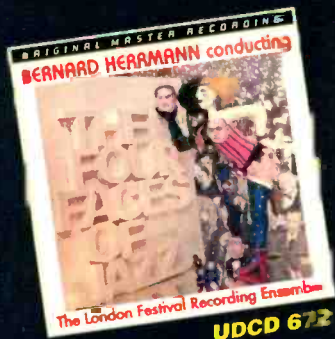
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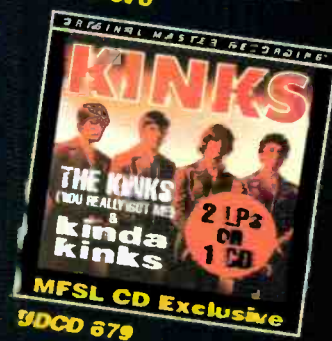
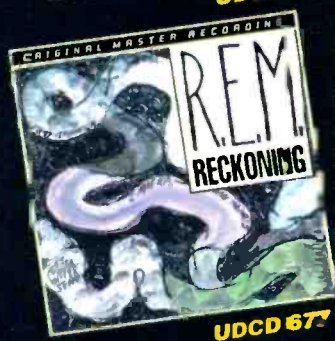
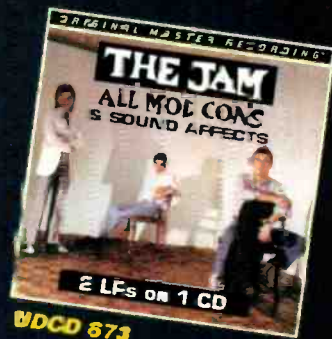
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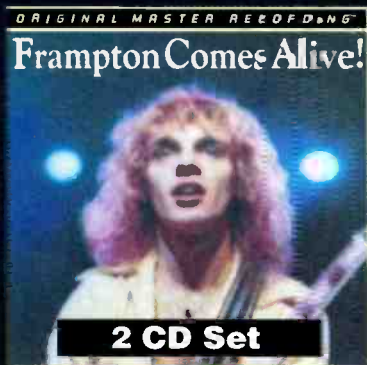


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BEST OF THE MONTH

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



MIAMI VANDERKAM/DGC

Beck: A Cutup and His Collages

When you get right down to it, many contemporary musicians turn to sampling because they simply can't write or play. Beck Hansen, however, plays a wide range of instruments — guitar, keyboards, bass, drums, and more — and he can sing as well as rap. For him,

sampling is another tool in the musical arsenal. His new album, "Odelay," plays through in such a casual way that the intricacy of its stitching won't be clear to the casual listener. But if you stop and ponder what goes into assembling such crazy but clever quilts, you'll have to give Beck his due.

Most musicians have a single identifiable style, but Beck has many. If you had to pin him down to one, it would be from the world of art: collage. Working samples and sound effects into the fabric of his material, he recontextualizes arcane bits of music, conversation, and noise to often comic ends. No genre escapes his purview, be it classic rock, gangsta rap, country-and-western, Blue Note jazz, screeching punk, fuzz-toned garage-rock, bottleneck blues, or Indian sitar music. It's one man's way of processing the information overload to which we all are subjected. What results, amazingly enough, is an album of real songs, leavened with a healthy sense of the absurd and rocking like gangbusters.

On "Odelay," Beck's list of samples — from Sixties Irish rock band Them to jazz drummer Bernard "Pretty" Purdie — is esoteric, to say the least. Juxtaposed in a song like *Devils Haircut* (a catalog of depressive complaints that could be as minor as a bad snip job or as major as life itself), they become ingredients in a recipe for inspired lunacy, a musical loony bin where voices babble in different tongues but make a strange kind of sense. Beck's quasi-country songs, *Lord Only Knows* and *Sissyneck*, are executed with the same mix of formal reverence and sly smirkingness projected by the Rolling Stones in their infrequent forays into twang-land. Both tunes are subverted by left-field screams, hip-hop beats, electronic non sequiturs, and lyrics that defy reason: "You only got one finger left and it's pointed at the door / And you've taken for granted what the Lord's laid on the floor." Elsewhere, *Derelict* is a horrifying evocation of its title character, from its bizarre images to its dark-streaked music, while *Novacane* describes a harrowing night world of trucks and turnpikes with an audio verité that suggests a merging of William S. Burroughs and Public Enemy. Then there's the party tune of the year, *Where It's At*, with a mighty helping of handclaps bolstering an infectious chant.

A literal cutup, Beck crafts a world of sound and sensibility from the boundless scraps of popular culture. He's a smart kid, and with those smarts comes a certain droll detachment. Nobody will ever accuse him of having a heart of gold or possessing a vision for a better future. Instead, the inscrutable ironies and encoded ennui in his music doubtlessly resonate with all the disillusioned Gen Xers who wonder, "Is that all there is?" Finally, the funky beats give them something to do besides mope. *Parke Puterbaugh*

BECK: Odelay.

Devils Haircut; Horwax; Lord Only Knows; The New Pollution; Derelict; Novacane; Jack-ass; Where It's At; Minus; Sissyneck; Readymade; High 5 (Rock the Catskills); Ramshackle. DGC 24823 (52 min).

BEST OF THE MONTH

Tchaikovsky's "Iolanta" Rediscovered

Tchaikovsky wrote a dozen operas, but only *Pique Dame* and *Eugene Onegin* have even a precarious foothold on the international stage. Too bad; all the operas deserve better. One problem is that they are in Russian and do not fare well in translation. Another is that they can be dreadfully idiosyncratic, as witness the mysterious and little-known *Iolanta*, his last opera, based on a Danish romantic one-act play. Fortunately, Valery Gergiev's new recording of *Iolanta* on Philips with his Kirov Opera chorus and orchestra provides good solutions to both difficulties, and it turns out to be a striking work.

The story, which has nothing to do with the plot of Gilbert and Sullivan's *Iolanthe*, concerns a blind princess who is brought up in isolation so that she does not realize that she is a princess nor that she is blind. Lack of knowledge is the motor of the piece, but this rather extraordinary conceit requires a substantial suspension of disbelief on the part of a modern audience. The supporting cast includes a heavy-handed father who keeps the princess in captivity (we're just a few years ahead of Freud here), a sage Arabic doctor who tries to cure her, and a gallant knight who, mad for all that virginal purity, gives the game away but helps inspire her to cure herself. This is perhaps the ultimate case of an operatic heroine as vic-

tim, but, lo, everything turns out happily; she falls so hard for her tattletale knight that she wills herself to see!

Romantic twaddle? Perhaps, but there is something touching about this story, and it moved Tchaikovsky to write an opera that is remarkable for its eloquence and its variety: pseudo-rococo court music, orientalism for the good doctor, melodic sweetness in the title role, Wagnerism in the unbroken hour-and-a-half composition, orchestral pulse and color, and a good measure of chromatic and harmonic intensity. All this might have resulted in a pastiche in the hands of a lesser master, but Tchaikovsky put the diversity to work in a surprisingly unified manner.

What the work requires is an idiomatic and high-quality Russian performance, and Gergiev and his excellent cast provide it. The much-maligned text, by the composer's brother Modest, actually has its merits, and, as sung in Russian by Russians, it is evocative and moving. Soprano Galina Gorchakova may be just a bit too knowing for this supposedly unsophisticated heroine, but, musically and vocally, she creates an appealing and unvictimlike *Iolanta*. The strong male cast is headed by tenor Gegam Grigorian as an outstanding Count Vaudémont, baritone Dmitri Hvorostovsky as his friend and rival, Duke Robert, and bass Sergei Alexashkin as *Iolanta*'s father, King René. The Moorish physician, Ibn-Hakia, could be a dreadful caricature but is particularly sympathetic as sung by Nikolai Putilin.

Gergiev continues to elicit idiomatic, engaging performances from his Kirov forces. Not an eccentric or specialist conductor, he has a knack for bringing the colorful and odd fringes of the Russian



Soprano Galina Gorchakova

repertoire right back into the operatic mainstream — normalizing them, so to speak, and making them accessible to Russian and Western audiences alike. In short, this strange, beautiful piece is a genuine discovery. *Eric Salzman*

TCHAIKOVSKY: *Iolanta*.

Galina Gorchakova (*Iolanta*), Sergei Alexashkin (King René), Dmitri Hvorostovsky (Duke Robert), Gegam Grigorian (Count Vaudémont), Nikolai Putilin (Ibn-Hakia); Kirov Opera Chorus and Orchestra, Valery Gergiev cond. PHILIPS 442 796 (two CD's, 96 min).



JOHN ABBOTT/MUSICMASTERS

Rodney Jones Transformed

Jazz guitarist Rodney Jones may not be a household name, but he has worked with some impressive talents — Lena Horne, Dizzy Gillespie, Ruth Brown, Patti LuPone, Maceo Parker, and Tony Bennett among them. He was recording under his own name as far back as 1980, but if you take "When You Feel the Love," an Impulse release from that period, and compare it with his latest album, "The 'X' Field," you will hear a striking difference in approach and a new virtuosity, brimming with energy and substance. Jones calls the transformation a liberation of sorts, and it is: a breaking of the Wes Montgomery/Grant Green mold he used to fit into so snugly.

Not all past influences have been abandoned (indeed, Montgomery and Green

still echo in *Mobius 3*), but Jones more often swings his guitar off the beaten path and into a developing area beyond bop. The supporting cast includes saxophonist Greg Osby, who himself is not afraid to venture out beyond the limits of guaranteed acceptance (but who always does so tastefully). The young and remarkably cohesive rhythm players are pianist Kevin Hays, bassist Kenny Davis, and drummer Eric Harland. This quintet is not a working group, but it has the unity of one.

Jones is now toiling on TV in the *Rosie O'Donnell Show* band, but on "The 'X' Field" he's roaming free, taking the music on daring detours. And lest you think this is some inaccessible Albert Ayler-ish space trip, let me assure you that the Rodney Jones quintet soars with its feet close

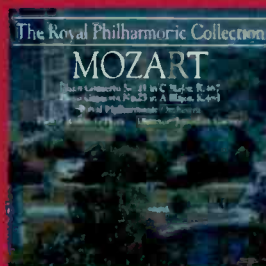
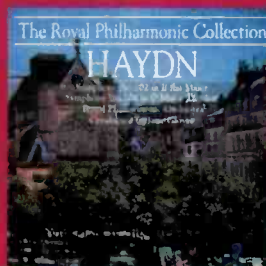
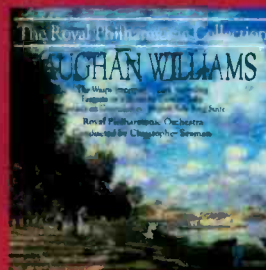
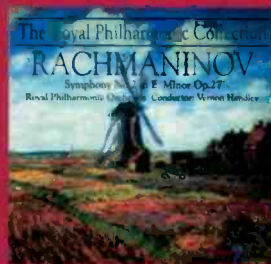
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BEST OF THE MONTH

to the ground. The result is extraordinarily refreshing. *Chris Albertson*

RODNEY JONES: *The "X" Field*. *Silent Darkness*; *Blues for the Monkey Who Escaped*; *Little Melonae*; *The Call of Soul*; *The "X" Field*; *Laura's Eyes*; *Mobius 3*; *Between Then and Now*; *Blues Standard*; *Uncle Willie's Moonshine Blues*. MUSICMASTERS 65147 (56 min).

