

Stereo Review

NOVEMBER 1989 ● \$2.50

INCORPORATING HIGH FIDELITY™

**HOW TO MATCH
COMPONENTS FOR TOP
PERFORMANCE**

**SETTING UP FOR
SURROUND SOUND**

**TESTED:
HARMAN KARDON CD PLAYER
NAKAMICHI RECEIVER
ALTEC LANSING SPEAKERS
...AND MORE**



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The SRS Series



"The sound is superbly balanced and totally effortless." Stereo Review Magazine

“Matthew Polk’s SRS Speakers Bring You the Ultimate Listening Experience”

“Spectacular...it is quite an experience.” *Stereo Review Magazine*

The Joy of Owning the Ultimate Dream Speakers

Music lovers who are privileged to own a pair of SRS’s will share in Matthew Polk’s dream every time they sit down and enjoy the spine-tingling excitement of listening to their favorite music. Demonstrating them to admiring friends ultimately increases their pride-of-ownership. “Awesome” is the word most often used to describe the sound of an SRS system. They are capable of playing at live concert levels for long periods of time, with a surprising lack of effort and without producing ear-fatigue.

The bass response can literally move your body any time the music requires it, yet they perfectly reproduce all of the subtle nuances of a string quartet and are just as enjoyable at a low volume level as when played loud. Music and ambience surround the listener in an almost 360-degree panorama of sonic splendor that is, in the words of High Fidelity magazine, “Mind-boggling...Astounding...Flabbergasting.” But words alone cannot possibly describe the experience of listening to these ultimate speaker systems, you simply must hear them.

SRS 1.2 tl

Two time Audio Video Grand Prix Winner

The ultimate expression of Polk technology, this limited production flagship model sets the industry standards for imaging, detail, dynamic range, and bass reproduction.

SRS 2.3 tl

Audio Video Grand Prix Winner

This scaled-down version of the SRS 1.2 tl incorporates all of flagship’s design innovations without significantly compromising its awesome performance.

Polk Audio’s SRS: The Quest for Perfection

The goal of Matthew Polk’s Signature Reference System (SRS) speakers is to bring an unparalleled level of life-like musical reproduction to your home. Perfect musical reproduction, long the dream of every speaker designer, is approached so closely by Matthew Polk’s SRS’s that it will seem as if the musicians are performing right in your listening room. This stunning achievement combines technology and creative insight to bring you a listening experience that you will never forget.

1. Patented SDA True Stereo Technology — The first and only speaker systems to maintain full stereo separation all the way from the source to your ears. (see pg. 9 for a more complete description). SRS speakers seem to disappear as musical images fill your listening room and seem to immerse you in a fully three-dimensional soundfield of startling realism.

2. Multiple Driver Arrays — The use of multiple drivers allows each separate element to work less hard and lowers distortion even at live concert levels. Power handling is increased to 1,000 watts per channel, providing a seemingly limitless dynamic range.

3. Time-Compensated Driver Alignment — Time-coherent driver placement insures that the entire spectrum of sounds reaches your ears at the same time. The sound is better focused, balanced and less fatiguing.

4. Wavelength Optimized Line-Source — Vertical driver arrays focus the sound waves into the room in a way which greatly reduces floor and ceiling reflections. Progressive reduction of the acoustical length of the arrays maintains constant vertical dispersion and eliminates “comb” filtering effects that limit other multiple driver systems. The result is extraordinary clarity and detail, great flexibility in room placement and precise stereo imaging from virtually any place in the room.

5. Planar 15” subwoofer — SRS bass performance is breathtaking. The use of small active drivers (eight in the SRS 1.2 tl, six in the SRS 2.3 tl) coupled to a huge sub-bass radiator achieves a bass response that is extraordinarily tight, fast (no boominess), deep and distortion free. In fact, the distortion at 25 Hz is lower than that of many audiophile-quality tube amplifiers.

6. Bi-amp Capability — The optional use of separate amplifiers for the high and low frequencies further improves clarity, lowers distortion and increases dynamic range.

7. Hand-Crafted Limited Production — The one-at-a-time attention that goes into the production of every Polk SRS speaker system means that your pair will sound and look as good as Matthew Polk’s own.



Matthew Polk with the ultimate expressions of loudspeaker technology: The SRS 1.2 tl and SRS 2.3 tl.

The SDA Series



SDA 2B

"They have the ability to make your previous favorite speaker sound almost second rate."

Stereo Review Magazine

"Polk's Revolutionary True Stereo SDAs Always Sound Better Than Conventional Speakers"

"Mindboggling...Astounding...Flabbergasting" High Fidelity Magazine

SDA 1C

Audio Video Grand Prix Winner

This floor standing model uses SRS vertical line-source technology in an attractively slim, tower configuration, offering tremendous impact and amazing stereo imaging with a minimum use of floor space.

SDA 1C Studio

Same configuration as the SDA 1C but in a vinyl clad cabinet.

SDA 2B

AudioVideo Grand Prix Winner

The SDA 2B represents an incredible value which combines spectacular SDA performance with a remarkably affordable price. High Fidelity said listening to the SDA 2B is "an amazing experience."

SDA 2B Studio

Same configuration as the SDA 2B but in a vinyl clad cabinet.

SDA CRS +

AudioVideo Grand Prix Winner

The SDA Compact Reference System is the worlds' best sounding small speaker and can be either bookshelf or stand mounted. Stereo Review called the CRS "an impressive achievement." No other small speaker offers such a compact package of high technology and performance.



Polk Audio's Grand Prix Award winning SDA Series speakers. Pictured left to right, SDA 1C, SDA 2B and SDA CRS+.

A Fundamental Advance in Loudspeaker Design

Polk's patented SDA technology is the most fundamental advance in loudspeaker design in twenty years. High Fidelity magazine said of the SDA design, "Polk reinvents the loudspeaker...startling evidence of the industry's essential creative vitality." Rolling Stone Magazine agreed when they wrote, "They truly represent a breakthrough." The Polk SDA's are the world's only "True Stereo" speakers, that is, the only speakers which are specifically designed to realize the full sonic potential of every stereophonic recording.

The SDA Difference

In order to maximize performance, stereo separation is carefully maintained in all audio components. However, with conventional loudspeakers both ears hear both speakers and the two channels are mixed together before they ever reach your ears. Because stereo separation is not maintained all the way to your ears, much of the sense of spaciousness and sonic realism of the original recording is lost. The soundstage is only as wide as the distance between the speakers and sonic images are rendered flat and small.

Polk SDA speakers are the first true stereo speakers and are able to maintain perfect stereo separation all the way from the source to your ears. By acoustically isolating the two stereo channels, each ear hears only the correct stereo channel; the left ear hears left channel, and the right ear hears right channel. Recordings literally come alive in your listening room. Musical images are reproduced with incredible clarity and pinpoint accuracy. You are surrounded by a stunning three-dimensional sound stage that extends from wall-to-wall, and also wraps around you. Only with Polk Audio SDA loudspeakers can you hear all of the spaciousness and life-like imaging of the original performance.

How SDA Technology Works

Conventional speakers allow both of your ears to hear both the left and right channels at the same time. This is called "Interaural Crosstalk Distortion." This crosstalk distortion could be prevented by building a wall between your speakers right up to your nose, so that each of your ears would hear only the speaker on one side of the wall. SDA speakers cancel this distortion, but in a much more comfortable, elegant, and highly accurate fashion. Each SDA speaker reproduces a signal that is the exact opposite of the undesirable crosstalk signal. This cancellation signal is timed to arrive at your ear at precisely the same time as the undesirable crosstalk signal. When these two signals combine, they naturally and acoustically cancel each other. What remains is one correct stereo channel delivered to each ear. In this way SDA speakers allow you to hear stereo performances the way they were meant to be heard.

The SDA Advantage

Only Polk's patented SDA loudspeakers let you hear all of the information and spatial realism that is on the original recording. Conventional speakers restrict what you hear due to their failure to maintain complete stereo separation. Stereo Review magazine said that with SDA speakers: "The result is always better than would be achieved with conventional speakers." Hear the SDA advantage for yourself.

Where to buy Polk Speakers? For your nearest dealer, see page 166.

CIRCLE NO. 90 ON READER SERVICE CARD

"McIntosh . . . no other transistor amplifier is capable of reproducing as well."

"All the sounds, even those different one from another, remain separated and distinctive. There results a sensation of contrast, precision, and uncommon clarity.

. . . A close analysis of different frequencies reveals an extremely deep bass, very rich in spatial detail . . . The upper bass region is very linear testifying to an extraordinary richness of information. The very structured mid-range contributes enormously to listening pleasure.

The feeling of power is never refuted and instead of stunning the listener, the 7270 recreates an audio environment of a majesty that *no other transistor amplifier is capable of reproducing as well.*" Need we say more?

—REVUE DU SON, foremost French stereo magazine.

For a copy of the REVUE DU SON and information on the McIntosh MC 7270 Amplifier and other McIntosh products write:

McINTOSH LABORATORY INC.
P.O. Box 96 EAST SIDE STATION, DEPT. A47
BINGHAMTON, NY 13904-0096



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Incorporating High Fidelity®

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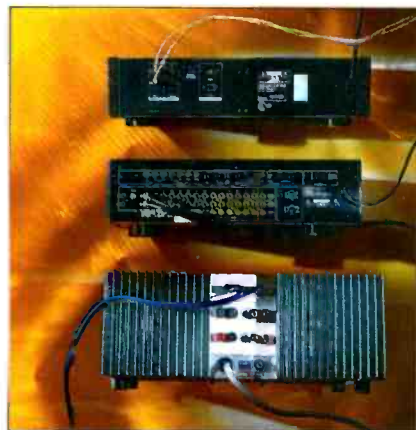
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Cover: The Harman Kardon HD7500 compact disc player and the Nakamichi TA-4A receiver are tested in this issue (see pages 76 and 68). The small speaker on the wall is a satellite unit from the NAD Pattern three-piece system. Design by Sue Llewellyn, photo by Hing/Norton. Zebra rug from ABC Carpet.



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In designing the new LS 400 luxury sedan, Lexus engineers were as preoccupied with frequency response and harmonic distortion as horsepower and handling. Their aim, you see, was to create car audio as advanced as the LS 400 itself.

The Engineers At Lexus Were Just As Concerned With Impressing Stereo Review As Road & Track.

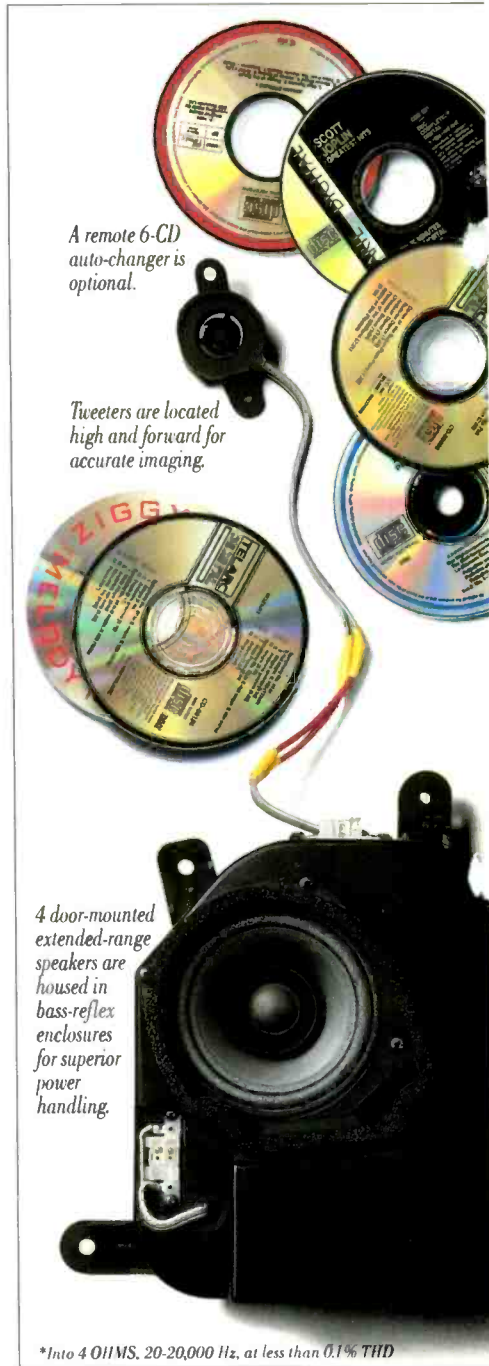
They began by setting performance goals beyond the best premium level systems available. In the end, they'd created two of the finest audio systems ever engineered for the automobile.

The first is the standard Lexus 7-speaker high-output audio system with bi-amplified subwoofer. Its continuous average



The Lexus LS 400

output is 65 watts*, with a maximum of 140—enough power to please the ear



A remote 6-CD auto-changer is optional.

Tweeters are located high and forward for accurate imaging.

4 door-mounted extended-range speakers are housed in bass-reflex enclosures for superior power handling.

*Into 4 OHMS, 20-20,000 Hz, at less than 0.1% THD

of both the casual listener and the confirmed audiophile.

The optional Lexus/Nakamichi Premium Sound System is simply car audio without compromise.



Car audio without compromise: the Lexus/Nakamichi Premium Sound System. Lexus is the first to offer Nakamichi as original equipment.

The power mast antenna even adjusts to 3 positions for ideal AM and FM reception.

The LS 400 audio system is pre-equalized to the interior's unique acoustics.



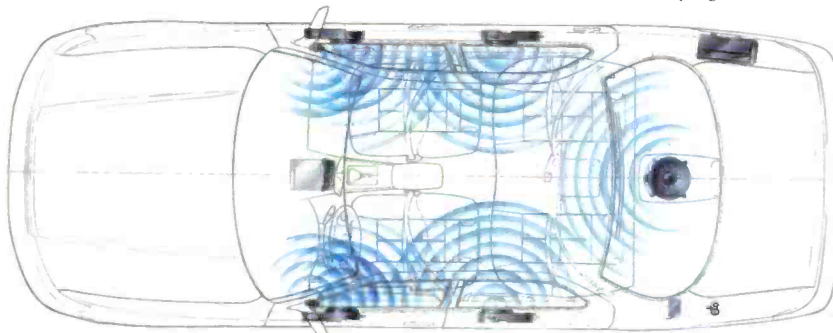
The Lexus/Nakamichi system is even equalized for the difference between cloth and leather trim.

BASS

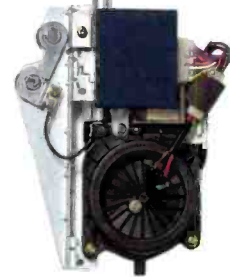


A bi-amplified 8-inch subwoofer punches out deep, tight bass.

The Premium ETR radio/auto-reverse cassette includes an FM diversity tuner with dual antennas.



7 speakers are ideally-located for accurate balance and sound staging. Electronic cross-over networks feed specific frequencies to each.



Its RMS output power is nearly doubled to 126 watts*, with a maximum of 220. The result? Bass response so deep, so tight, you don't just hear it. You feel it.

And with its more sophisticated specifications, refined circuit design and advanced speaker technology, you'll hear sound reproduction like you've never heard before in a car.

But then, doing what's never been done before is what Lexus is all about.





HUNGRY METAL

TDK's new MA cassettes have a voracious appetite for musical energy. Thanks to the awesome magnetic properties of their ultra-fine, ultra-dense Finavinx metal particles, they can consume (and store) massive quantities of the most powerful digital sources.

Considering the high frequency MOL'S (Maximum Output Levels) inherent in today's digital music, a tape must have extremely high coercivity and remanence to perfectly reproduce it. And MA's ultra-refined Finavinx, which contains nearly twice the magnetizable ions of normal and high position tapes, provides these two characteristics in a major way.

Compared to TDK's previous MA, an exceptional tape in its own right, new MA achieves a high frequency MOL (10 kHz) of 0 dB — an improvement of +3 dB! Combine this with an exceptional low bias noise of -58.0 dB, and you get a high frequency dynamic range improvement of 4.5 dB!

New MA's revolutionary particles also assure enduring storage and stable performance, thanks to TDK's special surface treatment. And to enhance these superb characteristics, the anti-resonance SP-AR mechanism drastically reduces modulation noise.

So, it's no wonder why audio perfectionists who demand perfect reproduction select MA. It's even available in 110 minute lengths, which will accommodate two CDs. Due to TDK's unique combination of smooth, durable base film and special coating technology, long term reliability is finally possible in this length.

Of course, new MA is also available in 46 and 90 minute lengths. Now, exactly how hungry are you for metal?



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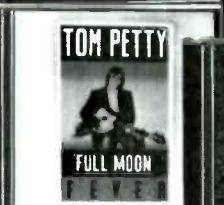
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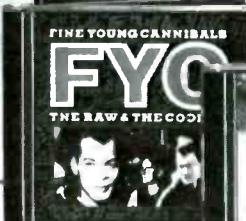
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The Cult—Sonic Temple (Sire) 381-798



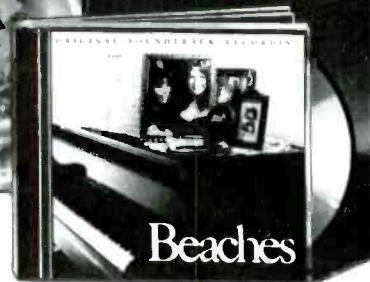
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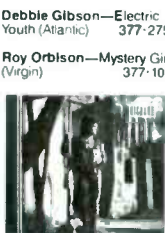
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Crosby, Stills, Nash and Young—So Far (Atlantic) 378-745

The Who—Who's Better, Who's Best (MCA) 376-657

Eddie Money—Nothing To Lose (Columbia) 374-223

Melissa Etheridge (Island) 371-468

Alice Cooper—Billion Dollar Babies (Warner Bros.) 363-531

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LETTERS

Phase and Polarity

In "Phase Inversion" on the September "Audio Q&A" page, Ian G. Masters missed another chance to spread the polarity gospel and enlighten an inquirer. Mr. Masters should know when the word "phase" or the word "polarity" should be used.

Remember, "Phase is frequency dependent; polarity is not."

DANIEL WIEGAND
Cloverdale, CA

Although life would undoubtedly be simpler if the terminology were less tangled, "polarity" and "absolute phase" mean the same thing, and so do the phrases "polarity inversion" and "phase inversion." Polarity reversal is equivalent to a 180-degree phase shift at all frequencies.

Joe Jackson

By now I'm used to disappointing reviews by Steve Simels, but his critique of Joe Jackson's "Blaze of Glory" in September takes the cake. Apparently Mr. Simels doesn't believe in artists evolving during the course of a decade; even Elvis Costello is not the "angry young man" he once was. Does Mr. Simels believe that middle-aged people should think and act like college students?

KEN MOTAMED
Columbia, MO

I usually agree with Steve Simels's reviews, but in the case of Joe Jackson's "Blaze of Glory" I think the album's message went right over his head. I appreciate lyrics that are not completely obvious, and the arrangements are really topnotch. *Evil Empire*, for example, is the best song I have yet heard about the way this country has lost its social conscience in the Eighties.

LARRY R. LENTZ
Twin Lakes, WI

Psychoacoustics

Ken Pohlmann's article "Psycho-What?" in September was very interesting indeed. As a consumer, however, I found a bit insulting his statement that consumers haven't "embraced" the Ambisonic surround-sound decoder. With Dolby Surround being shoved down our throats (er, into our ears) as the ultimate audio/video experience, how are consumers supposed to know that a far superior technology exists?

Virtually every major manufacturer of audio equipment now sells a product with Dolby Surround capabilities. How many manufacturers of Ambisonic decoders are there in the world? I know of

only one—Minim, in the U.K.—and it only sells to professional audio suppliers in the U.S. Consumers cannot be expected to embrace something that they cannot even buy in this country.

DAVID L. KALEITA
Hamtramck, MI

In "Psycho-What?" Ken Pohlmann credits us with demonstrating that "localization of a sound source is accomplished through several cues," the most important being time and intensity differences across the ears. While we are flattered that he mentioned our work, these primary cues for localization were known *before* the turn of the century. Our research concerned how various types of time differences are processed by the binaural system across different regions of the spectrum. These and many other pertinent issues are cogently discussed in *Directional Hearing* edited by W. A. Yost and G. Gourevitch (Springer-Verlag, 1987).

We also wish to inform STEREO REVIEW readers that the modern methods of psychoacoustics include *objective* testing procedures that yield extremely sensitive, precise, and repeatable measures of auditory information processing that are largely uncontaminated by the *subjective* biases of the listener. Our knowledge concerning the acoustical, anatomical, physiological, and behavioral aspects of hearing has increased dramatically thanks to the efforts of scientists trained in many disciplines. This knowledge is far from "subtle," can support many practical applications, and is available in scientific journals (including the *Journal of the Acoustical Society of America*) and several excellent undergraduate college textbooks.

LESLIE R. BERNSTEIN
CONSTANTINE TRAHOTIS
University of Connecticut
Farmington, CT

No Problem!

In September you printed my letter about the problem I was having in obtaining an owner's manual for a used Pioneer cassette deck I had purchased. I received a ton of mail and was inundated with calls from STEREO REVIEW readers. The problem is solved now, so thanks to all you helpful people out there!

Second, I need to make clear that Pioneer *did* help me. A scant few hours after mailing my letter, I received a call from Pioneer saying that a free service manual was en route to me. Those people take pride in making sure their customers get taken care of.

JOHN M. BECK
Suitland, MD

Todd Rundgren

Praise to Parke Puterbaugh for a decent review of Todd Rundgren's "Nearly Human" in the September issue. The main reason for Rundgren's four-year creative hiatus, however, was not that "he lost his footing as a recording artist" but Warner Bros.' ineptness. As Rundgren put it in a radio interview last summer, "I was sort of smarting from the way 'A Cappella' [his previous release] was treated. Nobody in the record company took it seriously They tossed it around as a negotiating point. It took me a while to get over that."

SCOTT R. VAN DUSEN
Rochester, NY

All the Way Back Issues

I am a charter subscriber to STEREO REVIEW and have retained almost all copies of the magazine from 1958 to 1989. In addition, I have almost all issues of *High Fidelity* from 1956 to 1989. The time has come for me to dispose of these magazines, and I would like to transfer them to someone who would appreciate and enjoy them. I would donate them to a college or university library or sell them at the best offer. Interested persons can write to me at the University of Missouri School of Law, Columbia, MO 65211, or call (314) 882-7562.

JOE E. COVINGTON
Columbia, MO

Earliest Remote Controls

After reading Julian Hirsch's "Technical Talk" in August, about remote controls, I thought it would be fun to see if I could find an earlier date than around 1982 for when audio manufacturers first included remote controls with their equipment. I found an ad in the December 1979 issue of STEREO REVIEW for three Aiwa cassette decks, two of which included a wireless remote control for all of their major transport functions.

STEPHEN WAGNER
Atascadero, CA

Mr. Hirsch did not intend to make any sort of definitive statement about the history of wireless remote controls but simply to give a rough idea of when such units began to be provided.

Correction

The price range of the new Tangent line of loudspeakers from Klipsch was incorrect in the August "Bulletin." The speakers range from \$190 to \$498 each. □

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Circle 120 on reader service card



HEATH

The Heath Company has developed a do-it-yourself Dolby Surround processor kit. The set has six audio outputs: two for surround speakers and one each for left front, center, and right front speakers and a subwoofer. It also has three surround modes: Dolby Surround, Music Surround (for non-Dolby

stereo programs), and Mono Enhance. It includes a 20-watt mono amplifier and has separate controls for time delay, "null" (input balance calibration), surround volume, and master volume. Price: \$199.95. Heath Co., Dept. SR, Hilltop Rd., St. Joseph, MI 49085.

Circle 121 on reader service card



OPTONICA BY SHARP

The Optonica WQ-CD83 portable music center includes twin top-loading CD players, an AM/FM tuner, a double cassette deck, built-in speakers, and a wireless remote control. Cassettes are stacked back to back in the single-well, full-logic transport, which features high-speed dubbing, double autoreverse, and

Dolby B noise reduction. A matrix-surround circuit is built in, and jacks are provided for surround speakers. The system can be powered from an AC line or from ten D cells. Price: \$699.95. Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430-2135.

Circle 122 on reader service card

MISSION ELECTRONICS

The 6 Series of loudspeakers from Mission Electronics includes (left to right below) the Models 765, 764, 763, 762, and 761 as well as the Model 767 (not shown). The Model 765, a two-way bass-reflex system, boasts a low-bass response down to 37 Hz \pm 2 dB. It has two 8-inch woofers and a 1-inch dome tweeter placed between them. The tweeter features an exclusive double-chamber design said to prevent breakup at high power. Nominal impedance is 4 ohms. Both biwiring and biamping are possible. The floor-standing speaker measures 37 1/2 x 10 1/4 x 13 1/2 inches. Available finishes are walnut or black-ash veneer. Price: \$1,299 a pair.

At the low end of the line, the Model 761 is a two-way system with a 7-inch woofer and a rated bass response of 60 Hz \pm 3 dB. The sealed cabinet, finished in simulated black ash, measures 15 x 8 1/4 x 8 3/4 inches. Price: \$249 a pair. The optional steel stands shown in the photo are \$149 a pair. Mission Electronics USA, Dept. SR, 18303 8th Ave. S., Seattle, WA 98148.

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Roy Orbison: Mystery Girl • You Got It, California Girl. 00842

Randy Travis: Old 8x10 • Honky Tonk Moon, Is It Still Over?, etc. Warner Bros. 00008

Tone-Loc: Loc-Ed After Dark • Wild Thing, Funky Cold Medina, etc. Delicious 01033

Bette Midler: Beaches/Original Motion Picture Sdtrk. • Atlantic 00793

Paula Abdul: Forever Your Girl • Straight Up, Little Smash, etc. Virgin 00933

E.U.: Livin' Large • Buck Wild, plus DaButt 89, etc. Virgin 01102

Mike + The Mechanics: The Living Years Atlantic 00710

Milli Vanilli: Girl You Know It's True • Title song, etc. Arista 01048

R.E.M.: Green • Orange Crush, Pop Song 89, etc. Warner Bros. 00715

George Strait: Beyond The Blue Neon Title hit, etc. MCA Digital 01025

TNT: Intuition • Tonight I'm Falling, Wisdom, etc. Mercury 01087*

James Galway: Greatest Hits • The Pink Panther, etc. RCA Digital 73233

Winger • Headed For A Heartbreak, Seventeen, more. Atlantic 00830

Bobby Brown: Don't Be Cruel • Don't Be Cruel, Roni, etc. MCA 00621

Dion: Yo Frankie • King Of The New York Streets, etc. Arista 00825

The Judds: River Of Time • One Man Woman, Young Love, etc. RCA 01027

Poison: Open Up And Say...Ahh! • Good Love, etc. Capitol/Enigma 73989

Vanessa Williams: The Right Stuff Dreamin', etc. Wing/PolyGram 01110

20 Million Dollar Memories • The Everly Brothers, others. Laurie 20773

Don Williams: One Good Well • Learn To Let It Go, etc. RCA 62406

AC/DC: Back In Black • You Shook Me All Night Long, Hells Bells, etc. Atlantic 13772

Breathe: All That Jazz • How Can I Fall, Jonah, others. A&M 00505

Robert Palmer: Heavy Nova • Simply Irresistible, etc. EMI 00035

Tchaikovsky, 1812 Overture; • Chic. Sym./Solti. more. London Digital 25179

Escape Club: Wild Wild West • Shake For The Sheik, etc. Atlantic 00804

Too Short: Life's...Too Short • City Of Dope, etc. Jive 54041*

Elvis In Nashville, 1956-1971 • A Big Hunk O'Love, etc. RCA 00833

Bobby McFerrin: Simple Pleasures • Don't Worry, Be Happy, etc. EMI 64165

Ronnie Milsap: Stranger Things Have Happened • Houston Solution, etc. RCA 01028

Simply Red: A New Flame • It's Only Love, Enough, etc. Elektra 01012

Judy Collins: Sanity And Grace • Pretty Polly, etc. Gold Castle 01039

Restless Heart: Big Dreams In A Small Town • Eldorado, etc. RCA 24777

The Decline Of Western Civilization, Part II Metal hits from the film. Capitol 00464

Bruce Hornsby And The Range • Scenes From The Southside RCA 80187

The Cowboy Junkies: The Trinity Session Sweet Jane, etc. RCA 01043

Major Glenn Miller & The Army Air Force Band 1943-44 • RCA/Bluebird 14720

Aretha Franklin: Through The Storm • Think, title hit, etc. Arista 01097

Bon Jovi:
New Jersey
00516

Cocktail (Original Soundtrack) • Bobby McFerrin, Beach Boys, etc. Elektra 00459

Steve Winwood: Roll With It • Don't You Know What The Night Can Do?, etc. Virgin 54633

Roxette: Look Sharp! • The Look, Cry, Dressed For Success, etc. EMI 01106*

1969/Original Soundtrack Original '60s hits. Polydor 00724

Melissa Etheridge • Don't You Need, Occasionally, etc. Island 60352

Enya: Watermark • Orinoco Flow (Sail Away), others. Geffen 01041

Beethoven, Sym. No.9 (Choral) • Norrington conducts. Angel Digital 00467

Sheena Easton: The Lover In Me • Days Like This, 101, etc. MCA 00708

Lyle Lovett And His Large Band • Stand By Your Man, etc. MCA/Curb 00932

INXS: Kick • Need You Tonight, Devil Inside, etc. Atlantic Digital 53606

Bon Jovi: Slippery When Wet • Never Say Goodbye, etc. Mercury 43465

Karyn White • Superwoman, Love Saw It, etc. Warner Bros. 00832

U2: The Joshua Tree • With Or Without You, more. Island 53501

Samantha Fox: I Wanna Have Some Fun • I Only Wanna Be With You, etc. RCA/Jive 00676

Dirty Dancing/Original Motion Picture Soundtrack • RCA 82522

Dirty Dancing Live In Concert • Hungry Eyes, Yes, etc. RCA 01026

Chicago: 19 • Heart In Pieces, Runaround, more. Reprise 54404

Pavarotti At Carnegie Hall • Songs by Schubert, others. London 15311

Animation • Room To Move, Send It Over, more. Polydor 01091*

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- Elvis Costello: Spike • Veronica, ... This Town..., etc. Warner Bros. 00841
- The Police: Every Breath You Take—The Singles • A&M 73924
- Holst, The Planets • Montreal Symphony/Dutot. London Digital 15448
- Whitney Houston: Whitney • So Emotional, others. Arista 52854
- Kenny G: Silhouette • Tradewinds, title song, etc. Arista 00603
- Benny Goodman & His Orchestra: Sing, Sing, Sing, • RCA/Bluebird 04857
- Raffi: Singable Songs For The Very Young Shoreline 44494
- Vixen: • Edge Of A Broken Heart, Cryin', Desperate, etc. EMI 00507
- John Cougar Mellencamp: The Lonesome Jubilee • Mercury 34420
- Morton Downey Jr. Sings! • Operate Operate, more. Compose/PPJ 01082
- Rick Astley: Hold Me In Your Arms • Dial My Number, etc. RCA 00684
- Nitty Gritty Dirt Band: More Great Dirt Latest hits! Warner Bros. 00818
- New Order: Technique • Fine Time, All The Way, etc. Qwest 00938
- Dan Seals: Rage On • Big Wheels In The Moonlight, etc. Capitol 00041
- Def Leppard: Pyromania • Photograph, Rock! Rock!, etc. Mercury 70402
- Barry Manilow: Greatest Hits, Vol. 1 Mandy, Daybreak, etc. Arista 72863
- Kiri to Kanawa Sings Gershwin • Summer-time, more. Angel Digital 70258
- Skid Row • Youth Gone Wild, I Remember You, etc. Atlantic 01038

The Cult: Sonic Temple 01015

- Tesla: The Great Radio Controversy • Hang Tough, etc. Geffen 00839
- Tracy Chapman • Fast Car, Talkin' 'Bout A Revolution, more. Elektra 53582
- Lou Reed: New York • Dirty Blvd., Halloween Parade, etc. Sire 01058
- White Lion: Pride • Wait, Tell Me, Hungry, etc. Atlantic 73981
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- .38 Special: Rock & Roll Strategy • Second Chance, others. A&M 00599
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- Phil Collins: Buster/Original Motion Picture Sctrk. • Atlantic 00517
- Genesis: Invisible Touch • Tonight Tonight, Domino, etc. Atlantic 53740
- Dwight Yoakam: Buenas Noches From A Lonely Room • Reprise 00009
- Horowitz Plays Mozart • Concerto No. 23 in A; more. DG Digital 15436
- Van Halen: OU812 • Feels So Good, Cabo Wabo, etc. Warner Bros. 50913

- Great White: Twice Shy • Once Bitten Twice Shy, etc. Capitol 01100
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- Debbie Gibson: Out Of The Blue • Only In My Dreams, etc. Atlantic 54066
- The Replacements: Don't Tell A Soul • I'll Be You, etc. Sire 01024
- Edie Brickell & New Bohemians: Shooting Rubber Bands At The Stars • Geffen 00789
- David Lanz: Cristofori's Dream • Free Fall, etc. Narada/MCA 00853
- Sidewinders: Witchdoctor • Cigarette, Bad, Crazy Sun, etc. RCA 01075
- Lita Ford: Lita • Close My Eyes Forever, others. RCA 24793
- Cinderella: Long Cold Winter • Gypsy Road, more. Mercury 14780
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NEW PRODUCTS



CUSTOM WOODWORK & DESIGN

The new video version of CWD's Woodmore Highboy Cabinet is shown here as the centerpiece of a wall system created from nine modular Woodmore cabinets. Complete with hideaway doors and an adjustable upper shelf, it was designed to accommodate television sets with up to 35-inch screens and both a VCR and a videodisc player. The cabinet is available finished in natural, dark, or black oak, natural walnut, high-

gloss black, or CWD's new "living colors," including white, pewter, ebony, and almond. Outside dimensions of the Highboy TV/VCR cabinet are 42 x 47 1/4 x 19 inches. Price: \$955 in natural and dark oak and the living colors, \$1,160 in black oak and walnut, and \$1,910 in high-gloss black. Custom Woodwork & Design, Dept. SR, 5200 W. 73rd. St., Bedford Park, IL 60638.

Circle 124 on reader service card



VECTOR RESEARCH

The Vector Research VCD-410R compact disc player has eight-times-oversampling filters and dual 18-bit digital-to-analog converters. It can repeat a track, a disc, a programmed sequence, or a random sequence and plays 3-inch CD's without an adaptor. A fifteen-func-

tion remote control is supplied. Dynamic range is rated as more than 95 db and signal-to-noise ratio as greater than 100 db. Price: \$269.95. Vector Research, Dept. SR, 1230 Calle Suerte, Camarillo, CA 93010.

Circle 125 on reader service card

PINNACLE

The Pinnacle PN7+ speaker uses a patented two-way design featuring dual "Diaduct" ports that are said to provide superior bass response from a small cabinet. The ports are steeply angled inside the cabinet to allow enough length to meet the requirements of a wide port diameter. The speaker has a 6 1/2-inch polypropylene woofer and a liquid-cooled 1-inch polymer-dome tweeter. Frequency response is rated as 38 to 21,000 Hz, impedance as 6 ohms, and sensitivity as 90 db. Finished in black-oak vinyl veneer, the cabinet measures 15 1/8 x 9 1/4 x 8 7/16 inches. Price: \$299 a pair. Pinnacle Loudspeakers, Dept. SR, 517 Route 111, Hauppauge, NY 11788.

Circle 126 on reader service card



DISC-SAVER

Disc-Saver was designed to clean compact disc surfaces of fingerprints and soil and to repair minor scratches that make discs unplayable. The compound will not interfere with the player's drive system or build up with successive uses, according to the manufacturer. Pictured is the DS-15 deluxe kit (\$14.95), which includes the cleaning compound, applicators, a buffing cloth, and a CD-3 with instructions and audio test. The DS-10 kit (\$9.95) includes everything but the instruction disc. A refill bottle is \$2.95. DaVic Corp., Dept. SR, 37 Dianne Lane, Ashland, MA 01721.

Circle 127 on reader service card



NEW PRODUCTS



AMERICAN ACOUSTICS

Billed as a "value" series, the American Acoustics AAL line consists of five speakers ranging in price from \$199.90 to \$499.90 a pair. At the low end of the line is the AAL 62, a two-way system with a frequency response rated as 90 to 20,000 Hz. The flagship model is the AAL 154, which has a 15-inch woofer, two sealed midranges, and a 3¾-inch

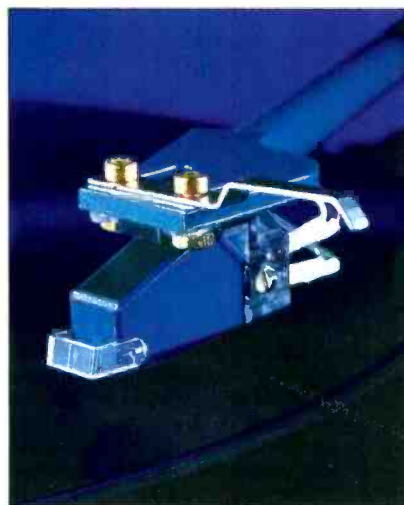
horn-loaded quartz tweeter. Its rated frequency response is 40 to 20,000 Hz. The speakers range in size from approximately 13 x 9½ x 7½ inches to 29 x 18½ x 15 inches. All American Acoustics speakers come with a ten-year warranty. American Acoustics, Dept. SR, One Mittek Plaza, Winslow, IL 61089.

Circle 128 on reader service card

SUMIKO

Sumiko's Blue Point is a budget-price moving-coil phono cartridge with a fine-line elliptical stylus. It has a standard mounting but can also be used in a P-mount arm when dismantled from its integral adaptor. Output is rated as 3 millivolts, frequency response as 15 to 35,000 Hz, and channel separation as 32 dB at 1,000 Hz. Recommended tracking force is 1.25 to 1.7 grams. Price: \$125. Sumiko, Dept. SR, P.O. Box 5046, Berkeley, CA 94705.

Circle 129 on reader service card



DIAMOND TEC

The Diamond Tec DT-300 is a revolving plastic CD rack that can hold up to fifty-six discs. The DT-300 comes disassembled and is packed with a sample of Armor All Protectant to preserve its finish and a screwdriver to put it together. Assembled, it measures 10½ x 9½ x 9½ inches. Price: \$21.99. Associates International USA, Diamond Tec Division, Dept. SR, 4952 Warner Ave., Suite 243, Huntington Beach, CA 92649.

Circle 130 on reader service card

CREEK AUDIO SYSTEMS

The Model 5050 integrated amplifier from England's Creek Audio is rated to deliver 50 watts per stereo channel or 200 watts in a bridged-mono configuration. Instantaneous peak current output is rated as 25 amperes. The amplifier has inputs for mono or stereo video recorders, a CD player, a tuner, a turntable, and two tape decks. There are separate source selectors for listening and

for recording, with fully buffered tape outputs. Additional features include a switchable moving-coil-cartridge input, turn-on delay, tone-control bypass, and a rear-mounted switch that splits the preamp and power-amp outputs. A 250-VA toroidal transformer is used to reduce hum and mechanical noise. Price: \$995. Distributed by Music Hall, 108 Station Rd., Great Neck, NY 11023.





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NEW PRODUCTS



JVC

Equipped with a built-in CD graphics decoder, JVC's XL-G512BK is the first CD player that can show images from CD+G recordings on any video monitor. It has both S-video and composite video terminals, a MIDI (musical instrument digital interface) output, fifteen graphics channels, four-times oversampling, an 18-bit noise-shaping digital-to-analog converter, and a remote control. The machine plays conventional CD's as well as CD+G discs. Price: \$500. JVC, Dept. SR, 41 Slater Dr., Elmwood Park, NJ 07407.

Circle 131 on reader service card

ARCAM

Arcam's Delta 60 integrated amplifier is rated to deliver 50 watts per channel into 8 ohms and 80 watts per channel into 4 ohms. It uses custom aluminum heat sinks and a low-profile 200-VA toroidal power transformer, which feeds two high-gain, high-current power amplifiers directly from the four high-level line inputs (CD, tuner, and two tape decks). The phono-preamplifier section

accommodates both moving-magnet and moving-coil cartridges and features two-stage, partly passive equalization and a separately regulated moving-coil preamplifier. The slimline chassis is only 2½ inches high. Price: \$599. Distributed by Audio Influx Corp., Dept. SR, P.O. Box 381, Highland Lakes, NJ 07422.

Circle 132 on reader service card



WHARFEDALE

Wharfedale's Coleridge loudspeaker is available finished in either black-ash or walnut veneer. Its frequency response is given as 45 to 20,000 Hz, sensitivity as 89 dB, and nominal impedance as 8 ohms. The two-way bass-reflex system has a 1-inch titanium-dome tweeter and an 8-inch polypropylene-cone woofer. The port is at the bottom of the cabinet, which is designed for placement on stands. Dimensions are approximately 19 x 10 x 10½ inches. Price: \$1,400. Distributed by Trans Pacific Marketing Inc., Dept. SR, 1230 Calle Suerte, Camarillo, CA 93010.

Circle 134 on reader service card

BLAUPUNKT

Blaupunkt's BMA 5350B is a five-channel, 350-watt automotive amplifier. It includes four 50-watt amplifiers for satellite speakers, a 150-watt subwoofer amp, and a fully integrated electronic crossover network with variable crossover frequencies and level controls for the front, rear, and subwoofer outputs. Its "smart" power supply approx-

imates power among the amplifier sections as needed and regulates the output to keep distortion low. Recessed gold-plated DIN jacks and fully isolated DIN jacks can be used with common-ground or floating-ground head units. Price: \$850. Blaupunkt, Dept. SR, P.O. Box 4601, N. Suburban, IL 60198.

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All product information is provided by the manufacturers and does not represent the results of tests or evaluations by STEREO REVIEW. Suggested retail prices were current as of press time but are subject to change without notice.



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*125-watts per channel minimum RMS, both channels driven into 8 ohms from 20Hz - 20kHz with no more than 0.05% total harmonic distortion. For the name of your authorized Mitsubishi dealer, call (800) 527-8888 ext. 145. © 1989 Mitsubishi Electric Sales America, Inc. Dolby Surround is a trademark of Dolby Laboratories Licensing Corp.

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CIRCLE NO. 22 ON READER SERVICE CARD



BLAUPUNKT NEW YORK SCD 08 CD TUNER

by Ken C. Pohlmann, Hammer Laboratories

BLAUPUNKT'S New York SCD 08 CD tuner has been in my dashboard for the past six months, giving me ample opportunity to evaluate its performance and features. The front panel is pure Blaupunkt in its unique yet clearly European styling. For some, Blaupunkts are plain. For me, they are usually excellent examples of form following function. Certainly everything about the New York's front panel is easily understandable—well, almost everything. Power-on and volume are handled from the same knob; the power-off setting is at the full left position. On some head units you push the volume knob to switch power on or off, which I prefer because it lets you hold a particular volume setting. But the New York does use the knob's push and pull options: When it's pushed in, it adjusts left/right balance; when it's pulled out, it adjusts the front/back fader. In addition, the volume knob has a good ratchet feel as well as a detent for the balance and fader controls. A rather small concentric switch turns the loudness compensation on or off (it gives an 8-dB boost at 60 Hz). Bass and treble, adjusted by two push-to-access knobs, have ± 14 -dB ranges. I like this tone-control design, but the knobs are somewhat crowded, and their smooth surfaces don't help.

Two buttons are used to select

radio bands. One button selects from three banks of six FM presets as well as a "travel bank" of the six strongest stations (AM and FM) in the reception area. The other button selects between two banks of six AM presets. While these selections could have been consolidated into one button, in practice it's nice to have two—you don't have to touch the button as many times to find the preset bank you want. Once a band and bank are chosen, the six preset stations are accessed by numbered buttons. A station is stored by simply selecting a bank, tuning in the station, then pressing and holding one of the preset buttons. This is much better than units that require pressing a separate memory button or other such nonsense.

A preset-scan button briefly plays all preset stations in *all* of the FM or AM banks. When the same button is pressed and held for more than 2 seconds, the tuner automatically stores the six strongest stations into the travel bank—a great convenience when you are traveling through unfamiliar reception areas.

A button somewhat mysteriously labeled "••m" is used to switch the tuner between normal search sensitivity, high search sensitivity, and manual tuning. This is workable, but it is somewhat clumsy to integrate the sensitivity control with a manual tuning mode.

A scan button is used to scan all

the receivable stations in the selected band. The tuning control is a bi-directional rocker switch. When either side is pressed once, the tuner moves to the next station in that direction (or, in manual tuning, to the next frequency). When the switch is held the tuner speeds up or down the band. To help tactile identification, the switch is sculpted—one side curves in while the other curves out.

All of these buttons are pretty self-explanatory, but the HIFI button may not be. Car radio design is pure compromise; you can receive weak signals cleanly or strong stations with high fidelity, but not both. Blaupunkt's HIFI button lets you have it both ways. Under weak signal conditions, the HIFI mode should be switched off, which activates noise-reduction and other processing circuits to clean up the signal. But with a strong signal you should switch to the HIFI mode so that these extra circuits are withdrawn. For example, in the HIFI mode there are no ceramic filters in the signal path, which dramatically improves the reception fidelity of strong signals.

The Blaupunkt New York uses a disc cartridge to hold CD's. When a cartridge is inserted, a power loader pulls it into the player and opens a sliding door so the laser pickup can read the disc. If the unit is in tuner mode, it automatically switches to CD mode. To return to tuner mode, you can eject the disc or press the CD/tuner button. If you do the latter, the disc player obligingly goes into pause mode and resumes where you left off when the unit is switched back to CD mode.

Selecting the CD mode alters the function of several buttons. The six tuner presets control a number of CD functions, including a track-program-memory function that is unique in a car CD player. Sequences of up to sixteen tracks from each of eighteen different discs can be stored in memory. The player recognizes each disc's identity from its subcode and automatically plays the programmed sequence. One of the tuner preset buttons doubles as a clear button.

The scan button plays each track on a disc for about 10 seconds; if

CAR STEREO

there is a programmed sequence, tracks are scanned in that order. The dual-sided rocker switch is used for swift skipping in either direction. Another preset button doubles as the play/pause button, and two buttons provide audible, double-speed search in either direction.

The New York's amber LCD window gives comprehensive operating information. In tuner mode it indicates the station frequency, stereo reception, selected band, bank, and preset, normal or high sensitivity, and manual-tuning mode. When a CD is first inserted, the display shows the total playing time and number of tracks, then the elapsed time and current track number. It also indicates the status of the track program memory and scan functions.

Other illumination is generally excellent. The illumination changes between the tuner and CD modes: The green-lighted preset numerals change to red code letters. Two quibbles: Buttons that are not operational in the CD mode should not remain illuminated, and the CD loading slot should be lighted.

As you might expect from a unit called the New York, there is a comprehensive antitheft coding mechanism. To program the system, you enter a four-digit code of your choice. After a power interruption, the correct code must be entered before the controls become operational. If a wrong code is entered, you must wait 10 seconds to try

again. After four wrong tries, you have to wait an hour. After another sixteen unsuccessful attempts, the display reads OFF, and internal modification is required before the unit will work again. Price: \$900. Blaupunkt, Dept. SR, P.O. Box 4601, N. Surburban, IL 60198.

Installation

When I installed the New York, it was an easy task to pull out my former head unit and slip the New York's DIN-sized sleeve into the dash, bending tabs to help secure it. The unit can be removed from its sleeve using a pair of handles. Three mounting positions are possible: horizontal and tilted upward either 22.5 or 45 degrees.

Power is supplied via a four-pin connector. The tuner circuitry is contained in a separate subchassis that connects to the head unit; the antenna input also attaches to the subchassis (a right-angle adaptor is thoughtfully included). Because there are no user controls on the tuner subchassis, it can be stuffed anywhere inside the dashboard.

The New York comes with an eight-pin IEC cable that makes it an easy matter to connect it to an external amplifier or equalizer with a DIN input. If your downstream equipment cannot accept a DIN connection, a DIN-to-phono adaptor is also included. Finally, the New York can also be connected to a cassette deck with an optional interface.

Road Tests

Over the months, I have grown quite familiar with the New York's roadworthiness. I can categorically state that it is the best-performing CD tuner I've used in terms of both its radio and its CD player.

Under strong signal conditions, with the HIFI mode switched in, reception is simply phenomenal. With high-cut filters, dynamic noise suppression, blending circuits, and other necessities of weak-signal reception stripped from the signal path, broadcast programs come in loud and clear. Of course, this "straight wire" approach leads to degradation under weak signal conditions. With the HIFI mode switched out, however, the New York's tuner is still among the best available. The AM section also deserves thumbs-up.

The CD player is topnotch as well. It uses a three-beam pickup and double-oversampling filters to reproduce discs with very high fidelity. Frankly, some car CD players are quite similar to portable models in that some corner-cutting takes place, especially in the audio output stages. There is none of that in the New York; its CD player is in the same league as good home players, with unmistakable clarity and transparency. In particular, transient material is well reproduced. Still, my Porsche is a noisy machine, often obscuring soft musical passages, and I feel that a switchable (or adjustable) compression circuit would be a big plus for future versions of the New York.

The CD player is absolutely secure in its tracking despite road shocks. Whether it is the added mass of the disc cartridge or simply a well-designed suspension that's responsible, I don't know. If you still think CD's have no place in the car because of skipping problems, you're wrong.

Clearly, Blaupunkt's New York SCD 08 is at the top of its class. Indeed, it sets a new standard for car audio electronics. Until Blaupunkt or a competitor manages to invent a superior product, the New York will remain in my dashboard, ready to challenge all comers.

Circle 139 on reader service card

LABORATORY MEASUREMENTS

□ **Tuner Section** (all figures for FM only except frequency response)

Usable sensitivity (mono): 13.4 dBf

50-dB quieting sensitivity: 12.8 dBf in mono; unmeasurable in stereo

Harmonic distortion (THD + noise at 65 dBf): 0.36% in mono, 0.44% in stereo

Channel separation (at 1,000 Hz, 65 dBf): 39.3 dB in HIFI mode

AM rejection: 72.9 dB at 65 dBf

Capture ratio: 3.1 dB at 65 dBf

Selectivity: adjacent-channel, 27.6 dB; alternate-channel unmeasurable

Image rejection: 77.6 dB

Frequency response (referred to 1,000 Hz): FM, 30 to 15,000 Hz

+0.3, -3.5 dB; AM, 30 to 3,000 Hz +0.2, -9.8 dB

□ **CD Section**

Frequency response (20 to 20,000 Hz): +0.3 dB, -0.6 dB

Channel separation: 79.5 dB at 1,000 Hz, 65.6 dB at 20,000 Hz

Dynamic range (A-weighted): 91.3 dB

Signal-to-noise ratio (A-weighted, referred to 0 dB): 92.0 dB

Distortion (THD + noise at 1,000 Hz): 0.006% at 0 dB, 0.05% at -20 dB

Defect tracking: tracked 1,500-micrometer defects on Pierre Verany #2 test disc

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THE BASICS

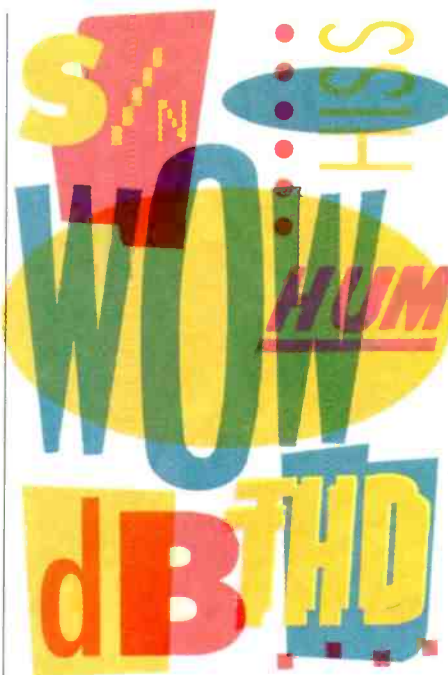
NAMES AND NUMBERS

The language of high fidelity – the second in a series on the basics of audio.

BY IAN G. MASTERS

WE buy what we buy for a lot of different reasons. Cars are sold primarily on the reputations of their makers, but we also consider price and things like color and standard features. We choose refrigerators mainly by size, cameras mainly for ease of operation. Certainly most of us look for some assurance of quality in any of those, but only a few of us look very deeply into the actual engineering of them.

Not so with stereo equipment. High-fidelity enthusiasts have traditionally subordinated other considerations to those of technical performance, real or perceived. Looks and size and price and brand name all have their place, of course, but none of them is decisive when it comes to making a buying choice. From the beginning, therefore, a vocabulary was needed to describe the specific attributes of audio components, and terminology borrowed more or less intact from the field of electrical engineering came to be applied to sound equipment. Early audiophiles, who were as likely to build their equipment as to buy it, were usually technically literate hobbyists for whom such engineer-



ing terms held little mystery. Also, as with all types of jargon, there was undoubtedly a sort of fellow-feeling among the users of this technical language, a way of distinguishing themselves from "outsiders."

As hi-fi grew popular, however, more and more "outsiders" were introduced to the subject, and in some quarters there was a tendency to discuss sound quality in such nontechnical terms as "depth," "clarity," "smoothness," "tightness," and so forth, terms that are still used by some people to describe equipment performance. But they are imprecise: How clear is "clear"? How bright is "bright"? To avoid this vagueness, most of the audio world correlates the sonic character of a piece of equipment with its technical performance; if a component behaves itself electrically, the theory goes, it will sound good.

While there are those who would dispute this assumption, it has resulted in the continued use of engineering language to describe audio performance. By and large, the technical terms employed have accepted definitions, so they mean the same things to whoever uses them. Whether or not a given level of performance, expressed in engineering terms, is good or bad can be argued indefinitely—how high the fidelity must be to constitute "high fidelity" will always be open to reinterpretation. Nor does everyone always agree on the correct way to measure any particular aspect of performance. But at least most of us are talking the same language.

Faithful to What?

Central to the whole field of sound reproduction is the notion of **fidelity**, from the Latin word for "faithful." Before there were recordings, music was always performed and listened to in the same acoustic environment. Symphonies were written to be played in large spaces, and the acoustics are an integral part of the music. Jazz, on the other hand, is usually performed in smaller areas, but there, too, the ambience is part of the musical experience. The nominal aim of sound-reproduction equipment in the home, therefore, is to re-create as closely as possible the aural impression of attending a live performance. "Concert-hall realism" has been the touchstone ever since sound started to be recorded.

In reality, it's an impossible goal. The overall sound of an orchestra in a concert hall, for instance, is made up of a complex blending of the direct sound from the instruments themselves with numerous reflections off the walls, floor, and ceilings. The size, shape, and furnishing

ings of the hall all determine the nature of these reflections. No two halls are physically identical, so no two sound exactly alike. Other factors affecting sonic character at any given time are the position of the orchestra and the number of people in the hall, both of which are usually quite different in a recording session than during a live performance. Finally, no two positions in the hall are exactly the same distance from the individual musicians or the reflecting surfaces, so every point has its own distinctive acoustic characteristics; where you sit during a concert, or where an engineer chooses to place his microphones while recording, will have a significant effect on the sound. So even a perfect system could only have perfect "fidelity" to the sound in a specific location in a particular hall on one unique occasion.