Finnish Sound Spectacles

Einojuhani Rautavaara, now in his late sixties, is one of the most versatile and prolific Finnish composers of the post-World War II generation. Having studied in the mid-1950's with Aaron Copland, Vincent Persichetti, and Roger Sessions, and subsequently with Wladimir Vogel, a Busoni disciple and Schoenberg adherent, Rautavaara has achieved faultless command of the language of twentieth-century music. He has composed in virtually every genre, his music ranging from the most



Conductor Leif Segerstam

accessible to the most recondite. The latest CD of his work from Finland's Ondine label, which has recorded all of his major pieces, demonstrates in most moving and thrilling fashion the extent of his creative mastery and vision.

The CD features Rautavaara's Seventh Symphony, titled *Angel of Light*, from 1994. This symphony has the same mystical aspect that plays a major role in several of his works, including the element of pantheism found in his *Cantus Arcticus* for orchestra and taped birds, a 1972 work that remains his most popular (the

same recording has been issued by Ondine and BMG's Catalyst label).

The opening of *Angel of Light* emerges seemingly from nowhere, and over the span of 12 minutes the music develops a feeling of limitless space permeated by spellbinding string sonorities that are accented with notes of metallic percussion and interwoven with triadic woodwind figures and gently insistent trombone proclamations. It's all somewhat reminiscent of another Finnish Seventh Symphony, the more famous one by Sibelius. Indeed, I wonder if this whole work is not Rautavaara's attempt to imagine what Sibelius's abandoned Eighth Symphony might have been like.

The second movement is fiercely eruptive, somewhat after the fashion of the third movement of the Vaughan Williams Sixth. "Like a Dream" reads the performance indication for the otherworldly third movement, which leads into the majestic finale and the realm shared by Alan Hovhaness, Arvo Pärt, and John Tavener. It all adds up to a near-overwhelming sonic and musical experience.

The 1976-77 *Annunciations*, a concerto for organ, brass, and winds, shows Rautavaara in his more aggressive and virtuosic aspect. As in *Angel of Light*, the opening is slow, but it gradually develops into a huge aviary punctuated by some mighty horn whoops. The organ comes more and more to the fore as the music develops, with virtuoso fireworks displays worthy of Messiaen. Most spectacular is the climax for full organ, wind, brass, and percussion, during which the organ motor is turned off and sonority disintegrates in truly weird fashion. A dazzling cadenza and finale pave the way to the eerie conclusion. In short, this is a blockbuster!

Conductor Leif Segerstam guides the Helsinki Philharmonic through magnificently convincing readings of both works in the acoustically ideal Finlandia Hall, with the organ soloist, Kari Jussila, doing a knock-out job in *Annunciations*. The whole recording is demonstration quality from start to finish. Don't miss it! *David Hall*

RAUTAVAARA: *Angel of Light (Symphony No. 7)*; *Annunciations (Concerto for Organ, Brass, and Winds)*.

Kari Jussila (organ); Helsinki Philharmonic Orchestra. Leif Segerstam cond. ONDINE 869 (65 min).

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CLASSICAL

BACH: *Mass in B Minor*. Soloists; Bavarian Radio Chorus and Orchestra, Eugen Jochum cond. EMI 68640 (two CD's). "... thrilling" (July 1983).

DVORAK: *Symphonies Nos. 7, 8, and 9 ("New World"); Carnival Overture; Scherzo Capriccioso*. London Philharmonic and Philharmonia Orchestras, Carlo Maria Giulini cond. EMI 68628 (two CD's). "Glow with warmth" (September 1977).

FRANCK: *Symphony in D Minor*. **RACHMANINOFF:** *Symphony No. 2*. Detroit Symphony, Paul Paray cond. MERCURY 434 368. "Living Presence" recordings from the late 1950's by the renowned French conductor.

MUSSOROSKY: *Boris Godunov*. Ivan Petrov, others; Bolshoi Theater Chorus and Orchestra, Alexander Melik-Pashayev cond. BMG/MELODIYA 29349 (three CD's). "[Petrov's] voice is a dark, powerful instrument" (August 1968).

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

THE BLACK CROWES: Three Snakes and One Charm.

AMERICAN 43082 (48 min).

Performance: Resurgent
Recording: Alive and lively

The Black Crowes' fourth album is a huge improvement over their last one, the parched, pedantic "Amorica." It synthesizes the best aspects of their first two releases — the choogling "Black Crowes" and the ambitious "Southern Musical and Harmony Companion" — into what may well be their finest effort to date. Singer Chris Robinson isn't so much preaching at the world as he is talking to it, and the attitude adjustment is crucial to the new album's success. All the same, there are biblical references aplenty, and the ongoing tension between damnation and absolution (think of Jerry Lee Lewis, a fellow Dixie-ite) gives the Crowes' music much of its sinuous intensity.

"Three Snakes and One Charm" begins with one of those slow, Humble Pie-type grinds at which the Black Crowes are so adept (*Under a Mountain*), then kicks in for real with *Good Friday*, a country-and-gospel-suffused breakup song whose back-porch drawl, big lazy beat, and pedal-steel moan would make the Rolling Stones envious of a genuine Southern upbringing. And the Crowes, especially Robinson, have recovered their sense of humor. Lashed to a snaky riff, *Nebakanazer* opens with the amusing, head-scratching lines "Nebakanazer never knew / He left his Beetle outside in the rain and it rusted through." The absurdist imagery seems to parody the more superstitious aspects of charismatic Christianity — or maybe Robinson's just being playfully wack, like Bob Dylan circa "The Basement Tapes." More easily readable is the compelling character study *Girl from a Pawnshop*, a richly detailed portrait similar in tone to *She Talks to Angels*.

Amid this resurgence, the best news of all is that the Crowes are kicking serious butt again. From the Sly Stone-style funk of

(Only) *Halfway to Everywhere* to the righteously raunchy *Blackberry* — a politically incorrect sex song to which you'll unapologetically shake your booty — the Crowes carry an Olympic-size torch for the sort of no-frills, feel-good, fundamental rock that most bands have forgotten how to make. Combine that with some fanciful changes of pace, such as the quasi-psychedelia of *How Much for Your Wings?* and the hard-won emotional maturity of *Better When You're Not Alone*, and "Three Snakes and One Charm" becomes powerful musical medicine indeed. P.P.



SONNY BURGESS.

ROUNDER 3144 (39 min).

Performance: Another place, another time
Recording: Okay

In his hometown of Newport, Arkansas, in 1955, guitarist/singer Sonny Burgess opened for Elvis Presley — and was so taken with the Memphis Flash that he later drove 95 miles to Sun Records to lay down his own tracks. He's been making music ever since (even if he didn't quit his day job), balancing country with rockabilly, blues, and boogie.

On his first album in four years, Burgess tackles material by left-of-center Nashville writers Radney Foster, Hank DeVito, and Steve Forbert, among others. But aside from *Six Nights a Week*, a bluesy shuffle written by ex-Blaster Dave Alvin and Chris Gaffney, his heart seems more in the music that still hangs around Memphis. *Hell Yes I Cheated*, a triplet-based confession in the

style of early Jerry Lee Lewis, is engaging both instrumentally and lyrically ("And I'd do it again"). Meanwhile, he wrings solos out of his electric guitar as if they were stubborn stains, counting on Stuart Smith or Garry Tallent to conjure the smoother passages. That's fine: Burgess sounds best just honkin' it out.

Unlike myriad rockabilly nostalgists, Burgess is the real thing — and more often than not, he'll give you chills. A.N.

CHER: It's a Man's World.

REPRISE 46179 (50 min).

Performance: All over the map
Recording: Ditto

Whew! Is this a mess, or what? Taking a nod from Tina Turner, the un-sinkable Cher recorded "It's a Man's World" with a slew of producers, both British and American. But at least Tina had a vision of how she wanted her album to sound — and a solid style from which to draw. Poor Cher, a chameleon at best, had neither.

Admitting in her press bio that "Sometimes I don't even sound like me," Cher darts out of the chute with *One by One*, a slinky call for universal love and tolerance that alternates the *sotto voce* stylings of Sade with full-tilt Anita Baker. By the next cut, Don Henley's *Not Enough Love in the World*, she sounds like her old overwrought self. From there, it's a total hodgepodge — and for the most part, wretchedness lurks (take a gag-rag to check out her version of Marc Cohn's *Walking in Memphis*).

There's one big shock at the end, as Cher pulls off a dynamite rendition of James Brown's *It's a Man's Man's Man's World*. She gets lost in the lyric, suggesting that she's realizing its stark truths for the first time. The result is startlingly moving. A.N.

GEORGE CLINTON AND THE P-FUNK ALL-STARS: T.A.P.O.A.F.O.M.

550 MUSIC/EPIC 67144 (75 min).

Performance: Steady as she goes
Recording: Very good

The Awesome Power of a Fully Operational Mothership (source of the title abbreviation) truly is an amazing thing to behold, as all who have gotten funk'd up to George Clinton's Parliament and Funkadelic ensembles over the decades are well aware. But awesome power is not exactly what Clinton and the P-Funk All-Stars display on this disc, their first since disappointing efforts for Prince's now-defunct Paisley Park label. Instead of soaring into the cosmos at full blast, they're warily cruising in low gear, carefully monitoring each move.

Of course, a vigilant Clinton is an engaged Clinton, and this is his most cohesive project since (dare I say it) "Computer Games." In fact, it purports to pick up the thread of the various characters he has divined on past masterworks such as "Mothership Connection" and "The Clones of Dr. Funkenstein." There's more Parliament than Funkadelic on "T.A.P.O.A.F.O.M.," meaning more throbbing, manicured grooves than hard, guitar-oriented funk. Chants and

counterchants are woven into the keyboard-and-percussion-driven flow, as a veritable mothership's crew of singers and players (the booklet lists twenty-three, count 'em, twenty-three All-Stars!) work to seduce and hypnotize in standout tracks like *Summer Swim*, *Hard as Steel*, and the supremely funky title track. The calls to party are a little more subdued and automatic than usual, as Clinton has his eye on a larger agenda: deliverance as the end, with determination as the key and a steady, rolling groove as the means. P.P.



FINN BROTHERS.

DISCOVERY 77043 (38 min).

Performance: Almost grand

Recording: Fine

Brothers Tim and Neil Finn joined each other's groups (Split Enz and Crowded House, respectively) at various points, and now these like-minded lovers of brainy, brooding pop are together again as a duo, which makes perfect sense. "Finn Brothers" shows them honing their fraternal craft to its essence in thoughtful lyrics and spare but striking settings, betraying a debt that dates back to "Revolver"-era Beatles.

While it is all quite sublime and very much welcome, the album is nonetheless missing some sort of vital spark — a trace of which is evident in only a handful of tracks, most notably *Eyes of the World* (a psychological tempest of a tune with despair and resentment at its core) and *Kiss the Road of Rarotonga*. The latter song, the closer on this fairly brief disc, was recorded live with notably diminished fidelity. Even so, it kicks with a drive that sets it apart from the rest of the album — and the contrast is glaring. P.P.

JOHN GORKA:

Between Five and Seven.

HIGH STREET 10351 (49 min).

Performance: Streamlined

Recording: Very good

Folkie John Gorka has an irritating habit of overdramatizing his delivery, as if he's a sanctimonious oracle who deigns to drop a pearl of wisdom on us when he's feeling generous. However, he keeps that tendency in check on "Between Five and Seven" (an album some folks might have called "Six"). Instead, Gorka serves up a well-rounded and extremely tuneful collection of songs, including portraits of a pathetic short-order cook (*Scraping Dixie*), a man who plays entirely too much pool (*Blue Chalk*), and an ill-suited couple traveling life's rocky road together, if only for now (*Airstream Bohemians*).

More than usual, Gorka fills his songs

with memorable lines. In *Can't Make Up My Mind* he describes a frustrating relationship by noting that "she cannot fit my name inside her mouth." Likewise, he zeroes in on the male character of *Airstream Bohemians* with "He was the type to look for work / Although not the kind to find it." And when the antihero of *Scraping Dixie* steams his face at the restaurant grill, Gorka affectingly reports "that grease got all up in his dreams."

Not all of the profiles are this finely drawn, and the songs of doomed love generally fail to engage (*Paradise. Once*). But John Gorka makes you think, and in the sensual *Lightning's Blues*, he may just stir more than your brain. A.N.

JAN AND DEAN: Save for a Rainy Day.

SUNDAZED 11035 (64 min).

Performance: A bit of history

Recording: Good, considering

Something of a Holy Grail to collectors of California music. "Save for a Rainy Day" is a nice, obscure piece of pop history that saw an extremely limited release in 1966. It was one of the first concept albums: Every song is about rain, and the tracks are linked by rainfall (which actually sounds like frying bacon). Although the

album is credited to Jan and Dean, only Dean Torrence was involved, as Jan Berry was slowly recovering from the horrific car crash in which he suffered permanent brain damage. The record won't make the world forget the Beach Boys' "Pet Sounds," but it has a likable, understated air and peerless musicianship to commend it. And this re-issue from Sundazed, available as a single CD or a gorgeously packaged double LP, offers twenty-three tracks, supplementing the original nine songs and one instrumental with alternate takes, new stereo mixes, and backing tracks.

Dean has good vocal range but lacks presence as a lead singer, apparent in *Here Comes the Rain*, where he's off-key, and *When Sunny Gets Blue*, where he's over his head as a lounge crooner. With the poppier material, he gets by on charm and overdubbing, and this is where "Save for a Rainy Day" shines. *Yellow Balloon* is a stone California classic: earnest bubblegum pop with an indelible vocal melody and an inventive arrangement that includes mandolin, glockenspiel, and bass clarinet. *Like a Summer Rain* is the other standout, showing off Dean's falsetto in a moody setting that morphs into *Theme from A Summer Place* at the end. Smaller pleasures abound, in-

LINDA THOMPSON: SONGS IN THE KEY OF EX

Her former husband, Richard, has always overshadowed her, but with the twenty-song retrospective "Dreams Fly Away," Linda Thompson finally gets her due. In performances that shimmer with beauty, she stands quite tall on her own, thank you.

Many of the tracks do capture her in duet with Richard, however. Among the most intriguing of these selections are *First Light*, which appears here in its original demo version (with Richard's lovely acoustic solo), and *Sometimes It Happens*, a 1972 track that was only recently discovered on acetate. In fact, most of this collection uncovers Linda's more elusive work (a mere seven of the songs are available elsewhere), including other performances from the early Seventies and tracks from the "lost" album she recorded in 1987 with Nashville musicians. There are also studio outtakes (the dark and desperate *Walking on a Wire*, a gorgeous version of *Dimming of the Day*), live cuts (*The Great Valerio*), and previously unreleased songs, such as the pretty pop tune *Insult to Injury*, which she co-wrote with Betsy Cook (who also helped her write *Telling Me Lies*, later covered by Linda Ronstadt, Emmylou Harris,

and Dolly Parton). And the album sets the record straight on an important song: It was Linda and Richard, not Richard alone, who wrote the affecting thrill-killer opus *Pavanne*. But Linda is never better than in her own *Talking Like a Man*, a naked confession of impending adultery and divorce, in which she proclaims she is "no more living a lie."

Produced with muted guitar, cymbal, and bass, it conveys a relationship dying by the seconds.

Although this is Linda Thompson's first album in a decade, it is also probably her last. She suffers from a condition called hysterical dysphonia, which prevents her from singing. "I always found [performing] a painful thing to do —

not physically, but emotionally," Thompson has said. "It was quite draining because I put so much into it." Which is precisely why "Dreams Fly Away" is such a remarkable, albeit finite, body of work. Don't miss it.

Alanna Nash



LINDA THOMPSON:

Dreams Fly Away:

A History of Linda Thompson.

HANNIBAL 1379 (78 min).

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cluding *Pocket Full of Rainbows* (great bass line, sweet vocal). *Taste of Rain* (which could pass for a lost nugget from the "Pet Sounds" sessions), and the title theme, a closing instrumental that envelops the album in a warm, rosy glow. Artful yet unpretentious, "Save for a Rainy Day" is a gem from a magical time. *P.P.*

THE LOUD FAMILY: Interbabe Concern. ALIAS 098 (57 min).

Performance: Superb
Recording: Nuanced

Loud Family leader Scott Miller writes songs whose titles are often more creative than most people's entire albums. Browse through the song list on "Interbabe Concern" — the third project he has released under the Loud Family name, though it's now more his show than ever — and one finds such entries as *Screwed Over by Stylish Introverts*, *Not Expecting Both Contempo and Classique*, *Rise of the Chokehold Princess*, and *Hot Rox Avec Lying Sweet Talk*. Those promise intrigue, smarts, passion, and surprise; the music delivers all that and more.

Miller used to front Game Theory, a sometimes inspired pop combo that had both a sweet side and an abstract side. With the Loud Family he has come into his own, writing material that's both wildly experimental and sublimely catchy; at his best, Miller shows how far the boundaries of guitar-based pop can be stretched. After 1994's "The Tape of Only Linda," a misguided attempt to give his bandmates the spotlight, "Interbabe Concern" finds Miller completely in control. In fact, it's the hardest-edged thing he's ever done, with sudden mood-shifts within songs, flashes of lyrical bitterness, a harsher tone in both his vocals and guitar playing, and a string of achingly sad closing numbers. Don't let that scare you away, however: The album's icy surface melts a little more with each listen, revealing killer hooks and harmonies, tender balladry, and exhilarating garage-rock, even a cerebral joke or two (the chorus of *Sodium Laureth Sulfate*, which doesn't occur until song's end, sounds like a surreal answer to Tommy James's *Hanky Panky*).

Deep but not depressing, "Interbabe Concern" is the work of a wounded but hopeful heart. It's also a brilliant album. *B.M.*

TRACY NELSON: Move On. ROUNDER 3143 (46 min).

Performance: Smashing
Recording: Good

Blues goddess Tracy Nelson didn't cut any albums in the Eighties, but she's making up for it now. As "Move On" is her third record for Rounder. At age 51 she has gained confidence in her own writing, with four original songs here, including the oddly Bee Gees-like title track. She also packs a new vocal and emotional resonance (it's thrilling to hear her reach way down or up into her register to convey a certain nuance), infusing lyrics of love lost and won — particularly Dianne Davidson's wistful ballad *Tonight I'll Dream* — with a school-of-hard-knocks wisdom and an almost



Soundgarden: four to the floor

prayerful appreciation for the kind of tenderness she might once have taken for granted. Still, with her smoke-meets-satin power delivery, she's no pathetic doornat; in *(I Was) Good to You Baby*, a no-good heel suffers a snaky assault he won't soon forget. Joined by Delbert McClinton, Bonnie Raitt, Maria Muldaur, Phoebe Snow, wild-and-wounded guitarist Mike Henderson, and Al Kooper on keyboards, Nelson shifts adeptly between Stax-era soul, New Orleans shuffle, and down-home country blues and gospel. "Move On" is a real head-turner. *A.N.*

PORNO FOR PYROS: Good God's Urge.

WARNER BROS. 46126 (40 min).

Performance: Spacey
Recording: Shimmers

As regards Perry Farrell and the second album from his band, *Porno for Pyros*: better a mystical, circumspect neo-hippie than an insufferable, self-absorbed hedonist. The group — pictured as a trio, though listed as a quintet and abetted, in any case, by numerous guest musicians — has taken a giant step forward on "Good God's Urge," a trippy album that tickles your consciousness like some lysergically embroidered West Coast exotica from the Summer of Love. An "Electric Music for the Mind and Body" for the Nineties, it bubbles up on waves of ambient-textured guitar and percussive samples.

This sonic tidal pool of the psyche suits Farrell's eerie, unearthly voice just fine. He sounds as serene as a sea anemone singing about sinking beneath the water's surface in *Porpoise Head* and *Tahitian Moon*, lapsing into meditative reverie: "The sea is a very easy place to disappear, drift away, fall asleep, make your peace." Farrell and guitarist Peter DiStefano get downright cosmic in *Thick of It All*, in which one conscious organism's role in the teeming whole of creation is pondered against a weblike backdrop of sound as tantalizingly strange as... well, life itself. It's almost blasphemous that an album this ethereal is credited to a band with a name as unfortunate as *Porno for Pyros*. *P.P.*

PATTI SMITH: Gone Again.

ARISTA 18747 (56 min).

Performance: Welcome back

Recording: Intimate

By now everybody's no doubt aware that Patti Smith's new album is an event, an epiphany, a heroic comeback after the deaths of Smith's husband, brother, and at least one close friend. So am I being hopelessly crass by admitting that I still wish it rocked a little more?

When "Gone Again" does rock, it's energizing and moving. The old Patti Smith Group nucleus — guitarist Lenny Kaye and drummer Jay Dee Daugherty, with extra guitar power from Tom Verlaine — is back and sounding great, and Smith's voice, while notably gruffer than it was when she last recorded, is more expressive than ever. The title track sets a memorial lyric to a tune written by her late husband, the ex-MC5 guitarist Fred "Sonic" Smith, and it's one of the strongest elegies that rock has yet produced, invoking the spirits without giving in to sentiment. Here Patti sounds tough, defiant, and open-hearted all at once. The other Smith-Smith collaboration, *Summer Cannibals*, gets closest to the old sound, its snotty tone a necessary balance to the album's emotional generosity.