When it comes to other sorts of music, the question of fidelity is more complicated. Popular music, rock, country, and jazz are all typically recorded in contrived environments where the natural acoustics have been deliberately suppressed. Any sense of "space" included in such recordings is artificially added by electronic or mechanical means. Similarly, the use of multiple microphones—sometimes several for one instrument—means that there is no natural sonic point of view; spatial relationships between instruments are created in the control room. In the most complicated productions, the various elements are recorded on different tracks at different times—occasionally even in different studios—to be mixed later. And some sounds, like synthesizers and electronic instruments, are totally artificial.

In such recordings, the producer's creative intent, rather than an actual performance, is the controlling factor as a number of elements are brought together in the final mixing stage. The "sound" that results from this rather arbitrary process is further influenced by the conditions under which the producer makes his choices. The acoustics of the mixing room and the characteristics of the speakers used there both contribute to artistic decisions, and neither will be exactly the same as those in the rooms of the ultimate listeners.

A Single Signal

Every musical instrument produces sound made up of two parts: one part is the **fundamental** note it is playing, determining its pitch, and the other is a series of mathematically related **harmonics**, or overtones, of that note, which give the instrument its particular character or timbre. When the instrument is played, its complex sound wave radiates outward in a series of variations in air pressure, or compres-



sions and rarefactions, bouncing off or being absorbed by anything that gets in its way, until its energy is finally used up. An orchestra consists of many such complex sound sources, each radiating its own wave pattern, each with a different point of origin. As all these sound waves meet, they influence each other.

The interaction of all these waves, both direct and reflected, is extraordinarily complex, but at any moment at any given point within the acoustic space, there is only one pressure level: the sum of all the sound waves reaching that point at that instant. The combination of reinforcement and cancellation of the different frequencies at that point produces an extremely complicated pressure pattern over time, but if an eardrum happens to intercept it, the human brain has no trouble sorting out all the elements into the sounds of individual instruments. A microphone placed at the

same point will convert the pressure variations into a constantly changing electrical signal; when this is reconverted into pressure waves by a loudspeaker, we are still able to identify violins, oboes, human voices, and so forth, even though they have all been combined into a single electrical signal.

This combination of sound information from many sources need not happen acoustically at the location of the microphone. Signals from two or more microphones or other audio sources can be mixed electrically with the same result. When we hear the finished product we are still able to pick out the individual instruments.

In a real acoustic space, the pattern of sound is never the same at any two points; the various waves arrive at slightly different times and with slightly different intensities. Because our ears are spaced a few inches apart, we can use these differences to hear a spacious, three-dimensional sound and to locate specific sound sources. The use of two or more independent channels in a stereo system allows us to hear some of this information in the home.

The Shape of Audio

The pattern, real or simulated, of air-pressure variations over time at a given point is known as a **waveform**. A waveform can be turned into electricity by a microphone, increased in magnitude by an amplifier, combined with other signals to make new waveforms, stored physically or magnetically, and ultimately turned back into sound by a loudspeaker. At any point along the way, a waveform should be exactly the same shape as when it was created; any variation is **distortion**. Ideally, in reproducing a waveform an audio system will add nothing, subtract nothing, and change nothing. To the extent that it can achieve this—and the component that exhibits *no* distortion whatsoever has yet to be built—the equipment is said to be **neutral** or **accurate** or, technically, **linear**.

The most basic requirement for a modern audio system is that it be able to reproduce everything we can hear. The human ear is sensitive to a fairly wide range of frequencies,



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which are measured in **hertz** (abbreviated **Hz**). A 1-Hz sound is a complete compression/rarefaction cycle—or its electrical equivalent—that takes 1 second. Most of us can hear sounds as low as 16 Hz or so (sixteen cycles each second); below that we tend to *feel* the vibrations. At the other end of the scale, most healthy adults can hear as high as 16,000 Hz (often expressed as 16 kilohertz, or kHz); many children can hear frequencies higher than that, but our ability to do so usually lessens with age. The frequency spread of 16 to 16,000 Hz is sometimes called the **audible spectrum**.

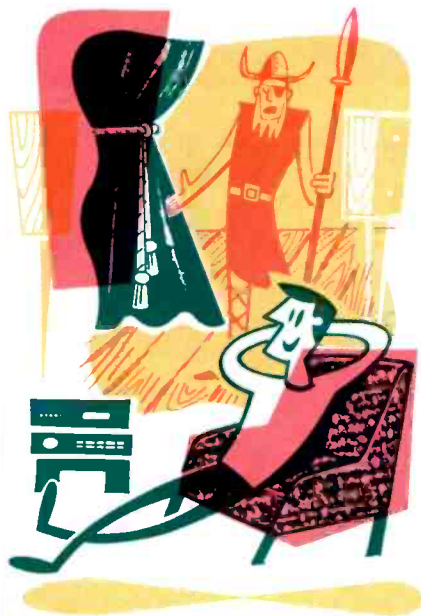
The frequencies a piece of audio equipment can handle with some degree of ease are expressed as its **frequency range** or **bandwidth**. It's important that the equipment not only be able to deal with all frequencies in the audible spectrum, but that it do so impartially, neither emphasizing nor attenuating any of them. The measure of this ability is its **frequency response**, which is stated in two parts: a frequency range and a measure of the variation in sensitivity across that range.

A component's output at all frequencies, assuming a constant input, is usually plotted on a graph with the frequency on the horizontal axis and the output level on the vertical axis. The ideal response is a perfectly straight line, indicating that the equipment is equally sensitive over the entire spectrum. In such a case, the response is said to be **flat**. Few components have truly flat response, however, so the second part of the frequency-response measurement states the amount of deviation from the ideal straight line (although not usually called distortion, such deviations are nevertheless a form of it).

The amount of deviation from flat response is expressed in **decibels (dB)**. Decibels are not units, like inches or watts; rather, a decibel measurement expresses a *ratio* between the levels of two signals. (A decibel is actually one-tenth of a **bel**, which was named after Alexander Graham Bell.) It turns out that 1 dB is about the smallest level difference that the average person can detect as such. Human perception of loudness operates on a sort of sliding

scale, requiring relatively large changes in acoustic power (sound pressure) to cause quite small apparent changes in loudness. The decibel scale, therefore, is logarithmic rather than linear to correspond roughly to the way we hear and to keep the numbers manageable (otherwise a level difference of, say, 60 dB would have to be expressed as a ratio of 1,000,000 to 1).

The effect of changes in the electrical power from an amplifier is also logarithmic. An increase in



loudness of 3 dB requires *twice* the power from an audio amplifier, though the change is barely audible (by the same token, a drop of 3 dB requires *half* the power). Doubling the perceived loudness would mean a level increase of 10 dB, requiring *ten times* the amplifier power.

In the past, 3 dB was considered an acceptable response variation, so frequency response was often specified as being "within 3 dB" (or " ± 3 dB"). Such a specification means that nowhere in the stated frequency range did the sensitivity vary by more than 3 dB up or down, although in practice the range was usually determined by the point at each end where response dropped by 3 dB, the extremes being the hardest part of the spectrum at which to maintain flat response. Nonetheless, most people can hear the *effects* of considerably smaller response variations—sometimes as

little as a fraction of a decibel. In recognition of that, and because the technology has improved, many components are now specified to closer tolerances—1 dB or less—although some manufacturers omit the decibel figure altogether when dealing with the more "difficult" components such as speakers.

It has become a modern convention to express the frequency response of most hi-fi equipment in terms of variations over the range from 20 to 20,000 Hz (or 20 kHz). This range, called the **audio spectrum**, gives a comfortable margin at the high end and also represents roughly ten musical octaves—there's a certain tidiness about it. Within that range, the spectrum is usually divided roughly into three sections: The **low-frequency** or **bass** region extends up to about 200 Hz; the **midrange** goes from there to perhaps 1,000 Hz; the **high-frequency** range extends from there to above audibility. These figures are approximations—the limits of the ranges have not been defined exactly.

Uninvited Guests

Problems in frequency response distort a waveform by altering the relationships between its elements. Other forms of distortion actually add unwanted information. Some equipment, for example, generates tones that are mathematically related to those of the music; like musical instruments, they produce overtones, and the result is **harmonic distortion**. Because it is produced in much the same way as natural harmonics, harmonic distortion is often masked by the music itself and so is not always audible. Still, it is common, and it is usually measured as **total harmonic distortion**, or **THD**, which is the percentage of a component's output made up of such extraneous material. More objectionable is **intermodulation distortion**, or **IM**, which is caused by two or more frequencies in the original signal "beating" together to create new signal components at frequencies equivalent to the sum and difference of the originals. These IM components usually have no musical relationship to the program material and hence are more easily heard than harmonic distortion. Like THD, IM is ex-

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Salem

THE REFRESHEST

THE BASICS

pressed as a percentage of the total output signal.

Another form of intrusive material—again a type of distortion, although it's usually not called that—is **noise**. Virtually all active components, as opposed to passive equipment such as speakers and headphones, generate a certain amount of residual (background) noise, although they differ widely in how much. Tape decks and FM tuners are notoriously noisy, while amplifiers and the like rarely exhibit audible noise (although it is still there, and measurable). Audio noise comes in two main forms: high-frequency **hiss**, which is an unavoidable byproduct of the reproduction system itself, and 60-Hz **hum**, which is induced by the substantial electromagnetic fields caused by house current. Audible hum usually indicates a fault either in the components or the wiring between them.

In the case of both hiss and hum, the extent of the noise is expressed in decibels referred to a specific program level, usually the maximum output of the device. This **signal-to-noise ratio**, or S/N, is important because noise, like other forms of distortion, is cumulative throughout an audio system. Several components used together may be fairly noisy even if their individual noise levels are below audibility.

One form of distortion that alters a waveform without adding anything to it is **phase shift**. The time it takes for a signal to pass through a piece of audio equipment should be the same no matter what its frequency; in reality, some components process some frequencies faster than others, which can alter the shape of the output waveform. In most cases, as with compact disc players, the phase shift is small enough and at high enough frequencies to be inaudible; with others, like speakers, the effect may be more significant. Phase shift is rarely specified; when it is, it is expressed in degrees. A 360-degree phase shift is a delay of a complete cycle at the frequency in question, and a 90-degree shift is a quarter of a cycle.

Beyond Distortion

Phase has other meanings as well. An audio signal is a form of alter-

nating current whose positive and negative elements correspond to the compressions and rarefactions of air in live sound. Unlike the alternating current that comes from the wall socket in your home, however, an audio signal is not symmetrical: The negative portion is not a mirror image of the positive one. Therefore, some audiophiles believe that the **absolute phase**, or **polarity**, of the signal is important: What was a compression in the original performance should also be a compression when we listen to it at home. There is little evidence that polarity actually makes an audible difference, and in any case there is usually no way to determine the absolute phase of the original sound a recording derives from, but a few audio manufacturers do include phase-reversal or polarity switches for those who believe that absolute phase is important.

There's no argument, however, that **relative phase** is important. A live sound produced directly in front of a listener arrives at both his ears simultaneously; identical information from both ears is the clue our brains need to tell us that the source is front and center. Slight variations between the ears in intensity and time of arrival, in turn, place other sounds to the right or the left, a process called **imaging**. In a stereo system, the illusion of position is achieved the same way. If a person is sitting in the correct position, an identical signal coming from both speakers should sound as if it were directly ahead of him. But this only works if both speakers are producing compressions at the same time—if they are **in phase**. If the polarity of one channel is reversed relative to that of the other, the system is **out of phase**, which makes proper imaging virtually impossible. Also, if a system is out of phase certain frequencies, particularly low ones, will tend to cancel out, producing a very irregular frequency response. Phase reversal can occur anywhere in the stereo chain, but it typically crops up in the link between amplifier and speakers. The cure is to reverse the polarity of *one* speaker.

Imaging is also affected by **crosstalk**, the leakage of signal from one stereo channel into another. Our

ability to pinpoint the positions of various instruments across the sound "stage" and to derive a sense of sonic spaciousness depends on the presence of different information in the two channels. Total crosstalk, where the two signals are blended completely, is the same as mono, which sounds as if the music is all coming from a single point between the speakers. Crosstalk is expressed in decibels as **channel separation**, the amount one channel's signal is attenuated in the other. A typical separation figure might be 60 dB, which means that there is some right-channel information in the left channel but that it is 60 dB quieter than the desired signal. Tests have indicated that a separation of as little as 20 dB is enough for proper imaging, although most audio equipment does far better than that.

One last general term should be noted, which applies only to equipment containing motors: turntables and tape decks. For proper reproduction of recorded sound, it is vital that mechanical devices operate at the correct speed, or musical pitch will be affected. Equally important is that such devices rotate a disc or pull a tape very smoothly. Speed irregularities caused by eccentricities in machined parts or by friction are known as **wow and flutter**. **Wow** refers to slow variations and **flutter** to fast ones, but the point at which wow becomes flutter has never really been defined. Both are very audible, wow as a distinct wavering of pitch, flutter as a sort of "underwater" or "honky-tonk" sound. The two are usually specified together as the average percentage deviation from the proper speed. A deviation on the order of 0.15 percent is easily audible, and 0.05 percent is usually undetectable; most equipment falls somewhere between these figures.

Compact disc players are almost immune to such speed problems even though they are mechanical in part. The digital data read from the disc is briefly stored in the player and then released at precisely the correct rate, the rate at which the sound was originally sampled. □

NEXT MONTH: More on the inner workings of CD players and the other devices for playing recordings.

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Philips Compact Disc Player LHH 1000

The Philips Reference Series LHH 1000 is now the standard by which other compact disc players will be measured. Other companies may claim state-of-the-art technology but the world's most particular audiophiles—Philips engineers—have achieved it, designing a technological masterpiece that is as pure and complete as any Mozart sonata.

A limited edition—and in strictly limited quantities—the Philips LHH 1000 says much about the people who designed the system and the discerning buyer. It says only the best will do...only a level of excellence attained after years of dedication to achieving the finest musical reproduction possible.

Every component of the Philips LHH 1000 is hand chosen for maximum performance. At the heart of the separate digital-to-analog converter and digital filter are special Select Grade TDA-1541 "AS-1" chips with four times oversampling that realize a startling 15.75 bits of resolution from the 16 bits available in the compact disc format. The highest resolution yet achieved in compact disc. Linearity error and distortion barely register. In fact, all specifications are where you would expect them to be—at the top of their class.

The separate transport section features the professional quality, broadcast standard Philips CDM-1 mechanism made of die cast aluminum alloy. An extremely accurate

single beam laser pickup floats on a Radialinear swinging arm that improves tracking ability and offers faster track-to-track access times. And, of course, the LHH 1000 has the renowned Philips Favorite Track Selection (FTS) system to program your entire CD collection.

Connections between the Reference Compact Disc Player System (DAC and transport) can be made with coaxial or optical fiber cable with diamond polished connectors. This ensures 100 percent error free transmission of digital data, resulting in truly lifelike, distortion-free sound.

The utmost thought and care went into every aspect of the LHH 1000. There are no plastic parts anywhere in the chassis assembly. The elegant looks belie durable and rugged construction that is second to none.

A sophisticated Learning Type Universal remote control is capable of learning 150 functions from other remotes. LCD readouts complements the system to provide complete fingertip control of this state-of-the-art CD player.

There is no question: the Philips LHH 1000 has set the gold standard for CD technology. It is the finest compact disc player currently available, for people with no tolerance for imperfection.





PHILIPS

COMPACT DISC PLAYER CD960

ON/OFF

COMPACT disc
DIGITAL AUDIO LINEAR SKATE DISC LOADING

OPEN/CLOSE

31311

LAP

REPEAT

SKIP

STOP

PAUSE

IR RECEIVER

TRACK

PHONES

TIME

REPEAT/LAP

PUSH TO OPEN

Philips Compact Disc Player CD 960

A signal-to-noise ratio of 100 dB. Dynamic range of 96 dB. Channel separation greater than 100 dB. These are just a few of the superb specifications of the Philips CD 960 compact disc player, a player that offers audiophile-quality sound for the most demanding listener.

From its elegant design to the superior chip architecture of the digital-to-analog converter, the CD 960 is truly world class. Philips, the inventor of the compact disc, has been constantly refining CD technology. The specially-selected high-resolution version of the acclaimed TDA 1541-A dual 16-bit converter chip incorporated into the CD 960 is the culmination of those efforts. Coupled with a digital filter with four times oversampling that effectively eliminates any unwanted ultra-sonic noise, the CD 960 is a compact disc player that will become the centerpiece of your audio system.

Complementing the sophisticated digital engineering is superior analog circuitry including third-order Bessel filters, "Elna Cerafine" ceramic powder capacitors and four separate power supplies to



eliminate unwanted interference. And all circuits are mounted on a massive, 4.4 pound nonresonant, die-cast alloy chassis. Even the disc transport is die-cast aluminum alloy guaranteeing the single beam, broadcast-quality CDM-1 laser pick-up will track accurately and quickly with fast track access averaging less than one second!

Simple to operate—with a full-function remote—the Philips CD 960 has won accolades from the enthusiast press around the world. The CD 960 is a superior example of the art of musical engineering, one that could only come from the originator of digital audio.





The jog shuttle dial and LCD readout only hint at the advanced capabilities of the CDV 488's remote control. Not only can it provide frame-by-frame, noise-free slow motion at variable speeds, the handheld unit can also "learn" the functions of other remotes in your A/V system, making it the only remote you'll need.

Philips CD Video Player CDV 488

Compact Disc Video...the finest picture possible and pristine digital sound. The new Philips CDV 488 can play every optical disc format, from CD-3s to standard 5-inch CDs as well as full-length feature films on 12-inch CD LDs. And the Philips CD Video player is the first to handle the new 8-inch LD single...all without the need for adaptors. This ability to offer all forms of music and movies at the highest possible quality levels.

Video specifications of the combination player are a scintillating 440 lines of horizontal resolution. This translates to a picture finer by far than that of any VCR. Another Philips exclusive is a proprietary high resolution Y/C processor developed for the CDV 488. It divides the disc's composite video signals into separate luminance (Y) and chrominance (C) signals, then routes the two through the S-connector out to a high quality TV monitor/receiver. Colors are purer...images more lifelike...interference artifacts virtually eliminated. Video at its best. And a wealth of software is available to see and hear. Over 2,500 movies and concerts are on disc with dozens of new releases every month.

Along with the best resolution figures of any video format, the CDV 488 offers the viewer special nonpareil effects. The jog shuttle dial on the infrared remote delivers rock-solid still frames in forward and reverse motion due to an 8-bit digital memory. The dial even allows for variable speed forward and reverse scanning. Other special effects include mosaics and strobos.

Along with the finest video image, the CDV 488 has the state-of-the-art audio specifications one expects from the inventor of the compact disc. Signal-to-noise ratio is greater than 100 dB. Dynamic range and channel separation more than 96 dB. The CDV 488 utilizes Philips' top quality "Select Grade" TDA 1541 "AS-1" dual digital-to-analog converter chip and a digital filter with four times oversampling. This translates to a real resolution of more than 15.75 bits out of the maximum possible 16 in the digital audio format, a superlative achievement.

For those who want the finest in sight and sound in one machine the answer—is Philips CDV 488.



Advanced digital technology allows the CDV 488's remote control jog shuttle dial to fast forward at up to 10x speed or capture noiseless "stills" one frame at a time.



From hit singles to hit movies, the CDV 488 can play *all optical discs* without adaptors and is the first to accommodate the new 8-inch LD single.



The CDV 488's remote control can learn the functions of 10 A/V components and the easy-to-read LCD display highlights all important operations.

Compact Disc Players	LHH1000	CD960	CD880
FREQUENCY RESPONSE	20-20,000 Hz+-.01 db	20-20,000 Hz+-.01 db	20-20,000 Hz+-.01 db
PHASE LINEARITY	+-. 2 degrees	+-. 2 degrees	+-. 2 degrees
SIGNAL TO NOISE RATIO	>101 db	>101 db	>101 db
DYNAMIC RANGE	>96 db	>96 db	>96 db
CHANNEL SEPARATION	>100 db	>100 db	>100 db
TOTAL HARMONIC DISTORTION	<.0015% at 1 kHz	<.0015% at 1 kHz	<.002% at 1 kHz
ULTRASONIC NOISE REJECTION	>60 db	>60 db	>60 db
ANALOG OUTPUT LEVEL	2V RMS, typical 1 kHz, all bits on	2V RMS, typical 1 kHz, all bits on	
ANALOG OUTPUT LEVEL, FIXED			2V RMS, typical 1 kHz, all bits on
ANALOG OUTPUT LEVEL, VARIABLE			2V RMS, 64 steps of 1 db
DIMENSIONS LHH-1001 TRANSPORT (APPROX.)	17 $\frac{1}{8}$ " W, 4 $\frac{1}{8}$ " H, 13 $\frac{3}{8}$ " D		
LHH-1002 D/A CONVERTER (APPROX.)	as above		
WEIGHT, COMBINED (APPROXIMATE)	62 lbs.		
	RC-5 remote control compatible	RC-5 remote control compatible	RC-5 remote control compatible
DIMENSIONS (APPROXIMATE)		16 $\frac{1}{4}$ " W, 4" H, 15 $\frac{1}{4}$ " D	16 $\frac{1}{4}$ " W, 4" H, 14 $\frac{1}{2}$ " D
WEIGHT (APPROXIMATE)		21 lbs.	22 lbs.

Philips of the Netherlands is one of the largest electronics companies in the world. With our vast research and development facilities, we have long had a commitment to leadership in consumer electronics that few, if any, can match.

Philips literally wrote the book on compact disc technology and is setting the standards for improved definition television and other emerging technologies such as HDTV. To audition the compact disc players features here, or to experience any of our select group of audio and video components visit your nearest Philips audio specialist.

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State-of-the-art sight and
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STEREO TO GO

by Ken C. Pohlmann

FIVE-speed manual transmission, four-cylinder in-line twin-cam sixteen-valve 2.0-liter engine, turbocharger and air-cooled intercooler, MacPherson struts front and rear, 200 horsepower at 6,000 rpm, 200 foot-pounds of torque at 3,200 rpm—those are some of the equipment and performance specifications for the 1990 Celica All-Trac Turbo. You would expect high-tech gear like that in an all-wheel-drive sports car from Toyota.

Ten independently located loudspeakers, including two biamplified 8-inch subwoofers, six-channel power amplifier (220 watts max), five-point fixed parametric equalization, diversity-reception FM tuner with two antennas, autoreverse cassette deck, full security lock-out, and compact disc player with four-times-oversampling digital filter—that's also some of the high-tech equipment in the 1990 Celica. Surprised that an automotive manufacturer would provide such a sophisticated sound system? Don't be. Some of the spiffy-looking cars you see roaring down the road may have better audio systems than you've got at home.

Traditionally, car makers have offered audio systems whose performance came up short when compared with components offered in the aftermarket. If you wanted really good sound, the first step was removal of the factory system. But over time the car makers have realized that inadequate factory sound systems are a big mistake. It is their job to provide the customer with all the amenities he demands, and many car buyers demand a high-quality audio system. Offering a good factory sound system helps satisfy the customers, and that realization has led to a renaissance in factory car stereo.

Car audio has become a big business—really big. Americans spent \$800 million on car stereo in 1979, but that's just peanuts compared with the estimated \$5.25 billion we'll spend in 1989—almost as

much as on our home stereo systems. We spent an average of only \$230 on our cars' factory sound systems in 1985, but the average investment has risen to \$400 in 1989. (Still, today's average aftermarket system costs \$500.) Because of the great number of cars sold, car makers have become major players in audio. For example, car makers sold 3.7 million cassette decks in the U.S. last year, and it's been predicted that they will reach annual sales of more than one million car CD players by 1992. Ford alone earned nearly \$900 million from audio sales in 1988. Other auto manufacturers have come on strong too. Car makers controlled 30 percent of the car audio market in 1978; in 1988 they controlled 70 percent.

To pump up the bottom line even more, car makers are designing high-end sound systems for their new cars that have features specifically chosen to attract certain buyers. For example, the target buyer of the Celica GT is a woman, around thirty-three years old, who earns about \$42,000 and is single more likely than not (All-Trac buyers differ considerably). According to market surveys, she likes a sporty car and in all likelihood likes music as well, but she probably isn't into audio hardware and may not feel comfortable choosing an aftermarket system. Enter Toyota with its ten-speaker high-end sound system, ready to provide a little customer satisfaction. One listen to this system, custom tuned and powered for loud listening levels, the way the target buyer likes it, and everybody's happy.

Well, almost everybody. The aftermarket has steadily lost ground to the car makers because the car makers have an advantage. The aftermarket audio manufacturers can make audio components whose quality is beyond reproach, but integrating them into a vehicle often requires compromises. Car makers can design the cars and their sound systems together (ironically, often employing the expertise of aftermarket audio companies). They are able to tailor a vehicle's basic interior structure with an eye toward the

size, shape, angle, and placement of speakers. The factory can employ computer analysis of a car's acoustics—including the effects of structural resonances, seating positions, interior materials, exterior noise, and other parameters—in order to optimize audio performance.

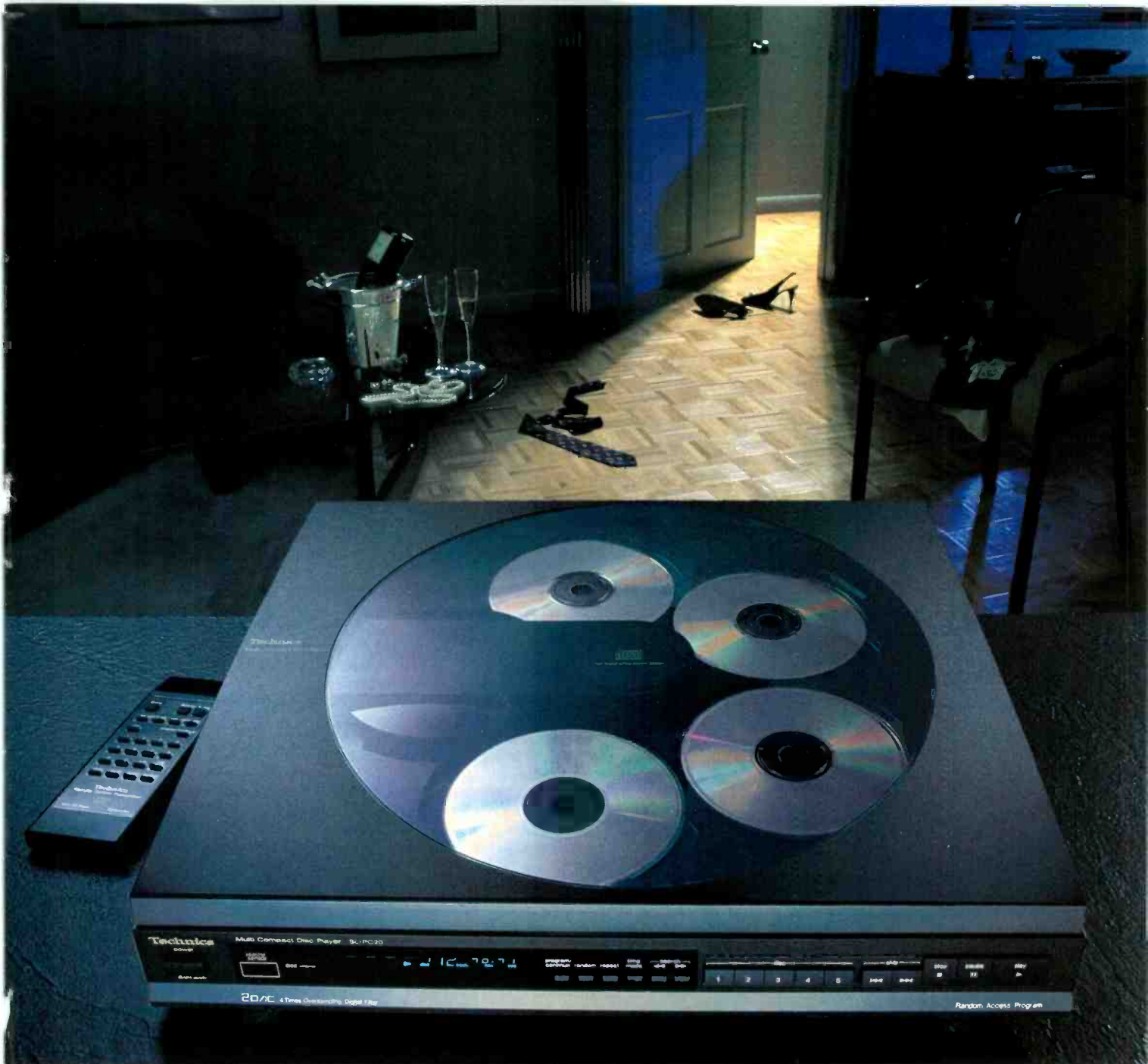


Components for the new Toyota Celica

Today, car makers are designing their cars specifically with audio in mind. For example, the Celica's rear body structure was actually designed around the rear loudspeaker enclosures. Other parts of the car were highly modified to improve audio response. The front-door trim panels, fitted with special seals around the entire periphery, are nonresonant, providing a 35-liter enclosure for the subwoofers and improving their bass response by 10 dB.

Is it all worth it? When the next gas shortage hits (as one day it inevitably must), will drivers appreciate that extra 30 or 40 pounds of audio gear they're hauling around (and burning gas to do it)? Good question. Meanwhile, there is no question about the pleasure of cruising in a good car in the company of good music.

Next time you go shopping for a car, better be prepared to listen to more than the way the engine sounds when you turn on the ignition and the way the doors sound when you close them. Better take along a few tapes and CD's, too. That way you'll be able to decide between a Maserati TC with an Infinity, a Z with a Bose, a Probe with a JBL, or a Lexus with a Nakamichi or a Pioneer. They said car sound was going to get better, and it has. But no one said it was going to make your decisions any easier. □



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wireless remote control. And a high-speed linear access motor.

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MASSACHUSETTS • New Bedford — Audiometrics
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• St. Louis — Quality Sight and Sound
MONTANA • Bozeman — Sound Pro
NEBRASKA • Norfolk — Mid City Stereo • North
Platte — Monte's Sound Systems • Scottsbluff —
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• Royalton — Phil Reddish Supply, Inc. • Toledo —
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• Ephrata — Galens of Ephrata • Erie — Studio One
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Systems • Johnstown — East Hills TV & Sporting
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• State College — Hi Fi, Inc. • Willow Grove —
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SOUTH CAROLINA • Columbia — Norton's
SOUTH DAKOTA • Rapid City — Team Electronics
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TENNESSEE • Memphis — Modern Music
• Nashville — Electronic Express
TEXAS • Austin — A&B TV • Corpus Christi —
Audio Video Designs • Houston — Applebaum &
Company • Lufkin — Sound Center of Lufkin
UTAH • Salt Lake City — Gadgets
VERMONT • Williston — Consumer's Showcase
VIRGINIA • Charlottesville — Audio World Limited
• Collinsville — Bryant Radio Supply • Roanoke —
Lee Hartman & Sons, Inc. • Stafford — ORC
Electronics • Virginia Beach — FX • Winchester —
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WASHINGTON • Bellingham — Video Depot
WISCONSIN • Janesville — Team Electronics of
Janesville • Madison — Phillips • Wausau — Sound
World of Wausau
WYOMING • Casper — Jeff's Electronics

AUDIO Q&A

by Ian G. Masters



Line Levels

Q *My new CD player has a remote volume control that is independent of the amplifier's control. I was under the impression that the line-level connections between audio components were at a constant level. If they are not, how should I adjust my system to get the best possible sound?*

RANDALL G. BEHRENS
Chicago, IL

A "Line level" is a professional audio term that has a very specific meaning in that field. The phrase has been adopted by consumer audio, but here it is very unspecific, referring generally to signals that are sufficient to drive the high-level inputs of a preamplifier or tape deck directly, as distinct from much lower-level phono signals, which require at least one extra stage of amplification, plus equalization.

Since there is no real standard for line level in consumer audio, some manufacturers of compact disc players and cassette decks provide output-level controls so that their signals can be matched with other sources. This is done to prevent sudden increases in level when switching from, say, FM to tape. With CD players, there is the added possibility that a huge—and possibly damaging—musical peak will come along. To allow users to catch this without having to dash across the room, a volume control is sometimes included in the remote control.

In your case, I would suggest that you

set your receiver to a comfortable listening level using a source that doesn't have its own level control, and then match your CD player with that.

CD Direct

Q *My CD player has a variable-level output with a volume control, and I am contemplating feeding this directly to the inputs of my power amplifier, with no preamplifier in the signal path. Are there any disadvantages to such direct connection?*

GEORGE PITURAS
Tenafly, NJ

A Not from a technical point of view. In fact, there are many audiophiles who insist that this is the *only* proper way to connect a CD player, as the various circuits in a preamplifier can only serve to interfere with the signal, however slightly.

The main disadvantage is one of operating convenience: Unless you intend to listen only to CD's, switching to any other source becomes an irksome matter of rewiring your system. Most CD users, therefore, are content to feed their CD players through their preamplifiers in conventional fashion, risking the chance of some signal degradation (which is probably inaudible anyway). As a compromise, a few manufacturers of integrated amplifiers provide separate CD inputs that feed directly to the power-amplification stage, bypassing the rest of the preamp circuitry.

Long Cable Runs

Q *Most of my stereo components are separated from the speakers by a relatively long distance, roughly 25 feet. I have the options of placing the power amplifiers close to the speakers and running low-capacitance shielded wire from the main system, or of placing the amplifiers with the other equipment and connecting them to the speakers with heavy-gauge speaker wire. Which option would degrade the signal less?*

IGNACIO GIL PINEDO
Cadiz, Spain

A These days, a 25-foot run is not at all unusual, and either configuration should yield good results, assuming you really are using the highest-quality cables. For longer runs, or in difficult situations, low-level signals—such as those from your preamplifier to your power amplifier—are usually more susceptible to interference and other forms of signal degradation than are high-level ones. Although there are exceptions, it is generally best to keep your electronics in one place and confine longer cable runs to the amplifier/speaker link. □

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THE FIRST ROCK GROUP THAT ACTUALLY IMPROVES THE SOUND OF OUR SPEAKERS.



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Presenting the Technics CX Speaker Series. A remarkable 3-way speaker system made from one of nature's most unique sound conductors: mica.

In fact, mica has just the right characteristics for a speaker. It's lightweight yet extremely rigid. 1.5 times more rigid than titanium. Which means no matter what type of music you listen to, our mica speakers can reproduce it with amazing clarity.

More specifically, the pure mica dia-

phragm tweeter and midrange driver cones provide incredible accuracy. And the composite mica/pulp woofer not only delivers a deep, rich bass but helps eliminate the distortion that can accompany it.

What's more, the CX series is available in a bookshelf and two floor-standing models. The latter uses a linear compliance Passive Radiator in the rear of the

cabinet to further improve low frequency reproduction and total efficiency.

So, if you appreciate a brilliantly clean sound, listen to the Technics CX Series.

We don't think you've ever heard rock sound like this before.



Technics Mica CX Series

Technics
The science of sound

CIRCLE NO. 177 ON READER SERVICE CARD

“Cambridge SoundWorks May Have The Best Value In The World. A Winner.”

David Clark—*Audio Magazine* Sept. '89

Cambridge SoundWorks has created Ensemble, a speaker system that can provide the sound once reserved for the best speakers under laboratory conditions. It virtually disappears in your room. And because we market it directly, Ensemble costs hundreds less than it would in stores.


where the speaker is placed in the room. If you put a conventional speaker where the room can help the low bass, it may hinder the upper ranges, or vice-versa.

Your listening room works with Ensemble, not against it.

Ensemble, on the other hand, *takes advantage* of your room's acoustics. The ear can't tell where bass comes from, which is why Ensemble's bass units can be tucked out of the way—on the floor, atop bookshelves, or under furniture. The satellites can be hung directly on the wall, or placed on windowsills or shelves. No bulky speaker boxes dominate your living space, yet Ensemble reproduces the deep bass that *no* mini speakers can.

“Very much in the Henry Kloss tradition... another hi-fi milestone.”

 **Review**



Henry Kloss, creator of the dominant speaker models of the '50s (*Acoustic Research*), '60s (*KLH*) and '70s (*Advent*), brings you Cambridge SoundWorks, a genuinely new kind of speaker company for the '90s.

The best sound comes in four small packages.

Ensemble consists of four speaker units. Two compact low-frequency speakers reproduce the deep bass, while two small satellite units reproduce the rest of the music, making it possible to reproduce just the right amount of energy in each part of the musical range without turning your listening room into a stereo showroom.

No matter how well a speaker performs, at home the listening room takes over. Room acoustics emphasize and de-emphasize various parts of the musical range, depending on

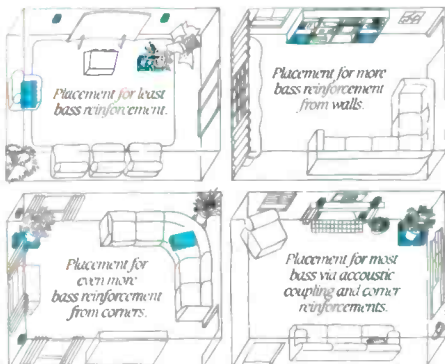
Unlike seemingly similar satellite systems which use a single large subwoofer, Ensemble uses two separate, compact bass units. They fit more gracefully into your living environment, and help minimize the effects of the listening room's standing waves.



™Ensemble & Amtrax are trademarks of Cambridge SoundWorks, Inc.

Not all the differences are as obvious as our *two* subwoofers.

Unlike seemingly similar three-piece systems, Ensemble uses premium quality components for maximum power handling, individual crossovers that allow several wiring options and cabinets ruggedly constructed for proper acoustical performance. We even gold-plate all connectors to prevent corrosion. An even bigger difference is how we sell it.



You can put Ensemble's low-frequency units exactly where they should go for superb bass. You can't do this with conventional speakers because you have to be concerned about the upper frequencies coming from the same enclosures as the low ones.

Thousands agree: the best showroom is your living room.

Choosing a loudspeaker after a brief listen at a dealer's showroom is like deciding on a car after one quick trip around the block. So we make it possible to audition Ensemble the *right* way—in your own home. In fact, Ensemble is sold *only* by Cambridge SoundWorks directly from the factory.

"They were designed to play music—and make it sound like music. This they do very well, in a most unobtrusive way, at a bargain price... it's hard to imagine going wrong with Ensemble."
Stereo Review

You get to listen for hours without a salesman hovering nearby. If after 30 days you're not happy, return Ensemble for a full refund (we'll even reimburse the original UPS shipping charges in the continental U.S.).

At only \$499—complete with all hardware and 100' of speaker cable—Ensemble is *the* value on today's speaker market.

"You get a month to play with the speakers before you have to either return them or keep them. But you'll keep them!"

Esquire



Introducing Ambiance by Henry Kloss.

Ambiance™ is an ultra-compact speaker that proves high performance, small size and low cost need not be mutually exclusive. Ambiance is ideal for bedrooms, dens, dorm rooms...or for use as an extension speaker or in surround-sound systems. While *no* speaker of its size can provide the same low bass and total volume as our Ensemble system, Ambiance has more output in the 40Hz region than any "mini speaker" we've encountered. Indeed we know of *no* compact speaker that outperforms Ambiance, including those costing hundreds more. Ambiance is only \$109 per speaker in Nextel or primed for painting; \$129 in solid oak,* and comes with our 30 day money-back guarantee.

"A listening test left no doubt that this system ranks with the best in its price range."

The New York Times

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Our toll-free number connects you to a Cambridge SoundWorks audio expert. He or she will answer all your questions, take your order (you can use Visa, MasterCard or American Express) and arrange surface shipment via UPS. Your Cambridge SoundWorks audio expert will continue as your personal contact with us. We think you'll like this new way of doing business.

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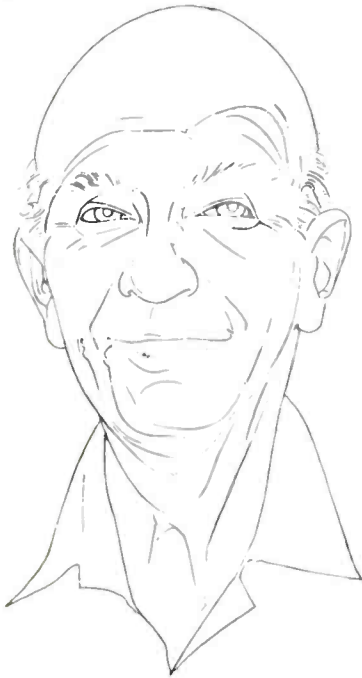
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by Julian Hirsch



REAL HI-FI AT THE MOVIES?

FIFTY or sixty years ago, movie sound was probably better than the reproduced sound most people enjoyed at home. Certainly it was more "professional," with its huge horn speakers and heavy, hot, low-powered vacuum-tube amplifiers. Today, however, the quality of home sound reproduction has made the deficiencies of movie theater sound painfully obvious.

Now that we can enjoy wide-range, low-distortion sound in our homes and automobiles, a visit to the typical neighborhood theater can be as appealing as settling down to a session of root-canal work at your dentist's office. Grossly unbalanced sound, with dull or screeching highs, honking midrange, distortion, hum, and other unpleasant remnants of before-high-fidelity times are only too common. The soundtrack often has the intelligibility of a "black box" airplane cockpit recording, and not being able to understand the dialogue can really

spoil your movie-going experience!

Well, it doesn't *have* to be that way. A few months ago I was fortunate enough to be part of an audio/video press group invited to visit the facilities of Lucasfilm Ltd., the organization responsible for such award-winning blockbusters as *Star Wars* and its sequels and the *Indiana Jones* series, films whose superb sound contributed immeasurably to their visual impact. The visit included a tour of the technical facilities at Skywalker Ranch in the hills of Marin County, north of San Francisco, and a screening of Lucasfilm's latest box-office success, *Indiana Jones and the Last Crusade*, in the company's optimally designed theater. To say that we were all impressed would be a total understatement.

Lucasfilm's work in movie sound began about 1980 with an analysis of contemporary theaters and their sound characteristics that disclosed an uneven quality level; although some theaters were very good, others left much to be desired. Lucasfilm set out to develop standards that would insure a similar level of performance in any conforming theater. Descendants of the early theater loudspeakers, highly efficient horn radiators, were still in widespread use. They suffered from poor low-bass and high-treble response, audible distortion on high-level bass material, uneven coverage of the audience area, and a combination of crossover network and mid-range dispersion characteristics that

resulted in an uneven frequency response.

The Lucasfilm THX sound system was designed to deal with these problems in several ways, the goal being that the audience hear precisely the sound created on a dubbing stage when the soundtrack is mixed. Today's powerful amplifiers permitted the THX system designers to use direct-radiator woofers flush-mounted in a large flat baffle. An electronic crossover network and multiple amplifiers helped to eliminate the weaknesses of traditional theater sound systems. THX is not a replacement for Dolby Stereo, by the way, but a complement to it. The place to hear Dolby Stereo at its best is a THX theater.

Parenthetically, Lucasfilm traces the origin of the THX designation to George Lucas's first feature film, a fantasy called *THX 1138*. Moreover, a major contributor to THX was Lucasfilm's technical director, Tomlinson Holman, who is recognized in the name of the system: *Tomlinson Holman's eXperiment*. Holman has also contributed substantially to the consumer hi-fi world as chief electrical engineer of Advent Corporation and later as co-founder of Apt Corporation.

To be a THX licensee, a theater must meet certain acoustical and technical requirements. The measured background noise level must be kept below a defined level with all mechanical equipment in operation, and the theater must be adequately isolated from external noise sources, including leakage from adjacent cinemas in multiple-theater installations. The internal sound treatment must provide a reverberation time calculated for the volume of the room. The limits of the range of audience viewing angles are defined, and the projectors must be on the center axis of the screen—effectively eliminating balconies.

Although THX requires the use of approved equipment for certification of a theater, Lucasfilm makes almost none of it, preferring to evaluate and approve the products of outside manufacturers. The company does provide architectural and acoustic consulting during the design or modification of a theater, (Continued on page 57)

Tested This Month

Yamaha CDX-1120
Compact Disc Player
Nakamichi TA-4A
AM/FM Receiver
Harman Kardon
HD7500 Compact
Disc Player
Altec Lansing 511
Speaker System
Kenwood KR-V9010
A/V Receiver

JVC

SUPER DIGIFINE AUDIO SERIES

**JVC Super Digifine Audio Series —
In full view of the possibilities**



SUPER DIGIFINE

*Digital Technology is no longer a shimmer on
some distant horizon. We are now in full view
of the possibilities that the technology affords us.
The Super Digifine Series from JVC turns
these possibilities into reality.*

RX-1010VTN Audio/Video System Control Center

CSRP — Getting control over the possibilities



Audio/Video Inputs and Outputs on Back (S-Video Terminals Included)

With technologies as advanced as Digital Acoustics Processing, Dolby Pro-Logic, electronics equalization and digital delay processing plus the variables of front and rear channel levels, balance, loudness compensation and even room compensation, the RX-1010VTN is an engineering marvel. It can quite literally recreate any acoustic experience, whether it be a movie in your neighborhood theater or the sound of a choir in a great cathedral. But how does one control the over 10 million possible settings necessary to achieve this?

CSRP — or COMPU LINK Source-Related Presetting — does the chore completely and automatically. Touch a single button and all the parameters change to a setting that is appropriate for the source you've selected.

Then if your listening determines that some fine tune adjustments should be made, make them. One more button updates the memory with your changes and from then on recalls all the settings everytime you return to that source.

For example: When you turn on your hi-fi system and listen to a CD, you get response specially customized for CD listening. Level and channel balance are properly adjusted, a customized equalization is recalled, and parameters for JVC's sound field processor — the Digital

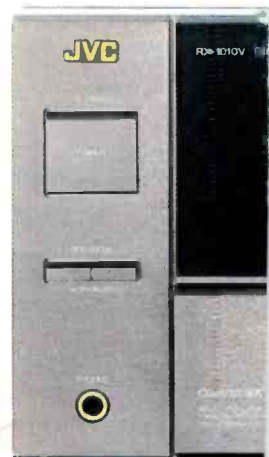
Acoustics Processor — are all optimized for the size and acoustics of your listening room.

Or, as you switch to video, settings you've preset for the Dolby Pro-Logic decoder, such as the center-channel

mode and center and rear levels, are automatically recalled.

This also holds true for all program sources — records, tapes and even individual radio stations. Since the RX-1010VTN accepts connection of up to eight audio and video programs, and provides presets of 40 FM/AM stations, this means it can handle customized control settings for a total of 48 different program sources or stations. That's control.

Example of Fluorescent Display with CSRP Preset (VCR-1 as a source)



DAP — Digital Acoustics Processing

In the RX-1010VTN, there's a ROM (Read-Only Memory) that stores the sound field patterns we measured at famous halls and theaters all over the world. Seven patterns, from symphony hall to movie theater, are programmed in memory for instant recall.



And you can fine-adjust these pat-

terns to suit the size, "liveness" and wall type of your listening room. This ensures that the ambience of your listening room is completely compensated for so that you enjoy the reflections and reverberations of only a desired hall.

Dolby Pro-Logic



With sound steering, active matrix and center channel output, Dolby Pro-Logic Surround provides you with an enhanced sense of direction and sharply centered dialog. When

watching videos, it will make you feel as if you were sitting in a first-class movie theater, especially since the digital acoustics processor is already at work.

The remote is a convenient LCD touch panel. The amplifier is a state-of-the-art Super-A design.

Our RX-1010VTN simply does everything and keeps everything simple.

**Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.



XL-Z1010TN Compact Disc Player

K2 Interface — Revealing possibilities at the source

Changing the digital code on a CD into music requires that a digital-to-analog converter choose 1 of 65,536 possibilities every 1/44,100th of a second.

It's commonly assumed that digital signal is composed of 1's and 0's, each represented by the presence or absence of a square-shaped pulse. But the fact of the matter is, a digital signal contains ripple — a type of distortion that changes the shape of a waveform — and jitter, components that move the timing of a pulse forward or behind.

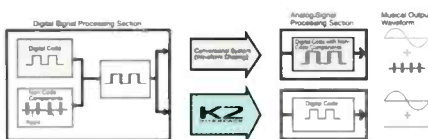
These "non-code" components can result in a sound that differs from the intent of the digital source. The K2 Interface solves this problem by completely regenerating the digital signal. At the heart of the K2 Interface is essentially an ultra-high-speed camera with a shutter speed of 20 nanoseconds (20 billionths of a second). Based on these quick snapshots, it recreates the digital signal as a perfect square wave.

Providing a perfect signal to the D/A converter allows for accurate reproduction of all the nuances such as sound staging and depth.

As a matter of fact, in many ways both frequency range and dynamic range are expanded. High frequencies sound clearer. There is a heightened sense of the power in the mid- to low-frequency range.

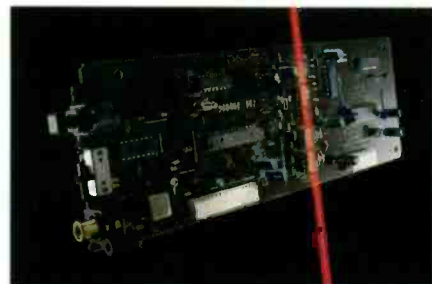
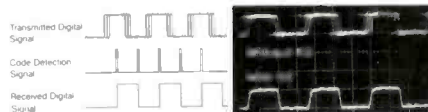
Comparison of K2 Interface and Conventional Transmission System

The JVC K2 Interface strips the transmitted signal of ripple and jitter as it travels from the digital to analog processing circuit.



Data Transmission Waveforms

The clean shape of data transmission waveforms indicates that the K2 Interface has removed ripple and jitter.



The K2 Interface optically decouples the digital from the analog section

Music seems to acquire more depth and width, providing clear images of instruments and voices. Overall, sound is smoother and more natural across the audio spectrum.

Precision D/A Converter System Using Four D/A Units

The XL-Z1010TN features two D/A converter units for each channel — four in all. There is a 16-bit converter for the most significant bits and a 2-bit converter for the two least significant bits. Since the least significant bits have greatest bearing on the sound quality at low level, JVC uses an elaborate discrete D/A converter system for these bits to ensure higher precision. All four converters operate with 18 bits "full time" whether the level is high or low. Our "quadruple full-time linear 18-bit combination D/A converter" allows you to enjoy digital sound at its most delicate and dynamic.



XP-A1010TN Digital Acoustics Processor

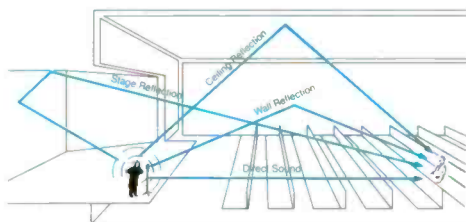
Bringing new possibilities to the home

Many of us have already invested in fine audio systems for our homes. Even the best, however, sound like music being played in a home environment.

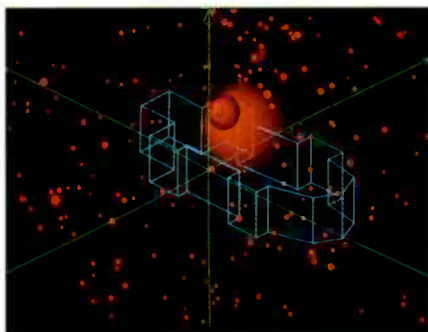
A new age is dawning in audio realism, thanks to the vast advancements in digital engineering. Now it is possible to simulate the acoustic ambience of a live music space — concert hall or movie theater — and recreate it right in your own listening room.

The new JVC XP-A1010TN Digital Acoustics Processor is the key. No other component available today so accurately brings concert hall ambience to the home.

The processor features a ROM (Read-Only Memory) containing a huge amount of data on reflections and reverberations — “sound field patterns” — our engineers measured in actual halls and theaters throughout the world.



Acoustic Response of a Musical Space



CHURCH
Sound Field Analysis Pattern

JVC's Unique Advantages of Acoustics Synthesis

The JVC XP-A1010TN offers a number of unique advantages. One,



Symmetrical 6-Point Sound Field Measurement Microphone Set

excessive reflections and reverberations added by your listening room can be compensated for, and so can reverberations contained in the source program. This means a precise sense of the size and shape of a simulated space is accurately recreated in any listening room.

Two, the entire process, from input to output, is performed channel by channel independently. Therefore, critical time-related information contained in music is retained, providing a natural sound field ambience.

Three, the size of the sound source — a point, like a solo or a spread, like an orchestra — is precisely reproduced.

The XP-A1010TN comes with sound fields from 20 actual concert halls, jazz clubs, theaters and stadiums. You can customize an additional 20 patterns of your own. With the XP-A1010TN, the possibilities now include the recreation of the concert halls around the system in your home.



AX-Z1010TN High-Power Class-A Amplifier

Digital Pure-A — New possibilities for class-A

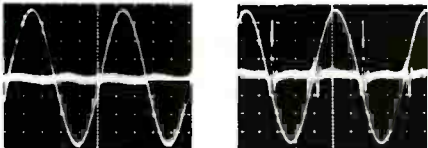
There's no doubt that an amplifier operating in class-A mode provides lower distortion and cleaner sound than those in popular class-B or class-AB. Their inefficiency, however, makes class-A amplifiers require elaborate heat sinking, and still the amps waste much of their power in the form of heat. This results in inflated cost and relatively low power output. But to enjoy the dynamic sound of digital programs, you need a lot of power.

How to combine the low-distortion sound of class-A with efficiency and power demanded by digital audio?

Class-A vs. Class-B Operation

With class-A, combined output from the paired transistors looks very close to that of the input. With class-B, this is not so, leading to crossover and switching distortion.

Output Waveform

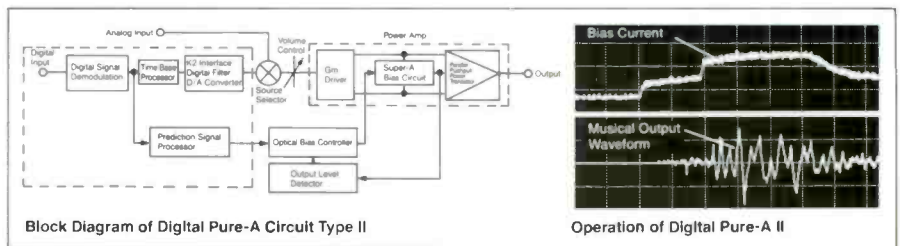


Class-A

Class-B

Enter the Digital Pure-A Type II

JVC has the solution — the Digital Pure-A Type II circuit featured in the AX-Z1010TN "Digital" Integrated Amplifier.



Block Diagram of Digital Pure-A Circuit Type II

Operation of Digital Pure-A II

This ingenious design takes the advantage of the fact that digital signals can be stored in memory temporarily without changing their frequency response or phase response.

In the Digital Pure-A Type II, digital signals fed directly from digital equipment are split into two: the main signal and the "prediction" signal.

The main signal is sent to a time base processor where it's stored in memory for a fraction of a second before it goes to the D/A converter. The prediction signal is sent to the bias circuit to optimize bias applied to the power transistors depending on dynamics of the upcoming signal. What you get out of this is low-distortion class-A sound with high efficiency and high power.

The AX-Z1010TN is a "digital" integrated amplifier incorporating a D/A converter system complete with the K2 Interface, 8-times oversampling and quadruple D/A converters.

And the amp features a special design for analog programs too — Opt Super-A, another JVC exclusive combining low distortion and high efficiency.





TD-V1010TN Discrete 3-Head Cassette Deck

The world's finest cassette deck? A distinct possibility!