However, much of "Gone Again" is a quieter affair, sometimes intensely beautiful and sometimes, as in the lengthy *Fireflies*, just intensely personal. (One exception: The Kurt Cobain-inspired *About a Boy* is obviously heartfelt, but it detracts from the album's autobiographical tone). Since there's more poetry than pop, the album echoes Smith's 1975 debut. "Horses," with quiet warmth replacing the punk of old. But "Horses" was a starting point that suggested plenty of future possibility — and so, in its life-torn way, is "Gone Again." *B.M.*

SOUNDGARDEN: Down on the Upside.

A&M 540 526 (66 min).

Performance: No surrender

Recording: Thunderous

Soundgarden's "Down on the Upside" is so dense and furiously overdriven that it's almost too much of a good thing. But if you can't stand the heat, get away from the tailpipe; I find the whole disc to be an exhilarating workout for the ears, an engine at whose power you can only marvel or mosh.

Whereas singer Chris Cornell's Robert Plant-like agonies and the group's dinosaur waddle were mostly an acquired taste of card-carrying grungeheads in the early days, Soundgarden has since moved up a few rungs on the evolutionary ladder. The wah-wah whine and chordal crunch of *Pretty Noose*, bouncing up and down over unfamiliar terrain, make for a torturously interesting ride. The band achieves maximum torque in *Dusty*, a kind of speed-metal bluegrass hoedown. Throughout the album, the combination of odd tunings and meters, artful filigrees, and combustible four-to-the-floor stampeding results in a play of shadows and light, of delicacy and power, that sustains for all but a handful of songs.

If there's a band more captivating and intense than Soundgarden at the moment,

I haven't heard it. Jack up the volume and prepare to blister. *P.P.*

NEIL YOUNG WITH

CRAZY HORSE: Broken Arrow.

REPRISE 46291 (49 min).

Performance: Neil Young

Recording: Likewise

You don't have to be Neil Young to pull off an album like "Broken Arrow," but it helps. It sounds as if he simply led Crazy Horse into the barn and let them cut loose

on songs they hadn't finished learning and he hadn't finished writing (hey, it's not like he's never done that before). The result is stronger on noise than it is on tunes, but it's a heck of a noise.

The good stuff is all in the first half, three tracks that run between seven and ten minutes each. *Loose Change* is the longest, but Young and Co. get the actual song out of the way early and head for a pounding one-chord jam. *Slip Away* makes good use of the whiny, post-teenage falsetto that

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Young is still able to access at age 50 (it also has the disc's most haunting tune — which the band gladly trashes). In *Big Time* he sings about how he's still living his dreams from the Sixties, but never specifies which dreams (Changing the world? Forming Buffalo Springfield? Making lots of money and meeting girls?). Then again, it hardly matters, because when the band swings into gear, it's still grungier than Young's last backup outfit, those youngsters from Pearl Jam.

Unfortunately, "Broken Arrow" takes a somber turn midway through. After the too-short rockabilly of *Changing Highways*, there's a string of ominous slow numbers that would have fit better on the doomy concept album "Sleeps with Angels." The closing cover of Jimmy Reed's *Baby What You Want Me to Do* — sloppily played and miserably recorded in a small club with audible chat and clinking glasses — is downright perverse. But that isn't necessarily a complaint.

B.M.



JAZZ

RAY BROWN TRIO: Some of My Best Friends Are . . . the Sax Players.

TELARC JAZZ 83388 (72 min).

Performance: Lots of good sax Recording: Excellent

Over the past five decades, bassist Ray Brown has appeared on more recordings than you are likely to find in most collections. The remarkable thing is that he has never performed less than well, and he continues to make excellent albums. "Some of My Best Friends Are . . . the Sax Players" continues a concept that began with last year's "Some of My Best Friends Are . . . the Piano Players," and again the many friends range from seasoned veterans to newcomers.

Benny Carter belies his 89 years with stunning readings of *Love Walked In* and *Fly Me to the Moon*. Stanley Turrentine, 62, is a relative youngster: with Illinois Jacquet's *Port of Rico* he acknowledges a major influence, and his sensitive reading of *God Bless the Child* demonstrates how far into jazz he has crossed since the days when honkers prevailed. Joshua Redman's playing in *Polka Dots and Moonbeams* and *Just You, Just Me* validates in a most eloquent way his current popularity. Ralph Moore's buoyant version of *Crazeology* and his robust take on *(When It's) Sleepy Time Down South* — a nod to early influence Louis Armstrong — prove he hasn't grown stagnant from years in the *Tonight Show* band. Joe Lovano has commanded a good deal of deserved attention lately, and his work in *How High the Moon* and especially *Easy Living* can only add to that. Then there is also saxophonist Jesse Davis, who clearly has Charlie Parker in mind for both *Moose the Mooche* and *These Foolish Things* but who gives the performances his own accent.

The leader's bass playing is very much in evidence throughout, with characteristic taste and subtlety. Pianist Benny Green is, as usual, superb, and the drums are skillfully handled by Gregory Hutchinson. This is a superb album.

C.A.

KENNY GARRETT:

Pursuance — The Music of John Coltrane. WARNER BROS. 46209 (65 min).

Performance: Fervent but lyrical Recording: Very good

Given the sanctimony that usually attends John Coltrane tributes, alto saxophonist Kenny Garrett's is first of all praiseworthy for its levity: *Giant Steps* dances along merrily, for a change, with no heavy lifting. Garrett, whose "Triology" was one of last year's most exciting releases, doesn't sound a bit intimidated by this material and the legacy it represents. He asserts his own individuality, even with bassist Rodney Whitaker and drummer Brian Blade weav-

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ing complex patterns around him, as Jimmy Garrison and Elvin Jones used to do with Coltrane.

Garrett has some of Trane's lyrical incandescence, and this makes his interpretation of *Dear Lord* a joy to hear. There are fevered moments as well: The most satisfying performance of all may be *Lonnie's Lament*, with both Garrett and guitarist Pat Metheny practically howling on their instruments. Metheny elsewhere chords in a softer, more "jazz"-like fashion than is customary for him: he's not exactly my idea of a great improviser, but he does contribute much to the overall success of this project. (It's too bad there's no category for "catalyst" in the annual jazz polls, because Metheny would get my vote on the strength of his work here and on Joshua Redman's "Wish" — still the young tenor saxophonist's best album.)

All told, Garrett is nicely fulfilling the promise he showed in those dark, pushing solos he played with Miles Davis a few years back. *F.D.*

**JOE MANERI/JOE MORRIS/
MAT MANERI: Three Men Walking.**
ECM 1597 (66 min).

Performance: Intense
Recording: Excellent

Joe Maneri is an odd duck, a clarinetist and saxophonist in his late sixties who has taught at the New England Conservatory of Music just about forever and who began his recording career in earnest only two years ago. A protégé of Josef Scmid (himself a pupil of Alban Berg and a close associate of Arnold Schoenberg) as well as a lifelong student of Asian and Mediterranean folk music, Maneri has devised his own microtonal system of seventy-two notes to the octave, and this gives his music a nattering quality that can be off-putting at first. But his collective improvisations with violinist Mat Maneri (his son) and guitarist Joe Morris finally win you over with their quiet intensity. Best to start with *What's New*, the one standard here — and a thing of mournful beauty. *F.D.*

ART TATUM: The Standard Sessions:
1935-1943 Broadcast Transcriptions.
MUSIC & ARTS 919 (two CD's, 159 min).

Performance: Magic fingers
Recording: Very good

Some regard Art Tatum as the greatest jazz pianist of all time, others say he was all technique and no soul, and still others agree with the late John Hammond, who didn't even consider him a jazz player. None of that should concern you, because labels are unimportant; what counts is the music and what it does for you. However, I believe that no one to this day has come close to matching Tatum's ability to embroider a tune. And no other pianist has so spectacularly combined dazzling technique with the kind of musical imagination he possessed.

From 1932 until his death in 1956, Tatum made hundreds of recordings for a variety of commercial labels and transcription services. Some of these sides were with

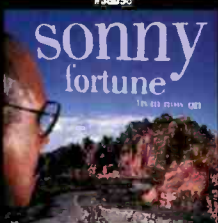
small bands, and many were with his own trio, but he sounded like a one-man band in his solo performances. "The Standard Sessions" contains sixty-three solo recordings Tatum made for the Standard radio transcription service between 1935 and 1943. All have previously appeared on small European labels, but never as splendidly remastered as they are here. The program includes some of the tunes Tatum was best known for — standards like *Tiger Rag*, *Get Happy*, *Tea for Two*, and *Sweet Lorraine*

and concert pieces like Dvorak's *Humoresque* and Massenet's *Elegie*, which he approached from such an unconventional angle that a co-composer credit might have been in order.

Did Art Tatum play jazz? Of course he did. Was he a soulless technical wizard? Of course not. Was he in fact the greatest pianist of them all? Perhaps. Other great ones, from Vladimir Horowitz to Earl Hines, seem to have thought so, and I won't argue with them. *C.A.*

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ACCURATE 3272 (two CD's, 145 min).

Boston's brainiest and most antic midsize jazz ensemble celebrates its tenth birthday with rousing performances that couldn't be squeezed on earlier releases. The group does especially well by Duke Ellington (*The Jeep Is Jumpin', In a Sentimental Mood*), but the takes on Burt Bacharach and John Lennon as well as the tributes to Mal Waldron and Sun Ra are keepers, too, as is Bob Nieske's diverting *There's a Boat That's Leaving Soon for Alban Berg's House*. *F.D.*

DAVE McKENNA/JOE TEMPERLEY:

Sunbeams & Thunderclouds.

CONCORD JAZZ 4703 (64 min).

McKenna's a known quantity, the greatest living exponent of swing piano. What makes his latest release special is its generous helping of Temperley, a baritone and soprano saxophonist usually hidden in big bands, whose work on the larger and chestier of his two horns displays something of the dark majesty associated with the great Harry Carney. *F.D.*



PERFECT:

When Squirrels Play Chicken.

MEDIUM COOL/RESTLESS 89315 (20 min).

People whose opinions I respect tell me that this new band featuring ex-Replacements bassist Tommy Stinson sounds like a glorious throwback to that sainted outfit's punkiest period. True enough. I guess, but even early on, the Mats had songs that stuck in your head immediately — a claim I can't advance seriously for this lot. Disappointing. *S.S.*

RICOCHET.

COLUMBIA 67223 (34 min).

If you haven't yet bought your requisite hepped-up country line-dancing record this year, you might put Ricochet, a kind of Diamond Rio, Jr., on your list. Somewhere near the bottom. *A.N.*

STOP: Never.

SMUT PEDLURZ/BOMP 001 (44 min).

Fronted by Mickey Leigh (Joey Ramone's kid brother), this is as devastating a piece

of neo-punk as I've heard in years. Imagine the drive and intensity of his sibling's outfit but with real guitar playing and a far more expressive lead singer, and you've got the idea. Amusing chutzpah: a blistering metallic take on Johnny Cash's *Ring of Fire*. Obvious hit: the opening *Lerk*, a sublimely riffy kiss-off to someone of that persuasion. *S.S.*

SUMMIT REUNION:

Yellow Dog Blues.

CHIAROSCURO 339 (67 min).

BOB WILBER: Nostalgia.

ARBORS JAZZ 19145 (67 min).

"Yellow Dog Blues" blissfully reunites Soprano Summit, one of the bands responsible for the small-group swing revival of the Seventies, and you know you're in good hands from the devilishly syncopated opening bars of Irving Berlin's *I'll See You in C-U-B-A*, a choice that shows co-leaders Bob Wilber and Kenny Davern haven't lost their knack for coming up with neglected gems. The same holds true for Wilber's "Nostalgia," which further benefits from a generous helping of his clarinet and from Ralph Sutton's inventive stride-piano solos. *F.D.*

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OF ROBERT BURNS, VOL. 1.

HONEST 5047 (64 min).

With fiddles, guitars, harmoniums, mandolins, whistles, voices, and citterns, Scotland's leading folk artists have collaborated in the first of a series of recordings of the nearly 400 songs by that country's national poet. Sincerity and undeniable authenticity are the hallmarks of these performances, without the self-consciousness that mars the work of many American folk singers. A twangy quality points to Scotland as the source of a great deal of American folk and a potent influence on country music. *William Livingstone*

ONLY ROCK 'N ROLL —

#1 RADIO HITS, 1965-1969.

ESSEX 1732 (51 min).

Looking for an album with twenty intelligently chosen songs from the end of the Golden Age of Top 40? Look no further. Personal fave: the Music Machine's brutal



punk assault *Talk Talk*. Guilty pleasure: the Fortunes' Brit Invasion weepie *You've Got Your Troubles*. Worse than I remembered: Barry McGuire's faux-protest *Eye of Destruction*. *S.S.*

NANCY WILSON: Ballads, Blues & Big Bands: The Best of Nancy Wilson.

CAPITOL 34886 (three CD's, 169 min).

Performance: The best

Recording: Ditto

The three most promising female singers to emerge in the Sixties would eventually become the decade's three biggest disappointments. Nancy Wilson, Aretha Franklin, and Barbra Streisand all began their careers with an incredibly rich and productive few years, but none was able to sustain the early brilliance, particularly on recordings. It's especially galling that Wilson has made only a handful of decent albums since 1970, compared with her output in the Sixties, when she released two or three LP's a year, nearly all of them wonderful.

Wilson artfully synthesized blues, jazz, and pop into an endlessly appealing sound, and her great period is beautifully sampled in "Ballads, Blues & Big Bands," featuring a host of superb songs in the company of the finest collaborators (Cannonball Adderley, George Shearing) and arrangers (most notably Billy May and Oliver Nelson). Producer Brad Benedict left out a few of my own personal favorites, but everything that is here is nothing less than great. It may sound like a stretch to refer to Wilson as a neglected giant, but these are some of the most thrilling and least-known vocals ever recorded. *Will Friedwald*

TEDDY WILSON:

Teddy Wilson and His All-Stars.

CHIAROSCURO 150 (51 min).

Performance: Wilson once removed

Recording: Good

Producer Hank O'Neal recorded Teddy Wilson for his Chiaroscuro label in 1976 because he wanted to hear Wilson once again in a small-band environment, as most of his sessions since the Fifties had been trio dates. The result was an album teaming the venerable pianist with trumpeter Harry "Sweets" Edison (a last-minute replacement for Bobby Hackett, who died the day after agreeing to do the session), trombonist Vic Dickenson, bassist Major Holley, drummer Oliver Jackson, and saxophonist Bob Wilber. A Sidney Bechet protégé, Wilber wrote the arrangements and — in an effort to recall Wilson's earlier band dates, which used head arrangements — deliberately kept them simple.

Perhaps too simple, in some cases. If the intent was to capture the feel of the old sides, then "Teddy Wilson and His All-Stars" fails. Wilson plays well but in a modified style that is bound to disappoint some of his old followers. Still, this is a spirited album sprinkled with good solos and played with clear affection. My favorite track is *Just Friends*, basically a string of solo statements. I feel a tad nostalgic when I hear *Blues in D-flat*, a new version of Wilson's *Blues in C-sharp Minor*, which he recorded in 1936 for Brunswick with Roy Eldridge, Buster Bailey, and Chu Berry. D-flat and C-sharp are actually the same key, but 40 years and a new title aren't all that separates the two performances; when something works, don't rerecord it. *C.A.*

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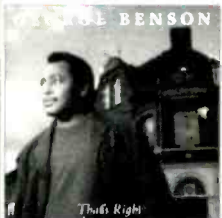
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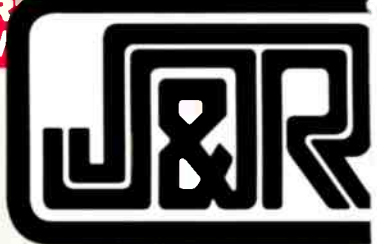
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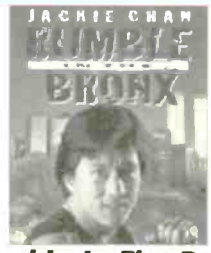
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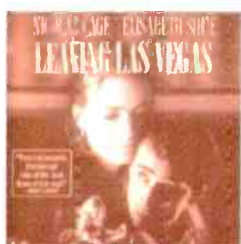
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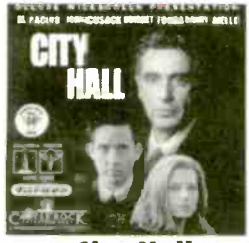
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CLASSICAL MUSIC

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

ADAMS: Violin Concerto; Shaker Loops.

Gidon Kremer (violin); London Symphony, Kent Nagano cond.; Orchestra of St. Luke's, John Adams cond. NONESUCH 79360 (59 min).

Performance: Brilliant
Recording: Shakes and shines

John Adams is a reformed minimalist. *Shaker Loops*, one of his early pieces of symphonic minimalism (1974), literally shakes, rattles, and rolls; it gets its power from a clear vision of rhythm and repetition. The 1993 Violin Concerto, commissioned by the Minnesota and London Symphonies and the New York City Ballet (!), treads the much more dangerous and shakier ground of Neoromanticism. It inherits from minimalism a spectacular nonstop solo part and the driving ostinatos and toccata form of the fast movements (particularly the finale), which suggest a middle ground between Neoclassicism and minimalism. In between, the ghostly, evocative, slow chaconne movement provides the most original moments of the work and its emotional

highs. A brilliant performance by Gidon Kremer and the London Symphony under Kent Nagano helps the piece come across.

Shaker Loops, the composer's best-known instrumental work, gets a fresh, first-class reading from the New York City-based Orchestra of St. Luke's under the composer's skillful direction. Adams made his mark with this piece; it is still one of his most engaging and original works, and he is, in many ways, its best interpreter. *E.S.*

DEBUSSY: Violin Sonata. POULENC: Violin Sonata. RAVEL: Violin Sonata; Tzigane; Berceuse sur le Nom de Gabriel Fauré.

Cho-Liang Lin (violin); Paul Crossley (piano). SONY 66839 (77 min).

Performance: Excellent
Recording: Exceptional

The one-movement sonata composed by the twenty-two-year-old Ravel in 1897, which came to light a little more than twenty years ago, seems to be taking a place in

the repertoire now. It's certainly an intriguing companion-piece to the familiar sonata he composed in the 1920's, and its inclusion in this exceptionally well-recorded disc means we have in a single package all the surviving music for violin and piano by these three composers. Happily, it is more than merely a generous and convenient collection.

Cho-Liang Lin, as always, combines brilliance, warmth, and a sense of genuine enthusiasm for the music at hand. Paul Crossley is no mere accompanist but a very full partner whose deep involvement in the French repertoire made him a happy choice for this undertaking. The interaction between these two seems to be unusually sympathetic; they seem to be really listening to and responding to each other as well as to the music, and theirs is decidedly not a "one size fits all" approach. The way Crossley seems to urge Lin along in the big Ravel sonata, the animation and intensity they bring jointly to the Poulenc, the sense of fresh discovery in the Debussy, the sheer



panache in *Tzigane* — all convey a spirit of truly engaged musicmaking that can never be taken for granted, especially in a recording studio. One or two of these six performances may be surpassed elsewhere, but not by much, and the sonic advantage provided by the Sony recording is not likely to go unnoticed. *R.F.*

DVORAK: Piano Quintet.

SCHUMANN: Piano Quintet.

Rudolf Buchbinder, Philippe Entremont (piano); Alban Berg Quartet. EMI 55593 (69 min).

Performance: Excellent
Recording: Schumann warmer

The Dvorak and Schumann quintets for piano and strings are arguably the most popular masterpieces in the genre, yet it appears that they have not been coupled on CD before. Count that as a bonus for this EMI disc of live recordings by the Alban Berg Quartet, with Rudolf Buchbinder as pianist in the Dvorak at Vienna's Konzerthaus in 1993 and with Philippe Entremont in the Schumann at Carnegie Hall in 1985 — just prior to its controversial renovation.

Both of these distinctive and vital performances rate very high on my list, though the Schumann is more to my taste overall than the Dvorak, in large part because of the acoustics of the two halls. Airiness and brilliance characterize the Viennese Dvorak recording. The playing by the Berg Quartet's first violinist is surpassingly sweet without being saccharine, and Buchbinder's pianism is fleet and lightfingered, notably in the scherzo. But there's a splendid warmth

APPALACHIA WALTZ



MARK HANAUER/SONY CLASSICAL

Take a classically trained cellist (Yo-Yo Ma), add a country-style fiddler (Mark O'Connor) and a bass player (Edgar Meyer) who has collaborated with musicians as diverse as the Guarneri Quartet and Garth Brooks, and you get a new CD called "Appalachia Waltz." The sixteen selections explore the diverse instrumental styles of the Appalachian Mountains in arrangements by O'Connor and Meyer. Meyer doubles as pianist, and O'Connor also plays mandolin and guitar on several tracks. Sony Classical was planning to release the disc in mid-September, and the trio will perform across the country this fall. A New York City appearance will be broadcast on National Public Radio.

to the Carnegie Hall Schumann recording, and Entremont eschewed his usual Gallic keyboard manner for playing tailored to Schumann's extroverted and broody Romanticism. I would have been even happier if the producers had edited out the applause in both recordings, the only serious blemish in an otherwise delightful program. *D.H.*



GOUNOD: Roméo et Juliette.