When it comes to specifications for cassette decks — such as wow & flutter, frequency response and signal-to-noise ratio — we can safely say today there is only marginal room for further improvement. This is because of the steady but sure advances over the years in mechanical design, heads, noise reduction designs and tapes.

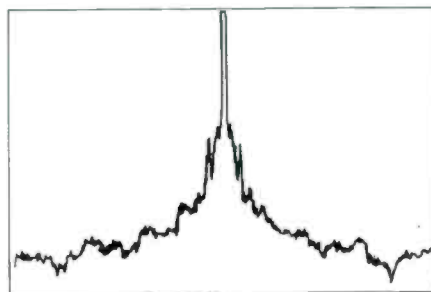
We have isolated "dynamic" response as one of the final steps in ensuring taped sound that's as pure and transparent as can be. We even developed a new specification to measure the degree of purity and transparency a cassette deck can provide: acoustic modulation noise.

In this measurement system, the test deck is subjected to a high 100-phon sound pressure during recording and playback. More rigorous than conventional modulation noise tests, this new method better simulates a real-world situations where the deck must operate while speakers are playing music.

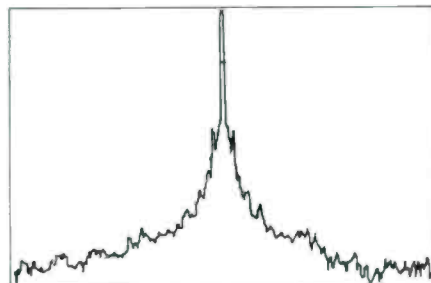
Taped Sound Free of Acoustic Modulation Noise

Based on what we discovered from

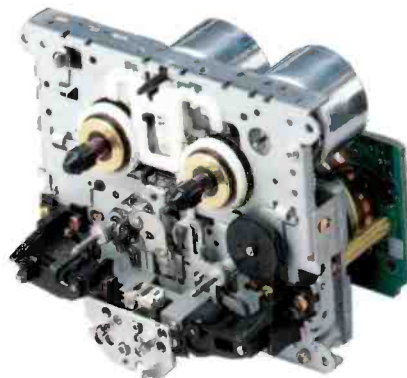
"Acoustic Modulation Noise"



Response of Conventional Deck



Response of Rigidly Built Deck



Closed-Loop Dual-Capstan Drive Mechanism

our test, we've developed solid mechanical designs in order to suppress resonance and vibration. The result of our efforts is taped sound that rivals digital.

Moreover, there are other ways we've improved clarity and purity of the taped sound of the TD-V1010TN. A "CD DIRECT" switch lets you route the signal from your CD player direct to the cassette deck. We've cut down wiring to a minimum length using remote rods and controls. We use the time-proven closed-loop dual-capstan tape transport to suppress modulation noise. "Fine" amorphous heads, highly pure PCOCC copper wire and high bias frequency also enhance the purity and transparency of the taped sound.

If you think that taped sound cannot compare with digital programs, you owe yourself a listen to the TD-V1010TN.



SOLID STATE FOR HEIGHT STABILITY AND LOW RESONANCE

FX-1010TN Computer-Controlled FM/AM Tuner

Self-adjusting to the possibilities

The FX-1010TN is a smart tuner that adjusts itself to the endless possibilities in the capture of radio signals.

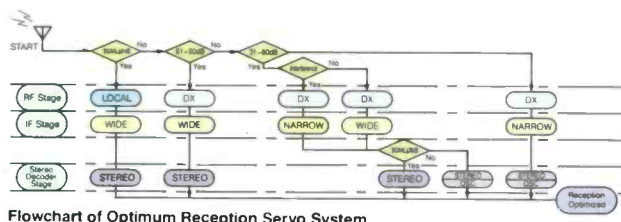
Our reception servo automatically selects the optimum operating mode — front-end gain,

IF bandwidth, stereo mode, etc. — after checking the degree of interference and the strength of the station you're tuned to. It guarantees you get the best reception anywhere and from every station. And yet the digital noise, which a

computer could create to muddy sound, is cut down by the "Opticalink" system separating the digital section from the analog.

The computer is put to use for special conveniences, too. You can preset up to 40 FM/AM stations for one-touch recall, and give a name to each preset station. You can let the tuner automatically preset all 40 FM/AM stations for you. You can "shop" for stations one by one. Also you can set the muting level to tune all stations in your area or only a few powerful ones.

Add circuitry designed for low distortion and wide dynamic range and you'll see that the FX-1010TN is the tuner that addresses the practical world of radio reception.



Flowchart of Optimum Reception Servo System



We are no longer at the threshold but have passed well into the world of digital technologies and their applications. In full view of the possibilities, we have endeavored to develop products that will endure the test of time and stand as small reminders that technology can advance while remaining sensitive to the needs of its users.

JVC®

JVC COMPANY OF AMERICA

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TECHNICAL TALK

however, and tests the completed installation to insure compliance with the THX standards. Following certification, which allows the theater to use the THX trademark in its advertising and promotion, the installation is retested twice a year to verify its continued compliance.

Some four hundred movie theaters throughout the world have already been licensed for THX, but their geographical distribution is

Comfortably seated in a theater equipped with the Lucasfilm THX system, I became aware that I was listening to true hi-fi sound. I have not heard that caliber of sound in any home.

uneven. While California and Texas are well served by THX theaters, as of August 1989 there were only a handful in New York State and even fewer in all of New England. On the other hand, audiences in Australia, Iceland, and Korea can enjoy the system's benefits.

Comfortably seated in Lucasfilm's Stag Theater, I was immediately aware of its silence—not the oppressive quiet of an anechoic chamber, but the total absence of extraneous sounds. During the many adventures of Indiana Jones in his quest for the Holy Grail the sound was unfailingly superb. Most impressive, oddly enough, was the remarkable intelligibility of the dialogue. No matter how noisy the background of the soundtrack, the voices of the actors were always natural and easy to understand. The sound effects typical of this series of films were awesome in their impact, and as I watched and listened, I gradually became aware that I was listening to *true hi-fi sound*.

I have not had the pleasure of hearing that caliber of sound in any home environment, although I suppose it must exist somewhere. A THX system delivers a useful (and surprisingly uniform) output from 20 Hz to beyond the upper limits of most people's hearing. It can generate very high sound-pressure levels

without audible distortion, yet it can sound natural at whisper levels. In the past, I have been impressed by the multichannel sound in some 70-mm Dolby Stereo theaters, but that was apparently only a hint of what could be done. It looks and sounds to me as though Lucasfilm has now *done it*.

How about home video? Is there a THX in our future? Yes, indeed. Lucasfilm has also developed the Home THX system to bring the benefits of the professional system to home video enthusiasts. Obviously, Lucasfilm will no longer have control of the end result, but the Home THX system should go a long way toward providing a reasonable simulation of its subjective goals. Home THX aims to improve the frequency range and provide proper balance over the full range; to provide adequate loudness and dynamic-range capability with low distortion; to produce proper stereo spatial properties, including localization and envelopment of the listener/viewer in the sound; and to provide intelligible dialogue.

Home THX is based on Dolby Pro Logic surround stereo, using a center-channel speaker to position the dialogue and improve its intelligibility. Frequency response is shaped to mimic that of THX theaters, so that movie soundtracks


will be reproduced with correct tonal balance. In addition, Lucasfilm has developed a unique set of loudspeaker directivity requirements for the front left/right and rear/side surround speakers to reduce the effect of room acoustics on the perceived sound of the front channels and to provide a suitably diffuse sound from the surround channels.

As in the professional THX system, Home THX will not be a group of components designed or manufactured by Lucasfilm. It will be a licensing system for the various pieces of audio and video hardware from qualified manufacturers.

A Home THX system was also demonstrated to us at Skywalker Ranch with standard videodiscs and cassettes, projection TV, and speakers in a room approximating the size and acoustic properties of a home listening/viewing room. Although it did not produce the visceral impact we had experienced in the Stag Theater, it was clearly an indication of a likely trend in home audio/video systems. We can expect to hear more about it in the future. In the meanwhile, if you live in a favored area, try to attend a THX-licensed theater. But be warned: It can be a humbling experience for anyone who thinks he has a really outstanding audio/video system at home! □



"... Rudy always was a bloody snob."



the only place you'll be without your music.

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technology, as well as multiple programming capability and random play.

As for versatility, you simply won't find a better car CD changer system. A Pioneer car CD changer can either replace or be added on to your current car

stereo, using one of four advanced CD controller units.

Of course, there are still some places where you won't be able to enjoy Pioneer's 6-disc CD Changer system. But we're working on it.



PIONEER®

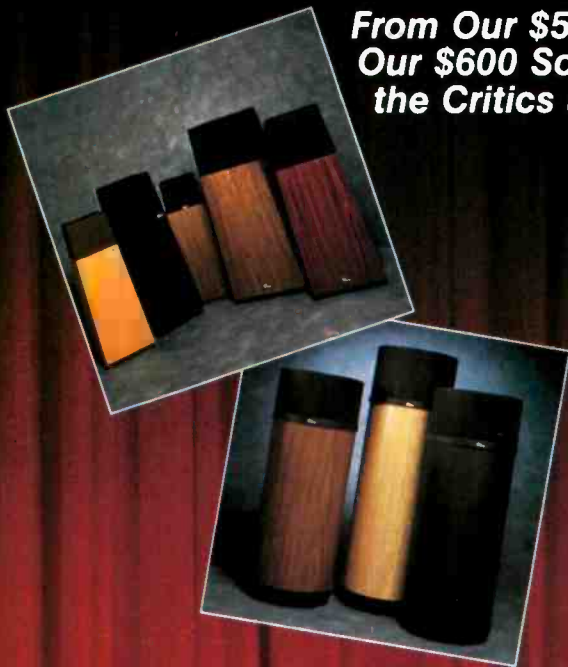
For more information and the name of your nearest Pioneer Dealer, call toll-free 1-800-421-1404.



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From Our \$5000 Walsh 5 to
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Stereophile 8-88

"So the bottom line is quite favorable: The Walsh 5 is a full-range speaker that is quite clean and images very well." "Sound staging is another strength and joy, and at their best the 5s can set up a very palatable illusion of the original performing space." "In its present incarnation it is one of the few dynamic speakers that my jaded electrostatic taste buds could live with." -Dick Olsher, *Stereophile*, Volume 11, Number 8 (August, 1988).¹

Audio 6-88

"The Walsh 5 is one of the cleanest speakers available...I perceived remarkable depth and spaciousness to music well recorded in a concert hall. This spaciousness did not result in a vague mass of sound: image location is sharply defined and accurately placed...They are a masterpiece of the speaker designer's art."²

Stereo Review 1-88

"The sound of the Ohm Sound Cylinders was smooth, balanced and thoroughly enjoyable, well beyond what anyone would expect from such a small, light speaker. Its dispersion was subjectively complete, and we were never aware of the speakers as distinct sound sources, no matter how much we moved around the room...these speakers certainly offer impressive value for their price and size."³

New York Times 3-88

"...the various frequencies emerge in their natural phase relationship--more than in conventional designs. To what extent this accounts for the speakers fine sound may be debatable, yet there is no question that the Ohm Sound Cylinders represent an excellent bargain, with a clarity and richness of sound rarely found in a speaker of this size and price."⁴

Find out about buying, directly from the factory by calling toll free 800-221-6984

*For Those Who Care
to Listen*



YAMAHA CDX-1120 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

ACCORDING to Yamaha, the recently introduced CDX-1120 compact disc player delivers higher signal-to-noise ratios, greater low-level linearity, and generally better performance than was heretofore possible. The player features Yamaha's "Hi-bit" technology, which was designed to obtain the best possible performance from the 16-bit compact disc medium.

Hi-bit technology, as embodied in the CDX-1120, is a combination of 18-bit digital filters with eight-times oversampling (at 352.8 kHz) and 18-bit digital-to-analog (D/A) convert-

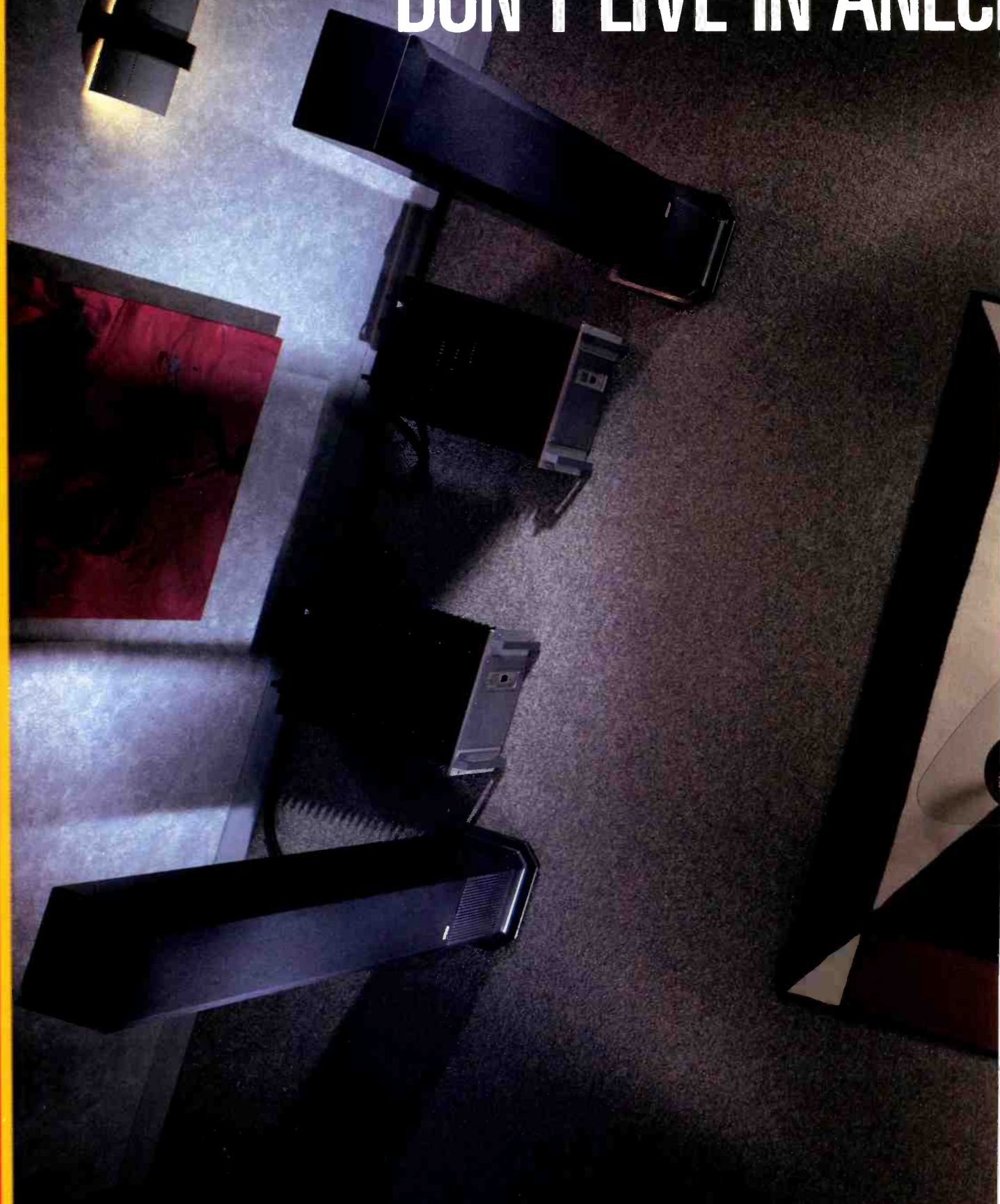
ers with four "floating" bits, which is said to give them the effective linearity of 22-bit converters. The player also features a high-performance digital volume control designed not to degrade or compromise the performance of the preceding circuit elements. The CDX-1120 uses a digital de-emphasis circuit that is said to have a frequency-response error of only 0.1 dB instead of the 0.5 dB typical of conventional analog designs. A "Hi-bit Direct Out" feature permits bypassing the analog low-pass filters in the signal path.

Each channel of the CDX-1120

uses two D/A converters, operating in opposite phase to give them a high common-mode rejection ratio and lower noise than conventional designs. To reduce noise further, the analog and digital portions of the player have independent, shunt-regulated power supplies operating from separate transformers. The player's heavy chassis is supported on a damped suspension that effectively isolates it from external vibration.

The CDX-1120 can be programmed to play up to twenty-four tracks in any order and to repeat any track, any programmed sequence of tracks, any selected portion of a disc, the entire disc, or the entire disc in a random sequence. Its bright orange LCD readout shows the current track and index numbers, the elapsed time in the current track, and the status of the Hi-bit Direct Mode feature. In pro-

**ENERGY. LOUDSPEAKERS
DON'T LIVE IN ANECHOIC**



S FOR PEOPLE WHO HOIC CHAMBERS.

The true performance of a loudspeaker can only be measured in the real world. Not the ideal environment of an anechoic chamber. Even though Energy loudspeakers are the result of highly-sophisticated CAD/CAM modeling and anechoic testing, we take the extra measure of fine-tuning them through an exhaustive series of real-world listening tests. That's why Energy is the preferred choice of thousands of demanding listeners. Our unique tweeter design is case-in-point. It provides ideal off-axis frequency response for superior imaging, extended soundstage, and exquisite transparency. The "dual hyperdome" configuration dramatically increases low-frequency power handling when compared with conventional designs. It allows the low-frequency transducer to roll off naturally for a smoother transition to the tweeter. Our top-of-the-line model utilizes a triple-chamber vented woofer enclosure that greatly extends bass response and acoustically cancels output non-linearities between the two woofers. The 7th-order bandpass design provides exceptional woofer damping for flatter response across the entire woofer range. All his "technospeak" is fine and necessary for understanding why all Energy models sound so amazing. But the real test is your ears. Energy loudspeakers are more natural no matter what the listening room is like. Or where the speakers are placed. Do your senses a favor. Take time to include them in your listening comparisons. You'll be immediately convinced of their sonic faithfulness and uncanny musicality.

The logo for Energy Audio Products International Corp. features the word "ENERGY" in a bold, stylized, sans-serif font. The letters are white with a black outline, set against a black rectangular background. The letter "Y" is particularly distinctive, with a sharp, angular design.

AUDIO PRODUCTS INTERNATIONAL CORP.
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CIRCLE NO. 58 ON READER SERVICE CARD

TEST REPORTS

grammed operation, the program number of the current track is also displayed.

The names of other selected features, such as AUTO SPACE (a 3-second silent interval between tracks), and the steps involved in programming the player appear across the lower part of the window as required. A row of twenty-four boxes shows the numbers of the unplayed tracks or the programmed tracks when applicable. Finally, a horizontal scale at the lower right of the window shows the setting of the digital volume control.

A portion of the front panel swings down to reveal a number of small pushbutton controls for direct access to numbered tracks or index points, programming, repeat play, or selecting the DIRECT OUT mode. Three narrow, center-pivoted rocker controls operate the fast-search, track-skip, and volume-adjustment

functions. The rear of the player has analog output jacks and both coaxial and optical digital outputs.

The CDX-1120 is a strikingly handsome unit, with a sculptured front panel and exceptionally legible display and control markings. When it was introduced a few months ago, it was available only in black, but our review sample was in Yamaha's new "titanium" color, a light-gray satin finish that complements its physical styling. The gray-finished infrared remote control supplied with the CDX-1120 duplicates every one of its front-panel functions except power switching. The button layout of the controller is logical, and its markings (like those of the player) are exceptionally legible.

The Yamaha CDX-1120 measures 17 $\frac{1}{8}$ inches wide, 15 $\frac{1}{2}$ inches deep, and 5 $\frac{1}{8}$ inches high. It weighs 26 pounds, 6 ounces. Price: \$1,199.

Yamaha Electronics, Dept. SR, 6660 Orangethorpe Ave., Buena Park, CA 90620.

Lab Tests

The Yamaha CDX-1120 easily met or surpassed every one of its specifications. We measured a number of its performance qualities with and without the Hi-bit Direct Out feature and found the differences to be insignificant, although sometimes measurable. For example, the frequency response, -0.2 dB at 20,000 Hz, improved to -0.1 dB with the analog filters bypassed. The interchannel phase shift, which varied a maximum of 0.75 degree from 5,000 to 20,000 Hz, improved to less than 0.05 degree with the filters bypassed.

The total harmonic distortion (THD) plus noise at a 0-dB level was alike in both modes (about 0.0025 percent) from 20 to 2,000 Hz. With the filters in use, it increased to about 0.004 percent at 10,000 Hz; in the Direct Output mode it remained under 0.0025 percent up to 12,000 Hz. On the other hand, in normal operation the distortion dropped at higher frequencies (probably because the harmonics were removed by the analog filters) to only 0.0016 percent at 20,000 Hz, while in the Direct Out mode it rose to 0.0063 percent at 20,000 Hz. Obviously, bypassing the analog filters had exactly the expected effects—both positive and negative—on the measured performance. In listening tests, we found absolutely no difference between the two modes.

The 1,000-Hz distortion at various amplitudes, a measurement unaffected by the Direct Out feature, was a constant 0.00125 percent (referred to the 0-dB output) from -80 to -20 dB and rose to 0.0025 percent at 0 dB. Spectrum analysis of low-level signals (from -60 to -90 dB) showed that noise and signal harmonics were typically less than -110 dB (one channel had a 60-Hz hum component at -118 dB). A barely detectable departure from signal-amplitude linearity could be seen at -90 dB; expanding the analysis scale showed a -1 -dB error. The error was considerably less at the higher levels.

Channel separation, slightly dif-

FEATURES

- Dual 18-bit D/A converters per channel with 4 floating bits to give 22-bit linearity
- Eight-times-oversampling (352.8-kHz) digital filters
- Digital de-emphasis circuit
- Digital electronic volume control for headphone output and analog line outputs
- Separate regulated power supplies for analog and digital circuits
- Heavy-duty chassis and suspension system
- Fast scan and track skipping in both directions
- Programmable to play up to twenty-four tracks in any order
- Random-play mode
- Repeat of track, entire disc, programmed sequence, or random sequence
- Displays numbers of all unplayed tracks, current track and index numbers, elapsed time in track, volume setting
- Time display switchable to total and remaining time on disc
- Hi-bit Direct Out mode to bypass analog low-pass filters
- Direct keypad access to any track and index number
- Auto space (inserts 3-second interval between tracks)
- Rear-apron analog outputs and coaxial and optical digital outputs
- Infrared remote control for all functions except power switching

LABORATORY MEASUREMENTS

Maximum output level: 2.125 volts

Total harmonic distortion at 1,000 Hz: less than 0.00125% from -20 to -80 dB, 0.0025% at 0 dB

Signal-to-noise ratio (A-weighted): 120 dB

Channel separation: 118 to 119 dB at 100 Hz, 116 dB at 1,000 Hz, 105 dB at 20,000 Hz

Maximum phase shift (from 5,000 to 20,000 Hz): 0.5 degree at 20,000 Hz; in Direct Out mode, 0.3 degree from 5,000 to 20,000 Hz

Frequency response: $+0$, -0.2 dB from 15 to 20,000 Hz; in Direct Out mode, $+0$, -0.1 dB from 11 to 20,000 Hz

Low-level linearity error: -1 dB at -90 -dB level

Cueing time: 1.5 seconds

Cueing accuracy: A

Impact resistance: top, B+; sides, A

Defect tracking: tracked 1,000-micrometer defects on Pierre Verany #2 test disc

TEST REPORTS

ferent in the two directions, was 118 to 119 dB at 100 Hz, 116 dB at 1,000 Hz, and 104 to 107 dB at 20,000 Hz. Yamaha's claims for an exceptionally accurate de-emphasis equalization circuit were confirmed by our measurement of essentially zero error up to 4,000 Hz and a maximum of -0.075 dB at 16,000 Hz.

The advanced circuit design of the Yamaha CDX-1120 CD player can take the credit for its equally advanced levels of performance.

The A-weighted wide-band noise level, measured with a "zero infinity" track on a test CD, was -119 to -122 dB. A spectrum analysis of the noise showed a decrease from -120 dB at 20,000 Hz to about -140 dB in the 500- to 1,000-Hz region. Power-line hum and its harmonics were evident from 300 Hz down to 60 Hz, with amplitudes from -138 to -117 dB, and the noise fell off rapidly at lower frequencies, to -150 dB at 30 to 40 Hz. The quantization noise during a 0-dB, 20-Hz test track was -93 dB, and the dynamic range (EIAJ) was 100 dB. The frequency (speed) error was only -0.0046 percent.

The player's maximum output level was 2.125 volts, and the volume control reduced it, with no audible evidence of digital stepping, all the way to zero. The disc drawer opened and closed in total silence, if not quite as fast as in some players we have tested. The CDX-1120's error-correction effectiveness was typical of good CD players; it played 1,000-micrometer defects, either singly or two in rapid succession, with no audible mistracking, but errors of 1,250 micrometers produced distinct dropouts.

Impact resistance was good, with almost total isolation from side blows, and the player required a hard slap or fist blow on its top to cause mistracking. The player cued accurately to tracks that were not separated from adjacent tracks by a silent interval. Slewing was fairly fast, 1.5 seconds from Track 1 to Track 15 of the Philips TS4 disc.

Comments

The advanced circuit design of the Yamaha CDX-1120 can take the credit for its equally advanced levels of performance. It is interesting to note that the compact disc player, from its earliest days the most nearly ideal means of reproducing recorded music, has undergone more "improvement" in a short time (about five years) than any other audio component. Although some people will differ strongly with me, I question the necessity, from a listening standpoint, for the endless refinement of a system whose imperfections have always been many orders of magnitude lower than those of any other part of the audio chain, with the possible exception of the amplifier, which is ironically a rival of the CD player in the "improvement" process.

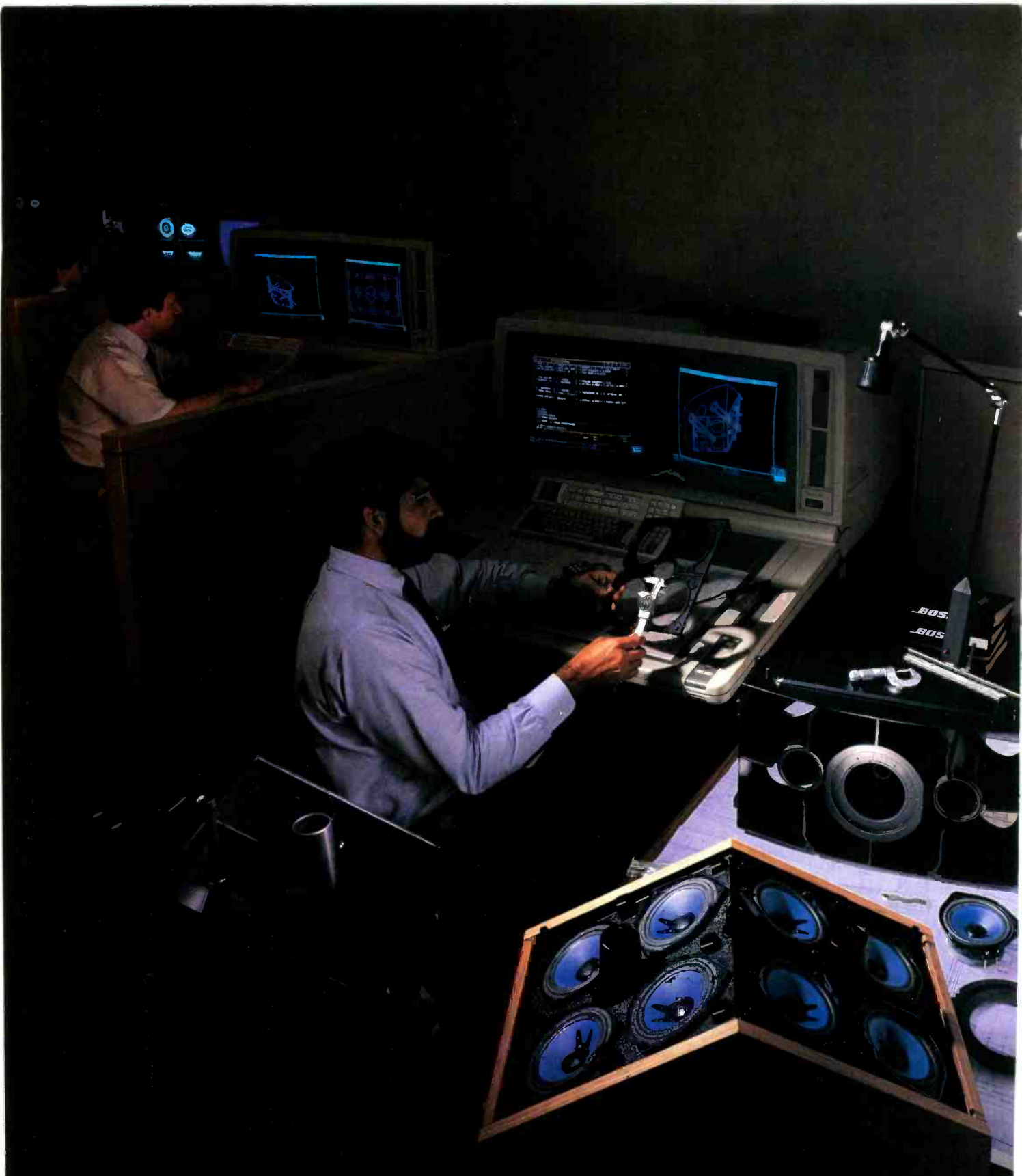
No matter how you look at it (or listen to it) the measured performance of the CDX-1120 is already at the highest levels attained by a consumer audio product. It has most of the virtues and few of the faults of its genre. It also has something that not many of the others share—strikingly attractive styling, greatly simplified operation without loss of flexibility, and a generally high level of "user friendliness."

Our use and testing of the CDX-1120 produced no negative reactions or substandard measurements. Many of its performance characteristics are crowding current measurement limits and would not have been measurable at all a couple of years ago. In our experience, most modern CD players sound pretty much alike, so it is no denigration of the CDX-1120 to say that it sounds at least as good as its competitors, and it does virtually everything the others can do.

This level of overall quality does not come cheaply. The CDX-1120 is a high-end product in every sense of the word. For such products, the law of diminishing returns applies. You pay a lot more to get a little more, but with this comes the satisfaction of knowing that you have not accepted a compromise in quality, either in performance or construction, in the interests of economy. In that respect, this handsome component is well worth its price.

Circle 140 on reader service card





Bose® engineers use advanced design systems to bring the benefits of new technologies to the constantly-refined 901® Direct/Reflecting® speaker. The Intergraph InterAct 32 CAD/CAM system (above) at Bose Corporation's Framingham, Massachusetts worldwide headquarters is part of this commitment to "better sound through research."

The Bose® 901® Direct/Reflecting® speaker system: A technological breakthrough 20 years ago— pushed to the edge of *today's* technologies.

Twenty-five years ago Dr. Amar Bose directed a research program at the Massachusetts Institute of Technology on the physical acoustics and psychoacoustics of sound reproduction. The results of this effort provided the theoretical basis for the design of the first Bose 901 Direct/Reflecting® speaker system five years later. Its introduction in 1968 was greeted with the highest critical acclaim ever accorded to a loudspeaker.

"... I must say that I have never heard a speaker system in my own home which could surpass, or even equal, the Bose 901 for overall "realism" of sound."

—Julian Hirsch, *Stereo Review* 1968

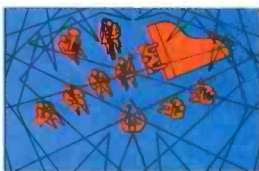
"There is no doubt that the much-abused and overworked term, 'breakthrough,' applies to the Bose 901 system and its bold new concepts."

—Bert Whyte, *Audio* 1969

"Many people swear by these speakers as the ultimate."

—*Complete Buyer's Guide to Stereo Hi-Fi Equipment* 1975

But this was just the beginning. Bose research continued to focus on the 901 system, incorporating the latest technology as it was developed. For example, in 1976 two new innovations were brought to the system to dramatically improve its efficiency and power handling. These new technologies—the Acoustic Matrix™ enclosure and the Helical Voice Coil driver—alone represent a significant investment in research and development. As a result of this commitment, the rave reviews continued.



Live music is a combination of direct and reflected sound energy.



Bose Direct/Reflecting® speakers accurately reproduce live music's natural balance of direct and reflected sound energy, in *full stereo* (blue area) throughout the room.

"... it has a total sound that soars, with a brilliance that defies description."

—*Modern Hi-Fi & Music* 1977

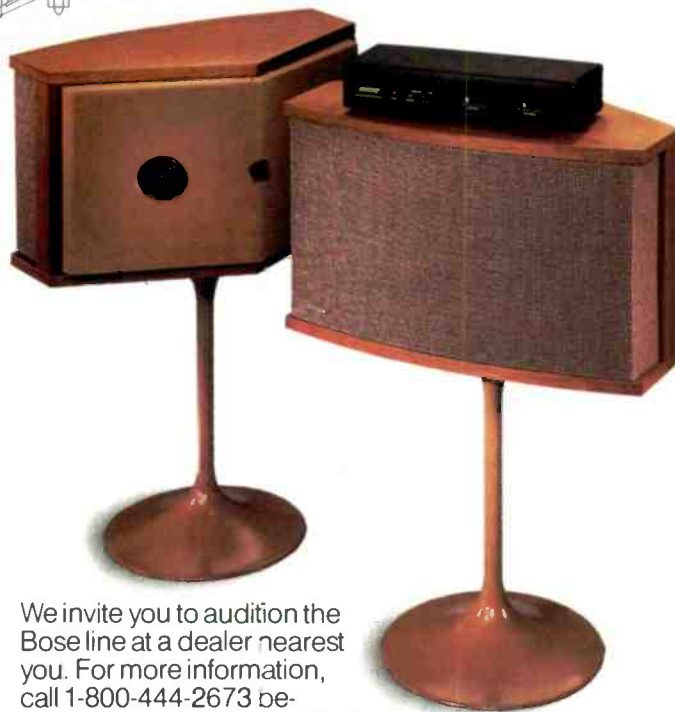
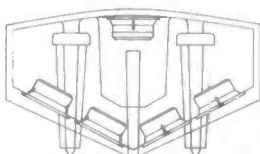
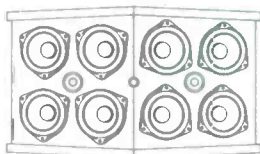
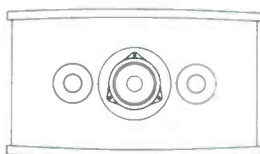
Bose engineers work continuously to develop and perfect new audio technologies with one common denominator: if they demonstrate the potential to improve performance, they

become part of the Bose 901 system. In today's era of digital sound, with hundreds of engineering and design improvements over the original 901 system, the 901 Series VI Direct/Reflecting® speaker system is the technological flagship of Bose Corporation.

"The 901 VIs sound live and exciting the moment you fire them up... There are more than a few music lovers who won't listen to anything else..."

—Daniel Kumin, *Digital Audio* 1988

We submit that the research and development behind the Bose 901 system make it the most advanced, lifelike sounding speaker you can buy. But you must be the final judge. Ask your dealer to give you an "A-B" demonstration comparing the Bose 901 system to any other speaker, regardless of size or price.



We invite you to audition the Bose line at a dealer nearest you. For more information, call 1-800-444-2673 between 9 a.m. and 5 p.m. EST.

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Better sound through research.



NAKAMICHI TA-4A AM/FM RECEIVER

Julian Hirsch, Hirsch-Houck Laboratories

AT 100 watts per channel, the Nakamichi TA-4A Tuner/Amplifier is the most powerful receiver in the Nakamichi line. It is also a highly versatile audio/video control center with video switching and dubbing capabilities, and it is adaptable to remote-controlled multiroom systems.

The PLL-controlled digital-synthesis tuner section of the TA-4A covers the FM band in 100-kHz steps and the AM band in 10-kHz steps. Automatic and manual tuning modes are provided. In the manual mode, which also disables the tuner's muting and stereo functions, it covers a band either in single steps or rapidly while a tuning button is

held in. In the automatic mode, it tunes to the next receivable signal each time a button is pressed. Each of the ten preset buttons can be set to either an AM or an FM frequency. Station memories are retained for at least five years by a built-in lithium battery.

The narrow display window above the tuner-control buttons shows the band and frequency, tuning mode, stereo reception, station-lock status, and relative signal level. It also indicates the speaker-selection mode: A, B, or both. The green fluorescent display is easy to read yet subdued enough that it is not visually obtrusive.

The preamplifier section of the TA-4A uses Nakamichi's Isolated

Ground principle for maximum isolation between various circuit stages. The six local power regulators are also fully isolated. There are input selectors for tuner, phono (moving-magnet or moving-coil), CD, two audio tape decks, two video sources, and a third audio recorder or a VCR. Lights above the large rectangular buttons indicate the selected source.

Two small knobs operate the bass and treble tone controls, which can be bypassed by a small button between them. The large volume knob at the right of the panel is concentric with the balance control. Below the volume knob is a smaller variable-loudness knob. There is also a mute button, which reduces the output by 20 dB, and a "subsonic" (infrasonic) filter to reduce the effect of turntable rumble and record warps.

The TA-4A provides completely independent selection of sources for listening and recording. There are also three dubbing modes for copying tapes from any connected audio

It stands to reason that the cassette decks built most like studio tape recorders will produce the highest quality home recordings.



Denon Studio A:
All our components
reflect lessons learned
in the recording studio.

The benefits of building home cassette decks with recording studio technology are even greater when the technology is your own.



Since 1910, Denon has been involved in every step of sound reproduction: recording music, making records and CDs, building studio tape recorders and producing open reel and cassette tape. In fact, Denon built the world's first digital studio tape recorder.

Denon builds this expertise into every cassette deck. Denon's proprietary clutchless Non-Slip Reel Drive produces constant tape tension, reduces distortion, wow and flutter and maintains superior performance over time. SF combination heads, in concert with Dolby B, C and HX Pro,[®] extract the most from today's digital sources by extending headroom and eliminating noise.

Lest you fear that Denon reserves this technology for its esoteric models, *all* these features are found for under \$400 on the three-head DRM-700, the DRW-750 Dual Cassette and the DRR-680 Auto-Reversing Cassette Decks.*

Why do Denon cassette decks sound better? Perhaps, it's because Denon has been making only one thing for over 80 years.
Music.

DENON
DESIGN INTEGRITY

*DRM-700 shown with the optional side panels available for most Denon models. Prices quoted are manufacturer's suggested retail prices and may vary.

TEST REPORTS

deck to one or two others as well as full dubbing facilities for two or three video recorders. The receiver has one rear-apron video output to a video monitor or TV set. Wide-

band buffer amplifiers provide isolation and impedance matching at all the video outputs to insure undiminished picture quality.

The TA-4A's power-amplifier sec-

tion employs the unique Stasis circuit design of American designer Nelson Pass. Essentially, the system uses two amplifiers: a pure Class A "stasis" amplifier to supply a low-distortion, low-current output signal and a complementary high-current Class A "current mirror" amplifier to provide the necessary current to a low-impedance speaker load. The stasis amplifier determines the unit's overall distortion, correcting for the nonlinearities of the more powerful current-mirror stage. There is no global negative feedback or series output inductance (needed for stability in conventional amplifiers). As a result, the output source impedance of the amplifier section is constant across the full audio frequency range.

The TA-4A receiver is rated to deliver 100 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.1 percent total harmonic distortion (THD). It has a peak current-output rating of 28 amperes per channel. The power amplifier's input jacks and the preamplifier output jacks on the rear apron are normally joined by jumpers, which can be removed to insert a signal-processing accessory. There is a second pair of preamplifier outputs that can be used to drive an external power amplifier. The speaker terminals are insulated binding posts that accept stripped wire ends or either single or dual banana plugs.

The TA-4A's speaker selector also has a REMOTE setting for use with a novel Nakamichi accessory, the RS-7 Remote Sensor. This small box, which can be placed anywhere within sight of the infrared remote control, allows the receiver to be controlled from a position beyond the normal range of its remote control, or even from a separate room. The RS-7 connects through a long cable (about 30 feet) to a DIN socket on the rear of the receiver. Its operation does not affect normal use of the remote control. Other connectors on the rear of the receiver accept control cables from various Nakamichi cassette decks and CD players, which can then be controlled remotely either directly or through the RS-7 extender. Up to three RS-7 units can be daisy-chained to extend

FEATURES

- Digital-synthesis AM/FM tuner
- Ten station presets
- Manual and auto-seek tuning modes
- Phono preamplifier switchable for MM or MC cartridge (MC phono gain switchable between 24 and 32 dB)
- Inputs for tuner, phono, CD, two audio tape decks, two video sources, third audio deck or another VCR
- Switchable infrasonic filter
- Independent recording-output selector for all sources
- Dubbing from any audio deck to any other (or both) and from any video source to any VCR
- Video output to monitor
- Isolating buffer amplifiers on video outputs
- Defeatable bass and treble controls
- Variable loudness control to boost low and high frequencies
- 20-dB audio mute
- Motor-driven volume control with concentric balance ring
- Speaker selector for one or two pairs
- Front-panel headphone jack
- Detachable AM loop antenna
- Input for 75-ohm FM antenna (300- to 75-ohm transformer supplied)
- Infrared remote control with keys for other Nakamichi components
- Optional RS-7 Remote Sensor to increase remote range or provide multiroom control capability

LABORATORY MEASUREMENTS

- Tuner Section** (all figures for FM only except frequency response; measurements in microvolts, or μV , referred to 300-ohm input impedance)
 - Usable sensitivity** (mono): 11 dBf (2 μV)
 - 50-dB quieting sensitivity:** mono, 15 dBf (3 μV); stereo, 37 dBf (39 μV)
 - Signal-to-noise ratio** at 65 dBf: mono, 84.5 dB; stereo, 76.2 dB
 - Harmonic distortion** (THD + noise) at 65 dBf: mono, 0.046%; stereo, 0.032%
 - Capture ratio** at 65 dBf: 1 dB
 - AM rejection:** 65 dB
 - Selectivity:** alternate-channel, 67 dB; adjacent-channel, 5.3 dB
 - Stereo threshold:** 27 to 29 dBf (12.3 to 15.5 μV)
 - Stereo pilot and subcarrier leakage:** 19 kHz, -72 dB; 38 kHz, -68 dB
 - Hum:** -89 dB
 - Stereo channel separation** at 100, 1,000, and 10,000 Hz: 50, 63, and 52 dB
 - Frequency response:** FM, 30 to 15,000 Hz ± 0.4 , -0.15 dB; AM, 60 to 3,100 Hz ± 0.5 , -6 dB
- Amplifier Section**
 - 1,000-Hz output power at clipping:** 135 watts into 8 ohms, 190 watts into 4 ohms; protection circuit limits output into 2 ohms
 - Clipping headroom** (relative to rated output): 1.3 dB
 - Dynamic power output:** 156 watts into 8 ohms, 264 watts into 4 ohms; protection circuit limits output into 2 ohms
 - Dynamic headroom:** 1.93 dB
 - Maximum distortion** (20 to 20,000 Hz into 8 ohms): 0.19% at 20,000 Hz with 100 watts output
 - Sensitivity** (for a 1-watt output into 8 ohms): CD, 15.5 mV; MM phono, 0.25 mV; MC phono, 0.02 mV at 24-dB gain, 0.008 mV at 32-dB gain
 - A-weighted noise** (referred to a 1-watt output): CD, -82.5 dB; MM phono, -79 dB; MC phono, -79 dB (24-dB gain)
 - Phono-input overload:** MM, 185 to 190 mV at 20 to 1,000 Hz, 68 mV at 20,000 Hz; MC (24-dB gain), 12 mV from 20 to 20,000 Hz
 - Phono-input impedance:** 52,000 ohms in parallel with 100 pF
 - RIAA equalization error:** +0.2, -0.5 dB from 20 to 20,000 Hz
 - Infrasonic-filter response:** -12 dB at 10 Hz
 - Tone-control range:** 100 Hz, ± 6.5 dB; 10,000 Hz, ± 7 dB
 - Loudness compensation response:** at -20-dB setting, +2 dB from 20 to 100 Hz; at -40-dB (minimum) setting, +20 dB at 20 Hz, +12 dB at 100 Hz, +5 dB at 400 Hz, +5 dB from 10,000 to 20,000 Hz

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Sonance makes music more beautiful with "Architectural Audio:" Custom in-wall stereo speakers and controls that blend unobtrusively into your home's most discriminating decor.

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Sonance Products include Five variations of Speakers,
One Passive & One Active Subwoofer, a Speaker Distribution System
and Five different Volume Controls & A/B Selectors.
(All Built-in Products fit in "2x4" wall)

TEST REPORTS

system control to several different rooms.

The receiver's supplied RM-4TA infrared remote control has clearly separated and identified groups of keys dedicated to controlling certain Nakamichi tape decks and CD players as well as the TA-4A. Most of the receiver's functions are duplicated on the remote unit.

The TA-4A's rear apron contains an F-type connector for the 75-ohm FM antenna input (an adaptor is supplied for a 300-ohm antenna), a mounting clip and terminals for the supplied AM loop antenna, and three AC outlets, two of them switched. The Nakamichi TA-4A, finished in black with gold markings, measures 17 inches wide, 14½ inches deep, and 5 inches high, and it weighs about 33 pounds. Prices: TA-4A, \$1,250; RS-7, \$250. Nakamichi, Dept. SR, 19701 S. Vermont Ave., Torrance, CA 90502.

Lab Tests

The FM tuner section of the Nakamichi TA-4A was outstanding, not only in its measured performance but also in how closely its specifications matched our measurements. The mono usable sensitivity was 11 dbf (1.9 μ V), as rated. The 50-dB quieting sensitivity was 15 dbf (3 μ V) in mono and 37 dbf (39 μ V) in stereo, compared with ratings of 14.7 and 37.5 dbf. The signal-to-noise ratio at 65 dbf was 84.5 dB in mono and 76.2 dB in stereo; the ratings are 82 and 75 dB, respectively. The capture ratio, rated at a good 2 dB, measured an excellent 1 dB. The rated AM rejection of 60 dB was topped by our 65-dB measurement. Alternate-channel selectivity, rated at 65 dB, measured 67 dB. The stereo frequency response was +0.4, -0.25 dB from 30 to 15,000 Hz. Channel separation, rated as better than 50 dB at 1,000 Hz, measured better than 60 dB from 400 to 8,000 Hz and reached 65 dB at 5,000 Hz. The image rejection of 75 dB exactly matched the rated value. Harmonic distortion was much lower than the 0.07-percent rating, reading 0.046 and 0.032 percent at 65 dbf in mono and stereo, respectively.

The RIAA phono-equalization error, unmeasurable from 150 to 5,000 Hz, reached its maximum of

+0.2 dB at 28 Hz and fell to -0.5 dB at 10 and 20,000 Hz. The infrasonic filter's effect was negligible above 30 Hz and rolled off the response by 12 dB at our 10-Hz lower measurement limit. The tone-control range was roughly ± 10 dB at the frequency extremes, with the bass response having a variable inflection point (from approximately 20 to 200 Hz) and the treble curves being hinged at 2,000 to 3,000 Hz. The loudness-compensation control produced a large amount of relative boost at low frequencies (20 dB at 20 Hz with a midrange volume reduction of 40 dB) and a nearly constant high-frequency boost to a maximum of +5 dB from 10,000 to 20,000 Hz.

The preamplifier section had a clipping output of 7.9 volts. The amplifier's sensitivity for a 1-watt output was 15.5 millivolts (mV) for a high-level input, 0.25 mV for the MM phono input, and 0.02 mV for the MC phono input at its lower gain setting. The corresponding A-weighted noise levels were -82.5, -79, and -79 dB. The MM phono-input overload was a good 185 to 190 mV at 20 and 1,000 Hz, decreasing to only 68 mV at 20,000 Hz (the phono stage "motorboated" at that input). The MC phono input overloaded at about 12 mV at all frequencies. The phono-input termination was 52,000 ohms in parallel with 100 picofarads.

With both channels driven, the receiver's 1,000-Hz output clipped at 135 watts into 8 ohms and 190 watts into 4 ohms. The 8-ohm distortion was 0.17 percent at 1 watt, decreasing to a minimum of 0.04 percent at 118 watts. The 4-ohm readings were only slightly higher, with a minimum of 0.075 percent distortion at 120 to 150 watts. The amplifier's protection circuits prevented our making clipping-level or other high-power measurements into 2 ohms. At the rated 100 watts output into 8 ohms, the distortion (THD plus noise) was 0.145 percent below 2,000 Hz, rising smoothly to 0.19 percent at 20,000 Hz. Although these distortion readings included wide-band noise as well as harmonics, spectrum analysis of the 1,000-Hz distortion showed a large number of low-level harmonics (up to the nineteenth) whose combined

value was consistent with the THD-plus-noise values.

Comments

The Nakamichi TA-4A is one of the finest receivers we have tested. Its FM tuner section was especially notable, with almost every aspect of its performance surpassing that of other receiver tuner sections. The preamplifier section had very low noise (rivaling that of good separate preamplifiers), and the receiver's operating flexibility is all that anyone could ask for in a single, easy-to-use package. Its power amplifier is unarguably husky, yet well protected against damage.

The ergonomic aspects of receiver design, which are at least as important as the more debatable sound qualities (though less often discussed), have been executed with skill and thoughtfulness in the TA-4A. By eliminating useless features and "juke-box" styling, Nakamichi has reduced the learning curve for effective use of the TA-4A to a minimum. The panel markings are clearly visible and in plain English. The number of controls, their placement, and their shapes are consistent with their functions, and their operation is intuitive. The display clearly presents all the information a user should require in a way that should give no offense to anyone's aesthetic sensibilities.

The same can be said for the RM-4TA remote control. Although only about half of its buttons are directly associated with the TA-4A, they are logically grouped and as easy to use as the front-panel controls they represent. The only significant exception is the loudness control; if it is to be used at all, it should serve as a substitute for the volume control, yet it is not adjustable from the remote. We connected the RS-7 remote sensor to the receiver and found that, even within the same room, it added a worthwhile improvement in the remote control's usability. In general, the remote unit could be pointed in any direction in the room without loss of control.

In short, the Nakamichi TA-4A is a thoroughly satisfying piece of equipment.

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The most powerful expression of unique technology.

The Bose® 10.2™ Series II Direct/Reflecting® system with Acoustimass® speaker technology.

Inside and out, it's a speaker unlike any other.

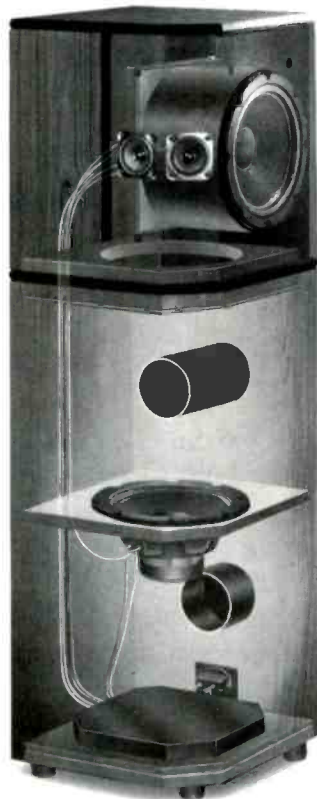
The Bose 10.2 Series II speaker successfully harnesses a series of audio technologies, taking the listener one step closer to the goal for all speakers: the realism of live music. The 10.2 Series II speaker combines the most powerful Acoustimass speaker designed for the home with the proven, critically-acclaimed benefits of a Bose Direct/Reflecting® system. The result: a musical listening system with *no* compromises—one that's at home in any environment.

Technology in harmony with home aesthetics.

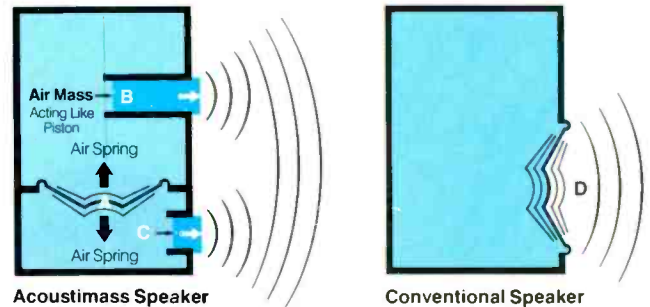
The 10.2 Series II system brings lifelike sound into the living environment without overwhelming it. Each speaker's genuine wood veneer, hand-crafted enclosure produces the bass necessary to make even the most demanding music come to life, yet requires just *one square foot* of floor space. The system's Stereo Targeting® arrays precisely shape and control sound, providing listeners—regardless of where they stand or sit—with full, balanced stereo sound from both speakers. Where the speakers look best is also where they *sound* best.

Greater musical realism with any sound source.

Like all Bose Direct/Reflecting® speakers, the 10.2 Series II system is designed to accurately reproduce much of the clarity and spaciousness of live music. This strict attention to sonic detail is carried through to the lowest notes, where Acoustimass speaker technology provides much of the realism and impact normally experienced *only* in the concert hall. The system provides the dynamic range and high power capability required for optimum results with any audio or video system and software—especially digital.



How an Acoustimass® speaker works.



Improving speaker performance means first reducing distortion. The design of an Acoustimass® speaker *substantially* reduces distortion (see diagrams and graph). The benefits of this patented speaker technology are *purer sound* and an *increase in the dynamic range of bass performance*.

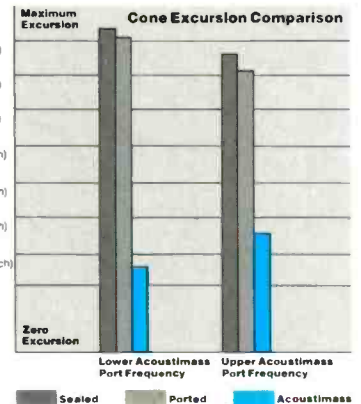
Left: An Acoustimass speaker *launches* sound into the room using two masses of air working like pistons (B&C, darker blue), rather than by a surface vibrating directly into the room. *The sound launched into the room by the Acoustimass speaker's air pistons is the purest sound that can be produced by present technology.*

Right: A vibrating cone radiating directly into the room (D) produces unfiltered sound.

Cone Excursion Comparison.

(lower excursion means lower distortion)

Graph: The distortion produced by any speaker rises dramatically with its cone motion, or *excursion*. At port-tuned frequencies, a typical Acoustimass speaker's cone (A) has less than 1/16 the maximum distortion-producing excursion* of sealed and ported cones. Inside an Acoustimass speaker, the interaction of the air springs with the air masses in the ports produces a very high pressure at the surface of the cone. This greatly reduces the cone's excursion, and therefore reduces distortion. The air springs act with their respective masses to form low-pass filters, removing any small distortion components generated by the cone. *based on cone travel measurements at 128 watts input.