Placido Domingo (Roméo), Ruth Ann Swenson (Juliette), Susan Graham (Stephano), Sarah Walker (Gertrude), Kurt Ollmann (Mercutio), others; Chorus of the Bavarian Radio; Munich Radio Orchestra, Leonard Slatkin cond.

RCA VICTOR 68440 (two CD's, 156 min).
Performance: A few good moments
Recording: Impressive but cold

Gounod's *Roméo et Juliette* is one of the best operatic treatments of Shakespeare: It follows the Bard fairly closely and enriches him with effervescent Gallic *mélodie*. Unfortunately, despite a few fine performances, this recording keeps its feet firmly, and flatly, on the ground. Gounod's music is simply not the right material for either Leonard Slatkin or the Munich Radio Orchestra, and the lyrical passages never really take flight.

Another major problem is the Roméo: It's not a pleasure to say this, but Placido Domingo is simply too old to be singing roles like this one. He still has the high notes, but they sound like an old man's high notes. Ruth Ann Swenson is one of the best coloratura sopranos around, with absolutely flawless technique, but the recording does not capture the golden highlights of her voice very nicely. Nonetheless, her rendition of the famous ariette "*Je veux vivre dans ce rêve*" is mighty impressive, with a trill that could stop a clock.

Some of the smaller parts are very well cast: the veteran British mezzo Sarah Walker is fine as the matronly Gertrude, and the American baritone Kurt Ollman tosses off Mercutio's Ballad of Queen Mab with great élan. Unfortunately, most of the opera belongs to the young lovers. If only they were convincing. *J.J.*

KODALY: Hary Janos, Suite; Dances of Galanta; Dances of Maroszek; "Peacock" Variations.

Montreal Symphony, Charles Dutoit cond.

LONDON 444 322 (77 min).
Performance: Polished
Recording: Splendid

The ever-popular suite from Zoltan Kodaly's opera *Hary Janos* and his two sets of dances get a crisp and clean treatment on this generously programmed CD. The only drawback is that the performances

are a little polite for my taste compared with those from such Hungarian conductors as Eugene Ormandy and Antal Dorati — or, for that matter, Kurt Masur's recent New York Philharmonic recording of the *Hary Janos* suite.

Charles Dutoit is more in his element with the superb variations on the Hungarian folk song *The Peacock*, which I have long regarded as Kodaly's major orchestral masterpiece. In variety of treatment and tone color the work is closer to the French repertoire for which Dutoit has become justly renowned. The final variations, including a peppery fugue, come off with great style.

This CD stands out as a best buy just for its playing time, but the performance of the "Peacock" Variations is the clincher. The sonics are fully up to the Montreal/London Records standard. *D.H.*

MOZART: Piano Concertos Nos. 9 and 24.

Kyoko Tabe (piano); Lucerne Chamber Orchestra, Jesús Lopez-Cobos cond.

DENON 78833 (64 min).
Performance: Tidy
Recording: Likewise

MOZART: Piano Concertos Nos. 9 and 20.

Mikhail Pletnev (piano and cond.); Deutsche Kammerphilharmonie, VIRGIN 45130 (66 min).

Performance: Compelling
Recording: Good

Two performances of Mozart's first truly great piano concerto — No. 9, in E-flat Major (K. 271) — could hardly be more sharply contrasted than these. Kyoko Tabe is a stylish Mozart player, but she is apparently willing to take the last of the solo concertos from Salzburg at more or less face value. Her playing, characterized predominantly by clarity and directness, is lively in the opening movement, sensitive in the middle one, and tends to pall in the last — particularly in the minuet episode, in which animation is put on hold. Mikhail Pletnev, on the other hand, sustains tension in every phrase; he seeks out the darker undercurrents and shows a sharper and more flexible sense of rhythm, making the work dramati-



cally compelling from the first bar to the last without in any sense distorting its essential proportions.

Whereas Tabe enjoys elegant, well-meshed accompaniment from conductor Jesús Lopez-Cobos, Pletnev, conducting from the keyboard, achieves a full integration rather than a mere accompaniment. He doesn't miss a chance for chamber-music give-and-take between keyboard and orchestral soloists. He doesn't settle for simple,

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sweet resignation in the slow movement but unleashes its disturbing emotional tussle, and his finale gleams with unexaggerated vitality, giving more point to that curious minuet episode without hotting it up.

The two discs offer different companion works, but since each of them is one of Mozart's overtly dramatic minor-key concertos, comparisons may be made almost as directly as in the two performances of the E-flat. Tabe's approach to No. 24, in C Minor (K. 491), is much the same as in No. 9: evenly spun out, unruffled, again sympathetically accommodated by her conductor, but overall little more than tidy. Pletnev seizes the drama of No. 20, in D Minor (K. 466), in which the dark element hardly needs seeking out. His pacing is on the expansive side throughout the work, yet momentum never sags. The stark phrasing of the famous *romanza*, and even the wind comments toward the end of the final movement, gently reassert the character of the work as one of profound resignation. Both discs are well recorded. *R.F.*

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CLASSICAL MUSIC

PUCCINI: *Madama Butterfly*.

Ying Huang (Butterfly), Richard Troxell (Pinkerton), Richard Cowan (Sharpless). Ning Liang (Suzuki), others; Orchestre de Paris, James Conlon cond. SONY 69258 (two CD's, 133 min).

Performance: Enjoyable
Recording: Very good

The byproduct of a new film directed by Frédéric Mitterand, this set presents the opera uncut and, aside from occasional instances where the orchestra blankets the singers, in vivid sound. To enhance visual authenticity for the film, oriental singers were used in subsidiary roles, and the young Chinese soprano who sings Butterfly, Ying Huang, was supposedly chosen by conductor James Conlon out of a field of two hundred candidates.

Huang offers a gentle, vulnerable Butterfly, skillfully capturing the girlish inflections of the character in the early scenes and subtly transforming herself into a tragic presence after the visit of the American consul, Sharpless. Her singing may miss certain nuances that do not escape the great interpreters of this role, such as Renata Scotti and Mirella Freni, and her suicide scene is not truly shattering, but the overall portrayal is well thought out and sensitively and securely vocalized.

Conlon's direction, which avoids the excessively broad pacing favored lately by several big-name conductors, propels the opera with an unhurried urgency. Puccini's dynamic markings are carefully observed, and the transitions are handled with exceptional control and subtlety. The young American tenor Richard Troxell is an involved Pinkerton whose pleasant tone, somewhat tight on top, does not ring out in the ensembles. Juilliard-trained Ning Liang portrays a sympathetic Suzuki, and Richard Cowan brings a plummy sound and a somewhat heavy touch to Sharpless.

The top-heavy recorded competition cannot be ignored, but this latest version merits praise nonetheless. *G.I.*

SIBELIUS: *Symphonies Nos. 3 and 5*.

Oslo Philharmonic, Mariss Jansons cond. EMI 55533 (58 min).

Performance: Crisp and vital
Recording: Clean-cut

Sibelius's Third Symphony has remained something of an orphan child in terms of public popularity, for there are no spectacular high points. It's just wonderful, outdoorsy music that virtually smells of northern forests. Mariss Jansons and his Oslo players articulate the simple, declarative opening pages as crisply as one could possibly wish, and they bring a fine sense of flow to the following lyrical-pastoral music. The hushed violin unison that paves the way for the eventual recapitulation is carried off with exquisite finesse, and the hymnal coda is a joy to the senses. Pacing of the quasi-waltz central movement is ideal, and the combined scherzo-finale has just the right vivacity at the start, with no dragging in the long anthemlike buildup to the finish. There is both power and tension here.

The Fifth Symphony, whose popularity is



Madama Butterfly, the movie

exceeded only by the patriotic Second, gets a heady treatment. The pace is deliberate and firm from the beginning, and the movement reaches its high point with the famous "moaning" bassoon episode. The following section moves at a fast and vital clip — it's practically airborne — culminating in the wild conclusion, which here has a sense of inevitability rather than of a mad scramble.

The "intermezzo" slow movement can sound inconsequential in many performances, but Jansons captures the ebb and flow of its variations with a true poetic sensibility. The dissonances toward the end have a real cutting edge, adding a special poignancy to the final pages. The famous finale is spine-tingling from start to finish, and I have never heard the last chords, which spell out the harmonic foundation of the celebrated ostinato horns, so thrillingly hammered home. The recording is bright and clean. Even with twenty-odd CD versions of the Sibelius Fifth, I'd put this new one very near the top. *D.H.*

R. STRAUSS: *Elektra*.

Deborah Polaski (Elektra), Waltraud Meier (Klytämnestra), Alessandra Marc (Chrysothemis), Johan Botha (Aegisth), Falk Struckmann (Orest), others; Berlin State Opera Chorus and Orchestra, Daniel Barenboim cond. TELDEC 99175 (two CD's, 101 min).

Performance: Exciting
Recording: Excellent

Daniel Barenboim copes with Richard Strauss's lifelong "struggle between words and music" as it applies to *Elektra*, his most "revolutionary" opera, as skillfully as any conductor on records. Aided by splendid engineering, he propels the music relentlessly forward, revealing its ferocity without obscuring its brilliant orchestral textures and without gliding over the few but important lyrical episodes.

I know of no soprano on records besides Birgit Nilsson who has met all the title role's merciless demands. Deborah Polaski's achievement here is respectable — in the Recognition Scene considerably more than that — but it is a compromise. She captures Elektra's obsession and hectic in-

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tensity, though at the cost of severe vocal strain. The challenges of Klytämnestra, also substantial, are triumphantly met by Waltraud Meier. A darker timbre might be preferred for effective contrast, but her tone is rich and dramatically illuminated; she portrays a suffering, pathetic figure, not a monster.

The music of Chrysothemis is also unforgiving. Alessandra Marc sings with a steady tone, and her high notes are fearless, but she brings little variety or textual clarity

to her performance. Falk Struckmann's Orest is suitably dark and ominous, Johan Botha is a firm and unexaggerated Aegisth, and the many small parts fit smoothly into the well-oiled ensemble.

There are three "traditional" cuts (in Elektra's monologue at the end of the Klytämnestra scene, a brief bit in the scene with Chrysothemis, and part of her music in the Recognition Scene). Strauss deplored these cuts but reluctantly accepted them *in performance* to lighten the soprano's bur-

den. They add up to about 6 minutes, and, frankly, they should have been restored for this recording. *G.J.*

TCHAIKOVSKY: Symphony No. 5; Overture 1812.

Chicago Symphony, Daniel Barenboim cond. TELDEC 10904 (60 min).

**Performance: Refined
Recording: Variable**

In the notes with this CD, Daniel Barenboim speaks of having "relearned the work specially for this recording," rethinking every note. Perhaps my ears are not on right, but I discerned no blinding interpretive revelations, just unusual care lavished on the lyrical element and a general freedom from the blatant vulgarity that has marred many a reading. Though Barenboim speaks highly of Yvgeny Mravinsky's interpretation, there is little of the ferocious Mravinsky drive here. Nonetheless, for my taste the pacing is dead on target from start



to finish. The low string sonority at the opening of the slow movement is gorgeous in its darkly burnished coloration, and the coda is altogether lovely thanks to the first-chair clarinet, Larry Combs. The episodic finale seems a bit on the careful side, but it's in keeping with the reading as a whole.

I am not altogether happy with the rather close-miked sound. The instrumental presence is very much there in terms of both big ensemble and inner detail, but I kept wanting more elbow room — a shade more extended decay time.

The *1812 Overture* fares better sonically, with a touch more room tone and more effective lateral imaging. The notes don't say that the cannon and church bells at the end were overdubbed, so I assume that the very well-placed and effective-sounding cannon shots are of the electronic variety and that the bells are the chimes of the Orchestra Hall organ. *D.H.*

VAUGHAN WILLIAMS: Symphony No. 5; Norfolk Rhapsody No. 1; The Lark Ascending.

Sarah Chang (violin); London Philharmonic, Bernard Haitink cond. EMI 55487 (68 min).

**Performance: A bit too rarefied
Recording: Luminous**

Bernard Haitink's recording of the Vaughan Williams Fifth Symphony is the fourth installment in what will presumably be a complete cycle under his baton. His interpretations of "A Sea Symphony" (No. 1), "A London Symphony" (No. 2), and the *Sinfonia Antartica* (No. 7) have been memorable not only for their penetrating poetry but also for the subtle variances

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from the tradition established by a long line of British conductors.

In the Fifth Symphony, as pantheistic and otherworldly as the Fourth and Sixth are Miltonically furious and indignant, Haitink underlines the otherworldly aspect too much for my taste. In the scherzo, especially, I miss a sense of the gusty open air, and I want more drive in the concluding passacaglia. Where is the welling passion in the central episode of the wondrous third-movement *romanza*, which is associated with the composer's visionary opera *The Pilgrim's Progress*?

The filler pieces are both beautifully done — especially the Norfolk Rhapsody No. 1. I have heard more magical larks than the one evoked by the young violinist Sarah Chang in *The Lark Ascending*, but she does achieve a most exquisite pianissimo at the very close. The recorded sound throughout is gorgeously rich and luminous. D.H.

Collections

CHRISTOPHER HOGWOOD AND CHRISTOPHE ROUSSET:

Keyboard Concertos and Duets by Bach and His Sons.

Christopher Hogwood, Christophe Rousset (keyboards). L'OISEAU-LYRE 440 649 (66 min).

Performance: High-intensity
Recording: Too much contrast

All the two-keyboard music from the Bach family that has survived is recorded here, performed on pairs of harpsichords, clavichords, and fortepianos. The shock comes when we move from the music of the father to that of his older sons — that is, from the harpsichords to the clavichords. Johann Sebastian's Concerto in C Major for two solo harpsichords and Con-



trapunktus 13 from *The Art of Fugue* are vigorous, full-out Baroque pieces played and recorded at a high level of intensity. In contrast, the expressive concerto by Wilhelm Friedemann and the four elegant little duets by Carl Philipp Emanuel are played on a pair of clavichords tuned a whole step below modern pitch and recorded at their natural level — hardly more than a whisper.

In the annotation Christopher Hogwood instructs us to set the playback level for the harpsichords and then "resist the temptation to alter it for the clavichords," an injunction I found it impossible to follow. Even with a boost, it took a long time to get used to the tiny sound — softer even than the click of my computer keyboard! Eventually I began to get acclimated, but by the time the intimacy of expression finally began to make

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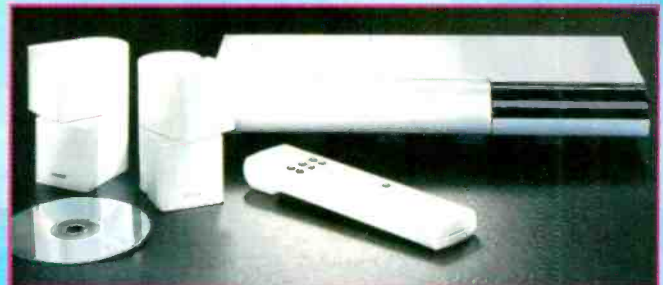
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its point, the clavichord part of the program was over, and the square fortepianos of Johann Christian Bach's Duet in G Major came bumping through like rude, uninvited guests at a seance.

The moral: If you are going to record clavichord music, stick to the clavichord. An hour of pure, uninterrupted digital clavichord played by musicians of the caliber of Hogwood and Christophe Rousset at, say, 3 o'clock in the morning would be quite an experience! *E.S.*

MONK AND THE ABBESS Music of Hildegard von Bingen and Meredith Monk.

Musica Sacra, Richard Westenburg cond.
CATALYST 68329 (62 min).

Performance: Intense
Recording: Expansive

Hildegard von Bingen was a twelfth-century abbess, poet, and composer whose intense, unaccompanied, unharmonized mystical songs have recently had a tremendous vogue. Meredith Monk, an artist with a remarkable body of theatrical work, is no abbess, but she is also a polymath and a hugely influential figure: an emphatically late-twentieth-century choreographer, performance artist, and composer who has expanded the very concept of vocal music and whose work also has an intensely spiritual quality.

The idea of putting these two together must have seemed inspired. Unfortunately,

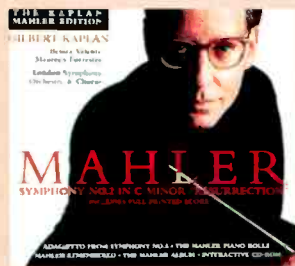
Mahler Deluxe

Gilbert Kaplan's life was literally changed the first time he heard Mahler's Symphony No. 2 ("Resurrection"). A trade-magazine publisher who had never conducted before, Kaplan devoted himself to studying this single masterpiece and finally achieved his goal of conducting it in public in 1983 at Carnegie Hall. Since then he has been invited to conduct the symphony by orchestras around the world, and his well-regarded 1988 recording with the London Symphony Chorus and Orchestra and soloists Benita Valente and Maureen Forester has sold more copies than any other version.

"The Kaplan Mahler Edition," a two-CD set that was scheduled to be released in September by Conifer Classics, features that recording of the "Resurrection" and also Kaplan's reading of the adagio from Mahler's Symphony No. 5, which he brings

in at a record 8 minutes (some conductors slow it down to 12 minutes or more) based on his research into the composer's own tempos. The second CD in the deluxe set contains the digital recording Kaplan produced of Mahler's own performances on piano rolls of transcriptions from his Fourth and Fifth Symphonies and of two of his songs as well as "Mahler Remembered," recorded recollections by the composer's contemporaries, and, for thoroughly modern Mahler fans, a CD-ROM interactive multimedia presentation of 150 photos and drawings with captions in three languages called "The Mahler Album."

Two print publications accompany the set, a 140-page booklet by Kaplan that contains archival photographs and a pocket-size reproduction of the 1897 first edition of the Second Symphony's full orchestral score.



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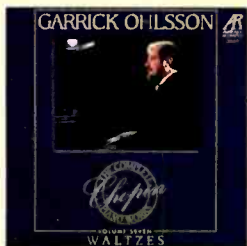
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QUICK FIXES

BRITTEN: Phaedra; The Rescue of Penelope.

Janet Baker (narrator), Alison Hagley (soprano), Lorraine Hunt (mezzo-soprano), John Mark Ainsley (tenor), others; Halle Orchestra, Kent Nagano cond. ERATO 12713 (51 min).

Britten's last major vocal work was a 15-minute cantata for solo voice based on Racine's *Phèdre*, which he composed for the great mezzo-soprano Janet Baker. In this new recording, Lorraine Hunt sings the work with spirit and conviction, but she can't displace memories of the redoubtable Dame Janet — whom the producers of this disc brought out of retirement to narrate the first-ever recording of *The Rescue of Penelope*, a minor early work for radio based on *The Odyssey*. *J.J.*



CHOPIN: Waltzes.

Garrick Ohlsson (piano). ARABESQUE 6669 (71 min).

The seventh installment in Garrick Ohlsson's traversal of Chopin's complete works for piano solo, this CD adds to the accepted canon of nineteen waltzes a twentieth (in F-sharp Minor) that is of somewhat questionable authenticity but nonetheless attractive. The entire program is performed with a refreshing vitality that by no means rules out subtlety, and the recorded sound is first-rate. *R.F.*

HANDEL: The Great Harpsichord Works.

Bob van Asperen (harpsichord). SONY 68260 (59 min).

Negatives: I hate titles like "The Great Harpsichord Works"; Bob van Asperen plays on a big, ugly, jangly harpsichord; and he has a tendency to rush some of the details. Positives: He has the grand manner, and that suits the music. All the favorites are here, including the E Major Suite, which contains the air and variations on *The Harmonious Blacksmith*, the great little G Minor Passacaglia, and the F Minor Suite, which rivals Bach himself. Much of this music undoubtedly originated as improvisation, and van Asperen gives us a good measure of performing flourish, filling out chordal structures and adding ornaments and cadenzas in the appropriate places. *E.S.*

MOZART: String Quartets Nos. 22 and 23.

Shanghai Quartet. DELOS 3192 (52 min). Stylish, beautifully balanced performances of Mozart's last two string quartets make this the Shanghai Quartet's most fetching release so far. For many, it will recall the warmhearted elegance of the Budapest Quartet and the Quartetto Italiano, with the very welcome advantage of lustrous sonics ideally suited to the material. *R.F.*

PROKOFIEV: Symphony No. 5; The Year 1941.

Ukraine National Symphony, Theodore Kuchar cond. NAXOS 8.553056 (57 min). Naxos, the bargain CD label, has produced a startling number of "best buys" in a wide variety of repertoire. This version of Prokofiev's heroic Fifth Symphony is not one of them. The performance is enthusiastic but rough-hewn, the recording of the airplane-hangar variety. The four-movement suite *The Year 1941* is a wartime Stalinist potboiler. *D.H.*

ROBERTO ALAGNA AND ANGELA GHEORGHIU: Duets and Arias.

Angela Gheorghiu (soprano); Roberto Alagna (tenor); Orchestra of the Royal Opera House, Covent Garden, Richard Armstrong cond. EMI 56117 (61 min).

Many beautiful moments distinguish these excerpts sung by the opera world's most glamorous and widely publicized young newlyweds. Although some of the selections sound like studio sight-reading and the recorded sound is not always flattering to Roberto Alagna's voice, his and Angela Gheorghiu's talents and youthful voices shine through, especially in Mascagni's "Cherry Duet." *William Livingstone*



JOSHUA BELL: The Kreisler Album.

Joshua Bell (violin); Paul Coker (piano). LONDON 444 409 (63 min).