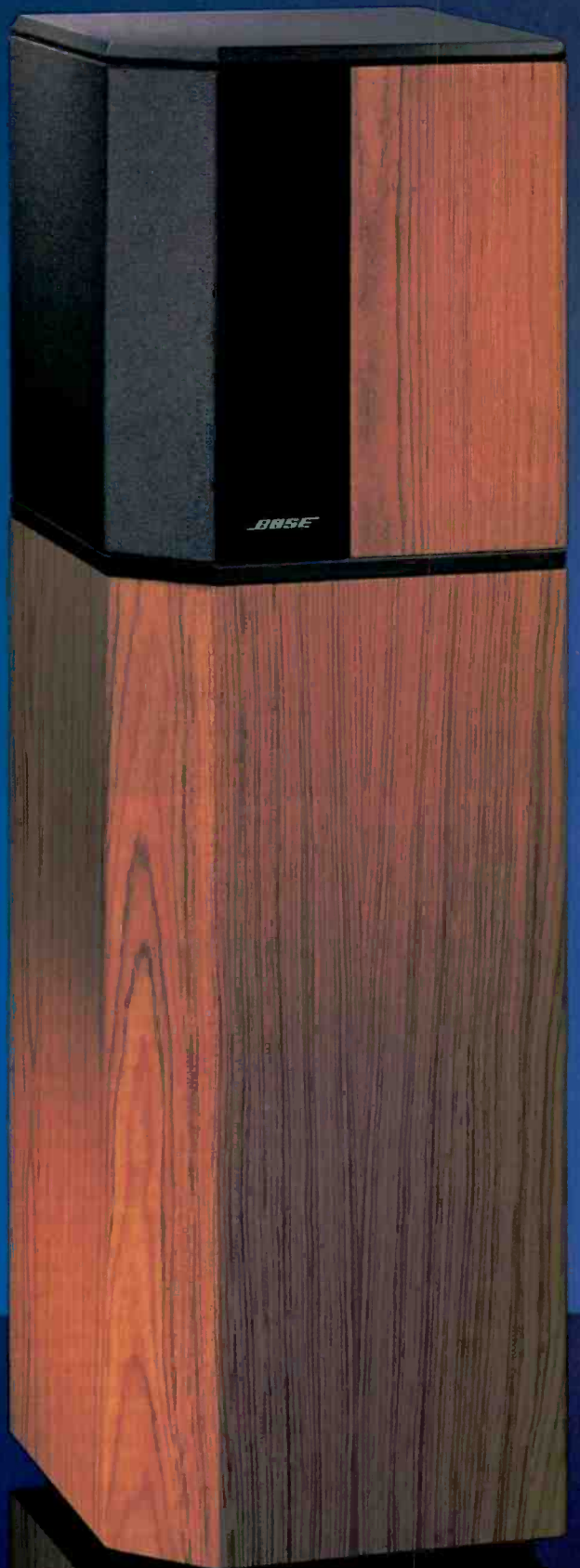
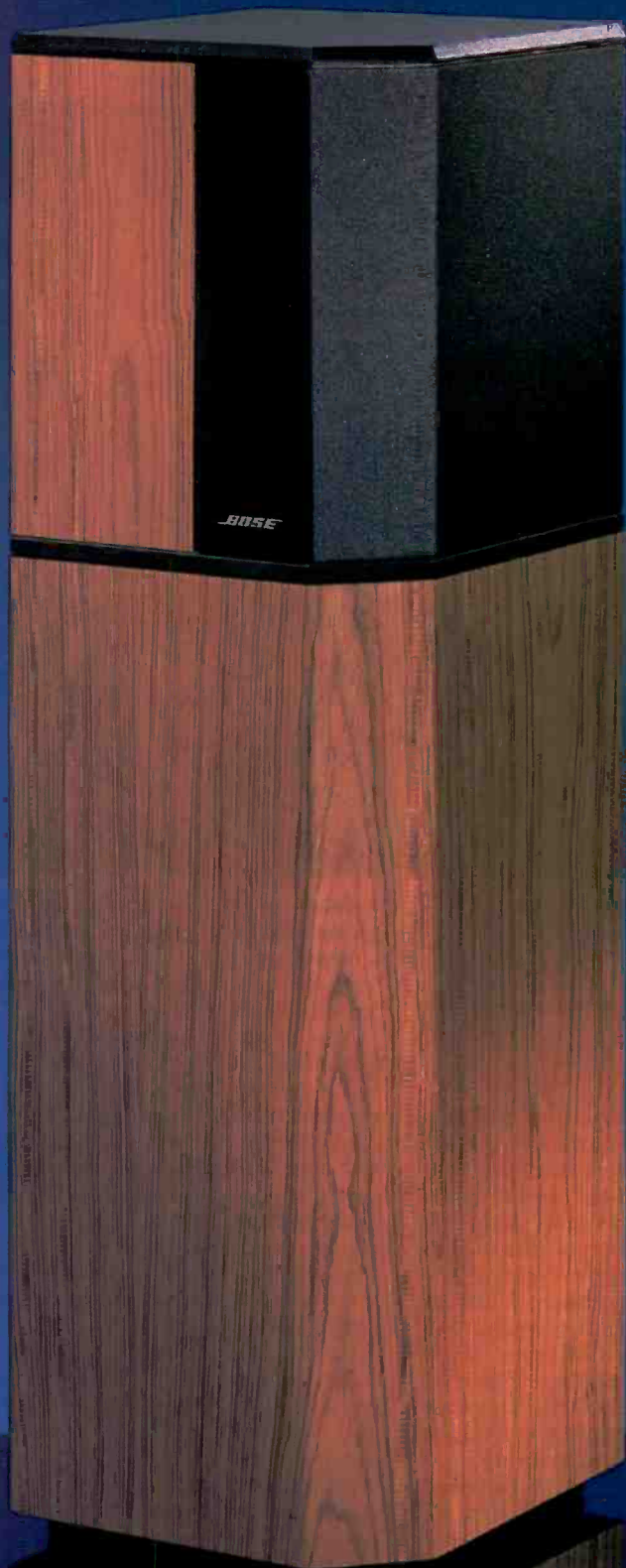


Judge for yourself.

Ask your authorized Bose dealer to demonstrate the Bose 10.2 system with Acoustimass speaker technology against any other speaker—and hear the difference for yourself. For more information or a product brochure, call 1-800-444-2673 between 9 AM and 5 PM EST.

"If music is important in your life, sooner or later you will own a Bose system."

BOSE®
Better sound through research.





HARMAN KARDON HD7500 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

HARMAN KARDON'S new HD7500 is one of the first of the recently developed "1-bit" or "bit stream" CD players to come on the market. We can expect to hear more about this development and see it used in new players from many manufacturers in the months to come.

Although all compact discs are recorded by converting the original analog program into a stream of 16-bit digital words, in practice it has not always been possible to realize the theoretical advantages of this system, which include residual distortion levels on the order of -96 dB (0.0016 percent) and a noise level somewhat lower than that. A major problem is the difficulty (and cost) of making truly linear digital-to-analog (D/A) converters.

The accuracy with which the lowest-level signals are reconverted to

analog form is frequently compromised by cost and manufacturing considerations. The result can be a large distortion of the lowest levels in the program, possibly reducing the *effective* number of bits in the data stream to 14 or even less. One solution for this problem, found in some higher-priced CD players, is to use D/A converters offering 18 or even 20 bits of resolution. This system can work effectively, although it is costly and requires extra care and expense in manufacturing.

In recent years, a very different D/A conversion system has been developed in Europe and Japan that converts the 16-bit data stream from the disc into a very high-frequency stream of single (1-bit) pulses. The audio program can be represented either as a modulation of the width of the pulses or of their repetition rate. All that is then

needed to extract the analog program from the digital data stream is a low-pass filter that removes the high-frequency components, leaving the audio waveform.

This system is inherently highly linear and thus has the advantage of not requiring critical adjustment or manufacturing precision in the D/A converter. It thereby has the potential for reducing manufacturing costs and hence selling prices. One disadvantage of the system is a higher noise level, but special noise-shaping circuits are used to reduce the noise in the audible frequency range, allowing it to increase at ultrasonic frequencies.

To the user, the differences in technology between conventional and 1-bit D/A conversion matter little. Even the potential benefits of high linearity down to the lowest signal levels may not produce clearly audible differences in the sound of the new players. Nevertheless, there can be no doubt that this is a step forward and one that's almost certain to bring state-of-the-art performance to tomorrow's budget-priced CD players.

The Harman Kardon HD7500 is

TEST REPORTS

an attractive, distinctively styled component. The disc drawer and many of the controls resemble portions of a long, narrow cylinder across the top of the front panel. The drawer is flanked by the power and open/close buttons. At the right of the cylinder, which also includes the display window, are six controls that affect the display information or playback programming. One button blanks the entire display, and the normal display of elapsed time in a track can be switched to show the remaining time in the track or on the entire disc.

The CHECK button can be used to display the playing time of each track on a disc or in a programmed sequence, one by one, followed by the total playing time—a convenience when you're planning to dub a number of tracks to tape. The CLEAR button deletes the most recent addition to a programmed sequence.

Below the display window are two rows of controls shaped like miniatures of the upper ones. One is a group of eleven numbered buttons for direct track selection or programming of up to thirty tracks in any order. Below them are seven larger buttons controlling the disc transport (play, pause, stop, bidirectional track skipping, and fast scan) identified only by the international symbols for their functions.

The lower right corner of the panel contains a headphone jack and a small knob that controls its volume and the level at the variable outputs in the rear of the player. The rear apron also contains a pair of fixed-level outputs.

The supplied remote control duplicates all of the front-panel controls except OUTPUT LEVEL, and it has four additional functions: intro scan (the first 15 seconds of each track), A-B repeat (any user-selected portion of a disc), index scan, and auto space (4 seconds between tracks).

The Harman Kardon HD7500 is finished in flat black with light gold lettering. It measures 17 $\frac{3}{8}$ inches wide, 14 inches deep, and 4 inches high, and it weighs 12 pounds. Price: \$449. Harman Kardon, Dept. SR, 240 Crossways Park W., Woodbury, NY 11797.

Lab Tests

The frequency response of the Harman Kardon HD7500 varied only 0.02 dB overall from 20 to 8,000 Hz and was down 0.25 dB at 15,000 Hz and 0.5 dB at 20,000 Hz. The maximum de-emphasis error was -0.32 dB at 16,000 Hz. The channel levels (2.182 volts from a 0-dB-level test-disc track) were matched within 0.15 dB. The channel separation, 100 dB at 100 and 1,000 Hz, was 87 dB at 20,000 Hz. The interchannel phase shift varied from -0.45 degree at 5,000 Hz to +0.1 degree at 20,000 Hz.

The total harmonic distortion (THD) plus noise at a 0-dB level was 0.0045 to 0.0035 percent from 20 to 2,000 Hz, rising to 0.014 percent at 10,000 to 15,000 Hz and falling to 0.0028 percent at 20,000 Hz. At 1,000 Hz, the THD plus noise was about 0.0023 percent from -20 to -70 dB, rising to 0.0032 percent at 0 dB.

The effectiveness of the 1-bit D/A conversion system was demonstrated by the low playback linearity



DAVID KELLEY

errors, about 0.02 to 0.03 dB at -60 dB, -0.08 dB at -70 dB, and less than 0.2 dB at -80 dB. At -90 dB, the right channel had no detectable error, while the left channel's error was +0.67 dB. The results of the

FEATURES

- Pulse-width-modulated bit-stream D/A converter operating at 33.8688 MHz
- Direct access to any numbered track
- Fast scan and track skipping in either direction
- Repeat function for track, disc, or user-selected portion of disc
- Programmable for up to thirty tracks in any order; CLEAR deletes last addition
- Display of current track and index numbers, elapsed time on disc, numbers of all unplayed tracks, status of all operating modes
- Selectable display of playing time of each track in sequence and total time on disc
- Display blank
- Fixed- and variable-level analog outputs (front-panel control for variable output)
- Headphone jack
- Remote control for all front-panel functions except variable level setting plus intro scan, index scan, auto space, and A-B repeat

LABORATORY MEASUREMENTS

Maximum output level: 2.182 volts
Total harmonic distortion at 1,000 Hz: 0.0032% at 0 dB, 0.0024% at -30 dB, 0.0022% at -70 dB
Signal-to-noise ratio (A-weighted): 113.4 dB
Channel separation: 100 dB at 100 Hz, 100 dB at 1,000 Hz, 87 dB at 20,000 Hz
Maximum phase shift: (5,000 to 20,000 Hz): -0.45 degree at 5,000 Hz

Frequency response: +0, -0.5 dB from 7 to 20,000 Hz
Low-level linearity error: with dither, 0.0 dB at -110 dB, 1 dB at -115 dB; without dither, 0.67 dB at -90 dB
Cueing time: 2.8 seconds
Cueing accuracy: A
Impact resistance: top and sides, C+
Defect tracking: tracked 1,250-micrometer defects on Pierre Verany #2 test disc

Bose® Acoustimass® Speaker Technology. A benefit you can hear, not see.

The early days of audio dictated that bigger was better – a room full of bulky speakers equaled a roomful of sound... an old idea that some still believe. From the beginning, Bose has believed that just the opposite is true – quality sound components needn't overwhelm their environment to produce realistic, room-filling sound.

*“Superb sound and virtual invisibility”
“...side by side with speakers costing three to five times as much, the AM-5 consistently produced the more exciting and listenable sound...”*

— Stereo Review, Julian Hirsch



All you see are the tiny stereo imaging cube speaker arrays.



The Bose® Acoustimass®-5 Direct/Reflecting® Speaker System



Since you can completely hide the Acoustimass bass module, you have a Virtually Invisible™ speaker system.



You can mount the arrays from the ceiling, much like track lighting.

The Acoustimass-5 speaker system is the result of years of research dedicated to providing room-filling, high quality sound reproduction – without a roomful of speakers.

An Acoustimass speaker is different from any other. Unlike conventional speakers, sound from the system is launched into the room by two air masses, rather than by a vibrating surface. The result is pure sound reproduction from a Virtually Invisible™ speaker system.

All the lifelike, spacious music with full, deep bass seems to come from a pair of extremely small cube arrays (each measuring slightly over 7 in./17 cm), while a compact Acoustimass bass module reproduces pure bass from any convenient location in a room – even behind or under furniture.

Optional mounting accessories let you install the system almost anywhere on walls or ceilings. And since the system is magnetically shielded, you can place it close to video monitors.

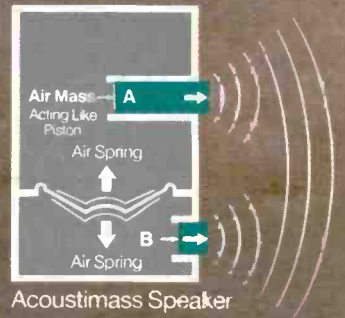
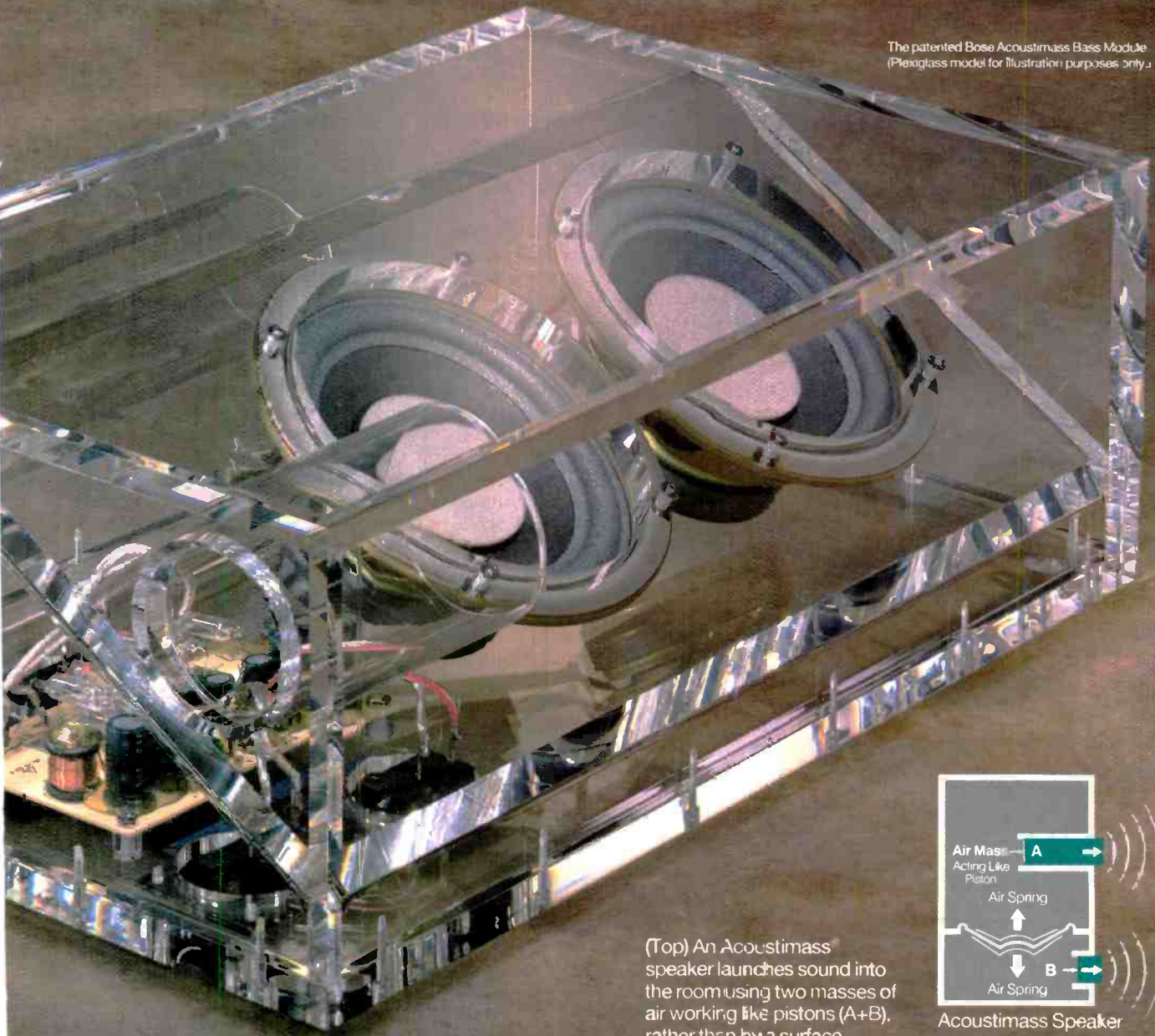
Compare the Acoustimass-5 Direct/Reflecting speaker system to much larger and more expensive systems... even to systems costing “three to five times as much.” We submit that no other conventional speaker system will offer the same level of performance and flexibility.

For more information and free product brochure, or to find your nearest Bose dealer, call 1-800-444-BOSE.

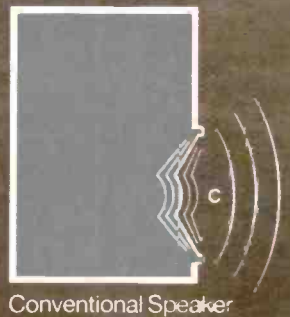
“If music is important in your life, sooner or later you will own a Bose system.”



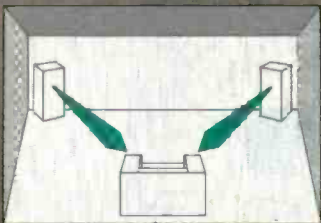
The patented Bose Acoustimass Bass Module
(Plexiglass model for illustration purposes only)



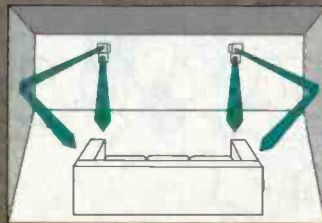
(Top) An Acoustimass[®] speaker launches sound into the room using two masses of air working like pistons (A+B), rather than by a surface vibrating directly into the room. The sound reproduced by the Acoustimass speaker's air pistons is the purest that can be produced by present technology.



(Bottom) A conventional speaker with a vibrating speaker cone radiates sound directly into the room (C), producing more distorted sound.



Conventional speakers reproduce mainly direct sound energy. They miss much of live music's realism and impact — and let you hear stereo only in a narrow area.



Bose[®] Direct/Reflecting speakers realistically reproduce live music's natural balance of direct and reflected sound energy.

BOSE
Better sound through research.

"Shure's most recent version of its top model, the V15 Type V-MR... strikes this listener as perhaps the most musical-sounding phono cartridge ever made."

Hans Fantel
The New York Times



SHURE®

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500-Hz slow sweep (with dither) from -60 to -120 dB on the CBS CD-1 test disc were most dramatic, with less than a 1-dB departure from linearity down to about -115 dB. There was about a +4-dB rise at -120 dB.

The A-weighted noise level was -113.4 dB, with quantization noise at -91.9 dB. The dynamic range (EIAJ) was 98.9 dB. From 30 to 1,000 Hz the noise-spectrum level was -130 to -140 dB referred to a 0-dB level, rising to -115 dB at 20,000 Hz. With the de-emphasis in operation, the 20,000-Hz noise fell to -120 dB. The frequency (speed) error was +0.0031 percent.

The laser tracking mechanism cued accurately to tracks having no separation from an adjacent track. The slewing time of 2.8 seconds from Track 1 to Track 15 of the Philips TS4 disc was about average. The player's error-correction system enabled it to track through 1,250-micrometer defects, although some mistracking occurred at 1,500 micrometers. The only weakness we found in the HD7500 was its susceptibility to physical impact. Moderate finger tapping on the top or sides caused brief signal dropouts. The headphone level with AKG K340 phones was very good.

Comments

As a demonstration of the effectiveness of 1-bit D/A technology, the HD7500 was right on the mark. Naturally, it sounded very good, although we would expect the audible effects of improved linearity at -100 to -120 dB to be, at the very most, extremely subtle. As this feature makes its way into lower-priced players, the performance gap between the price extremes should narrow appreciably.

The player handled well, with smooth and positive controls. Our only criticism of the controls was the proximity of the track-selector buttons to the transport controls. It was too easy to press a numbered button when reaching for the track-skip or fast-scan controls. On the other hand, programming it was exceptionally easy. We also found the remote control very compact, clearly marked, and uncluttered by extraneous buttons.

The Harman Kardon HD7500 offers an appealing combination of the latest technology in CD players, a full complement of operating features, simple controls, handsome styling, and a very reasonable price.

Circle 142 on reader service card



"Thank you all for taking part in this vacuum-tube versus transistor amplifier listening test, folks, and before you leave, all ten of our gold-plated connectors are missing, so we're going to turn off the lights for two minutes to enable the person who took them to drop them to the floor, no questions asked."



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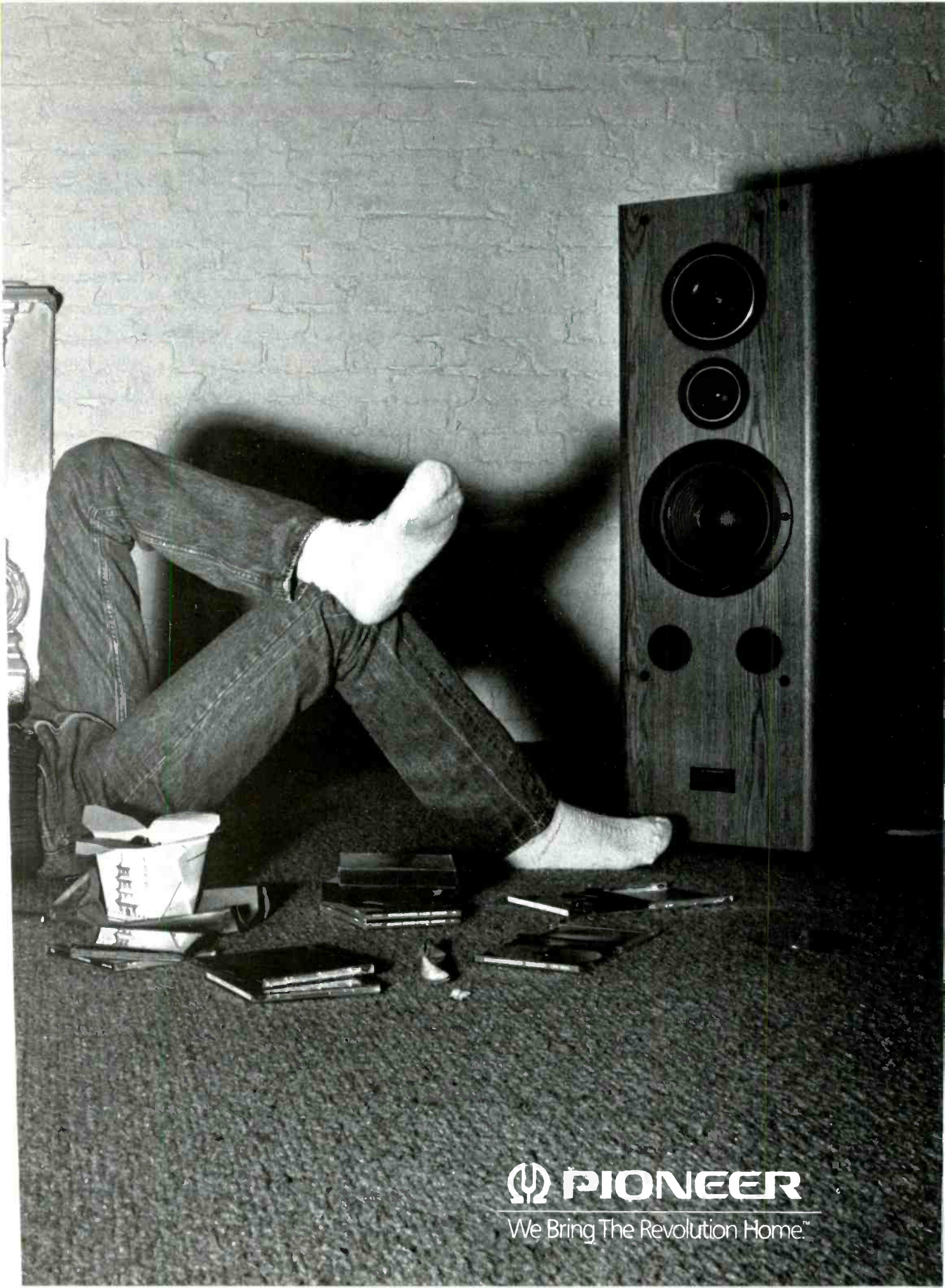
Now there's a new line of advanced speakers designed to bring out the full dynamic range and emotion of today's digital recordings.

Developed by the same team that makes Pioneer's renowned TAC speakers for major recording studios, these speakers feature ceramic carbon dome tweeters for flawlessly brilliant highs and integrated twin woofers for natural, powerful bass. Even the cabinets are superbly crafted to enhance imaging and minimize vibration for smooth true-to-life sound.

So if it's great live performances you're looking for, catch the debut of our new ST Series at your Pioneer dealer today.

Model shown: S-T500. Models available: S-T300 and S-T100. For more information, call 1-800-421-1404. © 1989 Pioneer Electronics (USA) Inc., Long Beach, CA

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ALTEC LANSING MODEL 511 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

THE Altec Lansing Model 511 is a five-driver, four-way speaker system incorporating elements of the technology originally developed for the company's flagship Bias 550 system. It is a large, column-shaped speaker—57 inches tall, 13 inches wide, and 13½ inches deep—that

weighs a substantial 110 pounds. The cabinet is handsomely finished in walnut veneer on four sides. A removable black cloth grille covers all of the drivers and most of the front of the speaker.

The two 10-inch acoustic-suspension woofers operate in a sealed enclosure. Their woven carbon-

fiber cones, reinforced with epoxy resin, are said to provide an unmatched combination of lightness and rigidity. At 180 Hz there is a crossover to a 6½-inch mid-bass cone, similar in design to the woofers, that operates up to 1,500 Hz, where there is another crossover to a 2-inch dome midrange driver. The silver-colored dome is made of polyimide and diamond-coated for added rigidity. The final crossover, at 3,500 Hz, is to a 1-inch dome tweeter, similar to the midrange driver but cooled by ferrofluid. All of the crossovers have slopes of 12 dB per octave.

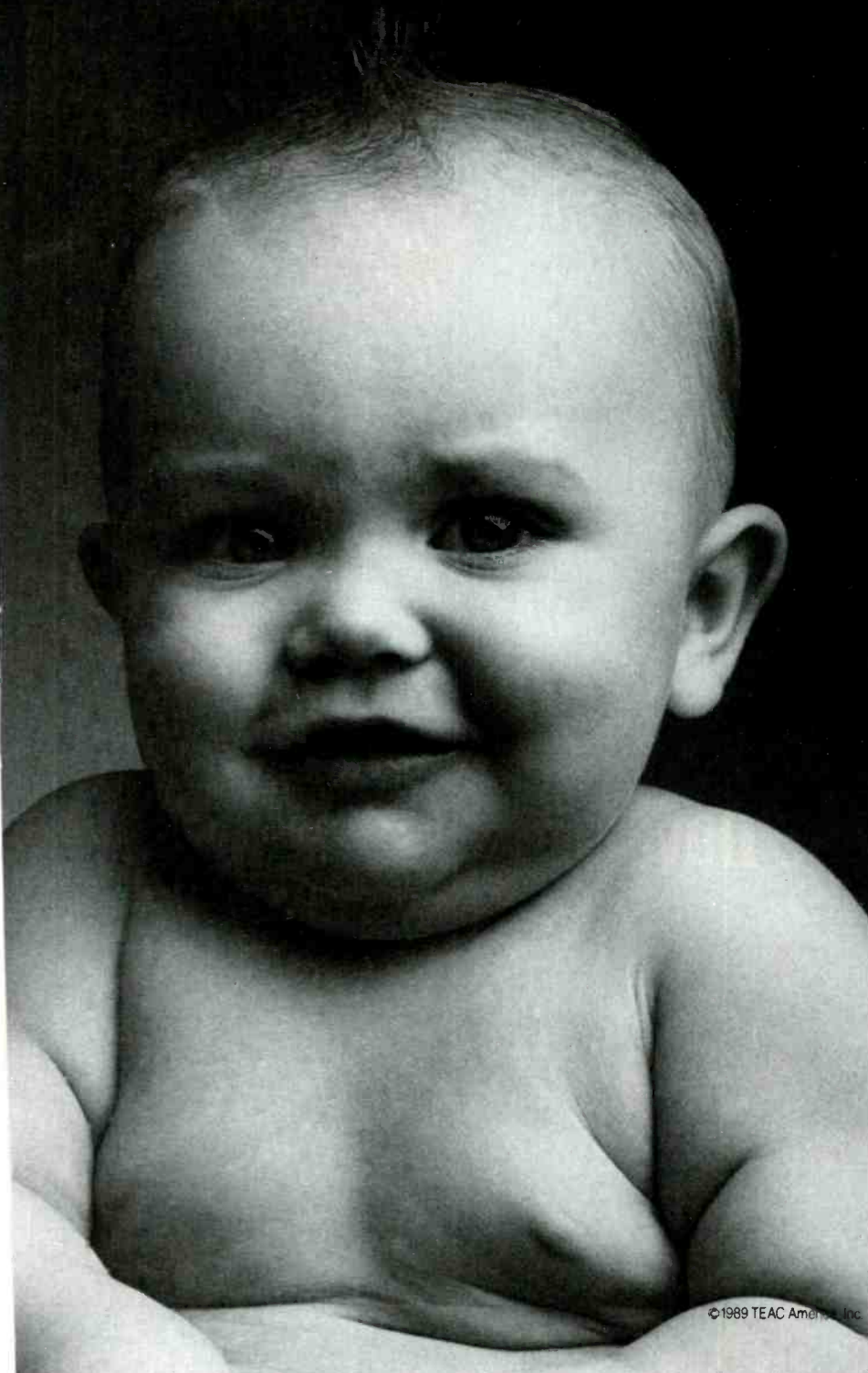
The five drivers are vertically aligned on the front panel, with the tweeter approximately at the ear level of a seated listener and the lower woofer's center about 14 inches from the floor. The crossover network and its controls are installed on the top of the cabinet, where they are normally covered by a dark plastic panel. Lifting the panel reveals the individual level adjustments for the drivers.

The accessibility of the level controls simplifies balancing the speaker's response for optimum performance after it has been placed, without having to move the cabinet around. The four adjustments—bass rolloff, upper-bass level, midrange level, and high-frequency level—are quite subtle in their effects. Three have settings marked +1, 0, and -1 dB; the bass rolloff is simply marked 1, 2, and 3.

The input connections are located on the upper rear of the cabinet on a separate panel attached to the crossover section. There are four pairs of heavy gold-plated binding posts, one for each section of the system, that are normally joined by individual gold-plated jumpers. This design makes it possible, by removing one or more of the jumper links, to multiwire the system using two, three, or four separate cables from the amplifier. Another possibility is to drive the speakers with from two to four separate amplifiers, although the crossover elements for each driver are always in the circuit, possibly diluting the benefits of such multi-amplification.

The frequency response of the Altec Lansing Model 511 is rated as 24

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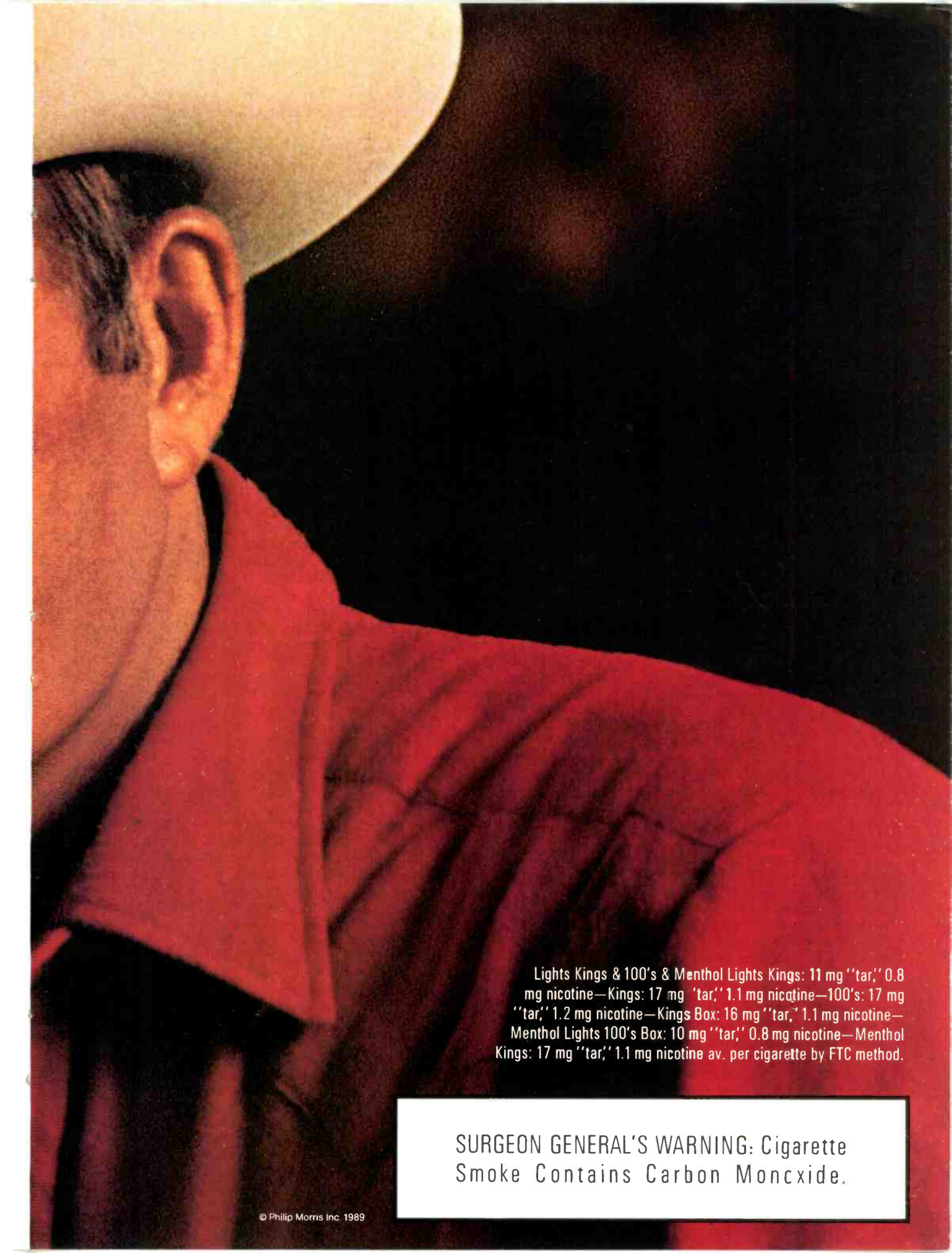
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Come to where the flavor is.



Lights Kings & 100's & Menthol Lights Kings: 11 mg "tar," 0.8 mg nicotine—Kings: 17 mg "tar," 1.1 mg nicotine—100's: 17 mg "tar," 1.2 mg nicotine—Kings Box: 16 mg "tar," 1.1 mg nicotine—Menthol Lights 100's Box: 10 mg "tar," 0.8 mg nicotine—Menthol Kings: 17 mg "tar," 1.1 mg nicotine av. per cigarette by FTC method.

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

TEST REPORTS

to 20,000 Hz ± 3 dB. Its rated sensitivity is a 92-dB sound-pressure level (SPL) at 1 meter with a 2.83-volt input. The system's impedance is not stated, although amplifiers rated between 50 and 300 watts output are recommended. Its harmonic distortion at a 90-dB level is rated as less than 0.8 percent from 35 to 100 Hz and typically 1.2 percent at 20 Hz. Price: \$3,000 a pair. Altec Lansing, Dept. SR, Milford, PA 18337.

Lab Tests

The room response of the Altec Lansing 511 speakers was unusually wide and relatively uniform, although it had the typical irregularities caused by boundary reflections and the resulting standing waves. With no corrections applied, it was ± 5 dB from 20 to 20,000 Hz. The close-miked bass response peaked at 67 Hz, dropping at 12 dB per octave above and below that frequency. The midrange driver's response was impressively flat and smooth, as was the tweeter's response up to about 12,000 Hz, above which it rose to a peak of 6 dB at 16,000 Hz, returning to its normal level just above 20,000 Hz.

The composite frequency response of the system (with all level settings at their middle, or "zero," positions) was within ± 3 dB from 88 to 13,500 Hz, rising an additional 2 to 3 dB at 65 to 70 Hz and at 16,000 Hz. Although the low bass rolled off at 12 dB per octave, in the room it was greatly enhanced, as evidenced by the extension of the room response down to 20 Hz.

The minimum system impedance was 4 ohms (at 75 Hz); the maximum was 16 ohms at 40 Hz (the bass resonance) and 200 Hz. The average impedance over the full audio range was close to 8 ohms. The effect of the driver level adjustments was typically about ± 1 dB, as marked, although it was not always symmetrical about the middle setting or uniform through the driver's operating frequency range.

The tweeter resonance was highly visible in both steady-state and FFT measurements. Following a drop of 6 dB between 6,000 and 11,000 Hz, the output rose steeply by 9 to 10 dB at 15,000 Hz and fell just as abruptly above that frequency. The horizon-

tal directivity of the system was moderately good up to the tweeter resonance, but above that frequency the output fell precipitously at 45 degrees off the speaker's axis. Despite this behavior, the system's phase linearity was good, with an overall group-delay variation of about 0.3 millisecond from 1,500 to 28,000 Hz (except for a sharp 0.5-millisecond dip at the tweeter resonance).

The Altec Lansing Model 511 speakers sounded clean and well balanced, with an extended high-frequency response as well as exceptional overall smoothness.

The measured system sensitivity was 92 dB SPL, exactly as rated. When we drove it with a 2.25-volt signal (equivalent to a 90-dB SPL), the bass distortion was unusually low, essentially matching the manufacturer's ratings. The minimum bass distortion was 0.15 percent at 60 Hz, rising to 0.8 percent at 38 and 115 Hz and 3 percent at 20 Hz. The upper-bass driver did an equally impressive job in its range, reading about 0.4 to 0.5 percent distortion from 200 to 600 Hz.

As usual, our amplifier clipped before the midrange or high-frequency drivers distorted or overloaded. The available power was 950 watts into a 7-ohm impedance at 10,000 Hz and 720 watts into 10 ohms at 1,000 Hz. The woofers' output waveform became visibly (and audibly) distorted, however, at a surprisingly low power input, about 110 watts into the 5-ohm impedance at 100 Hz. This effect appeared to be caused by a nonlinearity in the speaker's mechanical system rather than by the voice coil's reaching its excursion limits, since the amplifier clipped at 1,560 watts into 5 ohms with no prior sign of the rasping sounds of woofer overload.

Comments

Consistent with its extended and smooth response and low distortion, the Altec Lansing Model 511 speaker sounded clean and well bal-

anced, with no audible evidence of its tweeter resonance peak (which is well above the range of most musical harmonics). A slight amount of mid-bass heaviness was occasionally noticeable with male voices, though to a lesser degree than with many (if not most) other speakers.

We experimented with the individual driver level controls, though their effect was usually too subtle to be audible. The most direct way to judge the sound character of the Model 511 was to compare it in A/B tests with speakers whose sound and measured performance were familiar with. Such comparisons quickly confirmed the reality of the 511's extended high-frequency response as well as its exceptional overall smoothness. Surprisingly, in view of its size, the Model 511 did not have a bass-heavy character, although it obviously had no lack of lower-octave output capability.

This speaker sounded as big as it looks (and is). The impression of size is probably inevitable given that its drivers are distributed across about 3 feet of vertical panel space; two of these speakers visually dominate an ordinary room. They are clearly at their best in a large room (our 15 x 20-foot room is really not large enough to do justice to speakers of this size), but they were not totally out of place in more modest acoustic surroundings.

The Model 511 is a relatively sensitive speaker, requiring little input power to produce a considerable acoustic pressure level. Since it can also handle very large input powers, a pair of 511's can easily generate a lease-breaking sound level when driven by almost any amplifier. We listened to the Model 511's principally with a Nakamichi TA-4A receiver, whose more than 100 watts per channel could generate painful sound levels (in excess of 112 dB). We never felt like advancing the volume control beyond its 9 o'clock position!

For audiophiles fortunate enough to have large listening rooms and a matching equipment budget, a pair of Altec Lansing Model 511 speakers can provide an experience rarely enjoyed by those of us with more limited space and finances.

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ES

Seven years ago,
Sony made
your turntable
obsolete.

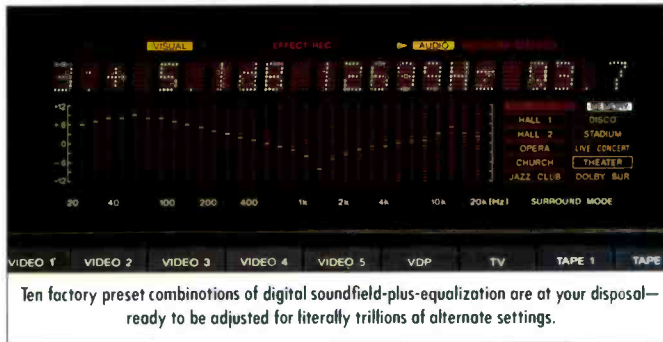
Our Digital
Signal Processing
is about to do the same to
the rest of your system.



Sony proudly presents the TA-E1000ESD Pre-amplifier,
incorporating the most advanced Digital Signal Processing in high fidelity.

Seven years ago, Sony engineers astonished the world with the Compact Disc, the first giant step for digital high fidelity. Now, the Sony ES Series is pleased to introduce the second step: bringing the digital technology of the Compact Disc to the rest of your system.

Sony's new TA-E1000ESD Preamplifier incorporates Digital Signal Processing (DSP) to maintain the integrity of Compact Disc sound from input to output. This incomparable circuitry not only



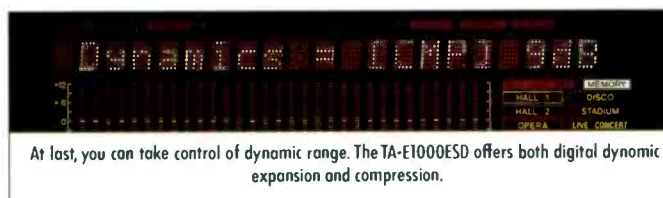
handles digital sources in the digital domain, it even converts analog sources to digital. So all your music can receive the full DSP treatment, including digital expansion, digital compression, digital parametric equalization, digital reverberation, digital delay, and digital surround sound encompassing ten digital soundfield parameters. Now you can heighten sonic performance digitally, obtaining optimum ambience and brilliance without enduring the veil of conventional signal processing.

Unprecedented technology from the company with a precedent for introducing it.

To create the TA-E1000ESD, Sony overcame formidable obstacles in high-speed conversion and computation. Our research produced two landmark integrated circuits. One Sony IC undertakes equalization, compression, and expansion while the other provides the most extensive reverberation, delay, and surround sound processing ever.

Direct the Dynamics.

The numerical prowess of DSP puts you in full digital control of dynamic range, with nine discrete steps of compression or



expansion. So you can finally do a proper job of fitting live music within the limitations of analog cassettes. You can also optimize

recordings for your car by raising soft passages above the road noise. And DSP expansion brings your analog sources closer to digital standards.

Bass and treble controls were never like this.

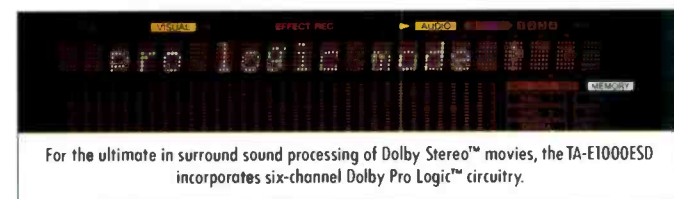
Conventional tone controls tend to be inaccurate and inconsistent. That's why Sony developed digital parametric equalization. It's simple, effective, and free from the distortion, phase shift, and noise of analog equalization. With any of 31 center frequencies and four slope settings, you have a choice of over three trillion EQ curves. Which is more than enough boosting, peaking, shelving and tweaking to overcome acoustical deficiencies.

If you don't like your listening room, change it.

Because listening rooms were never designed to contain the Vienna Philharmonic, Sony's digital surround sound places you in your choice of symphony hall, movie theater, stadium, studio or small club. Unprecedented digital adjustments let you choose



room depth, width, wall absorbancy, reflection times—even the row and number of your seat! You get acoustic environments so detailed, so authentic, they have a palpable presence. And for Dolby Stereo™ movies, our six-channel Dolby Pro Logic™ Surround Sound projects a more vivid soundstage than most sound stages.



Oh yes, it is a preamplifier.

With all these digital attainments, you might forget that the TA-E1000ESD is a preamplifier. But we didn't. We included five low-noise audio inputs, three digital inputs, seven audio/video inputs and a programmable remote control to let you run your entire A/V system from a comfortable distance.

All of which leads to an inevitable conclusion. The company that wrote the book on digital audio has just inaugurated a whole new chapter.

Sony ES.

Reinventing high fidelity one component at a time.



As singular an achievement as the new Digital Signal Processing Preamp is, it has a natural place among the singular components of Sony's ES Series. Since the inception of ES, every model has challenged long-accepted compromises, defying the status quo.

Today's ES Series components are proud inheritors of this tradition of rebellion. Take, for example, the CDP-C8ESD Compact Disc Changer. It embodies the Sony carousel mechanism that is now the object of fevered imitation. Incorporating generous helpings of technology from Sony's reference standard CDP-R1, the changer is admirably fit for audiophiles.

Consider the TA-N55ES Power Amplifier, which produces

output power in casual disregard of speaker loads that would cause a lesser amplifier distress. Then there's the ST-S730ES Tuner, whose Wave Optimized Digital Stereo Detector extracts the full benefit from today's improved FM broadcasts. And the TC-K730ES Cassette Deck emphatically disproves the notion that analog recording is immune to substantial improvement.

Finally, contemplate the ES three-year limited parts and labor warranty. (See your authorized ES dealer for details.) It's a ringing confirmation of the outstanding quality that brings perceptive audiophiles to their nearest ES dealer. To locate that dealer and to receive a free White Paper on Sony DSP technology, call 201-930-7156 during East Coast business hours.



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JOOK LEUNG

KENWOOD KR-V9010 AUDIO/VIDEO RECEIVER

Julian Hirsch, Hirsch-Houck Laboratories

THE Kenwood KR-V9010 is a powerful stereo receiver with extensive audio and video control facilities. The main amplifier is rated to deliver 130 watts per channel to 8-ohm speakers at an unspecified distortion level. A pair of 20-watt channels is provided for rear (surround) speakers. No other performance specifications were available to us at the time of testing. The receiver has an AM/FM tuner with twenty station presets, and it includes a seven-band graphic equalizer.

Inputs include phono (moving magnet), CD, tuner, two audio tape decks, and up to four VCR's (a videodisc player can be substituted for one of them). Complete recording, playback, and dubbing facilities are provided for each audio tape deck. Video dubbing is possible from a VCR or a videodisc player to either VCR 1 or VCR 2 while another source is selected for listening or viewing. An Audio Injection feature allows an external audio program to replace the original sound of a dubbed videotape. The video inputs and

outputs are in both composite and S-video formats.

A hinged panel conceals one set of video input jacks, the controls for the Dolby Pro Logic surround-sound delay setting, and other seldom-used controls, including a level adjustment for a mono center-channel (dialogue) speaker powered by an external amplifier. If no center speaker or external amplifier is available, a phantom center channel can be created and heard through the regular stereo speakers.

The headphone jack and equalizer controls are also in this portion of the panel. A rocker switch steps the level in the selected equalizer band in 2-dB increments over a nominal ± 12 -dB range. Small buttons flanking it select the band to be controlled; the bands have nominal center frequencies of 60, 150, 400, 1,000, 2,400, 6,000, and 15,000 Hz. In addition to five factory-set equalization characteristics, another five user-selected response characteristics can be stored in the receiver's memory for later recall.

With the hinged panel closed, the

front of the receiver presents a more conventional appearance. A row of flat, short-throw buttons selects the program source. Smaller buttons select surround characteristics (Dolby Pro Logic, Theater, or Hall) or bypass (disable) the rear channels. Other buttons activate either of two sets of front speakers (only one pair at a time can be driven, however), turn the equalizer on and off, and operate the tuner section.

The principal tuner controls are two narrow tuning bars, an auto/manual bar, and the AM and FM selector buttons. The ten numbered preset keys are switched between Channels 1-10 and Channels 11-20 by a separate button. Pressing the DIRECT button enables the numbered keys to provide direct access to any frequency in the tuner's range.

The large volume control at the right of the panel carries a red LED index marker. Below it are small buttons to set the rear level and others to select audio muting and CD Direct mode, which connects the CD inputs directly to the volume-control circuits, bypassing all equalizer and input-selector switching and circuitry. At the bottom right of the panel are the balance knob and two SYSTEM MEMORY buttons, which can be used to store virtually the complete operating status of the receiver, including its equalizer and

TEST REPORTS

surround-circuit settings and level adjustments.

The display window across the upper part of the panel is unusually complete. It typically shows the se-

lected input source in large blue-white characters and the other operating conditions in smaller characters. The call letters of a radio station can be memorized and dis-

played with its frequency. While special receiver features such as surround or equalizer circuits are being adjusted, their parameters also appear in large characters in the window. In addition, the equalizer display can also serve as a real-time spectrum analyzer with a peak-hold feature.

The KR-V9010 is furnished with an infrared remote control whose keys duplicate virtually every front-panel function. About a third of the keys can be programmed to mimic the commands of controls for other components. When the volume control of the KR-V9010 is adjusted from the remote, the knob is motor-driven. Additional buttons on the remote unit work with a menu of operating options shown on an associated TV monitor. The remote control also provides a random-noise test signal used with the Dolby Pro Logic system to balance the relative channel levels at the listening position.

The rear apron contains the video and audio inputs and outputs and the speaker outputs, which accept stripped wire ends. There is also an input-balance adjustment for the surround system and an impedance selector that enables the amplifier section to drive 4-ohm speakers. The FM antenna input is a 75-ohm F-connector (a 300- to 75-ohm transformer is provided). The detachable AM wire-loop antenna has a base for free-standing operation. All three of the AC convenience outlets are switched.

The Kenwood KR-V9010 measures 17 $\frac{3}{8}$ inches wide, 15 inches deep, and 6 $\frac{1}{4}$ inches high, and it weighs 29 $\frac{1}{2}$ pounds. Price: \$850. Kenwood USA, Dept. SR, 2201 E. Dominguez, P.O. Box 22745, Long Beach, CA 90801-5745.

Lab Tests

Although the KR-V9010 receiver has only a 75-ohm antenna input, most users will probably connect a standard 300-ohm antenna with the furnished matching transformer. Therefore, we have referred all microvolt (μ V) readings in this report to a 300-ohm impedance (the equivalent value for a 75-ohm input is exactly half as much).

The usable sensitivity of 13.7 dbf

FEATURES

- Four-channel surround amplifier section with line output for externally powered mono center (dialogue) channel
- Two-position impedance selector for safe use with 4-ohm speakers
- Inputs for phono, CD, two audio tape decks, four VCR's (one on front panel): can accept one videodisc player instead of VCR
- Audio outputs and dubbing facilities for two audio tape decks and two VCR's: videotape can be dubbed while listening to another source
- Composite and S-video outputs to monitor
- Audio Injection to dub external source onto prerecorded videotape
- CD Direct mode to bypass input switching and equalizer circuits
- Seven-band graphic equalizer with ten presets, five factory-set and five user-selectable; equalizer display doubles as spectrum analyzer with peak hold
- Dolby Pro Logic, Hall, and Theater surround-sound modes
- Adjustable rear-channel delay and level
- Adjustable level for externally powered center channel
- Phantom mode for center image without center speaker
- Memory storage of complete receiver operating conditions
- Line outputs for rear channels
- Three switched AC outlets
- Supplied infrared remote control for most front-panel functions; can operate other Kenwood components and learn commands for other products

LABORATORY MEASUREMENTS

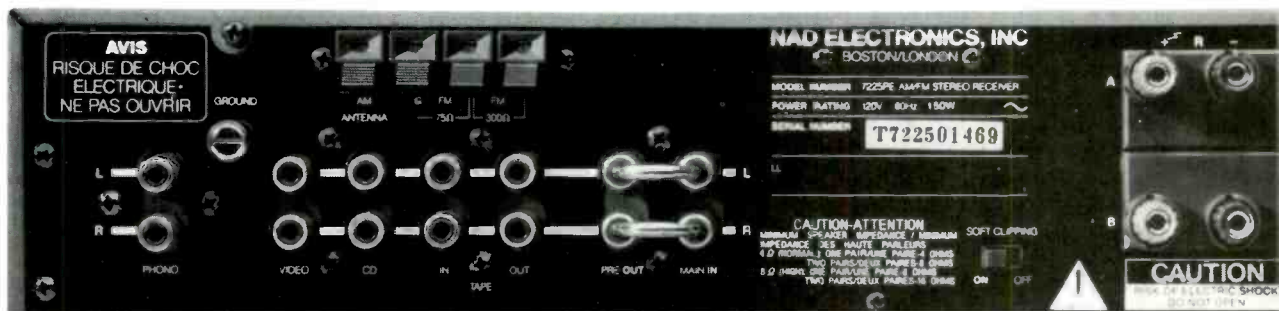
- Tuner Section** (all figures for FM only except frequency response; measurements in microvolts, or μ V, referred to 300-ohm input)
 - Usable sensitivity** (mono): 13.7 dbf (1.7 μ V)
 - 50-dB quieting sensitivity**: mono, 17 dbf (4 μ V); stereo, 40.4 dbf (17.4 μ V)
 - Signal-to-noise ratio** at 65 dbf: mono, 79 db; stereo, 70.4 db
 - Harmonic distortion** at 65 dbf: mono (THD + noise), 0.072%; stereo (THD), 0.095%
 - Capture ratio** at 65 dbf: 1 db
 - AM rejection**: 69 db
 - Image rejection**: 43 db
 - Selectivity**: alternate-channel, 55 db; adjacent-channel, 4 db
 - Stereo threshold**: 30 dbf (17.4 μ V)
 - Stereo pilot and subcarrier leakage**: 19 kHz, -35 db; 38 kHz, -37 db
 - Hum**: -80 db
 - Stereo channel separation** at 100, 1,000 and 10,000 Hz: 46, 63, and 43 db
 - Frequency response**: FM, +0.4, -0.3 db from 30 to 15,000 Hz; AM, +2, -6 db from 34 to 2,000 Hz
- Amplifier Section**
 - 1,000-Hz output power at clipping**: front channels (HI-Z), 165 watts into 8 ohms; front channels (LO-Z), 188 watts into 8 ohms, 137 watts into 4 ohms; rear channels (HI-Z), 26.8 watts into 8 ohms, 31.7 watts into 4 ohms
 - Clipping headroom** (relative to rated output): 1.04 db (front), 1.27 db (rear)
 - Dynamic power output** (front): HI-Z, 210 watts into 8 ohms, 325 watts into 4 ohms; LO-Z, 105 watts into 8 ohms, 180 watts into 4 ohms, 190 watts into 2 ohms
 - Dynamic headroom** (front): 2.1 db (HI-Z)
 - Maximum distortion** (130 watts output into 8 ohms): 0.22%, 20 and 15,000 Hz
 - Sensitivity** (for a 1-watt output into 8 ohms): CD, 17 mV; phono, 0.2 mV
 - A-weighted noise** (referred to a 1-watt output): CD, -77.3 db; phono, -76.2 db
 - Phono-input overload**: 105 mV at 1,000 and 20 Hz, 94 mV at 20,000 Hz
 - Phono-input impedance**: 47,000 ohms in parallel with 200 pF
 - RIAA equalization error**: +0, -1 db from 20 to 20,000 Hz
 - Equalizer range**: +12, -13 db
 - Rear-channel frequency response**: \pm 2 db, 70 to 7,000 Hz; -6 db at 34 and 8,000 Hz

"You don't have to spend an arm and a leg to get some of our best thinking."

Peter Tribeman
President, NAD (USA)



The 7225PE's front panel contains all the controls and displays needed for effective day-to-day use.



The rear panel contains additional controls and connections, including the Soft Clipping switch, speaker impedance selector, gold-plated phono-in jacks, heavy-duty binding-post speaker terminals, and preamp-out/main-in jumpers for system expansion.

Lately you have been hearing a lot about our take-it-to-the-limit Monitor Series components. We ask you to consider now a new member of the NAD Classic Series: The 7225PE Receiver. It is compact, shockingly powerful, and entirely affordable.

Simply put, a "25 watt" receiver is not expected to perform and sound like the 7225PE. Experienced listeners, in blind tests against receivers rated at twice and three times the power, have been moved to such comments as: "More open," "more dynamic," "richer sound." It was not news to us.

To obtain a glimpse into the reasons for this, ask your dealer to take the 7225PE off the shelf. Pick it up yourself. You will realize at once that you are holding a very substantial component. As you would expect from NAD, every ounce is there to enhance listening and ease of use.

For example, NAD's renowned Power Envelope amplifier design uses a two-stage "smart" power supply that provides higher power for musical peaks. Up to 85 watts of clean dynamic power. And our Soft Clipping™ circuit (which is defeatable) prevents harsh distortion when the demands of the music exceed most other amplifiers' limits.

In short, the 7225PE is a prime example of NAD's "no-compromises" design philosophy. And, we think, a product destined to become a standard

in its class. The ultimate judgment, however, should be made by listening. We invite you to do so at one of our carefully selected dealers. You may be surprised at what you hear.

Call us at (617) 762-0202 for your nearest dealer, or send the coupon for detailed product literature, to: NAD(USA), Inc., 575 University Avenue, Norwood, Massachusetts 02062.



For the music, pure and simple.

Please send 7225PE Receiver information and dealer locations to:

Name _____
Address _____
City _____
State _____ Zip _____

TEST REPORTS

(2.7 microvolts, or μV) was a typical receiver reading, but the mono distortion of 0.072 percent at 65 dbf (1,000 μV) was lower than average. Stereo distortion readings appeared surprisingly high, about 1.8 percent at most signal levels, but the cause was a very high level of ultrasonic pilot-carrier leakage into the audio (the 19-kHz component was -35 dB, and the 38-kHz component was -37 dB, giving a combined value of -33 dB, or 2.2 percent). A measurement with a spectrum analyzer, to exclude the effect of the leakage, showed a good stereo distortion reading of 0.095 percent at 65 dbf. Apparently there is little or no low-pass filtering in the tuner output, which may account for its very uniform frequency response of $+0.4$, -0.3 dB from 30 to 15,000 Hz. The AM frequency response, in sharp contrast, was $+2$, -6 dB from 34 to 2,000 Hz.

The stereo crosstalk was extremely low (-63 dB) at 1,000 Hz but returned to more typical values at higher and lower frequencies. It was better than -40 dB from 50 to 13,000 Hz. The stereo threshold was established by the muting circuit, and a 30-dBf (17.4- μV) signal was needed to unmute the tuner. Although a stereo signal is really not usable at that low a level, a mono signal is.

Most other tuner performance characteristics were at least average or better, except for a marginally acceptable 43-dB image rejection. The capture ratio, however, was an exceptional 1 dB at both 45- and 65-dbf signal levels.

The front-channel amplifiers clipped at 165 watts per channel at 1,000 Hz into 8 ohms. A 4-ohm load caused the receiver's protection circuits to shut it down (they were very effective in preventing damage from our deliberate abuse). Setting the switch on the rear apron for loads less than 8 ohms, we obtained an output of 188 watts per channel into 8 ohms and 137 watts into 4 ohms (a 2-ohm load shut the receiver down instantly). The rear channels clipped at 26.8 watts into 8 ohms and 31.7 watts into 4 ohms (using the receiver's higher impedance setting).

The dynamic power with the

higher load setting was 210 watts into 8 ohms and 325 watts into 4 ohms. The protection circuit was triggered with a 2-ohm load. Setting the impedance switch to its lower setting resulted in a greatly reduced dynamic output at 8 and 4 ohms (respectively 105 and 180 watts), but the amplifier was now able to drive 2 ohms at 190 watts output. The amplifier sensitivity for a 1-watt output was 17 mV at the CD input and 0.2 mV at the phono input. The respective A-weighted noise levels measured -77.3 and -76.2 dB.

The basic front-channel frequency response, measured through the CD input, varied less than 0.5 dB overall from 20 to 20,000 Hz. Switching to the CD Direct mode produced a level shift of only 0.17 dB, with no discernible change in frequency response. The equalizer curves were adjustable over a range of $+12$, -13 dB. The rear-channel response, in the Hall Surround mode, was down 3 dB at 55 and 7,000 Hz, with a 2-dB peak at 5,000 Hz. The RIAA phono-equalization error was $+0.1$, -0.4 dB from 20 to 20,000 Hz, and the phono-input termination was 47,000 ohms in parallel with a 200-picofarad (pF) capacitance. The phono-preamplifier input overloaded at about 100 millivolts.

With both front channels driven at 130 watts into 8-ohm loads, the 1,000-Hz distortion was about 0.2 percent from 20 to 20,000 Hz. The distortion was 0.19 percent at 1,000 Hz and 160 watts, just below the clipping point. The rear channels, at an output of 20 watts into 8 ohms, had a distortion of 0.35 percent in the vicinity of 1,000 Hz, rising to 1 percent at 110 and 7,000 Hz.

Comments

A full-fledged A/V receiver with the control flexibility of the Kenwood KR-V9010 is a complex instrument whose operation requires some practice and study. Once we mastered it, however, it was surprisingly easy to use.

With the lower panel hidden by its hinged door, the receiver looked (and behaved) much like any powerful, full-featured stereo receiver. After an initial setup process, access

to the hidden controls was required only infrequently. The surround modes were effective, including Dolby Pro Logic, which we used with a VCR program source, and the receiver's built-in test signals proved to be very convenient for setting levels. The remote control effectively did the job of virtually every front-panel control, and it was able to learn the commands of other controllers easily and much more rapidly than other programmable remote controls we have used in the past.

Not only were the operating qualities of the KR-V9010 excellent, but it proved to be as "bulletproof" as one could hope for in such a powerful receiver. The protection system won't let you damage the amplifier by overdriving it or connecting it to an excessively low load impedance. When the system was activated in our tests, the receiver was silenced and the words PROTECTION ON appeared across the full width of the display window, blinking brightly and replacing all normal indications. Shutting off the power for a moment cleared the system, and it was soon back in action, none the worse for the experience.

The price you pay for this protection feature is the inability to drive some speakers—those whose impedances fall below 4 ohms in a part of the audio range where significant power is required. On the other hand, setting the switch in the rear of the receiver to its low-impedance position should permit most speakers to be driven to reasonable volume levels.

All things considered, the Kenwood KR-V9010 is a lot of receiver for the money if you need or want its video and surround-sound capabilities. One of the few performance sacrifices we discovered was in the FM tuner section, whose outstanding capture ratio was offset by minimal image rejection. If you live near a major airport, the poor image rejection might expose you to interference on some channels, although we did not encounter any such problems. In other respects, we have no significant criticisms of the KR-V9010 receiver's performance or features.

Circle 144 on reader service card

We're making a big deal out of practically nothing.

The most difficult job for a compact disc player is to reproduce low amplitude signals. Fortunately, Yamaha has created a remarkable CD player that rises to the occasion.

The CDX-1120 reproduces those low amplitude signals that until now, have been distorted or lost in the noise generated by the digital-to-analog conversion process in most CD players.

Allowing you to distinguish the subtle variations between, say, both an oboe and clarinet softly playing middle C.

As well as enjoy improved ambiance, revealing the acoustic characteristics where the performance took place.

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All worthy reasons to take a good, soft listen to our remarkable new CDX-1120. Only then, can you truly appreciate Yamaha's Super Hi-Bit Technology.

Yamaha's exclusive Super Hi-Bit System utilizes the additional information generated by our 20-bit digital filter to more accurately

reproduce the low amplitude signals coming from the disc.

To achieve this superior sound definition, Yamaha uses four 18-bit D/A converters, each with an exclusive 4-bit Floating System to boost linearity to 22-bits.

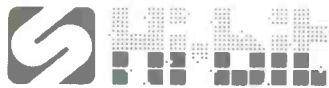
Delivering four times greater resolution of low amplitude signals than even fixed 20-bit D/A converter systems.

What's more, Yamaha's exclusive Super Hi-Bit DAC Direct Output provides phase accuracy so close to the original recording, it's unprecedented in the industry.

The CDX-1120 also features Digital DeEmphasis and Digital Volume Control to give the best possible signal output - - uncompromised by analog components.

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A full-function remote lets you control everything. With 24-track random access programming, 5-way repeat play and more.



COMPATIBILITY

Audio system performance depends on well-matched components.

IT'S reassuring to know that when you connect two audio components together they will almost certainly work. Hi-fi buyers have always tended to assemble their systems from different brands of equipment, so the audio companies have developed a series of *unofficial* standards to make sure large mismatches are a rarity. But they sometimes occur nonetheless, with effects that can range from subtle degradation of the sound quality to actual equipment damage. For most of us, a stereo system is a fairly major investment; to protect it, and to squeeze that last ounce of performance out of it, some awareness of the potential trouble spots is vital.

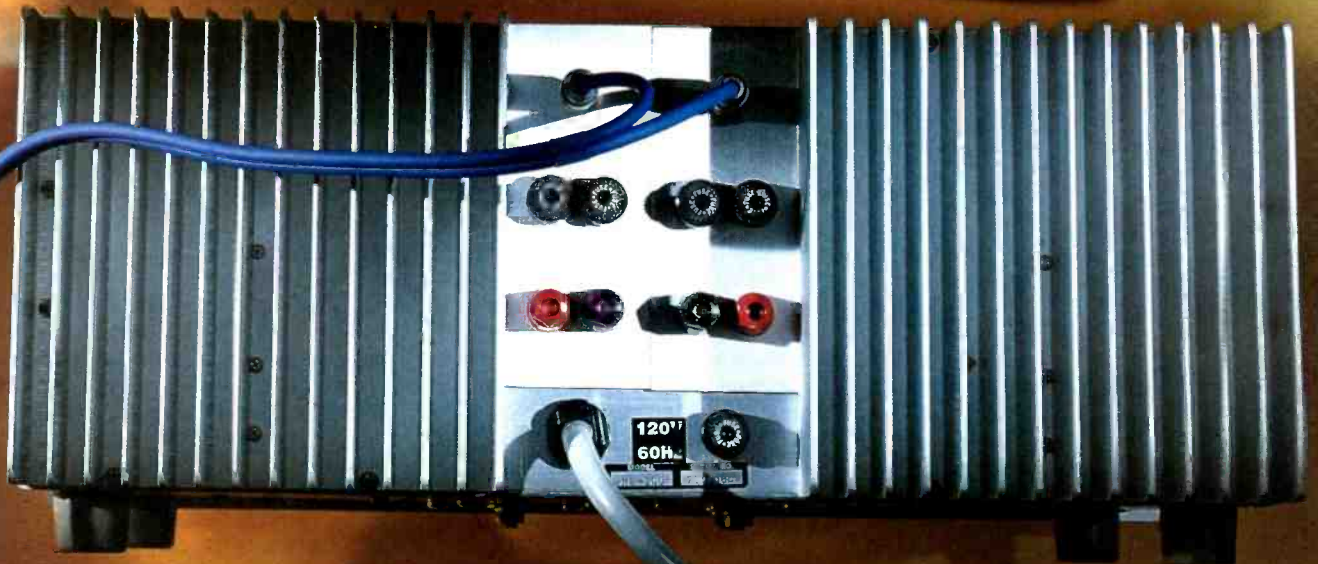
The Crucial Link

The area of greatest concern by far is the matching of speakers, both to the rest of the system and to the listener. Speakers are the "business end" of the hi-fi chain, so they must be compatible with your listening room and with your tastes. If, for example, you live in a small apartment, speakers that need a lot of space—either because they themselves are large or because they require special placement—are obviously inappropriate. In choosing

models more suited to your situation, you may find that they place certain demands on your amplifier. Often, for instance, the compromise a speaker designer must make in producing a small unit is to make it less sensitive than a larger one, so the amplifier power must be that much greater to provide the same acoustic output.

By the same token, if your tastes run to heavily compressed music—heavy-metal rock, for instance—played at high levels, the combination of speaker sensitivity and amplifier power will have to be chosen with that in mind. Even if your listening is somewhat more sedate, a compact disc player might well require more amplifier power than a tuner or tape player to handle the wide dynamic range of most CD's.

By IAN G. MASTERS



In general, it's always wise to err on the side of more power rather than less. Driving an amplifier beyond its comfortable limit in an effort to crank up the volume will cause clipping, which may well damage your speakers. But you *can* go too far. Some speakers need a lot of power—they are quite insensitive—but can't *handle* a lot. Overpowering such speakers can also cause damage if you push them too hard. A delicate balance between amplifier power, speaker power handling, and speaker sensitivity is thus essential if the most crucial part of your system is to perform to its utmost.



HERE are electrical considerations to be taken into account as well when you are matching amplifiers and speakers. Although it's easy to think of these as discrete components, electrically the amplifier's output stages, the speakers themselves, and the cables connecting them form a single circuit, and, like all circuits, its various elements must be closely matched. In effect, an amplifier's output stage is missing a resistor, whose function is taken by a speaker and its associated cable.

Some amplifiers are designed to accept a fairly wide range of values for the completion of the circuit, but most are quite restricted as to what will operate safely—too little resistance and the increased current drain can cause amplifier damage. If a speaker were a purely resistive device, the choice would be simple: Just pick one with the appropriate value. But speakers are dynamic devices, and their effect on the output of an amplifier is not resistive but reactive: It varies with frequency. The load a speaker presents to an amplifier, therefore, is termed "impedance" rather than resistance, although both are expressed in ohms.

If a speaker has a "nominal" impedance of, say, 8 ohms, it could still cause problems even though any hi-fi amplifier will be rated to drive that load. Such impedance specifications represent average impedance through the audio range; the actual figure might be much lower at some frequencies, and an amplifier that can't handle the lower impedance could fail despite the speaker's "correct" nominal impedance. The problem gets much worse

if two or more pairs of speakers are connected in parallel to the same amplifier, as this causes the total impedance to drop dramatically. In the case of such problem loads, an amplifier designed specifically to deal with low impedances is usually required.

The other element in this last stage of the audio system is the cable between the amplifier and the speakers. Wire does have its own electrical characteristics, both resistance and capacitance, and, at least in theory, these can affect the sound. Both factors are increased the longer the run between amp and speakers, but both can be minimized by using heavier cable.

Some speakers place distinctive requirements on the rest of the system. For example, a few models require the use of a dedicated active equalizer; in such cases, you have to choose electronic components that will allow the insertion of the needed equalizer, either between the preamplifier and amplifier or in an unused tape-monitor loop. Other speakers use special circuitry to enhance the sense of spaciousness or to widen the sound stage; there are also electronic circuits in certain preamplifiers, integrated amps, and receivers that do much the same thing. You should investigate these products carefully before thinking about using them together.

Line to Line

Speakers and amplifiers are two components whose compatibility is vital, though it is often not perfectly achieved. Mismatches can also occur elsewhere in the system, but they usually have less serious consequences. It's rare, for instance, to encounter impedance problems between electronic components: Impedance is important, but most electronic components are designed with low-impedance outputs and high-impedance inputs. This does result in some sacrifice of power, but it greatly reduces the possibility of distortion caused by mismatches and means that the inputs can tolerate a fairly wide range of voltages without distress. That very flexibility can cause problems, however.

Most components are designed to produce output levels roughly equal to one another, but there is no true standard, so variations may be encountered. Usually unequal output levels do not result in a degradation of sound quality, but the effect may

be inconvenient and annoying. If there are major level differences between input sources, for instance, switching between them can cause uncomfortable jumps in volume. Or if a source has an unusually high level or an input is unusually sensitive, the operating range of the preamplifier's or amplifier's volume control may be restricted. Conversely, a very low output that requires the volume control to be turned way up will increase a component's susceptibility to noise picked up on the way.

As for the connections between components, there are relatively few problems unless the units are placed very far apart. As with speaker cables, the wires that join one component to the next do have an electrical effect on the signal: They have both resistive and capacitive elements that can interact to create an unintentional low-pass filter, which in extreme cases can affect high-frequency response. In a typical system the cables are short enough that this rolloff occurs well above the audible range, with negligible sonic effect, but for unusually long runs special interconnect cables with reduced resistance and capacitance are advisable.



DIGITAL audio, on the other hand, presents a special case. In an effort to minimize possible interference between digital and analog circuitry within a compact disc player, a growing number of companies are providing their players with digital outputs for use with amplifiers that contain their own digital-to-analog converters. These outputs feed very high-frequency information. While the inherent high-frequency rolloff of conventional patch cords is unlikely to disturb a normal analog audio signal, it can have a substantial effect on the digital data stream.

Therefore, it is becoming more and more common for CD player manufacturers to provide an optical output that is connected to the amplifier with a fiber-optic cable. To take advantage of this, however, it is necessary to choose an amplifier that has an optical input and a suitable connector. The first players to offer this feature employed a number of different plugs; since then, the Electronics Industries Association of Japan (EIAJ) has standardized cables and connectors for this appli-

cation, but some older models may still have nonstandard hardware.

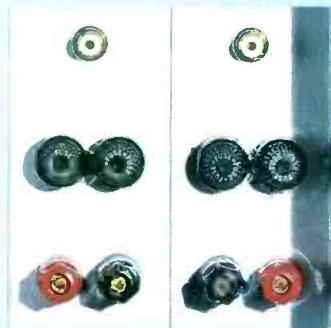
As for analog connections, few compatibility problems are likely to be encountered. The audio companies in both North America and Japan long ago accepted the familiar RCA jacks and plugs for virtually all line-level applications; microphones and headphones use different connectors, but these, too, are reasonably standard. The one area where there might be some mismatching is with European components: Most of them use DIN connectors. DIN-to-RCA adaptor cables are easy to find for such situations, but it should be noted that much European equipment uses different line levels, which might cause mismatches in spite of the cables.

The Vinyl Connection

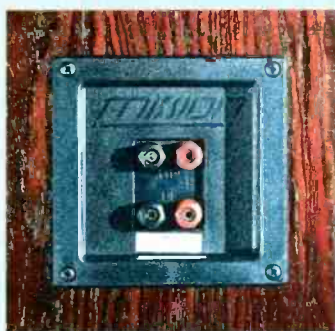
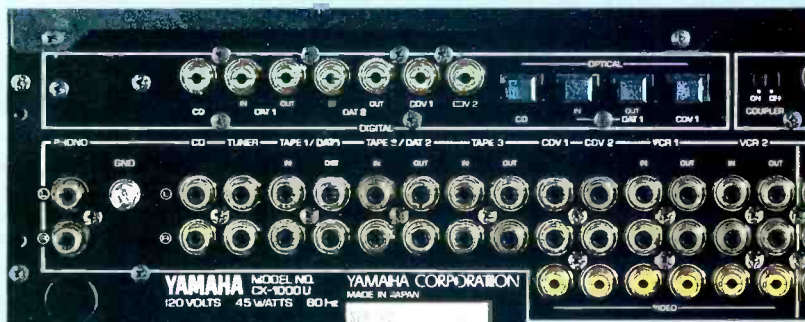
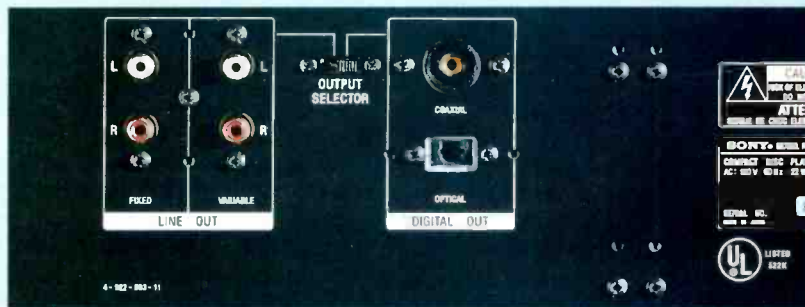
Aside from possible level differences, the components that feed information into an audio system are reasonably standardized. The major exception is often the record-playing equipment. Cartridges, tonearms, and turntables must be carefully matched if your vinyl collection is to yield its best sound.

In most cases, matching a cartridge to the inputs on your receiver or preamplifier is fairly straightforward. The phono-input section has a number of functions: It has to boost the tiny signal from a cartridge to line level, and it also has to equalize it to offset the standard pre-emphasis added during recording, called the RIAA curve. The audio industry has accepted reasonably tight standards for all of this, so most cartridges will work with most phono sections with no problem. But because the signal is at such a low level, the cable between the cartridge and the system's electronics is even more prone to capacitance and interference effects than ordinary patch cables. For this reason, most turntable manufacturers use low-capacitance cable for that link. If you must extend the cable—never a wise practice, but occasionally necessary—you should use similar wire to avoid adversely affecting high-frequency performance.

Moving-coil (MC) cartridges are somewhat more strict in their requirements, as their signal levels are even lower. Also, an MC cartridge requires either an extra stage of amplification in the phono-input circuitry or an outboard transformer. If neither is available, you might



The process of correctly matching stereo components can be daunting. Understanding the subtleties of a system's many hardware and software interfaces, however, will make the job much easier. When you're shopping, make sure the amplifier you buy is a good match for the speakers you've chosen, look for compatible optical and coaxial digital connections between digital components, consider the hook-ups necessary if you want to biamp your speakers, and make sure you have enough inputs to expand the system in the future.



Another critical link is between tape deck and tape. Finding the right brand and grade of blank tape for your cassette deck can make a great difference when it comes to overall sound quality. Check the manufacturer's recommendations and then experiment on your own. Some audio dealers will even adjust a deck's bias for the particular tape you want to use, but you should be prepared to pay extra for this.

choose one of the several "high-output" MC cartridges, as these are nominally designed to feed a normal moving-magnet (MM) input.

The physical match between cartridge and tonearm is as important as the electrical match between cartridge and phono input. In a broad sense, there are two sorts of cartridges, those using half-inch mounting holes and the plug-in P-mount ones. Some popular models are available in both formats, but most are not; there are also adaptors available if the cartridge you *must* have is in a different format from your tonearm, but these are compromises at best.



ONE advantage of the P-mount system is that all the physical considerations are standardized: Any P-mount cartridge should plug into any arm designed for that format and work with no further adjustment. With standard cartridges, however, many things have to be considered: Does the arm have enough range in the counterbalance to offset the physical weight of the cartridge? Do the tracking force and antiskating adjustments go high (or low) enough to provide the force specified by the cartridge manufacturer? Does the tonearm-cartridge combination allow enough flexibility to set the proper overhang? And do the combined compliance of the cartridge and the effective tonearm mass place the arm's resonance frequency in a range where the effects of warped records will be minimal (somewhere between 7 and 15 Hz)?

An area that is sometimes overlooked is the compatibility of your record-playing equipment with your listening room. Improper placement of the turntable may, for instance, put it in a room mode where low frequencies from the speaker are strengthened. This can cause acoustic feedback when you play records, sometimes at a level severe enough to damage your speakers. Record-playing equipment should also be located where it is isolated from vibrations caused by people walking—or dancing—in the room; a jumping stylus is a sure recipe for disc damage.

Tape vs. Deck

The maturing of the cassette from its voice-only roots to the true hi-fi medium of today has meant that tape has become *the* medium of

choice for the great majority of audio buyers. The convenience of the format may lead some to think it's foolproof: just pop a tape in and forget it. But, as with other areas of audio, some aspects of the cassette system can degrade performance if they're not attended to.

The simplest of these aspects are tape type and noise reduction. For the best playback results, you need to know which type of tape and which noise-reduction system were used for a given recording so you can adjust the machine accordingly. For instance, if a cassette was recorded on high-bias or metal tape, make sure to set the playback equalization properly. Many machines do this for you automatically by sensing cutouts in the cassette shell, but that doesn't work for older tapes without the right holes. If the cassette was recorded with noise reduction, make sure the same system—Dolby B, Dolby C, or dbx—is used for playback.

Not everything is in your control, however. If your deck produces an output level that differs from the Dolby standard by more than a couple of decibels, the Dolby circuits will mistrack. Too high an output and the sound will be too bright; too low and it will be dull. No machine we know of will let you adjust the output level, so a trip back to the shop may be in order if there are Dolby tracking problems.

Dolby mistracking may have other causes as well. To work properly, the playback circuits must "know" what a particular amount of magnetism on the tape represents in terms of the original recording level. In some cases, the recording circuitry may have been miscalibrated—the "Dolby level" on the meters of some decks is meant to correspond to a specific level of magnetic flux on the tape (200 nanowebers per meter, if you care); any variation will cause the playback Dolby circuit to misbehave. Again that may require professional adjustment. By the same token, the sensitivity of the tape itself—its output level for a given input—may cause problems. In recording without noise reduction, the more magnetism you can record on a tape the better, as that increases dynamic range. But large variations in sensitivity do exist from one tape to another, and these can play havoc with the operation of the Dolby system.

If playing back a tape requires

only minimal precautions, recording one introduces one of the most common sorts of audio incompatibility. To record an audio signal magnetically with the least distortion and the flattest frequency response, a high-frequency signal called "bias" is added to the sound. It is inaudible when the tape is played, but it is vital in the recording process. Every tape formulation has its own distinctive bias requirement, and no two are exactly alike. In broad terms, chromium-dioxide tapes, or equivalents, require higher bias levels than "normal" ferric-oxide tape; metal tape requires more than either. For this reason, almost all cassette decks provide at least three levels of bias to handle the three major tape types. Sometimes this is adjusted automatically, using the shell cutouts, and sometimes manually by means of a front-panel switch.

The difficulty is that no two tapes are exactly the same even within each type, and a three-position switch can only approximate the requirements of most of the tapes you are likely to use. It may be that there is one tape that matches your machine exactly, but few manufacturers tell you what it is—most list a number of tapes that will work acceptably. To find the right one, the only way is to try all of them and stick with the one that performs best. But beware: Even tapes with the same designation are subject to further development—the tape you buy today may not be exactly the same as the equivalent tape you bought a year ago.



THE only real way to optimize the recording process is with a deck that offers continuous bias trim, either manually operated or computerized. This feature lets you match your machine to any tape. Most such machines inhabit the higher reaches of the price scale, but they are definitely worth the investment if you do a lot of recording.

The fact that a stereo system is made up of disparate elements from a number of sources may make the occasional mismatch inevitable. The remarkable thing is that problems are as uncommon as they are. And the process of standardization—informal, to be sure—goes on. The components of the Nineties will undoubtedly be even more compatible than today's. □

NOT SO

SIMPLE

“We really wanted to reinvent ourselves.”

BY RICK G. KARR

Here's the scene: It's 1981, and Simple Minds is a group of fresh-faced Scottish kids on their first U.S. tour. They're a hit with U.K. hipsters, a closely guarded secret among U.S. fans. They arrive, gawk at the sights, and head for Philadelphia's Bijou Café, armed with their futuristic dance music, battery of synthesizers, chiming guitars, and Jim Kerr's artful, detached voice.

They play to fewer than twenty people.

Here's the punch line: The club manager approaches the band after the show. “Don't worry,” he says. “It's gonna





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happen for you guys. Incidentally, there was an Irish band in here last night playing to even less people than you, and they're gonna be a huge band as well."

"It goes without saying who they were," Jim Kerr said to me recently with childlike relish. He told the story with the expansive self-confidence that a decade of experience and worldwide Platinum success have afforded him.

Kerr and Simple Minds co-founders Charlie Burchill (guitar) and Mick MacNeil (keyboards) have suffered through enough U2 comparisons to keep them from mentioning "that Irish band" by name. Yet in Europe U2 and Simple Minds together dominate the stadium circuit with a sell-out certainty unheard of since the days of the mid-Seventies giants. They're two of a kind, either the twin-pronged conscience of today's rock or two sets of pretentious egomaniacs.

While U2 achieved unprecedented success in the U.S. and repaid the debt by producing a homage to American roots music, Simple Minds has fared inconsistently with American audiences. Their first hit was written for them, and their most recent album, "Street

Fighting Years," hasn't fared as well as its predecessor. Kerr would be justifiably frustrated. After all, one of the singles for the 1981 tour, *The American*, asked, "What do you know about this world anyway?"

"What does anybody know about this world?" Kerr laughed, comfortably in the middle of the sold-out European leg of the "Street Fighting Years" tour. "I'm certainly not anti-American. After all, I married an American."

K

ERR'S eyes sparkled with the irony of his words. His press-hounded marriage to the Pretenders' Chrissie Hynde landed on the rocks early last year, prompting an amicable separation and fueling much of the soul-searching in the new album. More important, Hynde's flight from Cleveland's desolation to London's punk mecca was nothing short of a permanent expatriation.

"Yeah, I guess I'm more American than she is," Kerr said. "Actually, everybody wants to be American. America is such a great con-

cept, we're even trying to have it in Europe now."

Kerr was relaxed. His quiet, jovial eyes and gently lilting speech exuded solid confidence. The stumbling was over. Simple Minds had reinvented itself.

"Big" is the best word for Simple Minds. Big success, big thoughts, big sound. Yet the rest of the band shares Kerr's relaxed, almost homey attitude. A few drinks with friends after the show, a few songs around the hotel bar piano, then to bed. There are no conspicuous excesses. It's a family atmosphere, an astonishing contrast to the reverent, deadly serious rhetoric of the new album and its live counterpart.

"Sometimes I think the biggest disappointment of being in Simple Minds is that our sense of humor never comes through in our music or when we go on stage," Kerr said. "On a bad night it can look like we're being pompous or overly serious. The whole thing is about taking the music dead seriously but not ourselves."

That distinction has failed to make an impact on the band's harsher critics. Simple Minds has received a sound thrashing from the music press for taking *everything*

too seriously. "One thing's for sure—we're in good company," Kerr said. "From Dylan to Lou Reed [a guest on the new album], everyone's had it."

"The press, especially in London, have an attitude problem," Mick MacNeil added. "Why are they always out for something new, for blood? They need to feel the music, write what they feel."



HE alleged political preaching in their new album drew an angry wince from Kerr. "The album wasn't even meant to be a political record. Politics is a ghost to me. It dreams. There's something more than that. We were trying to write a record about these times, people, places, and their lives."

But surely those are themes with strong political overtones? "Yeah, but it would've been crap if we'd said, 'Let's write a political record.' It would not have been entertaining." There's a distinction between personal suffering and political solutions, Kerr said. "Whether it's violence in Northern Ireland or crack dealers in New York, we're writing for the person who sees nothing in either side but every day has this on his doorstep and has to get on with his life."

Kerr's choice for the songs' settings in "Street Fighting Years" begs political questions, though: South Africa (*Mandela Day*) and Peter Gabriel's *Biko*) and Northern Ireland (*Belfast Child*) and Scotland under Thatcher (*Soul Crying Out*). The last, about a Thatcher policy that will increase taxes for the poor while cutting those for property owners, typifies Kerr's emphasis on the social over the political.

"It's not about the tax," he said, "it's about the hurt that something like the tax can bring on a family." And that kind of hurt transcends national borders, he feels. "In my dreams it's the same pain as Steinbeck. John Cougar [Mellencamp, from whom the band snatched violinist Lisa Germano] writes about it in his way. It's the same hurt, the same pain. It's the same bankruptcy of morality, that our leaders continually let us down." The key to Simple Minds' approach to such themes is to downplay the betrayal and em-

phasize the hurt. That shift from third-person to first-person songwriting is the most evident result of the band's reinvention of itself. "I had hoped we weren't confronting issues but transcending them, not just getting bogged down," Kerr said.

But Kerr readily accepts the label "crusader" with regard to South Africa. *Mandela Day* was written for last year's Nelson Mandela birthday concert, and the *Biko* cover was inspired by Kerr's contact with Peter Gabriel. "I called Peter and said, 'The Mandela concert is in five months' time. Are you gonna play?' He was stumbling and reluctant—I think he was up to his eyes in it. So I said, 'If you don't come we're gonna play it, and people are gonna ask where Peter Gabriel is.' It was just a touch of blackmail."

But why cover the song when Gabriel's own version is the definitive anti-apartheid anthem? "One could say there's no need, but any song that mentions Steve Biko or tries to carry on the reasons why Steve Biko is dead is worthwhile. It doesn't matter if you're playing it on the spoons," Kerr insisted.

Championing liberal causes has left the band open to accusations of indulging in feel-good politics: Sing about the issues, sell the records, but don't do anything to change things. Kerr stressed his commitment to motivating fans. "Tonight it's enough to sing the songs, but tomorrow you need some sort of action. Everybody's gotta find out what he can do."

If the ideas are big, the sound is gigantic. The kind of sound only a stadium could adequately contain. "People don't trust the big sound," Kerr said. "A lot of people would confuse it with pomposity, or big for big's sake. If you look at Mick's keyboards, say, they're huge. Then look at the place where he grew up. The only things you can see are sky and sea, the two biggest things in the world. He doesn't feel fazed by it. He loves it, and it's there."

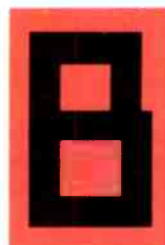
Simple Minds has traditionally worked with producers who thrive on wide-screen production. "Street Fighting Years" marks its first collaboration with Trevor Horn, the early-Eighties *enfant terrible* who shaped the Art of Noise, ABC, Frankie Goes to Hollywood, and Yes's first revival. Like Simple Minds, Horn was looking to shed his earlier image. "We thought it

was an oddball mixture [Simple Minds and Trevor Horn], but it was quite attractive as well because we really wanted to reinvent ourselves," Kerr said. "He was into the same thing. He wanted to put a stop to what he'd done. Fine, thanks, but it's finished."

Horn shares production credits with Steven Lipson, who caught the band's attention with his earlier work. "We met Steve first," Kerr explained, "and we wanted him to do it. He was worried about producing a band of our . . . magnitude? Because he was more of an engineer [than a producer] up until then. He said, 'I'd like to do it with Trevor. You should meet him. He's a really talented guy, and he really loves you.'"

"We had liked Trevor's work in the past, but we never trusted it. There was a whole myth around Trevor, sort of Wizard of Oz. You didn't know who played what, or who did what, or if they wrote the songs. He seemed great at making artifacts, all trickery and wizardry as opposed to heart," Kerr said. "He was a molder, but we've had our own vision for years."

There were rough patches with Horn, but the mix was successful—mainly because of Lipson's skills, according to Kerr. "It's Steven we'd really want to work with in the future."



IG ideas, big sound, and a big change in outlook. With the album out of the way and the tour humming along, Kerr refused to speculate on the next step. "'Street Fighting Years' is definitely something we needed to get out of our system. Where we go next, I don't have a clue. I'd like to think the next one will be more up."

Making "Street Fighting Years" was an attempt by Simple Minds to relearn its past, Kerr said, and the group will continue to learn. "Sometimes you try too hard," he concluded. "I don't ever mind being told I'm trying too hard. I think I enjoy it more now because I'm more relaxed. As for getting it wrong, absolutely. We've got it wrong before, and we'll do it again. The thing is to know when you're getting it wrong so you can get it right." □

SURROUND S · O · U · N · D

by Ken C. Pohlmann

WITHOUT question, digital audio—in the guise of professional tape recorders and signal processors as well as the compact disc—has raised the level of high fidelity. Yet, overall, audio technology remains exactly as it has always been since Edison first shouted into his tin-foil contraption—an imperfect means of conveying the impression of musical performance. With digital audio, however, that impression is again taking a giant step forward in believability.

The next problem to be tackled in digital audio is the reproduction of the ambient-sound information accompanying a live performance. Media such as the CD do a good job of storing the music signal itself, but the playback system fails to provide the ambience information that should rightly surround the listener when that music signal is present. It is this failure, among others, that immediately tips us off that a recording is merely a recording, not the real thing.

In a concert hall, sound from the performer(s) radiates in all directions. A direct path carries some of the sound to your ears. Other paths carry the sound to the stage, proscenium, and other nearby surfaces, where it is reflected and reaches you a short time later. Still other paths carry the sound out into the hall, where it is reflected many times, reaching you only much later. Thus, you hear a direct sound, early reflections, and later reflections, or reverberation.

Although the microphones set up to record the performance can indeed record the reflected information as well its source, reproduction in your home is limited because a pair of conventional loudspeakers can only reproduce sound, direct as well as ambient, from the two points where they are located. As a result, ambience information comes from the same position as the direct sound, and your ear is not fooled at all.

Of course, if your budget permitted, you could construct a listening room whose acoustical properties were such that sound supplied from your loudspeakers would be reflected in the room to create the same kind of ambient sound field as

in the recording locale. Fortunately, there is a cheaper way, which is also much more flexible, probably sounds better, and fits inside a space considerably smaller than a concert hall.

Digital Signal Processing

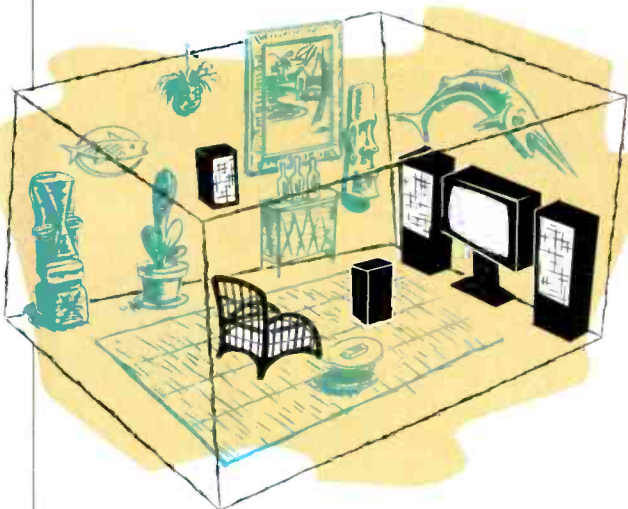
Using digital signal processing (DSP) technology makes it relatively easy to generate a set of ambience signals from the original recording and reproduce them through a stereo system. As a result, the playback environment takes on the acoustical characteristics of the original performing environment, and realism is dramatically enhanced.

Compared with the old quad systems, digital signal processing places a greater reliance on real-time generation of ambience information. For example, in-

Once you've used a well-adjusted surround system, you could very well wonder how you ever enjoyed music or video without it.

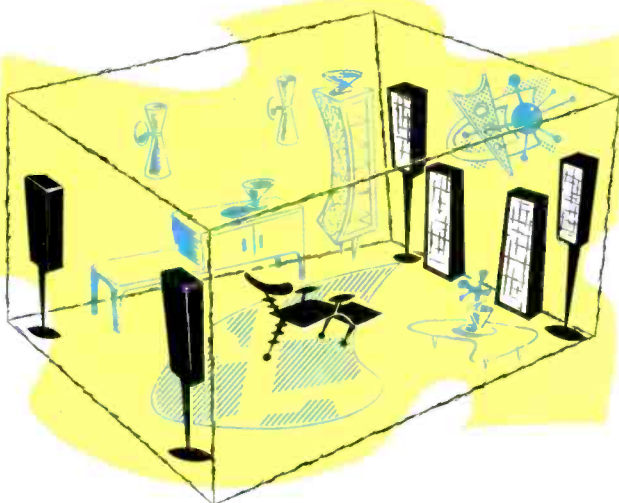


Speaker Setups for Surround Sound

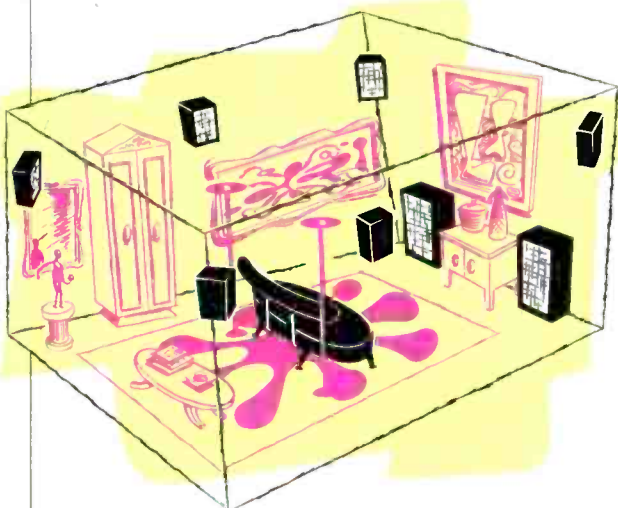


The NEC PLD-910's manual offers this room arrangement for a basic surround-sound setup. Although it looks slightly unusual to have the surround speakers centered on the side walls, this is optimum for certain types of surround processing.

This kind of basic six-channel setup is recommended by JVC with its XP-A1000. The two main stereo speakers are enhanced by pairs of front and rear ambience speakers. Note how the extra speakers are stand-mounted at roughly ear-level for a seated listener.



A complete eight-channel configuration like this one is recommended by Yamaha with its DSP-3000. The two main stereo speakers are supplemented by one pair each for front, rear, and sides. You can even take this approach a step further by adding a front fill speaker and a subwoofer.



stead of storing four separate channels, only two are stored; all the other required information is synthesized at the moment of playback from the original two channels. Alternatively, ambience information can be extracted from the original recording and directed to the appropriate channels. In either case, parameters describing the acoustical characteristics of a performing environment can be stored in the digital signal processor and used to determine how the ambience information is created. It is important to note that the "effects" channels are created from side-chain processing—that is, the fidelity of the primary channels is never affected.

Although professional processors have performed ambience generation for years (there are few popular-music recordings without it), it has only been through the advent of DSP chips that consumer surround-sound processors have become available.

Ambience Processors

Surround-sound processors—variously called digital sound-field processors (Yamaha), digital audio environment processors (Lexicon), and so forth—perform essentially the same task of generating ambience information. Ideally, the processor should be connected directly to a CD player's digital output. The audio signal from the playback source, whether digital or analog, is directed through frequency-dependent digital delay, equalization, and reverberation circuitry. A software program controls these parameters throughout the processing, tailoring the computation to produce an accurate, coherent spatial orientation. Following the generation of the effects channels, the digital signals are converted to analog and sent to the power amplifiers and loudspeakers.

All digital ambience processors provide a number of audio outputs. For example, a six-channel system would drive four additional speakers with a four-channel amplifier. The four effects speakers would be located toward the front and rear (or sides and rear) of the room, where they would provide the acoustical cues required to simulate a particular spatial environment for the sound from the main speakers. The main front speakers would reproduce the unprocessed original signal, and the front effects speakers

would reproduce early-reflection signals, simulating arrivals from the proscenium and other nearby surfaces. The rear speakers would provide a wash of delayed reflections and reverberation, such as would come from the side and rear walls of a hall. Alternatively, a surround system could use only an additional pair of rear speakers, or a more extensive system could use front, side, rear, and center-channel speakers as well as a subwoofer.

Effects processors offer a variety of presets in which the acoustical parameters have been adjusted to provide a coordinated sound field. The Yamaha DSP-3000, for example, has twenty sound-field presets simulating an opera house, a cathedral, a stadium, jazz clubs, concert halls, and other locations. Some of the presets offer a variety of environments (there are ten different concert-hall programs stored in the DSP-3000).

The derivation of presets is itself an interesting study. The design engineers could select the parameters themselves, creating artificial sonic environments, but it makes more

sense to take advantage of environments known to have good acoustics. For example, in developing programs for JVC's XP-A1000 acoustics processor, a team of engineers visited famous concert halls such as Amsterdam's Concertgebouw, Frankfurt's Alte Oper, Bonn's Beethovenhalle, Munich's Philharmoniehalle, and Vienna's Staatsoper to make analytical recordings in those spaces.

As a result, you can hear Pink Floyd performing in an opera house, a cathedral, a football stadium, or any other spatial environment that's been stored. The point is that with a menu of presets, you can match your own listening environment with what's most appropriate for the music.

With most surround processors, a user is also free to modify existing presets or create wholly new spatial environments and store them in memory. For example, while the front panel of the DSP-3000 is simple, its forty-one-key remote control allows you to adjust various acoustical parameters and store twenty user-created presets. You can set

parameters for room size, liveness, initial delays, reverberation time, high-frequency reverberation-time ratio, reverberation level, high-pass filter, low-pass filter, effects level, and effects balance. Alternatively, you can use its "presence" program to assign up to sixteen reflections per channel, with assigned values for filtering, delay, level, and direction, to build a new acoustical environment from scratch.

Speaker Placement

Like any piece of audio gear, a surround-sound processor requires some consideration in terms of set-up in the listening room. The room's own acoustical characteristics may influence use of the processor; for example, a large and highly reverberant room may generate sound reflections that are capable of masking those synthesized by the processor. Undesirable echoes from the room may spoil the desired effect. On the opposite extreme, an anechoic (acoustically dead) room will tend to increase perception of the direct sound from the speakers and thus make listener location



Lexicon's CP-2 surround processor (\$895) combines Dolby Pro Logic with Lexicon's own patented Auto-Azimuth system, which monitors phase and amplitude errors in incoming material in the digital domain for more accurate decoding.

The SSI Products System 4000II decoder (\$699) has four surround modes: Dynamic Logic (active steering), Dolby Surround, Music Surround (for nonencoded stereo sources), and Mono Enhance.



JVC's XP-A1000 digital acoustics processor (\$1,200) has adjustable parameters for room size, liveness, frequency response of reflections, reverberation level, and high-frequency reverberation time.

more critical. For proper operation of a surround system, the listening room should have relatively neutral acoustics, so that a convincing ambience can be created, with no single speaker being audible by itself.

Of course, the magic of DSP could also be applied to the problem. For example, the JVC XP-A1000 acoustics processor can help compensate for the (perhaps unwanted) acoustics of both the original recording venue and the listening room where the music is to be reproduced. Minimizing the effect of these variables helps create a new acoustical environment.

Similarly, speaker placement will probably require some trial and error during setup. Opinions differ on the best locations for ambience speakers. Some manufacturers recommend placing them to the rear, while others recommend placement on the sides of the listening position, plus or minus 20 degrees. Still others argue for using both side and rear speakers.

In general, side placement is often better than rear if the room's own side-wall reflections are damped. Also, ambience speakers should be moved away from walls—reflection from those boundaries tends to degrade the effect. The listening position should be centered on the left/right axis; it's critical enough to warrant using a tape measure rather than eyeballing it. Naturally, the problem of positioning and balancing surround-sound speakers increases with the number of speakers you use.

Of course, the best method of solving any speaker-placement problem is through listening. Try out different speaker locations combined with different settings on the processor itself. Aim for the most realistic spatial impression, with solid imaging. You'll know the "sweet spot" when you hear it.

How much amplifier power will you need for the ambience speakers? Surprisingly, quite a bit, as you may find yourself running the am-

bience speakers as loud as the primary speakers. Fortunately, ambience speakers do not require as much fidelity as the primary pair.

At the Movies

If film sound is a high priority for you, you'll need a front-center speaker to establish the all-important dialogue track in the middle and at least one rear speaker. A full system for movie sound at home might include two main, one center, two side, and two rear speakers, plus a subwoofer. The Shure HTS Theater Reference System is an excellent example of this type of surround-sound setup.

Film sound reproduction can be more efficiently tackled, however, by a line of products differing from general ambience processors. Surround-sound decoders such as the Yamaha DSR-100 Pro, Lexicon CP-1 and CP-2 (which also do DSP-based ambience synthesis), NEC PLD-910, and others have Dolby Pro Logic circuits that mimic the

NEC's PLD-910 decoder (\$999) includes Dolby Pro Logic, which provides a true center channel for more realistic dialogue, and a Creation Surround mode with adjustable parameters.



The Fosgate-Audionics DSM-3610 Pro-Plus (\$1,429) uses proprietary steering logic circuits to create a wide sound stage along with precisely located dialogue from a center-front speaker.



The Yamaha DSP-3000 Digital Sound Field processor (\$1,899) allows a multichannel home system to re-create the acoustic character of various actual listening environments such as concert halls, jazz clubs, opera houses, arenas, and cathedrals.



Dolby Stereo decoders used in movie theaters. Some home decoders offer only the less-advanced Dolby Surround format, while others, such as those from Shure and Proton, use proprietary circuits to achieve performance like that associated with Dolby Pro Logic. The better decoders use "steering" logic to coordinate the position of output channels relative to the position on the screen of the apparent sound source. The center channel puts dialogue right in the middle, and the separation of left, right, and rear channels is expanded as it is in a theater.

How Realistic Is It?

With the growing availability of DSP chips, it seems evident that digital ambience processing will grow in popularity for both music and video applications. The advantages are substantial and immediately obvious. When a well-adjusted surround system is switched in, the sound field becomes enormous, enveloping, and realistic; when it's switched out, the sound field seems flat in comparison. In time, listeners could very well wonder how they ever enjoyed music or video without it.

Still, there may be philosophical doubts as to its legitimacy. Some listeners may feel that the synthesized ambience information from a surround-sound processor is somehow inauthentic. They may argue that the only true approach to music reproduction is the purist one, using a single pair of speakers. In one respect, they are correct; it would certainly be inappropriate, for example, to play back a string-quartet recording in a football stadium. As with any new technology, there is a right way and a wrong way to use surround-sound processing.

The key to ambience processing is that it gives us a powerful new tool for increasing the realism of music reproduction. There is nothing sacred about two-channel stereo playback, which is itself an attempt to synthesize a realistic sound field through the use of spatially encoded software and multiple-mono playback sources. With the advent of DSP, the means to accomplish the same goal have simply become considerably more sophisticated. In comparison, conventional stereo reproduction may not be a purist approach so much as simply a relatively crude one. □

A Surround-Sound Glossary



SURROUND-SOUND technology adds almost as much to the high-fidelity vocabulary as it does to listening enjoyment. Although terms such as reverberation time, delay time, and room size have always been important to audio technologists, for the first time the consumer is able to adjust these variables, so an understanding of their meaning is important. Some of the most critical terms are explained below.

Ambience: The characteristic echo and reverberation signals resulting from reflections of a sound source in the environment where the sound is produced.

Delay time: The time it takes for a reflected signal to reach the listening position following the arrival of the direct sound, or the time it takes for a reverberation signal to be generated from a source; generally a function of room size.

Direct sound: The sound emanating directly from a source, without reflection; the sound signals that reach the listener first.

Dolby Pro Logic: A motion-picture audio system used to enhance the directionality of dialogue (keeping it in the center) and to maintain a broad panorama for other sounds.

Dolby Stereo: An encoding/decoding process for motion-picture sound that uses three front channels (left, center, and right) and one rear channel (surround).

Dolby Surround: A consumer-level audio playback technique for encoded videotapes and discs, derived from the professional Dolby Stereo system, in which dialogue comes from the front speakers (but isn't necessarily centered) while background music, ambience, and sound effects come from both front and rear speakers.

Early reflection: Any reflection from a surface near a sound's point of origin, used by the ear to help determine room size.

High-frequency reverberation time ratio: The balance between high- and low-frequency reverberation; in surround systems the ratio is adjusted

to simulate the natural decrease in high-frequency reverberation that occurs over large distances and with multiple reflections.

High-pass-filter cutoff: The point where low frequencies are rolled off; adjusted to reduce boominess caused by listening-room characteristics and speaker placement.

Initial delay time: The elapsed time between the direct sound and the first reflection, generally a function of room size.

Liveness: The amount and tonal characteristics of sound reflected by a room's boundaries, a function of the room's size and acoustical treatment.

Low-pass-filter cutoff: The point where high frequencies are rolled off; adjusted to simulate absorption of high frequencies over long distances and to improve timbral characteristics for clarity rather than muddiness.

Panorama: The spread of signals to left and right across the stereo sound stage.

Presence: A sound-field preset simulating a close-up listening position relative to the music source, with complex early reflections.

Reverberation level: The overall amplitude of the reverberation signal.

Reverberation time: The duration of the reverberation signal following the initial delay.

Room size: The size of a recording environment; the perceived size of a listening environment as manipulated by a surround-sound system.

Surround: A sound-field preset or surround-sound mode; for example, varying the listener's apparent distance from the primary sound images.

SYSTEMS

Bringing down the house

by Rebecca Day

IF it's a Saturday night in Lincoln, Nebraska, chances are they're raising the roof over at the Duncan house—or at least the ceiling. The Duncans listen to recorded music on their stereo system, but they also like to perform on the cello and a Steinway grand. When they were planning their new entertainment room, they outlined their diverse musical needs to Dominique Chéenne of C & C Consultants, a local acoustic-design company, and he proposed a motorized fiberglass ceiling that can be raised, by remote control, from a height of 8½ feet to 17 feet in order to create either an intimate or a bright and spacious listening environment. The ceiling has pyramidal coffers and a rough finish to scatter reflections and minimize standing waves.

The ceiling isn't the only part of the room to get special acoustical treatment. Chéenne had six diffuser panels installed in a structural wall—layers of rubber between the panels eliminate vibrations—to control reflections from the room's 17- by 20-foot windows.