The legendary violinist Fritz Kreisler also composed at least forty beautifully crafted short pieces, of which nineteen are played here with brio and sentiment by Joshua Bell, ably abetted by pianist Paul Coker. Most of the popular favorites are included: *Schön Rosmarin*, *Tambourin Chinois*, *Caprice Viennois* (the sentiment gets a bit heavy compared with Kreisler's own recordings), *Liebesfreud*, and *Liebesleid*. The most substantial piece is the virtuosic *Praeludium and Allegro in the Style of Pugnani*, which Bell plays to a fare-thee-well. Sonics and balance are A-1. *D.H.*

the impact is considerably diluted by segregating their music — 23 minutes of Hildegard's works are followed by 37 minutes of Monk's — which pushes the weaknesses of the Hildegard performances to the forefront. The Hildegard standard is the incomparable series of recordings by Sequentia on Deutsche Harmonia Mundi, and these are much tamer performances. Without a deep feeling for the performing style, Hildegard's mysticism seems remote.

On the other hand, and against the odds, Monk's profoundly unconventional work emerges as remarkably powerful here in what are essentially arrangements for a conventional chorus. Most of her music is created for herself and a small group of performers trained in her special vocal styles and techniques. *Nightfall* was written for this recording, but all the other music has been taken from her theater works, notated, and "normalized"; in particular, much of the special "extended voice technique" for which her musical work is known has been taken out or modified. But this process of normalization turns out to be far from negative: The strong underlying musical and expressive values emerge.

The spiritual/mystical element missing from the Hildegard performances is a major part of Monk's work and emerges very strikingly from these expansive performances and recordings. Indeed, some of the pieces reach an almost unbearable pitch of inwardness and intensity. The forms are simple and somewhat repetitive, but the content is always engaging and often powerful. Forget the abbess and go for the Monk. *E.S.*

BO SKOVHUS:

The Heart of the Poet (songs by Robert and Clara Schumann).

Bo Skovhus (baritone); Helmut Deutsch (piano). SONY 62372 (70 min).

Performance: Intense and involving. Recording: Excellent

The poets in this instance are Geibel, Rückert, and, above all, Heine, whose lyrics inspired the two Robert Schumann song cycles here. *Liederkreis* and *Dichterbelle*, as well as four of eleven songs by his wife, Clara. Her settings are particularly welcome, especially those of Rückert's *Liebst du um Schönheit* (better known in Mahler's version) and her compact, tense, and dramatic treatment of Heine's immortal *Lorelei*. In general, Clara's songs are not far removed from the harmonies and structures of her husband's; the piano writing is imaginative, and postludes are employed to good effect.

This CD is yet another example of the young Danish baritone Bo Skovhus's growing mastery. He persuasively communicates Geibel's nature paintings and Rückert's subtle love lyrics, and he proves to be an equally apt interpreter of the Heine songs that speak of thwarted love, anger, and dejection. His voice does not appear to be a substantial one, but it projects warmth and is used with considerable dynamic and coloristic variety, though it tends to lose some tonal evenness at *forte* levels. Still, his *Dichterbelle* is a moving account that ranks

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with the best currently available. Helmut Deutsch is a sensitive, assertive, and keenly musical partner. *G.J.*

GEORG SOLTI: United Nations 50th Anniversary Concert.

Soloists: London Voices: World Orchestra for Peace. Georg Solti cond. LONDON 448 901 (62 min).

Performance: **Sterling**
Recording: **Very good**

The 50th Anniversary of the founding of the United Nations was observed on July 5, 1995, with a concert held at Victoria Hall, Geneva. For the occasion, Georg Solti assembled a World Orchestra for Peace comprising seventy-nine players from forty-five orchestras and chose a program that he felt reflected the UN ideals of peace, brotherhood, and freedom.

A tribute to Switzerland is embodied in the exhilarating and wonderfully polished performance of Rossini's *William Tell* overture. The performance of Bartok's Concerto for Orchestra ranks with the finest of Solti's past readings. There's a finely honed opening movement, a crisp "Game of the Couples," an intensely poetic *Elegia*, an *Intermezzo interrotto* marked by sharp contrasts, and a sharp-edged finale with a roof-raisingly defiant coda. The whole reading is wonderfully swift and sure-footed, worth the price of the CD all by itself.

The exultant final scene from Beethoven's opera *Fidelio* comes off with passionate conviction. The all-important choral role is sung with fiery conviction by the London Voices. For once, applause does not seem out of place, and the sense of occasion has been splendidly captured in the recording. *D.H.*

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Index to Advertisers October

Reader Service No.	Advertiser	Page Number
—	Absolute Soundings	116
1	Adcom	56-57
4	Allegro	99
8	B&W	16
—	Blue Note Records	107
—	Bose	6, 53
—	Bose Acoustic Wave	60
—	Boston Acoustics	9, 37, 85
6	Cambridge SoundWorks	2-3, 40-41, 70-71, 73
—	Camel	45
—	Chesky Records	12
—	Columbia House	19
11	Crutchfield	104
15	Definitive Technology	22-23, 25, 27, 28, 29
—	Delco	C3
—	Echo Star	60
—	Electronic Depot	123
2	Energy	79
54	Eosone	61
—	Jack Daniel's	63
20	Jamo	105
30	J&R Music World	108-111
34	KEF	74
22	Kenwood	80
40	Klipsch	54
—	Marlboro	21
7	Mirage	C4
43	Mitsubishi	39
38	Mobile Fidelity	96
37	Mobile Fidelity	101
70	NAD	43
39	New West	122
41	NuReality	30
47	One Call	124
—	PARA	55
45	Paradigm	10, 11
28	Paradigm	49
—	Parasound	C2-1
—	Pioneer-Car	4-5, 64-65
—	Pioneer-Home	13, 50-51
—	Player's	101
53	Polk Audio	34
60	RF Link	106
35	Rock Solid	14
—	6th Avenue Electronics	117, 121
—	Sony	32a,b
59	Sound & Cinema	120
61	Sound City	119
3	Sound Dynamics	31
62	Spatializer	58
32	Stillwater Designs	109
69	Toshiba	93
—	Uncle's Stereo	118
—	U.S. Army	95
—	Velodyne	15
—	Yamaha	46-47, 48

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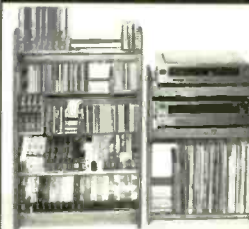
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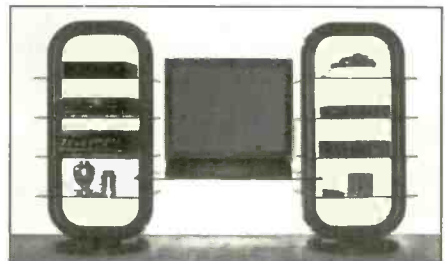
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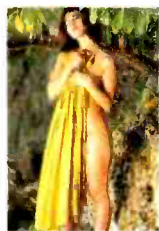
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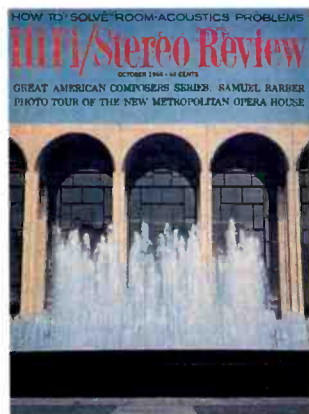
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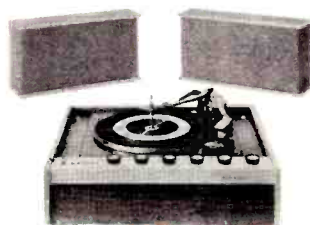
TIME DELAY



30 YEARS AGO

The October 1966 issue featured the sixth installment in our Great American Composers series, as Eric Salzman profiled Samuel Barber (who, alas, did not live to hear his famous Adagio for Strings in Oliver Stone's *Platoon*). Meanwhile, "Room Acoustics: Five Common Problems and How to Solve Them" offered hints "as modest as rearranging the furniture or as drastic as covering the walls and ceiling with absorptive material."

New products included Sonotone's Velocitone Mark V ceramic phono cartridge (\$32.50) and Sony's HP-450 (\$275), a compact stereo unit with a turntable by Garrard.



Sony compact stereo, 1966

Hirsch-Houck Laboratories tested the Magnecord Model 1020 open-reel tape recorder, which at \$570 "brings professional-caliber performance to the discriminating music lover." In Best of the Month, reviewer William Flanagan opted for Britten's *Curlew River* as co-conducted by the composer on London, and Nat Hentoff doffed his hat to Elektra's reissue of Leadbelly's "The Library of Congress Recordings."

And this is *before* Yoko: Gene Lees, reviewing the Beatles' "Yesterday . . . and Today" album, concluded, "This group is beginning to be a drag."



20 YEARS AGO

A tear fell in Forest Hills: In the October 1976 issue, critic Noel Coppage dismissed the eponymous debut LP by the Ramones as "strange, but lousy."

Julian Hirsch's buyer's guide to cassette decks included a look at the fledgling (but ultimately commercially doomed)

elcaset format. Meanwhile, in "Audio Basics," associate technical editor Ralph Hodges examined Angel's new line of XDR (Xtended Dynamic Range) prerecorded cassettes, concluding that cassettes "now actually bear being talked about in the same breath as discs." Hirsch-Houck Labs tested the Jensen Model 24 speaker (\$179), a three-way floor-standing system with tweeter and midrange controls. Elsewhere, Noel Coppage interviewed the then Grammy-less Bonnie Raitt, who told



Jensen speaker, 1976

him, "I really like sad songs, but sometimes it's like getting paid to split yourself open, like people were paying to see me bleed."

I love the smell of vinyl in the morning: Richard Freed, reviewing a Chopin recital by Emanuel Ax on RCA, declared it "one of the most beautiful records of anything ever offered to the public."

10 YEARS AGO

The October 1986 issue was a celebration of all things CD. "Compact Discs: The New Players" surveyed more than seventy new models introduced



THE RAMONES '76



since the beginning of the year. "On the Road with Digital Music" looked at CD options for the car (in-dash? under-dash? plug-in portable? trunk?), and "The Magic of CD Manufacturing" visited one of the CD plants that were beginning to proliferate around the country. And Richard Freed offered part two of "The Basic Repertoire on Compact Disc," a critical discography of symphonic music, declaring Bernard Haitink's Philips set



Hifonics car equalizer, 1986

of the complete Schumann symphonies "perhaps the easiest recommendation in this entire list."

In Best of the Month, Stoddard Lincoln got behind the debut recording of Handel's *Roman Vespers*, while Mark Peel hailed "Urban Beaches" by U2 wannabes Cactus World News. In test reports, Julian Hirsch and Christopher Greenleaf hit the road with the Hifonics Ceres IV, the first parametric equalizer available for the car, which the reviewers deemed "an absolute joy to use."

We know the feeling: Of the opening track from "Emerson, Lake & Powell" (that's Cozy Powell subbing for Carl Palmer), Mark Peel observed, "After five minutes you start longing for the Pet Shop Boys, and after nine minutes you've probably killed the cat."

— Steve Simels



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