The stereo system, most of which is concealed by an electrically controlled, mirrored panel, includes a Perreaux SM3 preamplifier, TS2 source switcher, and TU3 tuner, a Yama-

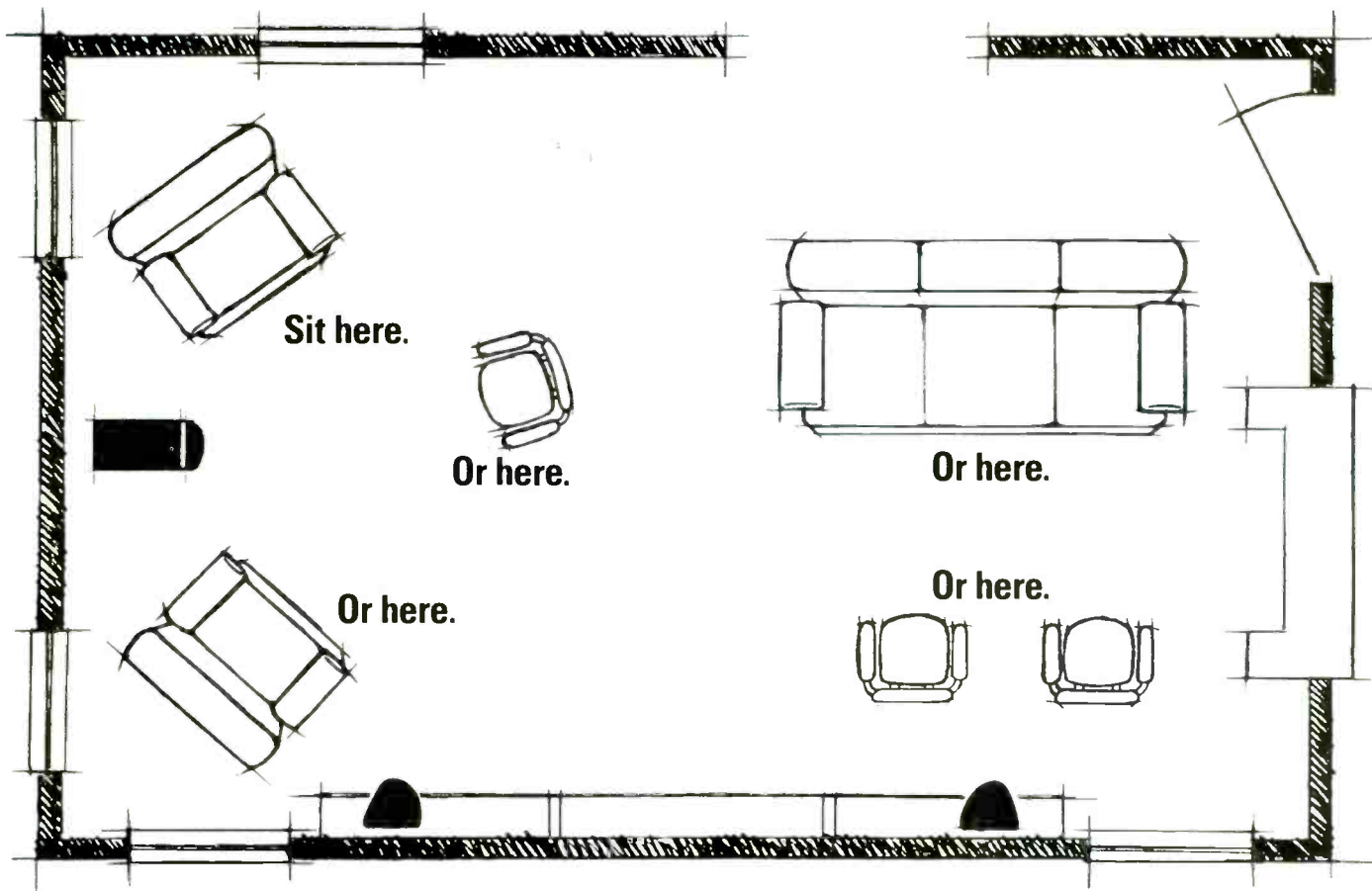
ha DSP-1 digital sound-field processor, a Nakamichi Dragon cassette deck, an NAD Model 5000 CD player, a Sony CDP-5 CD changer, a Sony XBR-36 monitor/receiver, and an RCA Model 9500 Super VHS VCR. Chéenne programmed a CL-9 CORE remote-control to operate the TV, VCR, and NAD CD player.

A Perreaux PMF-1850 amplifier powers the front-channel Quad ESL-63 speakers, and a Yamaha M-80 amplifier drives the rear-channel JBL Model 2816 speakers. Powered Audio Pro B2-70 subwoofers provide punch (and one doubles as a lamp stand). Sony Model 36 speakers are used for TV sound. An Acoustic Research SCR remote-control system operates the Perreaux components and is connected to the tape-monitor loop of the preamp.

Long before the audio equipment was installed, even before the dry-wall construction, Chéenne insured the room's acoustical integrity. He brought in a subwoofer, tested it at full power to reveal structural rattles that might interfere with listening, and then fortified trouble spots with rubber hoses or duct tape. Now the only shakes, rattles, and rolls heard in this house come from the recorded music or the Duncans themselves. □







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SPEAKER DESIGN

Conversations with the pros about
where we are and where we're going

BY JULIAN HIRSCH

MORE than six decades after its invention, the dynamic loudspeaker is still the mainstay of audio reproduction. Although the technology has undergone surprisingly little fundamental change in that time, many important advances, and countless minor ones, have made today's high-fidelity speakers vastly better than those of yesteryear. It is not easy to decide, even with the benefit of hindsight, which of these developments have contributed most to the present state of the audio art.

To shed some light on this question, I talked with five of today's most respected loudspeaker designers: Roy Allison (Allison Acoustics), Henry Kloss (Cambridge SoundWorks), Andy Petite (Boston Acoustics), Arnold Nudell (co-founder of Infinity Systems), and Matthew Polk (Polk Audio). I also asked them for their thoughts on the present state of speaker technology and for their predictions about the evolution of loudspeaker design through the remaining years of this century.

The Past

Before hi-fi became a hobby following World War II, serious loudspeakers were made only for theaters and public-address systems. "Amplifier power was limited," said Allison. "Efficiency was therefore of paramount importance, and horn systems met the requirement best." As Nudell put it, "Drivers and crossovers for these speakers were shrunk down and put into some sort of cosmetic box and placed in the home, for which they were not designed." Even so, the result "was frequently the most significant piece of furniture in the room," Polk noted.

Kloss pointed out that the early systems suffered from "a lack of integration of the cabinet and speaker and from the very large size needed" for adequate bass response.

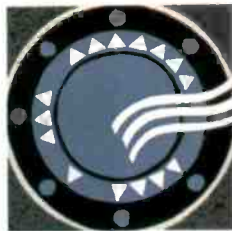
Allison mentioned the development of the bass-reflex enclosure and the Klipsch folded horn as partial solutions to the problem, but even at the end of the Forties, "Complete speaker systems of reasonable quality were still relatively large and expensive." As for performance, Polk said, "The last one I looked at with modern measuring equipment was a large corner horn. It was incredibly efficient, but it barely went down to 60 Hz and effectively didn't go above 8 kHz."

Edgar Villchur's invention of the acoustic-suspension woofer was credited by all as being, in Nudell's words, "a giant step toward more realistic sound," but at a steep price in efficiency. Fortunately, as Allison recalled, "In the early Fifties, relatively powerful amplifiers of good quality and low cost came on the market just in time to drive Villchur's radical acoustic-suspension speaker system. Small for its time (about 2 cubic feet), the Acoustic Research AR-1 set a new standard for extended, low-distortion bass, but it did need amplifier power. And it was just in time for stereo records:

One huge box in the living room might have been acceptable for some users, but two of them for stereo would not have been."

More work was needed, however. "A lot of old speakers that are still working properly sound pretty good playing modern software," said Andy Petite, "but their tweeters don't have the high-end extension [of today's systems], and they don't have the small diameter needed for wide dispersion. By virtue of the work that Eddie Villchur did, we took a giant step forward in woofer design, and what a lot of us are doing in woofers today isn't a whole lot different from what was done then. Where the improvements have been made since is in the dispersion and efficiency of tweeters."

Polk spoke of the early days in broader





Boston Acoustics president Andy Petite engineered the T-930 speaker.



The AL Series is the latest line of speakers from Roy Allison.

Henry Kloss's Cambridge SoundWorks sells the Ambiance (shown) and the four-piece Ensemble system factory-direct only.



Arnold Nudell was behind Infinity's state-of-the-art IRS Series V speaker.



The SDA-SRS 1.2TL with trilaminate tweeters is Matthew Polk's top loudspeaker.

terms. As he sees it, "Hi-fi was an entirely hobbyist-driven industry. You had to make a tremendous personal commitment of large amounts of space and money to enjoy a really high level of performance. Since then, technology has improved and made this level of performance available to many more people at a lower level of personal and financial commitment."

The Present

While the hi-fi speaker of the Eighties is basically much like its ancestors of the Fifties, the differences in detail are too numerous to mention. The final sound quality testifies to the effectiveness of the accumulated changes, however. Roy Allison referred to the Sixties and Seventies as a "period of growth and refinement" during which dome midrange and high-frequency drivers were developed (originally at Acoustic Research) and gradually became the standards against which others were judged.

Allison observed that the "systematization of low-frequency design procedures by Benson, Thiele, and Small made it easier and faster to optimize new designs, and computer programs for implementing this work reduced it to a routine. There was still some art required, but mostly for the selection of materials, cabinet shape, and driver placement and in deciding which set of compromises would produce the best results." He also noted (omitting, with characteristic modesty, mention of his own major contribution) "the development of serious efforts to quantify the dynamics of the rooms in which home speakers are used—how rooms affect the performance of speakers by modifying and redistributing the radiated sound energy."

Nudell agreed about the increasing importance of quantitative methods in speaker design. "Now you can make a speaker do what you want it to do," he said, "understanding what limitations you have. With Thiele and Small parameters, for example, you can make the shape of the low-frequency response curve from a reflex box very predictable; you can get the same kind of flat response that you can normally get with an acoustic-suspension system. But you can get the efficiency to be 3 dB higher in that band, and if you hook the rest of the speaker onto that band (the bass),

NAMES AND FACES



ROY ALLISON

Previously an editor of radio technology and audio magazines, Roy Allison became chief engineer at Acoustic Research during the time of founders Edgar Villchur and Henry Kloss. In the early Seventies, he formed his own company, Allison Acoustics, which he still heads. Known for their smooth, natural sound, Allison's speakers are based on his research into the interaction between loudspeakers and rooms.



HENRY KLOSS

One of the founders of Acoustic Research, Henry Kloss went on to form KLH (he was the "k"). There he produced acoustic-suspension speakers and other innovative products. Later, Kloss founded Advent Corporation, which, like AR and KLH, made significant contributions to hi-fi. But the real point of starting Advent was to develop high-performance projection TV for the home. Eventually Kloss left Advent and founded Kloss Video, where he designed and built a second generation of projection monitors. His current company, Cambridge SoundWorks, manufactures an unusual four-piece speaker system that he designed.



ARNOLD NUDELL

A laser physicist and fervent audio hobbyist, Arnold Nudell co-founded Infinity Systems in 1968 and was its president until his departure just

a few months ago. The company's first product, the Servo-Static, was a no-holds-barred hybrid-electrostatic system that was one of the most expensive and exhilarating speakers of its time. Many Infinity speakers continue to use planar (though not electrostatic) high-frequency drivers in combination with cone woofers. The Infinity line spans a wider range of prices, from approximately \$150 to \$50,000, than that of any other speaker manufacturer.



ANDY PETITE

Andy Petite joined KLH from the world of audio retailing and eventually became involved in speaker design. He later followed Henry Kloss to Advent. When that company was sold, he co-founded Boston Acoustics, where he is the chief designer. The first Boston Acoustics speakers used an innovative shallow-cabinet design and—like those of AR, KLH, and Advent before them—were based on the acoustic-suspension principle. The emphasis was, and is, on smooth, wide-range sound.



MATTHEW POLK

A talented designer almost a generation younger than the others in our group, Matthew Polk started Polk Audio on a shoestring with two college classmates. After a few years of slow but steady growth, during which the company's speakers earned a solid reputation for quality and value, Polk developed the Stereo Dimensional Array—a purely acoustical method of expanding the stereo image beyond the confines of the speaker area through the cancellation of interaural crosstalk. Polk Audio has since grown tremendously.

you can then take it up 3 dB. But nothing's ever free. You then have a resonant system, and many of us believe we can hear that resonance."

One result of the new emphasis on quantitative methods, according to Nudell, is that "Loudspeakers sound more alike than they ever did in the past. I think the reason is that people are starting to take measurements more seriously. And many more serious manufacturers are designing their speakers not only by ear, which is fine, but also with the use of all this [test] equipment that has been available now for several years."

Polk espoused a somewhat different point of view, arguing that as speakers got smaller and amplifiers got more powerful, the industry made a transition from designing loudspeakers on the basis of specifications alone to designing them on the basis of their sound. He sees this as a change from engineering alone to a combination of engineering and artistry: "The admission is that we really don't know the exact way to quantify all the factors involved in designing a loudspeaker. We know a lot of them, but we'll admit that we don't understand everything, and at a certain point we'll go with our own intuition and what we hear with our own ears and make it sound as good as we can."

PETITE observed that "the big problem is that we still don't know what it is that we're trying to make. And if you ever ask anybody what he thinks his neighbor will like, he will come up with outrageous things. I think one of the most valuable lessons I learned working with Henry [Kloss] is to design things for myself, what I would like in a product and what really excites me. You're not going to design a product that's going to appeal to all people. But it's going to appeal to a lot of people who have similar tastes, priorities, whatever."

Kloss himself, with typical iconoclasm, feels that loudspeakers have been better all along than we had thought. "For so long," he said, "one had heard that the loudspeaker was the weak link in the chain. All of a sudden, we got the CD and

everything sounded better. The loudspeaker wasn't the weak link; it was the recording process! The CD sounded so profoundly better and different. Suddenly there was a uniform and dramatic increase in quality that most of us heard. No one ever saw anything quite like that in speakers, and I don't think anyone ever will. Maybe the low frequencies from a small box back thirty-five years ago was a big step, but the long-standing idea that the loudspeaker is the weak link was, I think, laid to rest by one of the other links having suddenly undergone a great improvement, indicating that it must have been inferior before and very limited."

The Future

Questions about the future elicited a variety of responses. Allison feels that the Eighties brought a significant improvement in the average quality of loudspeaker systems, particularly in low-price models. In addition, he noted that "three-piece systems (a hideaway common-channel woofer with two very small main speaker enclosures) have enjoyed a resurgence in popularity. Dynamic-driver manufacture continues to be refined, and new plastics and alloys, plus powerful new types of magnets, have facilitated [development of] full-range ribbon and planar loudspeakers.

"With fantastic changes in video technology on the near horizon, I believe that integration with high-quality audio will become more common. There ought to be more emphasis on in-wall speakers, both as original equipment and as retrofits. Where built-ins aren't feasible, minispeakers will be used. Both will require separated woofer systems for really good results. The same kinds of speaker installations will be most practical for multichannel ambience and surround-sound systems, which are becoming better and more convincing in each generation."

There is still a place in Allison's future for the audiophile purist. He believes that "there will always be people for whom great music reproduced with the utmost possible realism will be more important than any other entertainment. For these folks, stand-alone speakers, properly placed, will remain the only possible choice."

Nudell is perhaps the group's most ardent futurist. "We're going

to see more and more of the planar-type speakers," he said, though he feels they won't become a major part of the market "because they are too expensive and too esoteric, and most companies are really not interested in doing that." Nudell pointed out that Infinity has been using planar drivers, sometimes going down to 100 Hz or below, throughout its line for years. Earlier, the company used electrostatic drivers, which he also expects will continue to be used in a limited number of speakers.



AT the same time, Nudell expects a lot of improvement in ordinary dynamic drivers, principally in their materials and cones. He pointed out that an ideal cone material has high stiffness, low mass, and breakup modes that are far outside the audio band. And when manufacture of magnets from neodymium—a very powerful magnetic material—becomes economic, it will, he said, permit design of much better drivers. "You might even think about depositing a very fine grain or powder of this material on a diaphragm and having a magnet that actually moves, with the coils stationary. I think materials will make a major difference, but that will be only the smallest part of it in the next ten years.

"The largest part will have very little to do with the loudspeaker. That's the next frontier, and a lot of people are working on it. Digital memories—and I'm talking about megabyte memories, which are necessary to perform this operation—are getting cheap enough, and certainly in the next five years they are going to be substantially cheaper than they are now. And what is this operation? It is to take the basic [acoustic] measurement of the room at the approximate listening position and characterize the room by a function of frequency and amplitude. You put that function into the memory and make what might be called a 'smart' loudspeaker.

"But, being an audiophile, I don't want to mess with the main loudspeakers. Leave them alone for now, take some other loudspeakers, and place them strategically around the room. I would suspect that you would start out with four—two in the front and two in the rear. Then

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K

LOSS touched on some of the same points as Nudell, though from a different perspective. He feels that the dynamic loud-speaker mechanism is still the best way to move air (the basic function of a loudspeaker). "You can get all the smoothness over the appropriate range—all the highs and lows—and you can do it very efficiently," he said. "Ten or twenty years from now, dynamic speakers will still dominate." He does not see any major role for large planar speakers.

"If you are close to a speaker," Kloss conceded, "there is an advantage to having a large source. There is also an advantage to the dipole radiation pattern that bounces a lot of sound off the back wall." The downside, he said, is that planar systems "need a lot of area and are very inefficient transducers. They also tend to be more limited in placement than other kinds of speakers. Because of these limitations, and the fact that area and size cost money, it's a hard and expensive way to do the job. So the planar

speaker won't come to dominate. I don't think it will be any more popular than it is now."

Kloss is not dogmatically opposed to things large, however. He developed and made the first big-screen home projection television set when he was at Advent Corporation, "The reason I made the large television set," he said, "is so that when I'm watching something, I'll watch it properly. I'd like to think people will listen to music that way, now that we can make speakers inconspicuous, and really at a lower cost than we have yet seen, with the idea of separated bass. I think that's going to dominate mid-price speakers in the near future. So that's the future that's the present, sort of."

"Then there is the integration of the speaker with the amplifier, which has been done intermittently. I think even the systems that are made don't use all the freedom that integration gives. That should become common practice. The idea of tailoring the amplifier and speaker to each other is something I would like to get back to sometime."

"Also, most of the music you want to hear was made for playing and listening in a substantially different environment [from a home living room], usually much larger. And that can be simulated easily by having a large number of speakers with a different delay and frequency response shaping the sound from each one. It's not an illusion; it's just a physical imitation. Today, the concentration happens to be on more complicated signal processing to maybe two additional speakers, but if you really want to re-create the original environment you can do it synthetically. I made my little system here in my office for just that—just ring the place with speakers with different delays all around. It's a very dramatic sort of effect."

Although Petite thinks that it is hard to make predictions much beyond the next five years, he does believe that dynamic speakers will continue to be the mainstay of high-fidelity reproduction for the foreseeable future. Of electrostatic speakers, he said, "I totally discount them because they're not reliable." Commenting on the sonic effect of cabinet shape, Petite noted that the early Boston Acoustics speakers were shallow and wide, which gave them outstanding dispersion characteristics, but people didn't want to give up that much wall space for the

speakers. "So now the current trend is to tower loudspeakers, which, from a user standpoint, I agree are much better. But sonically they are a little further from what you would want to do as a speaker designer."

B

OSTON Acoustics has recently joined the trend toward three-piece speaker systems. Summarizing their benefits, Petite said, "First of all, it's real small. Second, it gives you the opportunity to put the main speakers, those tiny little satellites, where you have to have them, because in most people's situations, that's really the case—it's where you *have* to put them, not where you *want* to put them. And then it gives you the freedom to move the woofer around to where you can get good bass response, which frequently is not where you have to put the main loudspeakers. So small is better, and this is a product that gives you the convenience of small plus the one thing that small usually doesn't give you, which is bass."

Petite also thinks that "in-wall speakers are really good. About the only thing they don't provide is real good deep bass, and that's an issue that is being addressed more and more now. I wouldn't be surprised if five or ten years from now an awful lot [of the speakers] sold were designed for in-wall mounting. It's almost as though we've come full cycle from the Fifties when we were building speakers into closet doors and the walls, and then we all got away from it."

Polk was reluctant to make specific predictions on future trends in loudspeakers. Generally speaking, he believes that "the level of commitment most people are willing to make in order to get a great listening experience is becoming less and less in terms of the amount of interference with their lifestyle that they will permit. They'll spend the money so long as it doesn't interfere with the way that they live their lives. And people have less time, so anything that enables them to enjoy their lives with less effort and less time doing it will be extremely successful." As for the products he might be building in ten years, Polk would say only, "If I knew that, I would be building them now." □

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BEST RECORDINGS OF THE MONTH

Stereo Review's critics choose the outstanding current releases

DASH RIP ROCK BUILDS UP SOUTHERN STEAM

DASH RIP ROCK is quite simply the best of the new bands to come out of the deep South since R.E.M. and the Georgia Satellites. I haven't heard a record in recent months that I enjoyed more than "Ace of Clubs," this New Orleans trio's second album. (Their 1987 debut, on 688 Records, is well worth searching out, too.) They've got it all: songwriting smarts, musical chops to burn, a regional identity that comes through in their songs, a well-cultivated sense of irony, and a serious side to boot. Imagine a literate, late-model rockabilly-pop band in Sun Studios, with Sam Phillips and Flannery O'Connor co-producing and Dave Edmunds sitting in; that's roughly what Dash Rip Rock is up to in "Ace of Clubs."

They apply uncommon insight to the distasteful matter of class and caste in the South in *Legacy* and depict one scared rebel's bird's-eye view of the Civil War in the electrified bluegrass romp *Mud Island*. Guitarist Bill Davis's high-octane twang and raspy vocals turn a macabre ode to Fifties singer *Johnny Ace*, dead by his own hand in a game of Russian roulette, into an opportunity to blow off the kind of steam that must build up inside every rock-and-roller now and then. Davis gets some red-hot licks off in the instrumental *Scratchy*, too. The sound of breaking glass cues guest guitarist (and Georgia Satellite) Dan Baird's feisty solo in the booze-fueled tantrum *Leave Me Alone (with My Bottle)*.

The pensive flip side of this rowdy crew is evident in such songs as the delightfully poppish *Lisa*, the folkish, pretty *Blue Moon at Midnight*, the mysterious, blues-tinged *Marsupial*, and the clenched and

angry *Money Love Time*, a let's-get-metaphysical tirade with a great, growled last verse. In the coy rocker *Go Home Little Girl*, the singer actually turns down a girl's advances. How's that for a twist? All in all, "Ace of Clubs" manages to be thoughtful and unbridled at the same time. It's easily one of the most intriguing and listenable albums of 1989. *Parke Puterbaugh*

DASH RIP ROCK: *Ace of Clubs*. Bill Davis (guitar, vocals); "Hoaky" Hickel, Jr. (bass); Fred LeBlanc (drums, vocals); other musicians. *Legacy; Jenny Says; All Hung Up; Leave Me Alone (with My Bottle); Lisa; Money Love Time; Johnny Ace; Go Home Little Girl; Mud Island; Scratchy; Blue Moon at Midnight; Marsupial.* MAMMOTH MR-0014, © MR-0014-4, © MR-0014-2 (35 min). Available from Important Record Distributors, Inc., 187-07 Henderson Ave., Hollis, NY 11423.

MULLOVA AND PREVIN AND SHOSTAKOVICH

SHOSTAKOVICH'S First Violin Concerto is by all odds one of the most remarkable such works composed in our century, trembling, it would seem, on the edge of the so-called "standard repertoire." The new Philips recording by Viktoria Mullova, with the Royal Philharmonic under André Previn, might well push the work over that edge, to a permanent place beside the concertos of Beethoven, Brahms, and Tchaikovsky.

The First Concerto was one of those urgently personal works Shostakovich composed at the time of the notorious blast from Stalin's spokesman Andrei Zhdanov in 1948 and prudently put away to be brought out at a more propitious time. It was dedicated to the violinist David Oistrakh, who introduced it in New York a few weeks after giving the première in Leningrad in the fall of 1955. He recorded it at the time of the New York performance, with Dimitri Mitropoulos and the Philharmonic, and rerecorded it in stereo in 1972 in London, in Shostakovich's presence, with the New Philharmonia Orchestra conducted by the composer's son, Maxim. Both of those recordings are treasurable, but so is Mullova's, which in several respects makes an even more striking impact.

Mullova's playing shows an abundance of both passion and intelligence. She has, of course, been able to study Oistrakh's wonderful interpretation in forming her own, but hers is neither an imitation of his nor a pointless attempt to be different for the sake of individuality. Every phrase lights up her consummate grasp of the work, both in broad outline and in minute detail—the sort of assuredness that enables a performer to play with the utmost freedom and spontaneity, in meditative and fiery passages alike. The urgency of Mullova's performance is as much a matter of deep inwardness and utter conviction as of sheer drive.

It is not a one-woman show, however. Previn's own sure feeling for Shostakovich has never been more

Dash Rip Rock: songwriting smarts and musical chops



BEST RECORDINGS OF THE MONTH



Mullova: passion and intelligence

Philips has gone all-out to match the achievement of the performers with a sonic frame exceptional for its detail, balance, richness, and overall vividness. If this review suggests I've simply been swept away—well, why wouldn't anyone want a musical experience to do just that? Magnificent is the word for this recording. *Richard Freed*

SHOSTAKOVICH: *Violin Concerto No. 1, in A Minor, Op. 77/99*. **PROKOFIEV:** *Violin Concerto No. 2, in G Minor, Op. 63*. Viktoria Mullova (violin); Royal Philharmonic Orchestra. André Previn cond. PHILIPS © 422 364-2 (61 min).

THE BODEANS: SONGS FROM HOME

OOWEE, these Wisconsin boys have got the goods. Of course, they've put out two very fine albums already, but their new one, "Home," is the hat trick. It proves that the BoDeans are a major band with major talent.

The BoDeans have two strong songwriters in their lead singers, Sam Llanas and Kurt Neumann,

whose compositional styles combine as well as their voices do. Llanas has a gritty, populist sensibility, and his realistic descriptions pack a wallop. In *No One*, a portrait of a down-and-out woman who desperately takes her only comfort out of a bottle, he sings, "Cherry, Cherry, will start to talk when she's feelin' her drunk / Sometimes there's no one to listen that don't stand in her way." Neumann, on the other hand, lets the images and word play come tumbling out like undisciplined children. Even when his lyrics are a bit vague, they often disclose a sharply observed truth. *You Don't Get Much* seems to be describing the friendship Neumann has with Llanas, when he sings, "There's two boys holdin' stars for wishin' / One boy's sure / One says, 'I don't know.'"

Musically, "Home" displays a range of musical riches. *Good Work* takes the influence of Chuck Berry into the Nineties, with its ringing guitar and irresistible beat. *Beaujolais* is a sweet, plodding folk song with a simple pairing of acoustic guitar and acoustic bass topped off with a melancholy accordion. Most of the album, however, takes a simple, straightforward rock-and-roll path: guitar, bass, drums, keyboards. Neumann is a minimal soloist who has the sure instincts of a

Neumann and Llanas of the BoDeans



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persuasive than in this superb collaboration. There is not only full accord with the soloist on the basic interpretive overview, but a flexibility that keeps the performance charged up with the sort of constantly refreshing give and take that would have listeners on the edges of their seats at a live concert and is the more remarkable in a studio session. These qualities are electrifying in the demonic scherzo and the concluding burlesque, and they insure that the intervening passacaglia touches us deeply without added emphasis.

The second work on the disc is the more familiar Second Violin Concerto of Prokofiev, a splendid piece that calls for and receives a performance on the same exalted level as the Shostakovich. The final movement might have been invested with a more overtly folkish quality, but it is certainly not short on vigor or playfulness, and the preceding andante is otherworldly in its tenderness.

Such music making would be irresistible in any decent recording, but



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BEST RECORDINGS OF THE MONTH

fine rhythm guitarist. He and his colleagues treat these songs like tracks, not springboards for instrumental pyrotechnics. Judging by the credits for "Home," the BoDeans are currently without a regular drummer, but for this album they recruited Kenny Aronoff, of John Mellencamp's band, for most of the tracks. Once again, Aronoff shows that he's one of the finest rhythm players currently working in rock, able to push a tune or fill it out without getting in the way.

Finally, a word about the harmonies that Neumann and Llanas produce. Both men have nasal voices, and separately they sound clear and convincing, if not beautiful. Together, they manage to produce a sound that is often chilling. In the first BoDeans album, they sounded like an keening version of the Everly Brothers. Since then they've been, if anything, even less mellifluous, but when the song calls for it they can raise the hackles of any listener. In word or in sound, these two singers are compelling partners. And they're still getting better.

Ron Givens

THE BODEANS: *Home*. BoDeans (vocals and instrumentals); other musicians. *When the Love Is Good (I Mean Good)*; *Beautiful Rain*; *Fire in the Hole*; *Good Work*; *No One*; *You Don't Get Much*; *Hand in Hand*; *Worlds Away*; *Far Far Away from My Heart*; *Brand New*; *Red River*; *Beaujolais*; *Sylvia* (CD only); *I'll Be There (VooDoo)* (CD only); *Tied Down and Chained* (CD only). SLASH/REPRISE 25876-1, © 25876-4, © 25876-2 (58 min).

NORRINGTON'S EXHILARATING BEETHOVEN

THE new recordings of Beethoven's Fourth, Fifth, and Seventh by Roger Norrington and his London Classical Players complete their revelatory traversal of the composer's nine symphonies. The performances are revelatory not merely because of the use of period instruments tuned to the concert pitch of Beethoven's day or even Norrington's following Beethoven's metronomic tempo indications, but more particularly because of the consistent musicality displayed by both the conductor and his ensemble throughout the series. They force you to hear Beethoven with new ears. As Norrington has said, he wants his listeners to experience some of the same shock, and even bewilderment, that affected audiences hearing the Beethoven symphonies when they were new.

The Fourth, in Norrington's hands, leans toward fast tempos except for the scherzo, which gets a surprisingly restrained treatment. It is fascinating to hear the horn "flare" at the end of this movement on the natural, unvalved instrument and to experience a totally different sound with the soft timpani roll that ushers in the recapitulation of the first movement. The bassoon work at the concluding reprise of the finale simply begs descrip-

tion. The London Classical Players are an agile lot.

The reading of the Fifth Symphony has its controversial aspects: The famous opening motive is shorn of both the fermatas that usually follow the initial three notes and the diminuendo on the last note. Nor is there any lingering in the andante, where the *con moto* is just that. Less controversial is the decision to repeat the main body of the scherzo—a practice that has become nearly the rule in view of recent musicological research. One of the remarkable aspects of the finale as it is done here is the effortless fast crescendo into the fanfare reprise—carried off at tempo and for once not degenerating into a desperate scramble.

Norrington's interpretation of the Seventh is decidedly Toscaninian in its swiftness and dynamism. There's nothing of the funereal in the famous allegretto, and the scherzo is in very much the spirit of the 1936 Toscanini—New York Philharmonic recording, whose fast tempo for the trio raised a few eyebrows in its day. As for the two overtures that fill out the disc, the *Coriolan* is full of tension and drama, but the *Egmont* will upset a few preconceptions: no portentous fermatas in the opening bars but stern observance of the *marcato* (stressed) element specified in the score. The whole capsulized drama is played out to its end in just six and a half minutes instead of the usual eight or so.

As in the best of the Norrington performances—which is to say, most of them—one comes away exhilarated by the spirit of the readings, by the enthusiasm and fabulous agility of the players, and by the sense of having experienced a new and invigorating way to hear Beethoven's music.

David Hall

BEETHOVEN: *Symphony No. 4, in B-flat Major, Op. 60*; *Symphony No. 5, in C Minor, Op. 67*. London Classical Players, Roger Norrington cond. EMI/ANGEL © 4DS 49656, © CDC 49656 (64 min).

BEETHOVEN: *Symphony No. 7, in A Major, Op. 92*; *Coriolan Overture, Op. 65*; *Egmont Overture, Op. 84*. London Classical Players, Roger Norrington cond. EMI/ANGEL © 4DS 49816. © CDC 49816 (51 min).

Norrington: consistent musicality





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*Discs and tapes reviewed by
Chris Albertson, Phyl Garland,
Ron Givens, Roy Hemming,
Alanna Nash, Parke
Puterbaugh, Steve Simels*

THE BODEANS: *Home* (see Best of the Month, page 124)

ALICE COOPER: *Trash*. Alice Cooper (vocals); vocal and instrumental accompaniment. *Poison*: *Spark in the Dark*; *House of Fire*; *Why Trust You*; *Only My Heart Talkin'*; and five others. EPIC OE 45137, © OET 45137, © EK 45137 (40 min).

Performance: *Schlocky*
Recording: *Shrill*

As a solo artist, Alice Cooper has been groping for a style that would suit him and sell a few records, but without the Halloween-night theatricality and hard-rock punch of his old band he's been missing the mark. "Trash" is the latest in a string of forgettable albums, notable only for its calculated turn toward poppier-sounding hard stuff after the undiluted heavy-metal grunge of his last few outings. "Trash" is the musical equivalent of a celebrity roast, with members of Bon Jovi, Aerosmith, and Winger showing up to lend a hand and Joan Jett and Desmond Child joining Cooper in the songwriting credits. Child, in fact, co-wrote nearly everything here (he is to problematic recording projects what Red Adair is to oil-field emergencies: a trouble-shooting hired gun).

As Lite Metal, "Trash" is definitely less filling. Cooper's stodgy growl, lacking the forceful power of his vocals circa *Eighteen* and *Under My Wheels*, is ill suited for conveying convoluted "romantic" sentiments such as *Hell Is Living Without You*. Old Black Eyes is no Sinatra when it comes to putting across a love song; in fact, the lyrics invariably sound like a prelude to domestic violence. How does Alice love thee? Let me count the ways: "Pull my trigger, I get bigger/Then I'm lots of fun," he playfully boasts in *I'm Your Gun*. "I want to hurt you just to hear you screaming my name," he jests in *Poison*. And to the target of his lighthearted jibes in *Why Trust You* he sings, "The noose is getting tighter/Your face is turning whiter/

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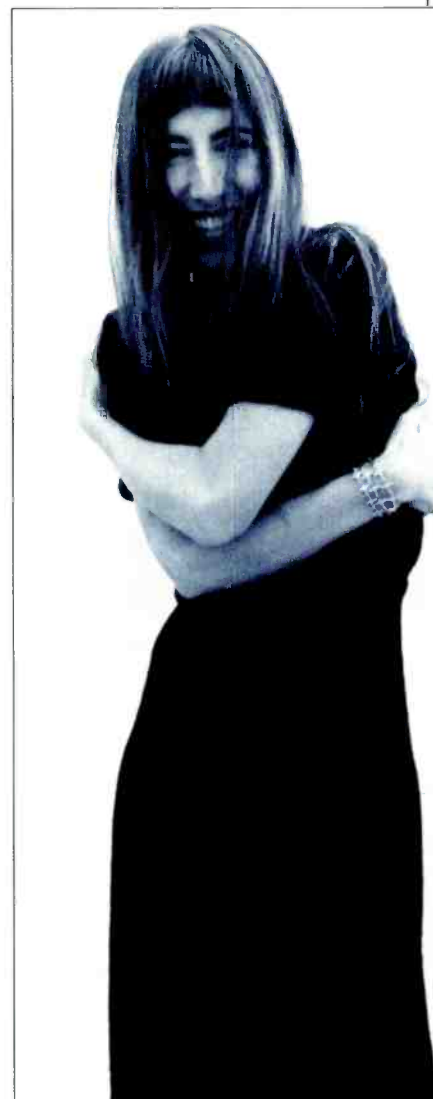
SURPRISE! IT'S SYD STRAW!

IN a purely secular way, Syd Straw sings in tongues. Whether it's a song she's co-written—there're nine of those in her solo debut, "Surprise"—or one she's plucked out of the basic repertoire (there's one here by Peter Holsapple of the dB's and one by nineteenth-century fave-rave Stephen Foster), Straw burrows down to the deep structure, the emotional heart of the material. In songs like *Heart of Darkness* and *Golden Dreams*, that means she sings plainly, with a husky, country-western softness. In *Future 40's* (*String of Pearls*) and *Sphinx*, her performance has the informed edge of the hippoisie. *Think Too Hard* and *Hard Times* are belted-out rock and plain-sung minstrelsy.

Behind the whole album is an attitude of artfulness, an intelligent mind attempting to demonstrate "emotion" and "taste" and "range." But in front of "Surprise"—surprise!—is a voice driven by a heart. Aesthetics and irony and postmodernism may be the subtext here, but the text is emotion. Without the latter, the former is empty posturing. Because Syd Straw sings with passion as well as thought, her album is worth feeling as well as knowing.

Some may know Straw as the former lead singer for the Golden Palominos. Her work with that changeable group was fine, but it didn't promise what she's done in "Surprise"—another surprise! For her solo album, Straw has drawn upon a wealth of contacts, demonstrating a considerable talent for networking. Marshall Crenshaw, Richard Thompson, Michael Stipe, Don Was, Benmont Tench, Bernie Worrell, Ry Cooder, Van Dyke Parks, Chris Stamey, Peter Dinklage, Dave Alvin, John Doe, Roger Eno, and Daniel Lanois are among the back-up performers on these varied cuts. Holding it all together, in a sense, is Straw. She produced five of the tracks herself and five with one other person, and only one song was produced entirely by someone else (Lanois). If Straw is a chameleon of sorts, at least she's her own chameleon of sorts.

Writing or singing, she has a way with words. *Heart of Darkness* says this about the awful translucence of relationships: "I'm looking through your heart of darkness/Past the gray to the light on the other side." Again, in *Sphinx*, she returns to the pain of passion: "Isn't it hard when it finally hits/That your lover is less than a friend/And all your exchanges are just poor counterfeits/For tender too precious to spend." She can be elliptical; *Future 40's*—which was written, appropriately



enough, with Michael Stipe as well as Jody Harris—seems to be a second thought about overoptimism, perhaps the idealism of the late Sixties and Seventies. Or perhaps not.

Syd Straw can rock, she can croon, she can opine, she can moon, she can smirk, and she can swoon. "Surprise" is a great album. And a pleasant surprise.

Ron Givens

SYD STRAW: *Surprise*. Syd Straw (vocals); other musicians. *Think Too Hard*; *Heart of Darkness*; *Chasing Vapor Trails* (*His Turn to Cry*); *Almost Magic*; *Crazy American*; *Hard Times*; *Future 40's* (*String of Pearls*); *The Unanswered Question*; *Sphinx*; *Racing to the Ruins*; *Golden Dreams*. VIRGIN 91266-1, © 91266-4, © 91266-2 (49 min).

ANDRE LANSSEL/VIRGIN RECORDS



Carole Davis: no nonsense

You can stuff it up your muffin and go stick it in the fire." Alice, it's time to put the act in mothballs and go back to work on your golf game. P.P.

DASH RIP ROCK: *Ace of Clubs* (see Best of the Month, page 123)

CAROLE DAVIS: *Heart of Gold*. Carole Davis (vocals); Nile Rodgers (guitars, keyboards); vocal and instrumental accompaniment. *It's in My Genes; Dissin' Jerome (Girl Talk); When My Money's Gone; Serious Money; The Thigh's the Limit;* and five others. WARNER BROS. 1-25903, © 4-25903, © 2-25903 (43 min).

Performance: *Something different*
Recording: *Very good*

What do you get when you pair producer Nile Rodgers with a white woman who grew up in London, Paris, Rome, Bangkok, and Phnom-Penh listening to black soul music, Patti Smith, and Debbie Harry? Well, to start with, you get a remarkably imaginative record by a woman who says she wants to be "the ambassadress of hip-hop funk by making it acceptable to the fifteen-year-old white girl in Iowa who can't identify with Ice T or Big Daddy Kane."

Davis, who wrote a song for Prince's Grammy-nominated "Sign 'O' the Times," makes her recording debut here with ten dance tunes that stretch the form of the genre, melding hip-hop, dance, and pure funk, and challenge conventional approaches to lyrics, melody, instrumentation, and production.

Her hard-muscle themes reflect struggles between sweet love and unvarnished sex, high ideals and street smarts, and the importance of keeping an eye on the bottom line. This material girl is tough, no-nonsense, and independent, throwing over the flirty pucker of most dance divas for a straightforward, if humorous, attack. As she writes in one song, "Antonio was a gigolo/But he loved me for free."

Is this truly "thinking man's dance fodder," as one reviewer believes? That's probably an oxymoron, but it's true that Davis and Rodgers grab you quick and never let you loose, particularly through the use of spoken cameo voices, which appear throughout the album both as sexy black raps and, in a brilliant remake of the O'Jays' *For the Love of Money* (retitled *Serious Money*), as the sort of layered collages Joni Mitchell frequently employs.

Davis isn't terribly romantic—and certainly not sentimental—but she finds a nice meeting ground between cynicism and vulnerability. If she keeps on like this, she could give dance music a bad reputation of the best kind. A.N.

GAIL ANN DORSEY: *The Corporate World*. Gail Ann Dorsey (vocals, bass, guitar); other musicians. *Wasted Country; Where Is Your Love?; If Only You; Just Another Dream; So Hard to Let You Go;* and five others. SIRE 25913-1, © 25913-4, © 25913-2 (45 min).

Performance: *Stunning*
Recording: *Excellent*

Gail Ann Dorsey, who grew up in Philadelphia but moved to London to seek her musical fortune, has come up with a stunning debut album that offers just the right combination of African-American soul and international rock to make her the ultimate crossover artist. Her approach to both music and lyrics is fresh and bold, and while many of her songs deal with the usual romantic themes, she often comments as well on contemporary values—or the lack of them. *Wasted Country* deals with the environmental ruin wrought by man, but from the vantage point of a child who cannot go out to play because the air is dangerous to breathe. *Wishing I Was Someone Else* explores the covetous materialism so common these days, and the title track, *The Corporate World*, uses a background of overheard spoken remarks to underscore lyrics that portray a bloodless, soulless view of contemporary life and love.

Dorsey would be special if only for the quality of her lyrics, but the same excellence prevails in her performances here. Her assertive contralto is anchored by her authoritative bass accompaniment, interwoven with a chorus of guitar statements by Bob Roberts and, on one track, Eric Clapton. That's good company to be in. At times, her sound seems closely linked to British rock, but she has imposed her own ocean-strad-

dling personality on first-rate material that she makes entirely her own. P.G.

EDDIE AND THE CRUISERS II: EDDIE LIVES. Original-soundtrack album. John Callerty and the Beaver Brown Band (vocals and instrumentals). *Runnin' Thru the Fire; Just a Matter of Time; Open Road; Maryia; Emotional Storm;* and five others. SCOTTI BROTHERS/CBS BFZ 45297, © FZT 45297, © ZK 45297 (43 min).

Performance: *Bland by design?*
Recording: *Okay*

The original *Eddie and the Cruisers* was, among other things, one of the odder commercial phenomena of recent years. A theatrical flop, it nonetheless became a sensation after airing a year later on HBO—hardly a conventional marketing strategy, but it also made the soundtrack album a hit. The picture was fairly audacious in its own right, however. Melodramatic excesses aside, it functioned rather neatly both as a mystery (did its Dylanesque hero fake his death?) and as a meditation on idealism gone sour. It was, in short, one of the more original rock-and-roll films of the decade, and it was helped in no small measure by a genuinely evocative bunch of songs by John Callerty, a usually undistinguished Springsteen clone whose music managed to strike just the right note for the picture's early-Sixties New Jersey milieu.

I haven't seen the sequel from which this new soundtrack album is drawn,

Gail Ann Dorsey: bold soul



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DON HENLEY



DON HENLEY'S "The End of the Innocence" is one of those albums that, if not exactly perfect, nonetheless perfectly capture a moment in time—in this case the shroud of confusion and chaos that envelops America as the Eighties wind down. In his last album, "Building the Perfect Beast," Henley segregated the personal songs from the political ones; here the lines blur as the personal informs the political and vice versa. "The End of the Innocence" is steeped in anger, despair, and even helplessness, but how can we hope to change things in a country whose citizens have been a willing party to their own deception? Henley seems to think that one way to start is by holding a mirror up to ourselves, and he does just that in "The End of the Innocence." He is brutally frank about annotating our moral apocalypse.

With only three albums to show for an entire decade, one might legitimately wonder about Henley's degree of commitment to the music business. And what right has a rich, reclusive rock star to point his finger at society when his own lifestyle has hardly been completely blameless? Well, perhaps because Henley has his own conundrums to work through, his new album has the ring of authenticity and the callused rub of honesty. A drummer as well as a singer, he has become so involved with finding just the right expression of his lyrical themes that he doesn't even play or program the drum parts, leaving the musical details largely to his chief collaborator, Danny Kortchmar. Like a less subversive Kip Hanrahan or Carla Bley, Henley occasionally allows his guest artists, such as Bruce Hornsby, to shape the dominant mood of a song

rather than leave a forceful front-and-center imprint of his own.

"The End of the Innocence" opens with the title song, a haunting paean to the fading American dream. It is a reflective pause before the nightmarish reckoning ahead, framed by simple block chords from pianist and co-writer Hornsby. Henley quotes the Bible and *America the Beautiful* as he paints a picture of storm clouds on the horizon.

The heavens break open and the thunder rumbles all over the rest of the album. *How Bad Do You Want It?* depicts a playboy turning away from love, incapable of making a commitment though he pays lip service to the ideal. "How bad do you want it? Not bad enough!" snarls Henley against a throbbing, grinding, and deliberately abrasive musical track. Equally aggressive is *I Will Not Go Quietly*, in which tantrum-prone Guns 'n' Roses singer Axl Rose raucously raises his voice alongside Henley's. Reality is again confronted head-on in *Shangri-La*, a dense, oozing piece of music.

The loping, faintly reggaetied *Little Tin God* is a song about televangelists and received belief systems that makes its points with something resembling compassion and common sense. *Gimme What You Got*, on the other hand, goes straight for the jugular as Henley excoriates the all-American culture of consumptive greed. The erosion of values receives its final shaking out in *If Dirt Were Dollars*, a plain-spoken narrative with unguessed guitars in the rustic, rootsy vein of John Cougar Mellencamp. *New York Minute* is the album's big production number, with Gershwinlike strings and piano flourishes sweeping blue brushstrokes across the musical canvas. Henley sings about how perceptions of reality can change in a "New York minute," with a personal loss suddenly yanking the tragic world outside into close-up focus.

"The End of the Innocence" portrays a society that's lost sight of the values that anchor lives and make them meaningful. In the final track, *The Heart of the Matter*, the implication is that in order for this country to heal itself, people must first learn to compose their own lives. That, in this album of wise, naked songs, is the long and short of it.

Parke Puterbaugh

DON HENLEY: *The End of the Innocence*. Don Henley (vocals); vocal and instrumental accompaniment. *The End of the Innocence*; *How Bad Do You Want It?*; *I Will Not Go Quietly*; *The Last Worthless Evening*; *New York Minute*; *Shangri-La*; *Little Tin God*; *Gimme What You Got*; *If Dirt Were Dollars*; *The Heart of the Matter*. GEF-FEN GHS 24217, © M5G 24217, © 2-24217 (53 min).

but the songs seem deliberately uninteresting, bland amalgams of late-Seventies clichés—precisely the sort of mediocre radio fodder that Eddie would find dominating the rock charts if he really did come back. It might work in the theater, but in my living room it was roughly as thrilling as tapes of an average Bob Seger tribute band rehearsing in a Jersey bar. Of course, the soundtrack of *Eddie I* probably sounds underwhelming if you haven't seen the movie, so I'll give this one another listen later out of critical responsibility. Whether you need to be that open-minded is between you and your conscience. S.S.

HOODOO GURUS: *Magnum cum Louder*. Hoodoo Gurus (vocals and instrumentals); other musicians. *Come Anytime*; *Another World*; *Axe Grinder*; *Shadow Me*; *Glamourpuss*; and six others. RCA 9781-1-R, © 9781-4-R, © 9781-2-R (40 min).

Performance: *Woolly*
Recording: *A little thin*

Talk about the real deal: Hoodoo Gurus make rock-and-roll as if nobody had ever invented synthesizers, digital recording, and power ballads. Unlike most of the rock bands you hear today, whose music is carefully calculated for just the right effect, whether emotional or commercial, Hoodoo Gurus let nothing stand between their essential creative spark and the final gurus result. In "Magnum cum Louder," as in their previous albums, these four Australians demonstrate the power of simplicity.

The Hoodoos' music basically consists of one acoustic guitar, one electric guitar, one bass, and one drum set, with one guy doing most of the singing. The arrangements, if you can call them that, are not in the least fussy or calculated. *Come Anytime* is a simple affirmation of affection set to a driving, straightforward electric-guitar riff. So is *All the Way*. So is *Death in the Afternoon*. The topics change, as do the riffs, but the Hoodoos don't waste time agonizing over their licks or their thoughts. They have the courage of their convictions and their talents. Although the songs in "Magnum cum Louder" start from uncomplicated premises, they often show wit, cleverness, even subtlety. The group frequently uses parody, but with such a straight face that you often cannot tell whether they believe what they're singing. Maybe that's intentional. *Axe Grinder*, however, is an intentional trashing of self-conscious, pretentious heavy metal. *I Don't Know Anything* captures perfectly the mindset of someone who is smart enough to know how stupid he is, but not smart enough to do anything about it.

Too many bands think too hard about their audience and get hung up on how people will react. Hoodoo Gurus show how much feeling and how much fun it can be to trust the pure creative impulse. R.G.

INDIO: *Big Harvest*. Gordon Peterson (vocals, guitar, keyboards, percussion); instrumental accompaniment. *The Grinding Wheel; Discovery; Save for the Memory; Big Harvest; Hard Sun*; and six others. A&M SP 5257, ©CS 5257, ©CD 5257 (52 min).

Performance: *Intense*
Recording: *Very good*

Gordon Peterson—who bills himself as Indio even though he's essentially a one-man act with studio help—takes no prisoners. When he rockets through one of his hyperextended folk songs, you feel as if you've been Rolfed. In "Big Harvest" the music just pounds away, the percussive effects of his singing, his guitar playing, and some exceptional rhythm-section work all giving the tunes an explosive quality. I only wish I knew what Peterson was singing about. He doesn't lack commitment, but I honestly can't tell what he's committed to—or against. The snatches of lyrics I can decipher appear somewhat mystical, although I haven't deciphered enough of them to know for sure. The music, however, with its Asian-Indian undertones, is enough to hold my interest. Perhaps by the time his next album comes out, I'll have figured out the words to this one. I hope he's worked a

little on his enunciation by then, or that his record company sees fit to bless us with a lyric sheet. *R.G.*

CHRIS ISAAK: *Heart Shaped World*. Chris Isaak (vocals, guitar); James Calvin Wilsey (guitar); Kenny Dale Johnson (drums, vocals); Rowland Salley (bass, vocals); other musicians. *Shaped World; I'm Not Waiting; Don't Make Me Dream About You; Kings of the Highway; Wicked Game*; and five others (six others on CD). REPRISÉ 25837-1, © 25837-4, © 25837-2 (41 min).

Performance: *Intense and moody*
Recording: *Excellent*

This is Chris Isaak's third album, and once again he's playing the role of Roy Orbison Redux—that is, contemporary rockabilly's Loneliest Man in the World. In song after song here, he's pining for some unattainable beauty, confused about his feelings, and generally carrying on as if he's just bought a co-op at Heatbreak Hotel. The musical idiom for all of this is a sort of hipster version of "The Sun Sessions," all minor keys, twangy minimalist guitar lines, and occasional discrete Fifties jazz-trumpet obbligatos (a nice touch given Isaak's eerie resemblance to the late Chet Baker). There's a certain hothouse quality

to the whole business, of course, a sense of contrivance that can get a little wearing over the course of an entire album. Still, Isaak's a genuinely expressive singer, his band is superb (particularly guitarist James Calvin Wilsey), and Erik Jacobsen's production catches just the late-night, last-call atmosphere the music needs. Which means that, at least on a song-to-song basis (pick hit: *Wrong to Love You*, which suggests the Ventures and Dire Straits on a crying jag), "Heart Shaped World" is a pretty impressive piece of work overall. Worth a listen. *S.S.*

THE JACKSONS: *2300 Jackson Street*. Jermaine, Jackie, Tito, and Randall Jackson (vocals); vocal and instrumental accompaniment. *Art of Madness; Nothin' (that compares 2 U); Maria; Private Affair; 2300 Jackson Street*; and five others. EPIC OE 40911, ©OET 40911, ©EK 40911 (54 min).

Performance: *Still special*
Recording: *Excellent*

It seems hard to believe that the Jacksons have been performing—in one configuration or another—for twenty-five years. It is to their credit that they have retained a sense of daring as well as a healthy respect for quality. Both are

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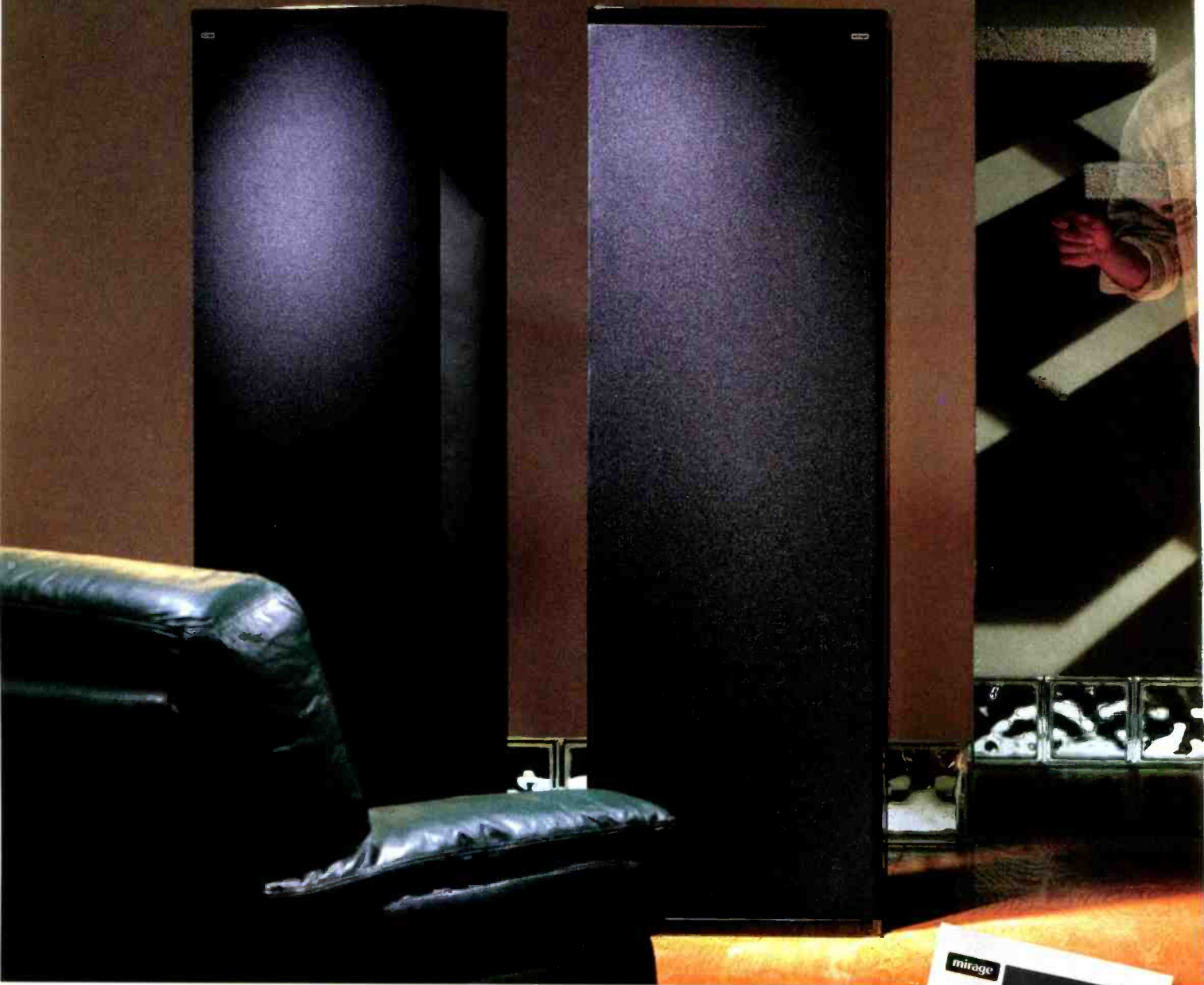
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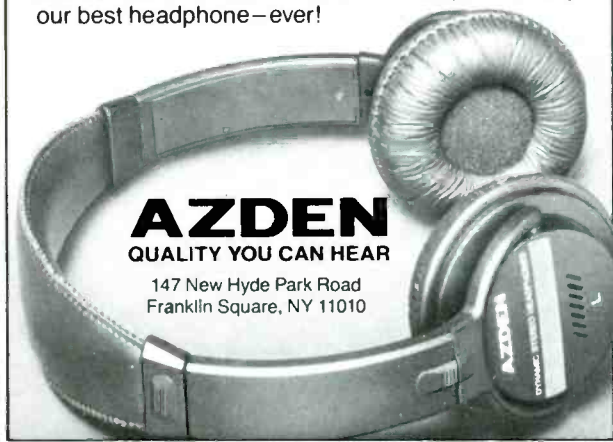
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apparent in this new album. Although the Jacksons are known for their consummate skill in blending and exchanging vocal lines to achieve rich textures, they venture here into rougher sounds of a more recent vintage with the harder-edged *Harley, Play It Up*, and *Midnight Rendezvous* and the delightfully propulsive *She*. They even offer a nod to tradition with *Alright with Me*, which is cast in a modern r-&-b groove. Yet the best selections here are those where they reach back to draw from the sweeter sounds that made them the public's favorites so many years ago. The title song, *2300 Jackson Street*, is a paean to their humble beginnings in a working-class neighborhood in Gary, Indiana. Featuring cameo appearances by the other star-class Jacksons, from Michael to Janet, and augmented by a chorus of nieces and nephews, it is as sentimental as an old family album and just as appealing. On a similar plane is the concluding number, *If You'd Only Believe*, with a superb solo by Jermaine, who handles most of the lead vocals throughout with admirable polish. By combining two basically different sounds, the Jacksons have come up with an album that offers enough variety to please both old fans and new followers. P.G.

RICKIE LEE JONES: *Flying Cowboys*. Rickie Lee Jones (vocals, guitar, keyboards); other musicians. *The Horses; Just My Baby; Ghetto of My Mind; Rodeo Girl; Satellites; Ghost Train;* and five others. GEFEN GHS-24246, © M5G-24246, © 2-24246 (55 min).

Performance: *Elliptical*
Recording: *Very good*

Don't try applying logic to Rickie Lee Jones or her art. It just won't work, whether you're analyzing her career, her music, her lyrics, or her singing. She simply goes where she goes, whether it makes sense or not. Her previous albums are no preparation for "Flying Cowboys." With each successive record release, Jones has been moving away from the straight-on pop of her debut, but this album is more elliptical and free-flowing than anything she's done before.

"Flying Cowboys" does have its direct moments. *Just My Baby* is an easy pop song about how the singer's boy friend "lights up all of me." *Ghetto of My Mind* is a snappy, well-controlled rocker about an ethnic neighborhood. *Love Is Gonna Bring Us Back Alive* is a reggae-driven tribute to the redemptive power of love. *Don't Let the Sun Catch You Crying* is a soft remake of what was a very tender hit for Gerry and the Pacemakers. These are the transparent songs; you can see Jones's motives clearly, even if you cannot unravel the exact meanings of all the verses and metaphors.

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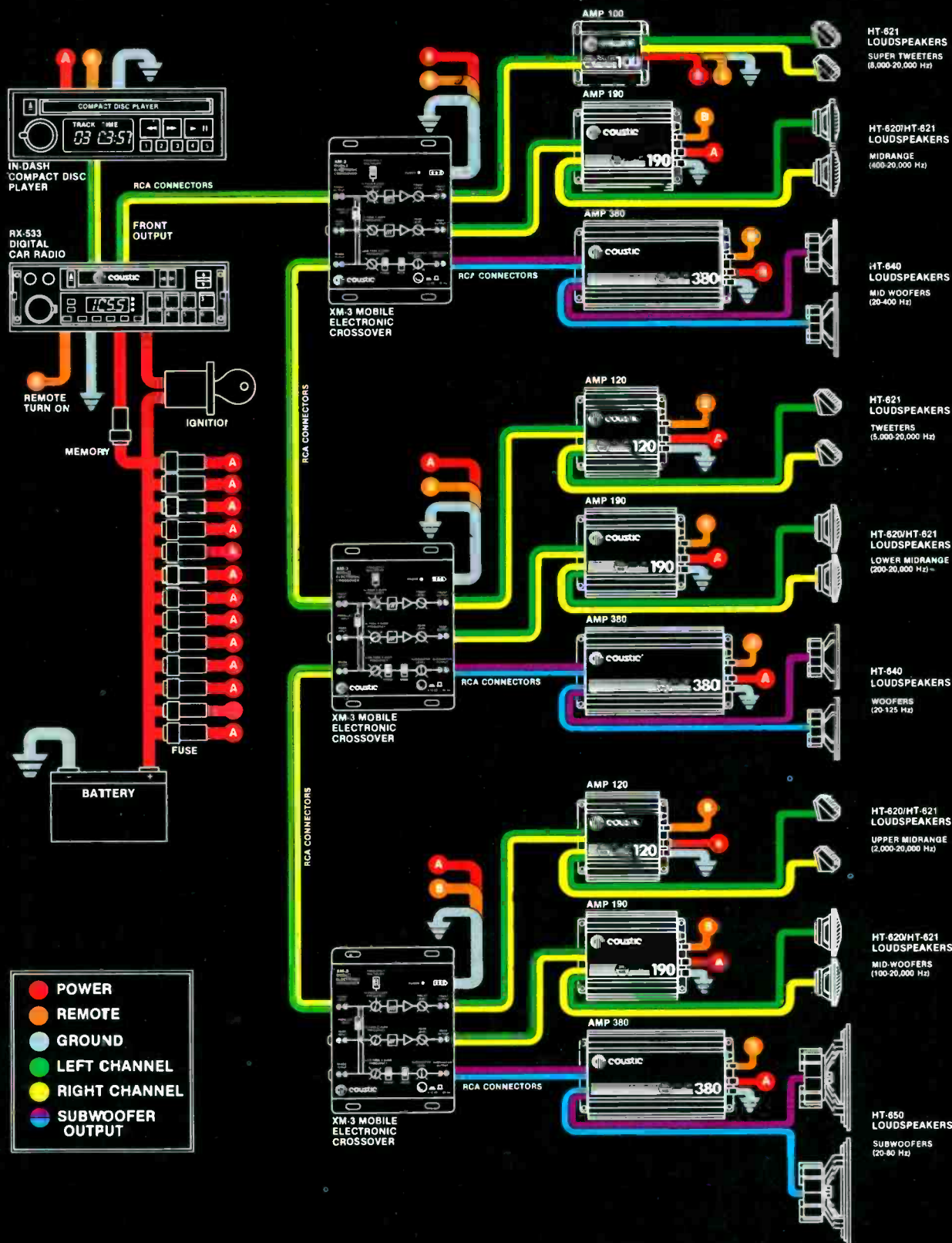


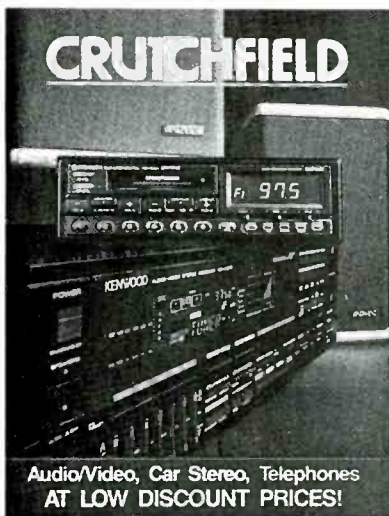
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degree of mystery, and some songs are simply opaque. The title track, for example, shifts from an omniscient viewpoint to the narrator's personal one. We don't know who these vaguely realized characters are or what they're doing. The song doesn't describe action so much as it juxtaposes different kinds of angst. Why, if the song doesn't mention flying or cowboys, is it called *Flying Cowboys*?

The music, by contrast, is more extroverted: About half of the album is snappy and propulsive. Appropriately, the more indirect lyrics are set to tunes that drift from one melodic idea to the next. This isn't a bad thing per se, because the languor creates strong moods. The deep sadness and longing of *Away from the Sky*, for example, comes from the still quality of the music.

Jones's singing has never been so restrained. In "Flying Cowboys" she softens the sharply modulated phrasing that has been her trademark. She's not trying to wrench the emotions from these songs; she seduces the material and lets it seduce her in return. For all of its difficult moments, the album seduces us as well. *R.G.*

THE O'JAYS: *Serious*. The O'Jays (vocals); instrumental accompaniment. *Out of My Mind; Leave It Alone; Have You Had Your Love Today?; Serious Hold on Me; Friend of a Friend*; and four others. EMI E1-90921, © E4-90921, © E2-90921 (43 min).

Performance: *Vintage r-&-b*
Recording: *Satisfactory*

Can you imagine the O'Jays, those stalwarts of Sixties and Seventies soul music, indulging in rap? Well, they do for a moment or two in this new album, which pays tribute to current fads, but most of the time they serve up the sort of solid, old-fashioned group singing that made them popular two decades ago. Several of the songs here are simply pleasant without being memorable, but the group does dredge up some powerful emotions in *Serious Hold on Me*, the sort of gut-wrenching soul balladry that is hard to come by these days. It leaves a nice taste in the mouth, sufficient to sustain you through the blander moments. *P.G.*

STACEY Q: *Nights Like This*. Stacey Q (vocals); vocal and instrumental accompaniment. *Give You All My Love; Nights Like This; Heartbeat; Incognito; Take That Holiday*; and five others. ATLANTIC 81962-1, © 81962-4, © 81962-2 (50 min).

Performance: *Fetching*
Recording: *Very good*

In her third Atlantic album, Twiggy-faced Stacey Q (a.k.a. Stacey Swain) makes a valiant effort to expand her repertoire of shiny techno-rock and uptempo dance music with songs that rise

above the usual mirrored-ball fare. Using a variety of producers and musical approaches, Swain, who co-wrote seven of the ten cuts, strives for some real melodies here (*Give You All My Love, Heartbeat*), and while the lyrics are by no means profound, they attempt to aim beyond boy-toy disco fodder. Whether you go for Swain's pouty vocals or not, her rhythms, especially in the float-away fantasy *Take That Holiday*, are undeniably fetching and hypnotic—perhaps just the ticket for those pesky summer's-over blues. *A.N.*

SAMUEL RAMEY: *Sings Rodgers and Hammerstein*. Samuel Ramey (bass); National Philharmonic Orchestra, Peter Matz cond. *June Is Bustin' Out All Over; I Have Dreamed; When the Children Are Asleep; Some Enchanted Evening; The Man I Used to Be; This Nearly Was Mine; Climb Ev'ry Mountain*; and seven others. EMI/ANGEL © 4DS 49581, © CDC 49581 (52 min).

Performance: *Appealing*
Recording: *Excellent*

Samuel Ramey may not have the richest, deepest, or most ringing bass voice in opera, but he knows how to use it intelligently and persuasively—and how to adapt it appealingly to lighter repertoire. He seems much more comfortable with the varied show tunes in this album than he was singing the role of Billy Bigelow in the disappointing MCA recording of Rodgers and Hammerstein's *Carousel*, which may be why his singing has greater conviction and more meaningful tonal shadings. A major part of the credit must certainly go to the airy genial arrangements and conducting of Peter Matz, a pro at this sort of thing.

As would be expected, Ramey is most clearly at ease with the songs Rodgers and Hart wrote for his illustrious Met predecessor, Ezio Pinza, to sing in *South Pacific*. He may be a shade too solemn for *You'll Never Walk Alone* and *Climb Ev'ry Mountain* (they aren't from *Boris Godunov*, after all), but he more than makes up for those near misses with a jaunty *The Man I Used to Be* (from the ill-fated *Pipe Dream*) and several ever-touching romantic ballads from *Allegro, Flower Drum Song*, and *Cinderella*. Overall, this is a more successful crossover album than some of Ramey's operatic colleagues have given us lately. *R.H.*

DIANA ROSS: *Workin' Overtime*. Diana Ross (vocals); vocal and instrumental accompaniment. *Workin' Overtime; Say We Can; Take the Bitter with the Sweet; Bottom Line*; and six others. MOTOWN MOT 6274, © MOTC 6274, © MOTD 6274 (43 min).

Performance: *Unconvincing*
Recording: *Satisfactory*

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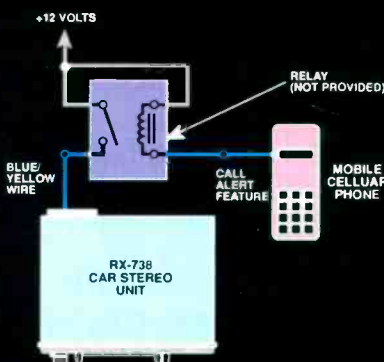
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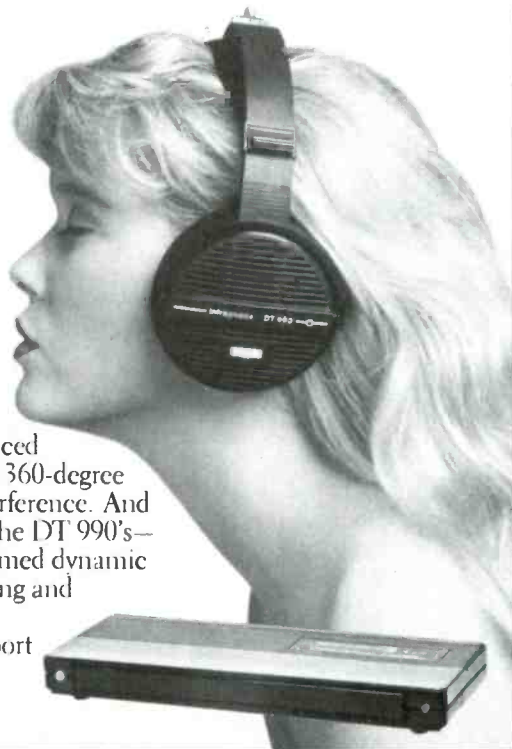
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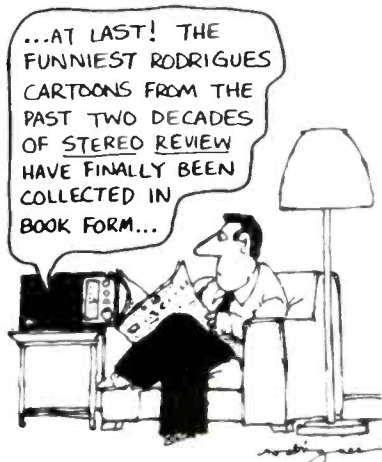


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Motown, is that the material seems totally inappropriate. Working with producer Nile Rodgers, Ross has incorporated the raw and minimally adorned percussive sound favored by contemporary young urbanites. That was a mistake. Street funkiness is hardly convincing when it comes from a woman known for her glamorous lifestyle. The album is salvaged to a degree by songs like Rodger's pretty *This House*, and Ross is in fairly good voice (she sounds more like Michael Jackson than ever). But she's woefully miscast. P.G.

JULES SHEAR: *The Third Party*. Jules Shear (vocals); Marty Willson-Piper (guitar). *I Don't Want It Now; The First Freeze After the Fall; Leave Town; This Primal Fire; Open Your Eyes*; and six others. IRS IRS-82008, © IRSC-82008, © IRSD-82008 (40 min).

Performance: *Good enough*
Recording: *Good enough*

"Remember the folk scare of the early Sixties?" a friend of mine asked me recently. "Whew... that stuff almost caught on." Well, thanks, I assume, to Tracy Chapman, it looks as if that stuff is almost catching on again, for here comes Jules Shear, heretofore a wonderful and successful commercial tunesmith (hits for the Bangles and Cyndi Lauper), backed only by an acoustic guitar in an album that recalls nothing so much as a mediocre Bob Dylan bootleg. Shear natters on at length in a voice that suggests Jackson Browne after a hunger strike, and though he appears to have little to say (the usual fake literary allusions and vague angst), he says it with an almost endearingly reckless abandon.

Notwithstanding a brief collaboration with the Cars' Elliot Easton, nothing—absolutely nothing—disturbs the album's early-Sixties folkie ambience. If you're the kind of purist who thinks pop music's gone downhill since *Subterranean Homesick Blues*, you'll doubtless enjoy this. I do, too, at least in small doses, but given the project's obviously negligible production cost (this is, incidentally, the first singer-and-guitar-without-overdubs release on a major label since Springsteen's "Nebraska"), the least IRS could have done is release it at a bargain price. Hmm... maybe this is an Eighties album after all. S.S.

THE SWANS: *The Burning World*. The Swans (vocals and instrumentals); vocal and instrumental accompaniment. *The River That Runs with Love Won't Run Dry; Let It Come Down; Can't Find My Way Home; Mona Lisa; Mother Earth; (She's a) Universal Emptiness*; and five others. UNI UNI-601, © UNIC-601, © UNID-601 (44 min).

Performance: *Alluring*
Recording: *Lifelike*

Until now, the Swans have had more in common with peevish, cawing crows

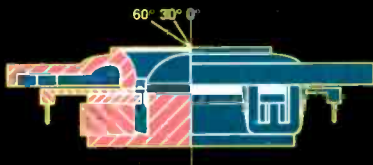
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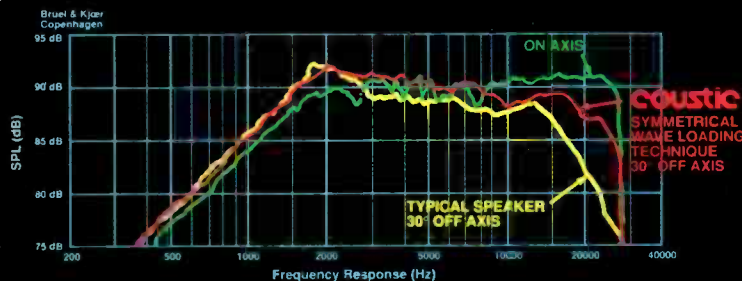
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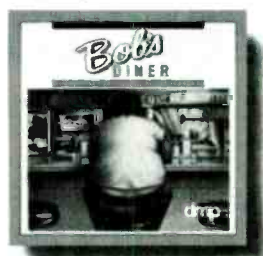
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than with their graceful avian namesakes. But "The Burning World," their major-label debut, is disarming in its depth and trancelike musical power. Credit producer Bill Laswell with allowing singer and guitarist Michael Gira to communicate his dark, poetic despondency without turning the songs into dissonant dirges. Or maybe credit Gira for meeting the world halfway. In any case, "The Burning World" spins an enchanting web that overtakes the listener with the haunting sweep of its moods.

The River That Runs with Love Won't Run Dry is oddly pretty, conveying a timeless feeling reminiscent of the San Francisco group It's a Beautiful Day. *See No More*, with its air of distaff psychedelia in the guitar, also harks back to the mind-altered music of the late Sixties. A female singer named Jarboe cloaks *Can't Find My Way Home*. Steve Winwood's classic song of dislocation and heartbreak, in an incandescent new light. Gira wearily ponders the void in a bassy, resonant voice in (*She's a*) *Universal Emptiness*. Then *Saved* finds him singing, "I don't deserve it, but I'm saved." Perhaps there's light, however faint, at the end of the tunnel after all?

"The Burning World" is a startlingly honest record. The despair sounds genuine, while the moments of transcendence feel earned. And the music—closely miked acoustic string instruments, including mandolins and violins, set against a free-flowing backdrop of trap drums, tablas, and other Middle Eastern exotica—is hypnotically alluring. Seek this one out if you're feeling musically venturesome. *P.P.*

TINA TURNER: Foreign Affair. Tina Turner (vocals); Mark Knopfler (guitar); Edgar Winter (saxophone); other musicians. *Steamy Windows; The Best; You Know Who; Undercover Agent for the Blues; Look Me in the Heart; Be Tender with Me Baby*; and six others. CAPITOL C1-91873, © C4-91873, © C2-91873 (55 min).

Performance: *Platinum*
Recording: *Fine*

Somewhere in the back of Tina Turner's throat lies the secret to her art. When she plunges to the bottom of her vocal range, she becomes totally believable. Her earthy, liquid singing never fails to convince us. She could sing actuarial tables and still break our hearts.

In "Foreign Affair" Turner is much more interesting than the songs she sings. We are still in the "Private Dancer" phase of her career, in which she places her soulful voice in a mild rock context. These cleanly produced albums are enjoyable. They've sold millions of copies. But they're too safe. You can't help wanting Turner to get nasty or greasy or funky.

The closest she comes here to down-

home r-&-b is *Undercover Agent for the Blues*. Mark Knopfler contributes some of his trademark fluid riffs, and the band jogs along as Turner sings. "He took me for a ride/Rattled me down to my shoes/I found out/He was an undercover agent for the blues." It's fun and clever, but a little too casual. Unfortunately, that's even truer for the rest of "Foreign Affair." *R.G.*

WEBB WILDER: Hybrid Vigor. Webb Wilder (vocals and instrumentals). *Hittin' Where It Hurts; Human Cannonball; Do You Know Something (I Don't Know); Cold Front; Safeside*; and five others. ISLAND 91280-1, © 91280-4, © 91280-2 (39 min).

Performance: *Worth your while*
Recording: *Good*

The music of Webb Wilder, Nashville's leading rock-and-roll band, has been called many things—"interplanetary southern roots-rock," "swampadelic uneasy listening," "sci-fi psycho-rockabilly," "detective rock-'n'-roll," "Mississippi moderne," "service station attendant music," and even "VFW metal." Some, though, might argue that with its pared-down, guitar-driven brand of contemporary blues-rock, Webb Wilder is the poor man's Rolling Stones. The group itself, in fact, likes to say it makes the kind of music the Stones would have made had they grown up in Mississippi. Either way, in the band's first album for Island, menacing Stones guitar intros abound, particularly in *Do You Know Something (I Don't Know)*, and an entire Stones persona takes root in such tuneful songs as *Hittin' Where It Hurts* and *Cold Front*. And with occasional influences from everyone from Chuck Berry to Devo, it isn't any wonder Webb Wilder calls this album "Hybrid Vigor," a phrase usually reserved for farm talk about corn bred for toughness.

But that isn't to say that Webb Wilder, or the lead singer it's named after, have nothing to offer. If Wilder himself lacks Mick Jagger's swaggering beauty and thrusting insolence, he and the band make their own mark with songs that take a cockeyed look at romance and sex and the emotional bankruptcy that often follows both. They're much more successful at using humor for the occasional turn of phrase or interior monologue, however, than in bolder attempts to be funny for an entire song, such as *Human Cannonball*, which quickly grows tiresome and deceives the listener as to the band's overall intelligence.

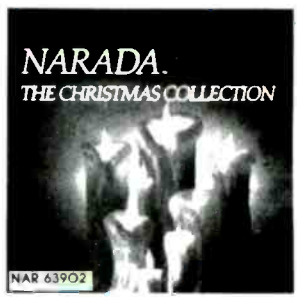
Such flaws aside, it is difficult not to respect a band with such infectious pop melodies, instrumental prowess, and accessible hooks. And considering their long-time credo—"Work hard, rock hard, eat hard, sleep hard, grow big, and wear glasses if you need 'em"—what right-minded American could possibly refuse their charms? *A.N.*



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SAE A-502
 • 200-watts/ch high-current power amp . . . \$449.95

Tandberg 3031A
 • Digital FM tuner with 8-presets . . . \$499.95

Audio Systems



Panasonic SC-T100 Compact Stereo System
 • Quartz-synthesized AM/FM tuner with 16 station preset memory • Double cassette deck • Semi-automatic turntable • 3-band graphic equalizer • Full range 6 1/2" speakers
J&R Price \$179.95 (PAN SCT100)

Panasonic SGX-88K
 • Dual cassette, 3-band equalizer . . . \$139.95

Panasonic SCT-105
 • Compact system with CD player . . . \$349.95

Panasonic SCT-305
 • Remote system with CD player . . . \$399.95

Casio MS-6025
 • 25-watts/ch, remote, dual-cassette . . . \$399.95

Panasonic SCT-505
 • Remote, CD player, dual-cassette . . . \$479.95

Technics SC5-400
 • 110-watts/ch, 5-disc CD-changer . . . CALL

Compact Disc Players



Teac PD-265 Remote Compact Disc Player
 • 16-bit D/A converter • 16-selection random memory • 2-way repeat • 4-digit LED display • 3-beam laser pickup • 3" CD compatible • Remote control
J&R Price \$159.95 (TEA PD265)

Sharp DX-670
 • 3-beam laser, 20-track programming . . . \$129.95

Technics SLP-102
 • 16-bit, 4X oversampling, remote . . . \$169.95

Technics SLP-222
 • 18-bit, 4X oversampling, remote . . . \$229.95

Teac PD-480
 • 18-bit, 8X oversampling, remote . . . \$229.95

Technics SLP-555
 • 18-bit, 4X oversampling, remote . . . \$299.95

Technics SLP-770
 • 18-bit, 4X sampling, jog/shuttle . . . \$349.95

Compact Disc Changers



Technics SL-PC20 Remote 5-Disc Rotary CD-Changer
 • 4X-oversampling • 2 D/A converters • Remote • 20-track random access programming • Disc-by-disc random play • Change discs while the others play
J&R Price \$269.95 (TEC SLPC20)

Magnavox CDB-486
 • 6-disc changer, remote, 16-bit . . . \$229.95

Technics SLP-C10
 • 5-disc rotary changer, 4X-sampling . . . \$239.95

Teac PD-700M
 • 6-disc changer, 4X-sampling, remote . . . \$259.95

Magnavox CDB-586
 • 6-disc changer, 4X-sampling, remote . . . \$259.95

JVC XLM-401
 • 6-disc changer, remote, dual 18-bit . . . CALL

JVC XLM-701
 • 6 + 1 changer, 18-bit, 4X-sampling . . . CALL

Portable CD Players



Technics SL-XP6 Portable Compact Disc Player
 • Ultra-compact & light weight • 4X oversampling • 3-way power supply • Includes rechargeable Ni-Cad batteries • 3 play modes • Headphones & carrying case
J&R Price \$259.95 (TEC SLXP6)

Teac PDP-7
 • 16-track programming, 2-way repeat . . . \$149.95

Sony D-2
 • 3-way repeat, soft touch controls, black . . . \$159.95

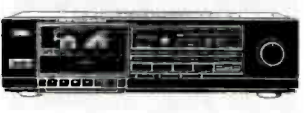
Technics SL-XP2
 • 18-track programming, X85 . . . \$179.95

Sony D-15
 • Rechargeable, 22-track programming . . . \$229.95

Toshiba XR-9458
 • Rechargeable, wireless remote . . . \$259.95

Sony D-25
 • Rechargeable, 4X sampling, digital filter . . . CALL

Cassette Deck Specials



Teac V-285CHX Stereo Cassette Deck
 • Dolby B and C noise reduction • Dolby HX Pro headroom extension system • Bias fine tuning • LED peak level meter • 3-digit tape counter • Black finish
J&R Price (TEA V285CHX)

Teac R-445
 • Auto-reverse, dolby B/C, soft-touch . . . \$129.95

Teac R-455CHX
 • Auto-reverse, dolby B/C & HX Pro . . . \$149.95

Teac V-480
 • Dolby B/C & HX Pro, logic controls . . . \$149.95

Teac V-570
 • 2-motors, dolby B/C & HX Pro, bias-adj. . . \$179.95

Teac V-670
 • 3-heads, 2-motors, dolby B/C & HX Pro . . . \$269.95

Fostex X-26
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Double Cassette Decks



Teac W-450R Auto-Reverse Double Cassette Deck
 • High-speed dubbing • Accurate rotary head auto-reverse • Continuous cassette playback • Dolby B/C noise reduction • Dolby HX-Pro headroom extension
J&R Price \$179.95 (TEA W450R)

Scott DD-660
 • Dolby B, hi-speed dubbing, soft-touch . . . \$99.95

Teac W-370C
 • Dolby B/C, continuous play, bias adj. . . \$129.95

Sharp RTW-800
 • Double auto-reverse, dolby B/C . . . \$159.95

Teac W-470
 • Dolby B/C, continuous play, logic cont. . . \$159.95

Technics RS-TR155
 • Series play, dolby B NR . . . \$179.95

Teac W-660R
 • Double auto-reverse, dolby B & C . . . \$279.95

Home Speaker Specials



Technics SB-L36 2-Way Linear Phase Speaker System
 • 2-way bass reflex design • 10-inch woofer • 2.5-inch tweeter • Detachable front grill • 100-watts maximum input power • Great sound at an even better price
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Pinnacle PN-5 +
 • 5.25" 2-way, rear vented port . . . Pair \$149.95

Technics SBL-56
 • 10" 3-way bass-reflex speakers . . . Pair \$129.95

Technics SBL-76
 • 12" 3-way bass-reflex speakers . . . Pair \$149.95

Technics SBL-96
 • 15" 3-way bass-reflex speakers . . . Pair \$199.95

Bose AM5
 • Acoustimas subwoofer & two modules . . . \$749.95

OHM FI
 • Walnut speakers, walnut cabinet . . . Pair \$899.95

Mini Speaker Specials



Bose RM-2 RoomMate Powered Speaker System
 • The small speaker with the big sound • Built-in stereo amp will accept output of personal stereo/CD players • 4.5" full range driver • Active EQ • AC powered
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AudioSource LSI
 • 2-way micro speaker, black . . . Pair \$119.95

Sony SRS-200
 • Amplified micro speakers . . . Pair \$229.95

Bose 101
 • 4.5" micro speakers, black . . . Pair \$179.95

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Turntable Specials



Technics SL-J33
Direct-Drive Programmable Turntable
• Quartz locked drive system • LP jacket size
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• Accepts P-mount cartridge

J&R Price **\$179.95** (TEC SLJ33K)

- Dual CS-2110A • Semi-automatic, belt-drive, Standard . . . \$79.95
- Gemini DJQ-1100 • Semi-auto, belt-drive, pitch control . . . \$84.95
- Technics SLBD-22K • Semi-automatic, belt-drive, P-Mount . . . \$94.95
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Shure V-15 Type V-MR
Deluxe Micro Ridge Phono Cartridge
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• Dynamic stabilizer • Side-guard stylus protection • Duo-point alignment gauge • Top rated design

J&R Price **\$129.95** (SHU V15-VMR)

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- Audio Technica AT231LP • Line-contact, Universal-Mount . . . \$39.95
- Shure V15-HRP • Nude hyper-ridge stylus, P-Mount . . . \$49.95
- Stanton 681EEHS • Stereoheadon stylus, Standard Mount . . . \$49.95
- Shure M-111HE • Hyperelliptical stylus, Universal-Mount . . . \$49.95
- Audio Technica AT152MLP • Microline stylus, P-Mount . . . \$99.95

Disco Phono Cartridges

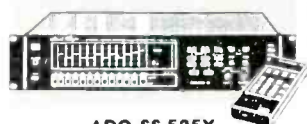


Stanton 680EL
High Performance Disco Cartridge
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• Standard-mount • Elliptical stylus
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Stereo Sound Mixer/Preamp
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- Gemini MX-4200 • Mixer, 3-phono & 3-line inputs, echo . . . \$99.95
- Atus AM-100 • Mixer, 2-phono & 2-Aux inputs, cueing . . . \$99.95
- Gemini MX-4400SE • Mixer, 3-phono/3-line sound-effects . . . \$134.95
- Gemini MX-6200 • Mixer, 7-band EQ, 3-phono, VU meter . . . \$184.95
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J&R Price **\$224.95** (DBX 120XDS)

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- Russound SDA4 • Speaker switcher, 4-pairs with volume . . . \$179.95
- dbx 18XDS • Dynamic controller, compressor . . . \$224.95
- dbx 400XG • Program route selector, 7 components \$239.95
- dbx SNR1 • Noise reduction unit . . . \$239.95
- dbx 38XDS • 3-band dynamic-range controller . . . \$399.95

Universal Remotes



Sony RM-P700E
Programmable Remote Control
• Learns & memorizes infrared commands for any remote control product • Sony remote commands built-in • Overlay card for easy operation

J&R Price **\$69.95** (SON RMP700E)

- Memorex CP4 • Controls 4 audio/video components . . . \$49.95
- Memorex CP8 • Controls 8 audio/video components . . . \$69.95
- One-For-All URC4000 • Controls 4 audio/video components . . . \$69.95
- One-For-All URC5000 • Controls A/V and X10 components . . . \$89.95
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- Technics SHR700 • 46-fixed & 98-learned functions . . . \$179.95

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Studio Pro Headphones
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- Beyer DT990 • Audiophile dynamic open-air design . . . \$189.95
- Sony MDR1F5K • Wireless, digital-ready, uni-motch plug . . . CALL

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Sony WMA26
 • Auto-reverse Walkman, small-size . . . \$34⁹⁵

Toshiba KT4029
 • AM/FM/Cassette, 3-band equalizer . . . \$39⁹⁵

Toshiba RP2057
 • AM/FM stereo, 5AM/5FM presets . . . \$39⁹⁵

Sony WMAF50
 • AM/FM/Cassette Walkman, MegaBass . . . \$57⁹⁵

JVC CXF30
 • AM/FM auto-reverse cassette, 5-band EQ . . . \$69⁹⁵

Sony WMF73
 • AM/FM/Cassette, water-resistant . . . \$99⁹⁵

Personal Stereos



Toshiba KT-4538 AM/FM Cassette Personal Stereo
 • Digital tuner with 10 presets • 3-band equalizer • Clock & alarm functions • Auto-reverse tape • Lightweight headphones • Belt clip • Requires 2 X AA batteries
J&R Price \$79⁹⁵ (TOS KT4538)

Panasonic RGV50
 • AM/FM/Cassette, DX/local selector . . . \$29⁹⁵

Panasonic RGV150
 • AM/FM auto-reverse cassette, EQ . . . \$49⁹⁵

Panasonic RGA60
 • AM/FM/Cassette, records, built-in mic . . . \$69⁹⁵

Sony WMAF57
 • AM/FM auto-reverse cassette, MegaBass . . . \$74⁹⁵

Sony WMA602
 • Auto-reverse cassette, dolby, MegaBass . . . \$89⁹⁵

Panasonic RGV340
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Panasonic RCX250
 • Stereo clock radio, dual alarm . . . \$74⁹⁵

Pearlfinder S930
 • Microcassette recorder, 2-speed . . . \$99⁹⁵

Panasonic RFB40
 • Portable short-wave band radio . . . \$179⁹⁵

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J&R Price \$149⁹⁵ (PAN RXCS750)

Panasonic RXFS400
 • AM/FM stereo cassette recorder . . . \$49⁹⁵

Sony CFS202
 • Compact size AM/FM stereo cassette . . . \$69⁹⁵

Panasonic RXCT800
 • 3-piece AM/FM dual cassette . . . \$89⁹⁵

JVC PC90
 • 3-piece AM/FM/SW-1 & SW-2/Cassette, EQ . . . \$99⁹⁵

Sony CFSDW80
 • AM/FM/double-cassette, MegaBass, EQ . . . \$199⁹⁵

JVC PCV88
 • 3-piece AM/FM dual-cassette, dolby, EQ . . . \$219⁹⁵

Portable CD Audio



Sony CFD-D75 MegaBass AM/FM Cassette CD-Player
 • 20-track programmable CD-player • 4 way repeat • Auto-reverse • Dolby • Digital clock/timer • Remote control • AC cord • Requires 8 X D batteries
J&R Price \$299⁹⁵ (SON CFDD75)

Sony CFD60
 • AM/FM/Cassette, CD player, dubbing . . . \$179⁹⁵

Sharp QCD25
 • AM/FM/Cassette, CD player, 3-band EQ . . . \$179⁹⁵

Panasonic RXFD55
 • AM/FM/Cassette, CD player, XBS, EQ . . . \$279⁹⁵

Panasonic RXDT50
 • AM/FM dual-cassette, CD player . . . \$259⁹⁵

JVC RCM510J
 • AM/FM dual-cass. CD player, relay play . . . \$299⁹⁵

JVC PCX300J
 • AM/FM dual-cass. CD player, hyperbass . . . \$399⁹⁵

Micro Television Specials



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 • Pocket size television, more portable than ever • HGM high quality matrix system delivers crisp, clearer and brighter images than ever • 2-inch screen
J&R Price \$129⁹⁵ (CAS TV400)

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 • 2" black & white Watchman, silver finish . . . \$99⁹⁵

Sony FD500
 • 4.5" black & white, AM/FM, MegaBass . . . \$119⁹⁵

Sony FD230
 • 2.7" black & white Watchman . . . \$119⁹⁵

Casio TV500
 • 2" color LCD, audio/video input . . . \$159⁹⁵

Casio TV6500
 • 2.7" color LCD, case & earphones . . . \$219⁹⁵

Casio TV8500
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Video Recorder Specials



Panasonic PV-4920 4-Head VHS Video Recorder
 • Bar code programming • Synchro edit • 155-channel digital quartz tuner • Variable and double-line slow motion • On-screen display • 57-function remote control
J&R Price \$349⁹⁵ (PAN PV4920)

Samsung VP2210
 • 3-speed VHS video cassette player . . . \$179⁹⁵

RCA VR280
 • 2-head VHS, on-screen programming . . . \$249⁹⁵

Panasonic PV2900
 • On-screen, 38 function remote . . . \$299⁹⁵

Toshiba M440
 • 4-heads, on-screen programming, remote . . . \$329⁹⁵

Panasonic PV4924
 • 4-heads, on-screen, unified remote . . . \$379⁹⁵

Panasonic PV4930
 • 4-heads, digital special effects . . . \$489⁹⁵

Hi-Fi Video Recorders



Toshiba DX-900 PCM Digital VHS Hi-Fi Stereo VCR
 • Digital special effects • Picture-in-picture • 4-video heads • MTS stereo cable ready tuner • 37 function wireless remote • PCM digital audio recording
J&R Price \$669⁹⁵ (TOS DX900)

GE VG7980
 • 4-heads, MTS-tuner, flying erase head . . . \$429⁹⁵

Panasonic PV4860
 • 4-heads, MTS, 44 function remote . . . \$449⁹⁵

RCA VR440HF
 • Super-VHS, 4-heads, MTS/SAP tuner . . . \$499⁹⁵

Panasonic PV4960
 • 4-heads, MTS, flying erase head . . . \$499⁹⁵

Panasonic PV54864
 • Super-VHS, 4-heads, MTS, on-screen . . . \$629⁹⁵

RCA VR695HF
 • Super-VHS, 4-heads, digital-effects . . . \$699⁹⁵

Camcorder Specials



JVC GR-40U Compact VHS-C Camcorder
 • 4-page digital superimpose • 6 L 2-speed power-zoom • High-resolution CCD • 8-LUX • Date/Time display & recording • Auto-focus • Zero frame editing • High-speed shutter
J&R Price \$999⁹⁵ (JVC GR40U)

Sony CCDF30
 • 8mm, 2-page digital superimposer . . . \$799⁹⁵

Panasonic PV500
 • Flying erase head, auto date/time . . . \$899⁹⁵

Sony CCDF70
 • 8mm, 6-page digital superimposer . . . CALL

Panasonic PV5445
 • Super-VHS, 7-LUX, Free-Case . . . \$1229⁹⁵

Panasonic PV460
 • Electronic image stabilizer . . . \$1399⁹⁵

Panasonic PVS350
 • Super-VHS, digital-effects . . . \$1399⁹⁵

Television Specials



Sony KV-13TR20 13" Trinitron Monitor/Receiver
 • Trinitron Mirrorback picture tube • Direct video/audio input • Cable-compatible express tuning • Sleep timer • Earphone jack • Remote control • Black cabinetry
J&R Price \$299⁹⁵ (SON KV13TR20-BK)

Samsung CT3140
 • 13" color, rotary tuning, quick-stop . . . \$159⁹⁵

Sharp 19RP519
 • 19" color, remote control . . . \$259⁹⁵

RCA F20581EG
 • 20" color, stereo, on-screen, A/V in . . . \$329⁹⁵

Panasonic CT12075S
 • 20" color, remote control . . . \$429⁹⁵

Toshiba CF2648
 • 26" color monitor, stereo, on-screen . . . \$449⁹⁵

Sony KV27TS30
 • 27" color monitor, unified-remote . . . CALL



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SALIF KEITA



IT doesn't matter if you can't understand Salif Keita's lyrics in his new album "Ko-yan." The intensity of the feeling behind his performances cannot be mistaken. Although he now lives in Paris, Keita is originally from Mali in West Africa, and the breathtaking rhythmic complexity of his music has naturally been strongly influenced by what he heard while growing up. Yet the album also shows, through synthesizers and electric guitars, the influence of modern rock. "Ko-yan" derives its power from the way in which Keita combines these dynamic traditions. He is true to both styles, and the result is greater than the sum of its parts.

Keita's music, like much African-flavored pop, is kaleidoscopic. The arrangements intertwine several instruments at once, and these combinations can shift quickly. Electric guitars, synthesizers, basses, and percussion all seem to leap through the tunes together in true musical equality. While some shifts in emphasis occur, including brief solos, everything stays in balance. The music is organic, and songs don't develop so much as evolve. The lilting guitar at the beginning of *Fe-so* gives way to a peppery interplay between bass and synthesizer. In *Primpin*, the counter-riffs pile on top of each other in a carnival-like explosion of accents, and just

when you think it's getting to be too much, another synthesizer joins the fun. Listening to Keita is like eating exquisitely spicy food. The overall taste sensation can be rich enough, but within it is a whole range of smaller intoxicating flavors. "Ko-yan" is, to follow this metaphor, a seven-course gourmet feast.

Riding above the music is Keita's high, charismatic voice. His soaring vocal lines sound like keening and joyous cries at the same time. He is the primary solo instrument on the record, especially for anyone who can't understand his words. Imagine a cross between a scraph and Smokey Robinson, and you will have come reasonably close to the sound of Keita singing. Since the record company doesn't include a translation of his lyrics with the album (one was sent with my review copy), few people will know of the strong spirituality, clear moral sense, and subtle use of language embedded in them. Fortunately, Keita's music and his voice communicate very clearly on an emotional level. This is one of the best international-pop records I've heard. *Ron Givens*

SALIF KEITA: *Ko-yan*. Salif Keita (vocals); other musicians. *Yada; Nou pas bouger; Ko-yan; Fe-so; Primpin; Tenin; Sahou.* MANGO MLPS 9836, © ZCM 9836, © CCD 9836 (42 min).

JAZZ

GEORGE BENSON: *Tenderly*. George Benson (guitar, vocals); McCoy Tyner (piano); Ron Carter (bass); Louis Hayes, Al Foster (drums); other musicians. *You Don't Know What Love Is; Stella by Starlight; Stardust; At the Mambo Inn;* and four others. WARNER BROS. 1-25907, © 4-25907, © 2-25907 (39 min).

Performance: *Superb*
Recording: *Very good*

Just as rumor had it that George Benson had stopped using facial makeup, here he is on the cover of "Tenderly" looking like Prince at a Tiajuana bordello. Androgyny may have done wonders for the Purple One's record sales, but I wonder if Benson isn't barking up the wrong tree. It may be of some comfort to hear that the music is not at all Princely but softly sung ballads accompanied by a rhythm section featuring McCoy Tyner and Ron Carter and, occasionally, sweeping strings or a brassy Marty Paich chart—the kind of backing you expect to hear behind Mathis or Sinatra. Benson plays guitar in all but one selection, *This Is All I Ask*.

While this is essentially a middle-of-the-road pop album, it contains a strong element of jazz, and that is good news to those of us who thought that yet another musician had climbed over the pop fence to stay. As I see it, one shouldn't fault a jazz player for embracing other musical forms, especially when he does it as well as Benson has. As this album so pleasantly demonstrates, Benson is an appealing, skillful pop singer as well as a superb jazz player. Just listen to his improvisational work in *Stella by Starlight*, *At the Mambo Inn*, and *I Could Write a Book* and to his solo guitar on the album's title track. From many standpoints, "Tenderly" is a thoroughly satisfying album that is bound to please Benson's many pop fans while giving his dwindling jazz following renewed hope. *C.A.*

HARRY CONNICK, JR.: *When Harry Met Sally* . . . Harry Connick, Jr. (piano, vocals); instrumental accompaniment. *It Had to Be You; Our Love Is Here to Stay; Stompin' at the Savoy; But Not for Me; Winter Wonderland;* and six others. COLUMBIA SC 45319, © SCT 45319, © CK 45319 (39 min).

Performance: *Superb*
Recording: *Very good*

In just two years, pianist Harry Connick, Jr., has advanced his career further than most performers do in ten. In fact, some spend a lifetime without reaching Connick's present recognition level. The nice thing about his climb is that he has almost made it on his artistry alone. His latest album, "When

Harry Met Sally . . ." is not a soundtrack release, but performances by Connick of music used in the film; the actual soundtrack, which also features Connick, includes familiar recordings by Ray Charles, Louis Armstrong, Frank Sinatra, and Ella Fitzgerald. Connick treats this material with great reverence and a finesse that captures the era that fostered it. We were introduced to his vocals in his second album ("20"), but his style of singing there was annoyingly mannered. Not so this time around; here he delivers such standards as *It Had to Be You* and *Where or When* with a Sinatra-like smoothness, complemented by Marc Shaiman's Fifties-style big-band arrangements in the former and by his own piano accompaniment in the latter. Connick's piano solos are heard to great advantage in this album too. Together, his three Columbia albums reveal a very talented young man in search of a musical identity. There is no discernible Connick style so far, but that will come. *C.A.*

CHRISTOPHER HOLLYDAY. Christopher Hollyday (alto saxophone); Wallace Roney (trumpet); Cedar Walton (piano); David Williams (bass); Billy Higgins (drums). *Appointment in Ghana; Omega; Bloomido; This Is Always; Ko-Ko; Embraceable You*; and three others. NOVUS 3055-1-N, © 3055-4-N, © 3055-2-N (61 min).

Performance: *Spirited*
Recording: *Very good*

Alto saxophonist Christopher Hollyday belongs to that new generation of acoustically oriented bopsters who are spreading their Parker-like wings on both sides of the Atlantic these days. In the forefront of this fusion backlash are men like Wynton and Branford Marsalis, Terence Blanchard, and Donald Harrison, who all hail from New Orleans, but Hollyday is a nineteen-year-old Bostonian. And so jazz history seems to be repeating itself—moving north from the Crescent City. With this album, Hollyday makes his debut on a major label and fulfills the promise of earlier performances in obscure releases. With the greatest of ease and a finesse that belies his age, he here weaves his way through a program that mirrors his admiration for Charlie Parker and for Jackie McLean, who has been a major source of encouragement to him. With trumpeter Wallace Roney at his side and pianist Cedar Walton at the helm of a solid rhythm section completed by bassist David Williams and drummer Billy Higgins, Hollyday is clearly in his right element. *C.A.*

MILTON NASCIMENTO: *Miltons.* Milton Nascimento (vocals, guitar); Naná Vasconcelos (percussion, voices); Herbie Hancock (piano, synthesized bass); other musicians. *River Phoenix (Letter to a Young Actor); Like Us; La bamba; Good Fruit; Sêmen*; and four

others. COLUMBIA FC 45239, © FCT 45239, © CK 45239 (43 min).

Performance: *Intoxicating*
Recording: *Very good*

Milton Nascimento, a singer, composer, and musical arranger of rare gifts, finds inspiration in a variety of sources, from the rich cultural mix of Brazil, with its African-laced rhythms and Latin song forms, to classical music and jazz. Although his work is categorized as pop, his art is an offshoot of the great iconoclastic Brazilian composer Heitor Villa-Lobos, who was famous for his borrowings from street songs and Indian chants. And there is a connection. Nascimento, born in Rio of African-Brazilian parents, was adopted at the age of three by a white couple, his adoptive mother being a piano teacher who had studied with Villa-Lobos.

His new album, "Miltons," is notable for its heavy infusion of jazz, with Herbie Hancock providing an ideal piano counterpoint to Nascimento's vocals and guitar. These two never fail to make magic together. Representative of this creative compatibility is *Don Quixote*, where the two seem to function as one, backed only by understated percussive accents. The range of material here is extraordinary, from the delicate lyricism of *River Phoenix (Letter to a Young Actor)* to Nascimento's rousing adaptation of the traditional *La bamba*, which is served up with unexpected poignancy. Thus the essence of the album is conveyed by its title, "Miltons," which in Portuguese means a multitude of tones and colors. That is what Nascimento always gives us, an endlessly varied world of aural shadings and nuances. *P.G.*

DAVID NEWMAN: *Fire!* David Newman (tenor saxophone, flute); Stanley Turrentine (tenor saxophone); Hank Crawford (alto saxophone); Steve Nelson (vibraphone); Kirk Lightsey (piano); David Williams (bass); Marvin "Smitty" Smith (drums). *Old Devil Moon; Chenya; Slippin' Down; Wide Open Spaces*; and two others (four others on CD). ATLANTIC ● 81965-1, © 81965-4, © 81965-2 (61 min).

Performance: *Refreshing*
Recording: *Very good remote*

If you like the sandy-toned Texas tenor sound, and if you are ready to pop your fingers and give your body a bit of bounce, here is the ideal album. David Newman spent a good part of his career accompanying Ray Charles, which has given him a few added layers of soul. There is nothing subtle about his music: it just moves on down the track at a pleasant pace, with a honk here and a twist there, and if you are in a partying mood, it gets you to the appropriate state of being. In other words, this is good, functional body music, and if Newman never really developed his own style, he certainly does very well

with those at hand. In any case, this robust music is refreshing to hear.

"Fire!" was recorded live at New York's Village Vanguard with a spirited quintet and two visiting saxophonists, Hank Crawford and Stanley Turrentine. Everybody performs well, but I am particularly impressed with the work of pianist Kirk Lightsey and vibist Steve Nelson, who provide the real spark that separates this set from other good blowing sessions. They are at their fiery best in *Blues for Ball*, which is unfortunately included only on the CD. *C.A.*



Milton Nascimento: magic

SPYRO GYRA: *Point of View.* Spyro Gyra (instrumentals). *Slow Burn; Swing Street; Fairweather; The Unknown Soldier; Hannibal's Boogie*; and five others. MCA MCA-6309, © MCAC-6309, © MCAD-6309 (46 min).

Performance: *Faceless fusion*
Recording: *Good*

Billboard recently dubbed Spyro Gyra the "number one contemporary jazz artists of the year." The fact is that Spyro Gyra is a very successful borderline-fusion group that has built up an enormous following since the mid-Seventies. That following is youthful and rather naïve when it comes to jazz, but quite faithful—people who, as Branford Marsalis has suggested, equate instrumental music with jazz and feel they have reached a stage in their life that calls for moving beyond rock. Actually, Spyro Gyra is not a bad choice when it comes to mindless contemporary fusion. None of the group's members, however, has the creative talent or the individuality of a Wayne Shorter or Joe Zawinul, nor do they offer anything approaching the intellectualism of Weather Report. *C.A.*

Discs and tapes reviewed by Robert Ackart, Richard Freed, David Hall, Stoddard Lincoln, Eric Salzman, and David Patrick Stearns

BACH: Concerto for Violin and Oboe in C Minor (BWV 1060); Concerto for Two Harpsichords in C Minor (BWV 1060); Concerto for Two Harpsichords in C Minor (BWV 1062); Concerto for Two Violins in D Minor (BWV 1043). Catherine Mackintosh, Jaap Schröder, Christopher Hiron (violin); Stephen Hammer (oboe); Christophe Rousset, Christopher Hogwood (harpsichord); Academy of Ancient Music, Christopher Hogwood cond. L'OISEAU-LYRE © 421 500-2 (58 min).

Performance: *Stylish*
Recording: *Very good*

There are really only two concertos on this record: each presumed original is accompanied by a transcription of it by Bach himself. This is not made at all clear in the packaging or the notes, but it is, in fact, rather fascinating.

The genesis and significance of Bach's concertos is still a matter of dispute, but we might say that for Bach "concerto" meant having some musical fun in the Italian style. Bach was certainly no purist. Most, if not all, of his concertos are transcriptions or adaptations of one sort or another (mostly from Vivaldi but from other composers as well, including himself). Furthermore, after he left the court of Cöthen (where instrumental music was his main preoccupation), he had to spend most of his professional time grinding out church cantatas. For relief he turned to the Collegium Musicum in Leipzig, a kind of community music society that met in the local coffee house. For this organization he seems to have rearranged his old Italian violin concertos for harpsichords.

Scholars are so certain that the Concerto for Two Harpsichords in C Minor, BWV 1060, is an arrangement that they have reconstructed its original, not for the usual two violins but for violin and oboe. Along with the still more famous Double Concerto in D Minor, BWV 1043, presumed to be original, we have Bach's own less well-known transcription for two harpsichords, listed as BWV 1062.

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This doubled-up pair of double concertos is, of course, played here on period instruments with the kind of finesse and style that one has come to expect from Christopher Hogwood and the Academy of Ancient Music. The rather thin harpsichord versions are performed with solo strings, on the likely theory that this was all that Zimmerman's coffee house could provide. The "originals" come with the "full" complement of a dozen strings. Quite a sumptuous sound, really—as one would expect from the music-loving Prince Johann Ernst and the court orchestra of Cöthen. *E.S.*

BEETHOVEN: Symphonies Nos. 4 and 5 (see Best of the Month, page 126)

BEETHOVEN: Symphony No. 7: Coriolan Overture; Egmont Overture (see Best of the Month, page 126)

BRITTEN: War Requiem, Op. 66. Lorna Haywood (soprano); Anthony Rolfe Johnson (tenor); Benjamin Luxon (baritone); Atlanta Boy Choir; Atlanta Symphony Orchestra and Chorus. Robert Shaw cond. TELARC © CD-80157 two CD's (83 min).

Performance: *Praiseworthy*
Recording: *Beautiful perspective*

Benjamin Britten's *War Requiem* is a melding of traditional Latin texts from the service for the dead with the war poetry—one should say, antiwar poetry—of Wilfred Owen, who was killed in World War I. One of the most powerful and original musical documents of recent decades, it catches and dramatizes the juxtaposition of ancient fear and the hope of redemption with a bitter and ironic cry from the bloody trenches of our century.

This is a fine performance and recording. My main complaint is that the soloists, all imported from England and supposedly Britten specialists, seem curiously remote from the material. Their very genteel and rather Byzantine, stylized English (a sound that only classical singers, not real people, make) betrays the powerful immediacy of the Owen poetry and its setting. The standard of comparison is Britten's own recorded performance with Galina Vishnevskaya, Peter Pears, and Dietrich Fischer-Dieskau, the soloists for whom the work was written—significantly, a Russian, an Englishman, and a German.

I have nothing but praise for the Atlanta singers and musicians under Robert Shaw's direction. Scored for three separate ensembles—soprano and chorus with large orchestra, male soloists with chamber ensemble, and boys' choir with organ—the work offers a lot of challenges, and they are well met

here. The performers were distributed throughout Atlanta's Symphony Hall, which gives a beautiful perspective, and the work sounds very good indeed in the digital CD medium. *E.S.*

BRUCKNER: Symphony No. 7, in E Major. Cincinnati Symphony Orchestra, Jesús López-Cobos cond. TELARC © CD-80188 (67 min).

Performance: *A bit earthbound*
Recording: *Good*

BRUCKNER: Symphony No. 7, in E Major. Berlin Philharmonic Orchestra, Lorin Maazel cond. EMI/ANGEL © CDC 49584 (74 min).

Performance: *Long-breathed*
Recording: *Good*

With these two latest recordings, the number of Bruckner Sevens on CD reaches a baker's dozen. Neither, however, offers any interpretive insights of major significance. Though the Spanish background of Jesús López-Cobos might incline one to question his qualifications as a Bruckner conductor, his advanced training was in Vienna under Hans Swarowsky, and for some years he was general music director of the Deutsche Oper in West Berlin. At all events, his reading of the Seventh is in a sound classical mode, with feet planted firmly on the ground, which may work for the scherzo and finale but not for the first movement and the adagio, where a sense of exaltation is essential. The ambience of Cincinnati's Music Hall is warm and clear, but the music could use a bit more space.

Lorin Maazel seems to go to the opposite extreme in the first two movements, striving for the utmost level of exaltation implicit in the music. But stretching the duration by six additional minutes, however earnestly the music is



Nicholas McGegan: ebullient Corelli

performed, is not necessarily enough to achieve that effect, even with superbly controlled playing by the Berlin Philharmonic. The scherzo and finale fare better in that they are at least up to speed: I like Maazel's interestingly re-

strained yet springy treatment of the main part of the scherzo and his unusually poetic handling of the trio episodes. The finale is finely detailed but could use more drive at the close. Given the rather bright, hard sound of Berlin's Philharmonie concert hall, the sound as such is good. *D.H.*

CHERUBINI: *Requiem in C Minor.* Berlin Radio Chorus; Berlin Symphony Orchestra, Claus Peter Flor cond. RCA © 60059-4-RC, © 60059-2-RC (49 min).

Performance: *Dramatic*
Recording: *Excellent*

Conductors periodically rediscover Cherubini's two Requiem Masses, and while they're certainly worthy of occasional hearings, the C Minor Mass, for all of its dark, eloquent austerity, is too monochromatic, too amorphous in its musical profile to capture a really large public. Claus Peter Flor's new recording is more dramatic, less reverential, and more clearly engineered than Riccardo Muti's excellent 1982 outing with the Ambrosian Chorus and Philharmonia Orchestra on EMI. Muti's interpretation, on the other hand, is more integrated than Flor's and allows the piece to unfold with a certain fateful inevitability. But Flor's chorus and orchestra are first-rate. *D.P.S.*

CORELLI: *Concerti Grossi, Op. 6, Nos. 1-6.* Philharmonia Baroque Orchestra, Nicholas McGegan cond. HARMONIA MUNDI 7014. © 407014, © 907014 (60 min).

Performance: *Thoughtful*
Recording: *Excellent*

Corelli's works are frequently treated like so-called sewing-machine music, but in these thoughtful performances Nicholas McGegan demonstrates why Corelli was taken so much more seriously in his own time than he is now. While McGegan has always shown a natural sense of authentic style and ebullient spirit, he seems unwilling to take any of the conventions and formulas embedded in these concertos for granted. Hence, the emotional content of his readings is less generalized than usual even in the fugal statements, and there's a greater variety of antiphonal effects and instrumental textures.

McGegan's musical revelations are fairly modest ones. Corelli still doesn't have the emotional depth of Bach or Handel, but he does emerge here as more than a mere charmer. *D.P.S.*

DVORÁK: *Rondo in G Minor* (see ELGAR)

ELGAR: *Cello Concerto in E Minor, Op. 85.* **TCHAIKOVSKY: *Variations***

LOOKING TO THE EAST



Keith Jarrett

BOTH Alan Hovhaness and Lou Harrison, whose works are coupled in a new Musicmasters album, came out of that mysterious and intriguing American avant-garde of the late 1930's and 1940's, a movement that turned away from Europe and looked East for inspiration. Hovhaness, who is an American of Armenian descent, was born in 1911. He has remained, to these many years, steadfast in vision throughout his prolific outpouring of music. He is said to have written over sixty symphonies; *Mysterious Mountain*, written in 1955, is the second of these and undoubtedly the best known. *Lousadzak*, his second work in the new set, is a one-movement piano concerto written in 1945 for Hovhaness himself to play.

The concerto aspect and piano timbre of *Lousadzak* make it the more exciting of the two works, especially as performed here by Keith Jarrett. Jarrett, known to most people as a jazz composer and pianist, is proving to be something of a specialist in this kind of music; he recently recorded, in an equally persuasive manner, the Harrison Piano Concerto. I find the symphony a little bogged down in its rich string sound—seemingly inappropriate for the kind of Eastern style evoked here. Perhaps the work (this is a serious sugges-

tion!) should be performed on eighteenth-century strings; it might sound quite wonderful.

Harrison is represented by his *Elegiac Symphony*, which he completed in 1975. It too is scored for a string orchestra, but it is beautifully conceived for the medium, a delicate and exquisite piece of work. I can't resist giving some of the rather mystical titles of its movements: "Tears of the Angel Israfael," "Praises for Michael the Archangel," and "The Sweetness of Epicurus." I am not sure if Epicurus refers to the celebrated philosopher of the same name, but Israfael is the angel of music and perhaps a stand-in for Harrison himself, an angel of music who has labored off the beaten track and outside the busy thoroughfares of musical commerce to produce a highly original and moving body of work. Nifty performances by the American Composers Orchestra under the excellent direction of Dennis Russell Davies. *Eric Salzman*

HOVHANESS: *Symphony No. 2, Op. 132* ("*Mysterious Mountain*"); **Lousadzak, Op. 48.** **HARRISON: *Elegiac Symphony.*** Keith Jarrett (piano); American Composers Orchestra, Dennis Russell Davies cond. MUSICMASTERS © MMC 60204, © MMD 60204 (63 min).

SUSANNE STEVENS/ECM

on a *Rococo Theme, Op. 33*. DVOŘÁK: *Rondo in G Minor, Op. 94*. Paul Tortelier (cello); Royal Philharmonic Orchestra, Charles Groves cond. RPO/MCA © MCAD-6295 (55 min).

Performance: *Vital and elegant*
Recording: *Radiant*

This disc is labeled "Tortelier—A Celebration." The great French cellist turned seventy-five last March, and in celebration of that anniversary he was invited to record concerted works of his own choice with the Royal Philhar-



Paul Tortelier: a celebration

monic on its own label (issued here by MCA). His earlier recording of the Elgar concerto, with Sir Adrian Boult, was issued on CD by Angel some time ago, with more Elgar but not more Tortelier. A contemporaneous one of Tchaikovsky's *Rococo Variations*, with his son Yan Pascal Tortelier conducting, was on LP import lists here in the Seventies and was reissued on CD for the seventy-fifth anniversary, but apparently only in Britain, together with a lovely account of the Dvořák concerto conducted by André Previn.

Those who look for an "autumnal" or "valedictory" aura here will be disappointed. These new performances, like the earlier ones, are charged with both the vitality and the elegance that have always characterized Paul Tortelier's music making. There appears to be an even greater sense of spontaneity and intensity now in the two big pieces, and the Dvořák rondo is an absolute gem in its unlabored charm. Admirers of Tortelier may well opt to let the respective couplings (and the question of domestic availability) determine choice between old and new versions. Sir Charles Groves's exceptionally sympathetic conducting and the radiant, well-

focused sound may tip the balance in favor of the new issue, which includes an affectionate birthday greeting from Mstislav Rostropovich. R.F.

FRANCK: *Prélude, choral et fugue; Prélude, aria et final*. Jorge Bolet (piano). *Variations symphoniques*. Jorge Bolet (piano); Royal Concertgebouw Orchestra, Riccardo Chailly cond. LONDON © 421 714-2 (62 min).

Performance: *To the manner born*
Recording: *Demonstration-class*

Jorge Bolet's stunning performance of the *Variations symphoniques* was originally issued just two years ago, on London, together with Riccardo Chailly's rather disappointing account of the Franck symphony. It is good to have it now in this alternative packaging with Franck's two big pieces for piano solo. You can sense Bolet's relish in this material, and his instinctive fastidiousness as well, as he clarifies, refines, burnishes, and generally vivifies it to a degree that renders comparisons simply pointless. The scale is grand, the pace is unhurried; there is power to burn, but it is always subtly controlled, and the overall impression is one of just the sort of spontaneity and flair one wants in this music, along with the touches of poetry and wit one hopes for. Chailly and the orchestra are fine partners in the *Variations symphoniques*, and the sound quality is demonstration-class throughout. R.F.

MOZART: *Concerto in C Major for Flute and Harp (K. 299); Flute Concerto in G Major (K. 313); Andante in C Major for Flute and Orchestra (K. 315)*. Irena Grafenauer (flute); Maria Graf (harp); Academy of St. Martin-in-the-Fields, Neville Marriner cond. PHILIPS © 422 339-4, © 422 339-2 (58 min).

Performance: *Charming*
Recording: *Delightful*

These three pieces were written on commission for wealthy amateur performers on what Mozart said were his least-favorite instruments. That didn't stop him from coming up with some very attractive music. The Concerto for Flute and Harp used to be performed quite a lot, but the Flute Concerto is the better piece—especially when heard in a very stylish performance like the one here. The Andante in C, generally considered to be an alternate slow movement, was probably written not because the Flute Concerto's original adagio was "too difficult" in a technical sense, but because it was too serious, long, slow, and boring for dilettantes. The replacement andante is altogether a lighter, more pleasant piece of music. Everything is beautifully played under Neville Marriner's direction and recorded right up to the mark. E.S.

MOZART: *Serenade in B-flat Major (K. 361, "Gran partita")*. Orchestra of

the 18th Century, Frans Brüggen cond. PHILIPS © 422 338-2 (51 min).

Performance: *Luminous*
Recording: *Radiant*

With its complex, seven-movement structure, Mozart's *Gran partita* for winds is one of his most inventive and masterfully sustained serenades. Frans Brüggen is perhaps the ideal interpreter for this piece. His previous recordings with the Orchestra of the 18th Century suggest that he is utterly preoccupied with the quality of instrumental sound, which in this recording pays off in the surprisingly rarefied, mellow timbres he draws from his group of authentic bass-set horns and other brasses and winds. Never a particularly high-profile interpreter, Brüggen lets the music unfold as if on its own. Though his relaxed tempos sometimes allow the momentum to sag momentarily, the music blooms naturally, in rich colors. D.P.S.

PROKOFIEV: *Violin Concerto No. 2* (see Best of the Month, page 123)

PURCELL: *The Fairy Queen (excerpts); Come Ye Sons of Art; High on a Throne of Glitt'ring Ore; O dive custos Auriacae domus*. Julianne Baird (soprano); James Bowman, Peter Becker (countertenor); Stephen Sturek (tenor); Wilbur Pauley (bass); New York Ensemble for Early Music's Grande Bande, Frederick Renz cond. MUSIC-MASTERS © MM 60188X (71 min).

Performance: *Uneven*
Recording: *Good*

There is some good playing and singing on this record, and I wish I could recommend it more wholeheartedly. The excerpts from *The Fairy Queen* are not well arranged. Purcell's artful sequences are broken up, and not all of the tempos are convincing. I find Peter Becker's countertenor solos mannered and sometimes sloppy in pitch. And a vocal quartet or quintet is no substitute for a real chorus. On the positive side, I liked Julianne Baird, and the quality of the instrumental playing is very good—nice tone and phrasing. The period-instrument game is gaining strength in this country, but the overall approach seems not always as serious or comprehensive as what we have come to expect from Europe. E.S.

RAVEL: *Alborada del gracioso; Tzigane; Une Barque sur l'océan; Shéhérazade (Asie, La Flute enchantée, L'Indifférent); Shéhérazade, Ouverture de féerie; La Valse*. Margaret Price (soprano); Salvatore Accardo (violin); London Symphony Orchestra, Claudio Abbado cond. DEUTSCHE GRAMMOPHON © 427 314-4, © 427 314-2 (68 min).

Performance: *Sexy*
Recording: *Excellent*

This collection features works from the more exotic, impressionistic side of

Ravel's musical output, but as interpreted by Claudio Abbado they have nothing mysterious about them. Instead of the crystal-clear textures characteristic of Pierre Boulez's Ravel recordings or the sensual haze infusing those of Charles Dutoit, Abbado paints in bold, vivid colors and builds to billowing climaxes that sweep through the orchestra like waves of desire. His more extroverted approach definitely takes some getting used to, but it's a valid one. The performances here are some of the most cogent readings of Ravel on records, projecting such a clear sense of form and thematic unity that you come away from them as impressed as you are moved.

Neither of the soloists, though, would be my first choice for this repertoire. Salvatore Accardo's playing is excellent in *Tzigane*, but this virtuosic piece calls for more abandon than he gives it. And Margaret Price, a singer who's a pleasure to hear under almost any circumstances, sounds rather detached in the three *Shéhérazade* songs. Her forced, slightly ragged vocalism suggests that the microphones caught her on an off day. Her natural artistry, however, counts for a lot, and there's plenty of that in this performance. *D.P.S.*

SCHUBERT: *Impromptus, Opp. 90 (D. 899) and 142 (D. 935)*. Melvyn Tan (fortepiano). EMI/ANGEL © CDC 49102 (58 min).

Performance: *Very persuasive*
Recording: *Excellent*

SCHUBERT: *Piano Sonata in A Major (D. 959); Piano Sonata in B-flat Major (D. 960)*. Melvyn Tan (fortepiano). EMI/ANGEL © CDC 49631 (67 min).

Performance: *As above*
Recording: *Likewise*

SCHUBERT: *Piano Sonata in C Minor (D. 958); Moments musicaux, Op. 94 (D. 780)*. Alfred Brendel (piano). PHILIPS © 422 076-2 (59 min).

Performance: *Superb*
Recording: *First-rate*

Melvyn Tan's EMI recording of Beethoven's first two concertos, with Roger Norrington and his London Classical Players, introduced us to a musician of obvious intelligence—but apparently one without much regard for musical enlivenment, let alone charm. The very qualities missing in those Beethoven performances, however, are engagingly present in these two discs of Schubert's solo works. Tan's instrument—a fortepiano made six years ago by Derek Adlam after a Nannette Streicher Viennese model of 1814—doesn't call attention to itself as a “novelty” but sounds smooth and warm and ideally chosen for the material at hand. There is no underscoring of dramatic passages, but they are not exactly understated, either. Tan has a very sly way of allowing us to feel he is just letting the music play

itself: His phrasing is so natural and unforced that no one would think of its being “shaped.” The pacing, too, is natural, sustained by steady rhythm and freedom from gratuitous gear-shifting.

The expressiveness of the E-flat and G-flat impromptus of the Op. 90 set is not belabored but allowed to sing in the most straightforward way, and the impact of the slow movements of the two sonatas is felt with singular directness in Tan's uncluttered approach. Once or twice, as in the last of the Op. 142 impromptus and the finale of the A Major Sonata, momentum threatens to sag and articulation is marginally less clear than elsewhere, but overall these are performances I want to come back to, even if not exclusively. The recorded sound is excellent, and so is the annotation (by Lionel Salter and Tan himself).

In the sonatas, Tan does not take the first-movement exposition repeats; they are less welcome, I think, on a fortepiano than on a modern piano, and many feel those movements are quite long enough without repeats. The opening movement of the great C Minor Sonata is more concise, though, and I was happy to find that Alfred Brendel, who omitted the repeat in his earlier recording of the work, does observe it in this new one. Everything that is different in the remake, in fact, makes it more appealing than his earlier version. In the mid-Seventies Brendel seemed determined to take an almost adversarial approach to Schubert, turning his singing phrases into angular ones and shifting gears conspicuously between first and second themes. Now he seems to have rethought that approach and to have found a surer way to the heart of the music. Some might say it is simply a matter of accepting Schubert on his own terms. If such a remark implies also an acceptance of a “traditional” interpretation, put it out of your mind; the remarkable intensity and concentration that marked Brendel's earlier performance are perhaps even more strongly projected here, but with an even greater regard for the integrity of the structure and for the sort of flow that is part of this music's essential character.

The *Moments musicaux* show a similar, if less dramatic, benefit of Brendel's rethinking since his earlier recording. Here No. 2 gains from a little tightening, and the first and last pieces are a shade more expansive than before; each of the six now seems ideally paced, with, again, a bit more warmth of heart than the pianist seemed willing to show last time round. The first-rate sound quality is another reason to be happy Brendel is redoing his Schubert. A very distinguished issue. *R.F.*

SCRIABIN: *Symphony No. 3, “The Divine Poem”* (see STRAVINSKY)

SHOSTAKOVICH: *Piano Concerto No. 1, Op. 35*. Evgeny Kissin (piano);

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MEXICO IN MUSIC



Enrique Bátiz

THROUGHOUT this decade recordings by the Mexican conductor Enrique Bátiz, with several orchestras on various labels, have been a consistent source of pleasure, both for imaginative selection of repertoire and for the polished and persuasive performances. His new ASV disc of music by his own country's two greatest composers is one of the nicest surprises in a year well filled with good things. He conducts the Royal Philharmonic here in the *Sinfonía de Antígona* and *Sinfonía romántica*—the Symphonies Nos. 1 and 4, respectively—of Carlos Chávez and the Mexico City Philharmonic in an assortment of unfamiliar items by Silvestre Revueltas.

The Chávez symphony we usually get on records is the Second, the brief, percussion-filled *Sinfonía india* (Bátiz began his discography with this work on a Varèse Sarabande LP). The first of his six completed symphonies, adapted from his music for Sophocles's *Antigone* in 1933, is a far more austere but similarly concise one-movement portrait of the heroine in which winds, massive brass chords, "scrubbed" strings, and a few imaginatively used percussion instruments evoke an impression of antiquity and the spirit of tragedy. The *Sinfonía romántica* of 1951, true to its name, is a more expansive and lyrical work in three sumptuous movements. Both works testify to Chávez's sustained flow of inspiration as well as his fine craftsmanship.

The Revueltas pieces, all from the Thirties, are exciting discoveries. *Cami-*

nos (Roads) is a prime example of Revueltas's knack for writing in a folk idiom without borrowing actual folk tunes—just as Dvořák did, for example, in his Slavonic Dances. There is more of this sort of thing, similarly ingratiating if less brilliant, in the two little sets of *Música para charlar (Music for Chatting)*, a title that would have been at home on a Fifties LP jacket) taken from a film score. The last piece on the disc, *Ventanas (Windows)*, was composed earlier than the others and is perhaps a little less disciplined. It is certainly more irruptive, with a dazzling sequence of colors and moods ranging from sinister to exuberant, but there's always a dramatic undercurrent to maintain momentum.

Bátiz obviously believes in all of this music, and he knows how to make his players and his audience share his enthusiasm. Both the English orchestra (of which he is principal guest conductor) and the Mexican one (of which he now is music director) do him proud with playing of vigor, precision, and commitment, and the sound itself is fine enough to insure the disc's becoming a favored audio demonstration item.

Richard Freed

CHAVEZ: *Sinfonía de Antígona; Sinfonía romántica*. Royal Philharmonic Orchestra, Enrique Bátiz cond. **REVUELTAS:** *Caminos; Música para charlar; Ventanas*. Mexico City Philharmonic Orchestra, Enrique Bátiz cond. ASV/HARMONIA MUNDI © CD DCA 653 (71 min).

Vassili Kan (trumpet); Moscow Virtuosi, Vladimir Spivakov cond. *Chamber Symphony, Op. 110a (arr. Barshai); Preludes, Op. 34, Nos. 10, 17, 24, 14, 13, 6, and 5 (arr. Poltoratsky)*. Moscow Virtuosi, Vladimir Spivakov cond. RCA © RK 87947, © RD 87947 (58 min).

Performance: *Brilliant*
Recording: *Superb*

A span of twenty-seven years separates the earliest and latest Shostakovich works recorded here. Where the Piano Concerto No. 1 and the Op. 34 preludes abound in contrastingly frivolous and somber elements, the Chamber Symphony—transcribed with the composer's blessing from his Eighth String Quartet—is deadly serious, haunted throughout by the Shostakovich signature theme D-S-C-H and quotations from earlier works.

Nineteen-year-old Soviet pianist Evgeny Kissin carries off the solo keyboard role in the concerto to perfection, brilliantly abetted by his co-equal soloist, trumpeter Vassili Kan, and ably supported by conductor Vladimir Spivakov, who is better known as a violin virtuoso of the first rank. In the Chamber Symphony, Spivakov's ensemble, the Moscow Virtuosi, emerges as a crack performing group, the equal of any comparable aggregation in the world. The performance is one of intense and fiery conviction.

The twenty-four preludes for piano of Op. 34 have been transcribed by a variety of hands for media ranging from violin and piano to full orchestra. There are at least three full-orchestra versions of No. 14, including a famous one by Leopold Stokowski as well as one by Shostakovich himself that was incorporated into his 1944 *Zoya* film score, and it comes off least well of the seven recorded here from the string-orchestra arrangement by Viktor Poltoratsky. The other preludes, especially the lighter ones, are realized with great elegance and style, and the recording, made in Paris for the concerto and in Vienna for the rest, is flawless. D.11.

SHOSTAKOVICH: *Violin Concerto No. 1* (see Best of the Month, page 123)

STRAVINSKY: *Symphony of Psalms*. **SCRIABIN:** *Symphony No. 3, Op. 43 ("The Divine Poem")*. Chorus of the Orchestre de Paris; Orchestre de Paris. Daniel Barenboim cond. ERATO © MCE 75494. © ECD 75494 (75 min).

Performance: *Competent*
Recording: *Strained*

The idea of pairing well-known works of Stravinsky with Scriabin symphonies seems to be an ongoing concept in Daniel Barenboim's concert programming. This disc, like his earlier one of Stravinsky's *Rite of Spring* and Scriabin's Fourth Symphony (*Poem of Ecstasy*),

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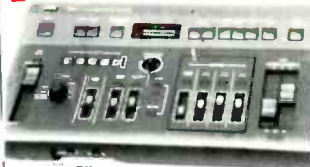
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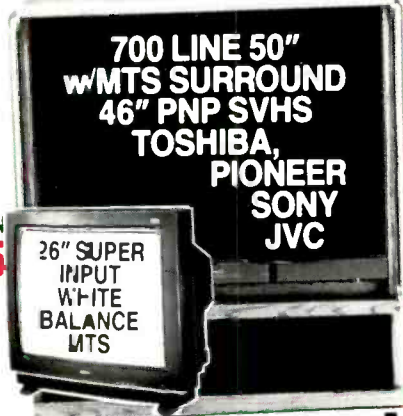
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EVEN before the big early-music boom, the Canadian Brass played early music, especially the Venetian brass music of the great masters of St. Mark's. Now, ironically, the Canadian Brass sounds old-fashionedly modern. The music of Giovanni Gabrieli and of Monteverdi resonates brilliantly in the golden glow of the high-powered brass sound of the group's new CBS album of antiphonal works by these two composers. It is a kind of tribute to William Vacchiano, long-time first trumpet with the New York Philharmonic and a teacher at Juilliard; it features not only his students from the Canadian Brass, the New York Philharmonic, and the Boston Symphony but also Vacchiano himself. This is a living tribute, in fact, to a whole school of brass playing that developed under the influence of this fine player and teacher.

The Empire Brass, featured in Telarc's new CD of music by Gabrieli, represents an essentially new school of American brass playing. Like the Canadians, the Empire Brass uses modern instruments, an augmented ensemble for antiphonal effects, and more than a bit of arranging. But the players are younger, and their performances have more bounce and bite; the sound is lighter and more inflected. The way they lean into the rhythms makes you want to jump up. Hot.

The Summit Brass, billed on a Summit CD as "America's premier large brass ensemble" and comprising some of the best players from all over the country, takes us back to the sweet and sterling brass sound originally developed by the American band. Unfortunately, this approach is not very suitable for J. S. Bach, and the arrangements in their album "Toccata and Fugue" are inflated in the manner of a "Bach's Greatest Hits" collection. The fat sounds work better for the Gabrieli that's included, but the record hardly compares favorably with its competitors. Overall, I much prefer "Bach for Brass" by the Läubin Brass Ensemble on Deutsche Grammophon. This German quintet—just a quintet, with no big arrangements for augmented brass choirs—has developed a very pure contrapuntal style not unrelated to the sound of certain Baroque organ stops. This is the kind of arranging and adapted performance that Bach himself would certainly have approved of.

Eric Salzman

MONTEVERDI: *Excerpts from Vespers of the Blessed Virgin and Christmas Vespers.* **G. GABRIELI:** *Canzon per sonare Nos. 1 ("La Spiritata"), 2, 3, and 4; Canzon in Double Echo; Canzon quarti toni; Canzoni II, V, VI, X, XII, XIV, and XVI.* Canadian Brass; mem-



The Canadian Brass

bers of the New York Philharmonic and Boston Symphony Orchestras, Kazuyoshi Akiyama cond. CBS © MT 44931, © MK 44931 (71 min).

G. GABRIELI: *Canzon duodecimi toni; Canzoni VIII, IX, X, XIII, XIV, XV, XVI, and XVIII; Sonata XIX; Canzon septimi octavi toni a 12; Canzon a 12; Canzon septimi toni No. 2.* **ISAAC:** *Instrumental Piece No. 1 ("Der Welt fundt"); Instrumental Piece No. VI.* **BANCHIERI:** *Concerto secondo, Magnificat; Concerto Primo, La Battaglia; Concerto Terzo, Magnificat.* **DIAZ:** *Lauda Jerusalem.* Empire Brass; other musicians. TELARC © CD-80204 (61 min).

BACH: *Toccata and Fugue in D Minor; Orchestral Suite No. 3, Air; Fugue in G Minor; Jesu, Joy of Man's Desiring.* **G. GABRIELI:** *Canzon primi toni a 10; Canzon duodecimi toni a 10; Canzon septimi toni a 8; Canzoni II, IX, XV, and XVI.* **FRESCOBALDI:** *Canzon 29.* **GUAMI:** *Canzon 25.* **BARTOLINO:** *Canzon 30.* Summit Brass. SUMMIT © DCD 101 (47 min).

BACH: *Prelude and Fugue in G Major; Chorale Prelude "Vater unser in Himmelreich"; Chorale Prelude "Kyrie, Gott Heiliger Geist"; Canzona in D Minor; Chorale Prelude "Jesu, meine Freude"; Prelude in E-flat Major; The Art of Fugue—Contrapunctus 1, 2, 4, 7, 11; Chorale Prelude "Nun danket alle Gott"; Toccata and Fugue ("Dorian").* Läubin Brass Ensemble. DEUTSCHE GRAMMOPHON © 423 988-2 (59 min).

was recorded during an actual concert in which the two works were presented. The sense of "liveness" is really felt in the first two movements of the *Symphony of Psalms*, but the lack of drive in the concluding one seems curiously at odds with both the text and the music's rhythmic base. If that movement here suggests Borodin and Ravel as frames of reference, the long first movement of the Scriabin suggests a souvenir of the Venusberg.

The Scriabin symphony receives the more consistently interesting performance, but while both performances would have been enjoyable enough in concert, neither seems to demand preservation in recorded form, and the strained, somewhat cramped sound—far from the showcase quality both works call for—is not a boost. Thus, even though the disc is exceptionally well filled in terms of playing time, it is not a real bargain. Bernstein's performance of the Stravinsky on CBS, with his own *Chichester Psalms* and Poulenc's *Gloria*, has a compelling power that overrides the harshness of its analog origins. Kondrashin's of the Scriabin with the Concertgebouw Orchestra, also from a live take and all by itself on Etcetera, has that sort of power too and seems to reach deeper into the work's unique character. *R.F.*

TCHAIKOVSKY: *Symphony No. 4, in F Minor, Op. 36; Romeo and Juliet, Fantasy Overture.* Chicago Symphony Orchestra, Claudio Abbado cond. CBS © MT 44911, © MK44911 (65 min).

Performance: *Splendid*
Recording: *Very good*

At the time of its release by Deutsche Grammophon in late 1976, the recording of Tchaikovsky's Fourth Symphony by Claudio Abbado and the Vienna Philharmonic was considered close to definitive. Whether this 1989 digital version with the Chicago Symphony matches or surpasses it is likely to be a matter of strong personal opinion. Do you like your Tchaikovsky Fourth hard-edged and tautly dramatic? Or do you want the nervous tension eased with a touch of genuine poetry and sentiment—preferably without self-pitying sentimentality?

The Abbado of 1976 was definitely of the former persuasion. In 1989, he brings an atmospheric element into the eerie first-movement waltz that is missing in the earlier version. The second movement becomes less of an entr'acte and more an integral part of the whole thanks to the more fluid phrasing of the assertive central episode, and the poignant coda, with its distant 2 a.m. bell, is most exquisitely done. In both recordings the overall pacing is relaxed but with no loss of drama, especially in the terrifying first-movement development around the "fate" theme. The pizzicato scherzo goes faster here than in the earlier version, but the flawless tim-

ing and rhythmic address of the Chicago players insure that it never becomes breathless.

Some may remember Abbado's 1969 Boston Symphony recording of *Romeo and Juliet* (paired with a not very convincing *Little Russian* Symphony) as being more fierce than this new one, but even though the opening expository passages here strike me as a bit tame, the performance gathers power as it goes on. The love music sings with sensitivity and ardor, and a sense of dramatic culmination is fully realized in the final pages.

The Orchestra Hall sound is rich and very wide in dynamic range, as well as highly effective in its depth imaging. I would rate this as one of the three best Tchaikovsky Fourth on CD, and *Romeo and Juliet* is a nice bonus. *D.H.*

TCHAIKOVSKY: Variations on a Rococo Theme (see ELGAR)

VAUGHAN WILLIAMS: Symphony No. 2 ("A London Symphony"); Concerto Grosso for String Orchestra. London Symphony Orchestra, Bryden Thomson cond. CHANDOS • ABRD 1318, © ABTD 1383, © CHAN 8629 (65 min).

Performance: *Good*
Recording: *Good*

Bryden Thomson's reading of Vaughan Williams's Second, or *London*, Symphony is rather lacking in poetic feeling. His opening movement is a bit brusque and stern, the scherzo-nocturne has no real lilt, and the finale, while strong, makes little of the dawn-drenched close. The slow movement fares best, if only for an exceptionally beautiful rendering of the cornet theme that ushers in the middle section.

The Concerto Grosso, composed in 1950 for an ensemble of amateur string players, is a charmer, blending folk and Tudor flavoring in three dance-style movements flanked by an "Intrada" and a "March and Reprise." With the London Symphony's string body in full force and in top form, this new version puts the recent English String Orchestra performance on Nimbus totally in the shade in terms of bite and body. And the recorded sound is decidedly more impressive in the Concerto Grosso than in the symphony, which could stand more warmth in the bass and less brashness in the midrange. *D.H.*

VERDI: La traviata. Lucia Aliberti (soprano), Violetta; Peter Dvorský (tenor), Alfredo; Renato Bruson (baritone), Germont; others. Fujiwara Opera Chorus; Tokyo Philharmonic Orchestra, Roberto Paternostro cond. CAPRICCIO © 10 274-5 two CD's (112 min).

Performance: *Energetic*
Recording: *Clear*

Taped in performance at Suntory Hall, Tokyo, this *Traviata* is arresting for sev-

eral reasons. Conductor Roberto Paternostro takes many passages at a considerably faster clip than we have come to expect in performances of this opera; likewise, his rhythms throughout are crisp. Compared with other recorded performances, this one is less sentimental and appreciably more purposeful in moving the drama forward. If such treatment does not always make for an especially affecting result, it produces several exciting moments, such as the Act II finale, which soars with a kind of relentless intensity.

In the cast listing above, the "others" refers to the secondary artists, all of them Japanese who are unknown to Occidental audiences; they sing with accuracy, intelligible Italian, and enthusiasm for their roles. As Violetta, Lucia Aliberti gets off to a rather strident start, but her work in both scenes of Act II is telling, and except for a rather melodramatic reading of Germont's letter in Act III, her final moments are affecting. Peter Dvorský brings a becoming youthful quality to Alfredo, making him a more believable lover than one frequently hears, and Renato Bruson conveys the kind of authoritative Germont one expects from this seasoned artist. His "Di proverza" is far less fatuous than that aria often is. The work of the Fujiwara Opera Chorus is disciplined, exact, and involved, qualities that may be ascribed to the playing of the Tokyo Philharmonic as well.

This is not an important recording of Verdi's most celebrated score; several others are currently available, remastered for compact disc, that delve deeper into characterization and musical content. The present one from Capriccio, however, is vital, ingratiating, and totally enjoyable. *R.A.*

ZEMLINSKY: Psalm 23, Op. 14: Symphony in B-flat Major. Ernst Senff Chamber Choir; Berlin Radio Symphony Orchestra, Riccardo Chailly cond. LONDON © 421 644-2 (56 min).

Performance: *Lively*
Recording: *Good*

Alexander Zemlinsky is best remembered today as the friend, mentor, and brother-in-law of Arnold Schoenberg, although he was, in fact, a symphonic traditionalist—a protégé of Brahms and an exponent of Classicism in the late-Romantic period. All that is evident in this latest release in what amounts to a modest Zemlinsky revival. The B-flat Symphony of 1897 is a lively, upbeat work in the tradition of Beethoven, Schubert, and Brahms—Brahms especially. The wonderful passacaglia finale makes the Brahms connection especially clear. Psalm 23, for voices and orchestra, dates from more than a decade later and is a more introspective and harmonically complex work. Both pieces are well performed under Riccardo Chailly's direction, and the recording is good. *E.S.*

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NOVEMBER

SALUTE TO FRANCE

by William Livingstone

THE celebration of the bicentennial of the French Revolution got mixed reviews in France last summer. A friend in Paris wrote me that she thought it was "a total flop and a waste of money." From where I sat, however, it looked better than that. I was in Japan, where TV coverage showed people from all over the world in the streets of Paris having a good time.

Japanese television also carried a concert from the Paris Opera in which international stars (including June Anderson and Shirley Verrett from the United States) sang arias from French operas. When Plácido Domingo came on to sing an excerpt from *Samson et Dalila*, it reminded me of how little attention is currently paid to that opera's composer, Camille Saint-Saëns.

In tribute to French music, therefore, I'd like to beat the drums a bit for Saint-Saëns and recommend recordings of some of his works. Throughout his long life (1835-1921) he wrote music in all forms, music that embodies the traits characteristic of the best in French art—beauty, clarity, elegance, and wit.

Ranked among the most gifted artists in the history of Western music, Saint-Saëns was a dazzling virtuoso on the piano and organ. Berlioz, Gounod, and Rossini were among the influential older colleagues who recognized his genius and encouraged him to compose. He, in turn, taught Gabriel Fauré and influenced many other composers, including Ravel.

Saint-Saëns's most influential single work is probably his Symphony No. 3 for orchestra and organ, the "Organ Symphony," a strikingly original work in only two movements. Scored for organ and strings, the *poco adagio* section that ends the first movement is sublime.

All things considered, the best recording of the Organ Symphony is the one by the Orchestre Symphonique de Montréal conducted by

Charles Dutoit with Peter Hurford as organ soloist on London Records cassette (410 201-4) and compact disc (410 201-2). Unfortunately, its playing time (34'17") is meager for a full-price CD.

An excellent alternative is the two-CD set from EMI Angel Records (CDBM 62643), which contains all five of Saint-Saëns's symphonies performed with authority, conviction, enthusiasm, and panache by the French radio and TV orchestra, L'Orchestre National de l'ORTF, conducted by Jean Martinon with Bernard Gavoty as organ soloist in the Symphony No. 3. The other four symphonies are rewarding, and the "City of Rome" Symphony—*Urbs Roma*—is particularly interesting. The sound, digitally remastered from analog tapes of the mid-1970's, is quite good. Playing time for Disc 2 is a very generous 77'12", and that of Disc 1 is an astonishing 79'04"!

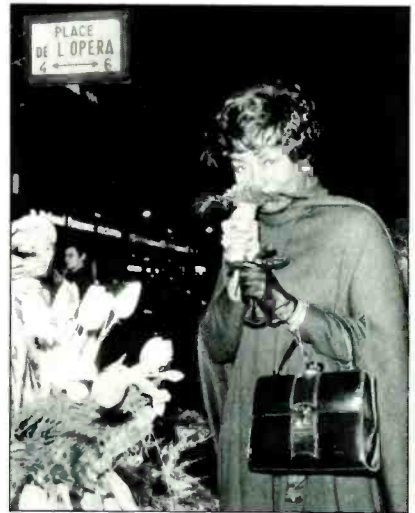
The high quality of the writing for the solo instrument in Saint-Saëns's five piano concertos is probably a result of his own phenomenal skill as a performer. Dazzling virtuosity, elegance, and *élan* are displayed by soloist Aldo Ciccolini in a complete recording of the concertos with the Orchestre de Paris conducted by Serge Baudo. This set, a winner of the Grand Prix du Disque, has been my reference standard for these works since it was released in the early 1970's. Digitally remastered, it is now available on two CD's from EMI Angel (CDBM 69443).

I also recommend the set of all five concertos performed by Pascal Rogé with three British orchestras conducted by Charles Dutoit (London 417 351-2, two CD's). These performances may be somewhat less fluent than Ciccolini and Baudo's, but the sound is a bit richer.

Saint-Saëns's gifts as a melodist and brilliant orchestrator are revealed in the opera *Samson et Dalila*. He earned the eternal gratitude of mezzo-sopranos by writing Dalila's three luscious arias, including the familiar "*Mon coeur s'ouvre à ta voix*" ("My heart at thy sweet voice"). The most idiomatic stereo recording of this work is the EMI Angel set with Jon Vickers and Rita Gorr in the title roles with the

orchestra of the Paris Opera under Georges Prêtre. The sound of this 1963 recording has benefitted greatly from digital remastering (CDCB 47895, two CD's).

An interesting alternative is a handsome video recording of *Samson et Dalila* with Vickers and Shirley Verrett with the chorus and orchestra of the Royal Opera Covent Garden conducted by Colin Davis. It is available on videodisc



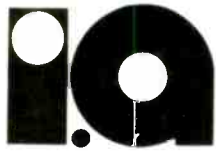
Shirley Verrett in Paris

from Pioneer Artists (PA-82-014) and on VHS Hi-Fi tape from Home Vision (C18C).

For Saint-Saëns's wit you should have the recording of the *Carnival of the Animals* by Dutoit and the London Sinfonietta (London 414 460-2). It also includes three of the composer's symphonic poems. To sample his large body of chamber music for piano and other instruments I recommend the lyrical Piano Trio No. 2 played by the Arden Trio (Delos D/CD 3055).

For a Gallic good time at budget prices there are some excellent tape bargains. For only \$2.99 you can buy the Saint-Saëns Symphony No. 3 played by the Bern Symphony under Peter Maag (MCA Classics 25933) or the Piano Concertos Nos. 2 and 4 performed by Philippe Entremont with the Orchestre du Capitole de Toulouse conducted by Michel Plasson (CBS Odyssey YT 39505). Either will provide a great deal of musical pleasure for very little money. □

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AR Fayetteville: Ft. Smith: Stereo One • Little Rock: Lesure Electronics • Searcy: Soltman
AZ Flagstaff: Sound Pro • Phoenix: Mesa: Hi-Fi Sales • Tucson: Audio Emporium • Yuma: Warehouse Stereo
CA Bakersfield: Casa Moore • Campbell: Sound Goods • Canoga Park: Shelley's • Carpinteria: Creative Stereo • Chico: Sounds By Dave • Corona Del Mar: Pacific Coast Audio Video • Davis: World Electronics • Eureka: Eureka Audio Video • Lancaster: California Soundworks • Long Beach: Audio Concepts • Mountain View: Sound Goods • Napa: Futurvision • Orange: Absolute Audio • Pennington: California Stereo • Redondo: Systems Design • Riverside: Speakercraft • Sacramento: Good Guys • San Diego: Sound Company • San Francisco & Suburbs: Good Guys Stereo Store • San Gabriel: Audio Concepts • San Jose: Good Guys • San Luis Obispo: Audio Ecstasy • Santa Barbara: Creative Stereo • Santa Cruz: Sound Wave • Santa Maria: Creative Stereo • Santa Monica: Shelley's Stereo • Sherman Oaks: Systems Design • Stockton: Gluskins • Thousand Oaks: Creative Stereo • Ukiah: Music Hut • Upland: Audio Haven • Ventura: Creative Stereo • Victorville: Incredible Sounds • Westminster: Vopstek Stereo
CO Boulder: Soundtrack • Colorado Springs: Sunshine Audio • Denver & Suburbs: Soundtrack • Grand Junction: Sound Company • Minturn: Custom Audio Video • Pueblo: Sunshine Audio
CT Avon: Hi-Fi Stereo House • Danbury: Carlston's • Fairfield: Audio Design • Greenwich: Al Franklin's • Hartford: Al Franklin's • New Haven: Audio Etc • Newington: Hi-Fi Stereo House • New London: Roberts • Norwalk: Auditorics • Waterbury: Zimmo Music
DE Wilmington: Bryn Mawr Stereo
FL Daytona Beach: Stereotypes • Ft. Myers: Stereo Garage • Ft. Lauderdale: Sound Advice • Ft. Pierce: Sound Shack • Ft. Walton Beach: Audio International • Gainesville: Electronics World • Jacksonville: Audio Tech • Key West: Audio International • Lakeland: Sound Factory • Merritt Island: Southern Audio • Miami: Electronic Equipment Co. • South Advice • Naples: Stereo Garage • Panama City: Watsound Stereo • Pensacola: Fidler Hi-Fi • Sunrise: Sound Advice • St. Petersburg: Cooper for Stereo • Sound Advice • Tallahassee: Stereo Store • Tampa: Sound Advice • W. Palm Beach: Electronic Connection • Sound Advice
GA Athens: Hi-Fi Boys • Atlanta & Suburbs: Hi-Fi Boys • Augusta: Hi-Fi • Brunswick: H&H Service Store • Columbus: Merrill TV • Macon: Georgia Music • Savannah: Audio Warehouse • Valdosta: Stereo Connection
HI Honolulu: Honolulu Audio Video
IA Davenport: Griggs Music • Des Moines: Audio Labs • Dodge City: Sound World • Dubuque: Reners Iowa City: Hawkeye Audio • Mason City: Sound World • Sioux City: Audio Visions • Waterloo: Team
IL Bona: Stereo Shoppe • Moscow: Stereo Shoppe • Sandpoint: Electracraft • Twin Falls: Audio Warehouse
IL Alton: Reliable Stereo • Aurora: Stereo Systems • Carbondale: Southern Stereo • Champaign: Good Vibes • Chicago & Suburbs: United Audio • Decatur: Team Electronics • DeKalb: Audio Plus • Highland Park: Columbia • Joliet: Stereo Systems • Kanakee: Barrett Entertainment • Lansing: Audio Clinic • Naperville: Stereo Systems • Normal: Sundown One • Peoria: Team Electronics • Rockford: Columbia • Springfield: Sundown One • Spring Valley: Audio Labs • Waukegan: Alan's
IN Bloomington: Campus Audio • Bluffton: Eley TV & Appliance • Evansville: Ristley • Ft. Wayne: Classic Stereo • Indianapolis: Ovalton • Lafayette:

Good Vibes • Marion: Classic Stereo • Michigan City: Audio Connection • Muskegon: Classic Stereo • South Bend: Classic Stereo • Terre Haute: Stereo Crafters
KS Junction City: Audio Junction • Kansas City: Brandy Mart • Overland Park: Audio Electronics • Brandy Mart • Wichita: Audio Visions • Topeka: Nelson's
KY Bowling Green: Audio Center • Lexington: Ovalton Audio • Louisville: Audio Video Buy Design • Owensboro: Paducah: Ristley's • Pikeville: Mayo Inc.
LA Lafayette: Sound Electronics • Metairie & New Orleans: Alterman Audio • Opelousas: Sound Electronics
MA Boston: Waltham Camera & Stereo • Fitchburg: Fitchburg Music • N. Dartmouth: Sound II • Pittsfield: H B S Stereo • Worcester: O Coins
ME Bangor: Sound Source • Camden: Harbor Audio • Portland: New England Music
MD Baltimore: Soundscape • College Park: Spaceways • Gaithersburg: Audio Buys
MI Ann Arbor: Absolute Sound • Hi-Fi Buys • Birmingham: Almas Hi-Fi • Dearborn: Almas Hi-Fi • Farmington Hills: Almas Hi-Fi • Flint: Stereo Center • Grand Rapids: Classic Stereo • Kalamazoo: Classic Stereo • Lansing/Midland: Hi-Fi Buys • Palosky: Kurtz Music • Royal Oak: Absolute Sound • Court St. Listening Room • Traverse City: Kurtz Music
MN Duluth: Mel's TV & Audio • Mankato: Audio King • Minneapolis & Suburbs: Audio King • Rochester: Audio King • St. Paul: Audio King
MO Cape Girardeau: Stereo One • Columbia: Johnston Audio • Rolla: End of the Rainbow • St. Louis: Sound Central
MS Hattisburg: McLelland TV • Jackson: Hooper's • Pascagoula: Empress
MT Billings: Video Sal • Sound Bozeman: Thrifty Ear • Great Falls: Rocky Mountain Hi-Fi • Kalispell: Audio Visions • Missoula: Aspen Sound
NC Boone: Hollins • Chapel Hill: Stereo Sound • Charlotte: Audio Video Systems • Conover • Tri-City • Greensboro: Stereo Sound • Hendersonville: Pro Sound • Kinston: Stereo Concepts • Morehead City: Anderson Audio • New Bern: Anderson Audio • Raleigh: Audio Buys Stereo • Sound • Rocky Mount: Microwave Audio • Wilmington: Atlantic Audio • Wilson: Modern Stereo • Winston-Salem: Pacific Sound • Fargo: Today Electronics
NE Kearney: Midwest Audio • Lincoln: Stereo West • Omaha: Stereo West • York: Midwest Audio
NH Concord: Audio of New England • Laconia: Lakes of Stereo • North Hampton: The New Audiophile • New London: North Star • Salem: Customs
NJ East Brunswick: Atlantic Stereo • Maple Shade: Bryn Mawr Stereo • Montclair: Perdue Radio • Paramus: Harvey Electronics • Raritan: AC Audio • Ridgewood: Sounding Board • Shrewsbury: Monmouth Stereo • Toms River: Rands Camera • Wall Twp.: Monmouth Stereo • West Caldwell: Perdue Radio
NM Alamogordo: D&K Electronics • Albuquerque: West Coast Sound • Carlsbad: Beason's • Clovis: Towne Crier • Santa Fe: West Coast Sound
NV Las Vegas: Upper Ear • South Shore Lake Tahoe: Audio Video Den
NY Albany: Clark Music • Batavia: Unicorn Audio • Buffalo: Speaker Shop • Corning: Chemung • Elmira: Chemung • Fredonia: Studio One • Giens Falls: Audio Genesis • Goshen: Longplayer's Stereo • Ithaca: Chemung • Sound Image • Jamestown: Studio One • Manhasset: Audio Breakthroughs • Massena: Hi-Fi Shop • Newburgh: Audio Expressions • New Hartford: Adirondack Music • New

York City: Audio Breakthroughs • Electronic Workshop • Harvey Electronics • Rochester: JB Sound • Scarsdale: Listening Room • Syracuse: Clark Music • Vestal: Hart Electronics • White Plains: Harvey Electronics • Woodbury: Audio Breakthroughs
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OR Beaverton: Stereo Superstereo • Eugene: University Hi-Fi • Grants Pass: Shekells • Medford: Shekells • Portland: Stereo Superstereo
PA Allentown: Bryn Mawr Stereo • Blakey: Hart Electronics • Bryn Mawr: Bryn Mawr Stereo • Camp Hill: Bryn Mawr Stereo • Chambersburg: Sunrise Electronics • Erie: Studio One • Harrisburg: Bryn Mawr Stereo • Johnstown: Gary's Entertainment • Kingston: Hart Electronics • Lancaster: G n I Stereo • Longmore: Bryn Mawr • Montgomeryville: Bryn Mawr Stereo • Natrona Heights: Stereo Land • Philadelphia & Suburbs: Bryn Mawr Stereo • Pittsburgh: Audio Junction • Quakertown: Bryn Mawr Stereo • Reading: G n I Stereo • Sellersburg: Stereo Shoppe • State College: Paul & Tony's Stereo • Strasburg: Main St. Audio Video • Westport: Audio Insight • Williamsport: Robert M. Sides
Puerto Rico Rio Piedras: Precision Audio
RI N. Providence: Eastern Audio
SC Anderson: Music Machine • Charleston: Audio Warehouse • Columbia: Music Machine • Greenville: Mitchell's Stereo • Music Machine • Myrtlewood: Stereo Shop • Spartanburg: Stereo Shop
SD Aberdeen: Engel Music • Rapid City: Team Electronics • Sioux Falls: Audio King
TN Chattanooga: RRRTV • Cookeville: Lindsey Ward • Jackson: New Wave Electronics • Kingsport: Audition • Knoxville: Lindsey Ward • McMinnville: Lindsey Ward • Memphis: New Wave Electronics • Nashville: Hi-Fi Buys
TX Amarillo: Sound Systems Ltd. • Arlington: Sound Idea • Austin: Marcum Electronics • College Station: Audio Video • Corpus Christi: Tape Town • Dallas: Hillcrest Hi-Fidelity • El Paso: Soundquest • Ft. Worth: Sound Idea • Houston: Sheffield Audio • Hurst: Sound Idea • Laredo: Mexel International • Longview: Audio Techniques • Lubbock: Electronics Supercenter • San Antonio: Bill Case Sound • San Marcos: Discovery Audio Video • Sherman: Worldwide Stereo • Temple: Audio Tech • Tezakarna: Sound Towne • Waco: Audio Tech
UT Logan: Stokes Brothers • Ogden: Stokes Brothers • Salt Lake City: Broadway Music • St. George: Boulevard Home Furnishings
VA Bristol: Audition • Charlottesville: Holdings • Sound Machine • Falls Church: Massasaute • Audio Buys • Richmond: Gary's Stereo • Roanoke: Holdings • Virginia Beach: Digital Sound
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WA Bellingham: OC Stereo • Chelan: Music Store • Oak Harbor: OC Stereo Center • Spokane: Electracraft (Halls)
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THE HIGH END

by Ralph Hodges



DAT: CONS AND PROS

ANNOUNCEMENTS of the almost-availability of digital audio tape (DAT) decks are back in the news, and interest in the format seems quite high among some potential consumers. But DAT equipment has been available to the professional recording establishment for several years, and the pros have acquired some idea of what an audiophile might expect. What have they learned?

First, it should be understood that DAT at the moment means R-DAT, for rotary-head digital audio tape, since the format employs a transport mechanism mimicking those of VCR's. Some work was once done on stationary-head, or S-DAT, digital recorders that were similar mechanically to analog audio recorders, but the sound quality was rather depressing in the demonstrations I attended, and further efforts seem to have been abandoned.

Already DAT decks have served as the master recorders for a good many CD's you can now buy in stores, and they're excellent CD's in some cases. How many is difficult to say, because the producers fear a credibility problem. After all, DAT started life as a consumer format, turning to the professional sector

only when politics left it no place else to go. Many professional recordists still bridle at admitting they use consumer devices. They especially worry when the recorder is smaller than some microphone preamplifiers, and their clients worry as well. But the format is definitely in use—moderately heavy use, from all indications—and this is a positive sign.

On the negative side, consider the reports from Richard Clark, president of American MultiMedia, the country's largest and most innovative independent tape duplicator. Clark told me that his company has so far received around twenty DAT masters for transfer to cassette, and every one of them has given trouble. The problems have included drop-outs, skewing, and various other difficulties related to tape guidance, apparently arising from incompatibilities between decks. They have been so severe that Clark calls them monstrous: "I don't believe that kind of data density on a tiny and fragile piece of tape is ever going to be reliable enough in a consumer format."

Terry O'Kelly, professional products director for BASF, brings more bad news. According to studies he has reviewed, DAT machines are coming up with head-life statistics of 300 to 500 hours at best. Many just don't have enough metal "meat" on their heads. Considering the expense and the difficulty of replacing those exotic heads, these are grim figures indeed.

Balance this news with the report from Dr. Richie Moore, chief technical engineer at the Record Plant studios in San Francisco, who has put in an estimated 2,000 hours of mastering and mixing on his Sony DTC-1000ES, a consumer machine, and loves it to pieces. Admittedly, he is careful about tape selection (Sony and Agfa are his preferences), he cleans the heads faithfully, and he adjusts the tape tension to minimum before each use—an internal calibration that most consumers would find inconvenient if not baffling. Still, Moore told me that Huey Lewis and the News acquired their machines at the same time as he did, have done nothing to them, and are still as delighted as he is.

Something of a middle ground is

occupied by John Eargle, a man of many parts, whose splendid engineering of a number of Delos recordings has been recognized in these pages. Eargle has found several applications for DAT decks, including the making of master recordings on certain occasions. But he would never think of conducting a session with just one machine. He always has a second, which he slaves to the first. One of the two tapes is declared archival, which means that it is never played until the transfer to a Sony 1630 for CD production. The other tape is played and copied freely for editing, blocking, and recording checks.

Eargle's policy is to use the same DAT machine for recording and playback of a given tape, but he doesn't wish to suggest, on the basis of his experience, that this is a necessary precaution. It simply fits in with his recording approach, which, except for some miking techniques he uses, is minimalist. Eargle understands Clark's complaints, has a firm feeling for how these problems could have arisen, and admits he has doubts about how permanent the DAT medium will prove for repeated playbacks. He wonders if some of Clark's troublesome tapes may have been subjected to excessive play or to clumsy editing attempts involving an intermediate bounce into analog.

As for head wear, Eargle points out that some big studio-quality rotary-head DAT machines have what amount to odometers, clocking every second that tape is in contact with the heads. Sony, in particular, recommends head replacement or reconditioning every 1,000 hours. "Consumers tend to expect a product like DAT to last forever," he said, "but a professional understands that clockwork maintenance is required or he's going to be in trouble. Also, people accustomed to analog processes expect gradual deterioration of performance, whereas when digital begins to fail, it crashes."

If these selected remarks sound forbidding, don't be too dismayed. Most professionals I interviewed love DAT and thoroughly believe in its wholesomeness. But it does appear that getting consistent performance out of a DAT deck is going to be a labor of love. □



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