

Stereo Review

JUNE 1990 ● \$2.50

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Where to buy Polk Speakers? For your nearest dealer, see page 120.

CIRCLE NO. 90 ON READER SERVICE CARD

Toy wonder Francis Goldwyn
has a new idea that's
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He also prefers
Christian Brothers Brandy.

Founder, The Manhattan Toy Co., Ltd.
Prehistoric and modern toys.
Last year's sales: \$5,000,000.



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When you know better.

Stereo Review

Incorporating High Fidelity®

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Design by Sue Llewellyn, photo by Hing/Norton.



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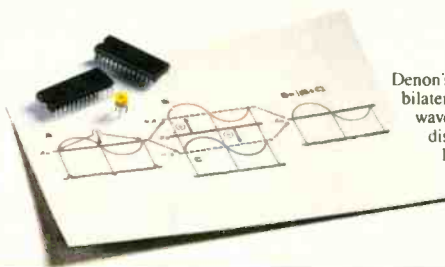


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Starting with the first digital recording of music in 1972, Denon has produced an unbroken string of digital audio breakthroughs.



Denon's LAMBDA processor bilaterally offsets the digital waveform to eliminate the distortion that occurs when low-level waveforms cross the zero line.

The LAMBDA Super Linear Converter: Another significant digital audio first from the first company to record music digitally.



Denon's CD player innovations include the Super Linear Converter, the 20-bit digital filter, the real 20-bit converter and noise-shaping filter circuitry.

Denon's latest digital advancement is the LAMBDA Real 20-Bit Super Linear Converter in the DCD-1560. The LAMBDA system's digital offset processor and dual 20-bit converters eliminate the most common source of distortion in CD players: the zero crossings of low-level signals.

Denon's consistent leadership in digital audio technology may explain why earlier generation

Denons often sound better than current competitors' models. And why a leading hi-fi journal found that a moderately-priced Denon equalled or outperformed all others tested, including machines costing over \$1800.

What makes Denon CD players better? Perhaps it's that Denon performs every step in the music chain from recording artists through pressing CDs. And that Denon has concentrated on one thing and only one thing for 80 years.

Music.

DENON

DESIGN INTEGRITY

Denon America, Inc., 222 New Road, Parsippany, NJ 07054

DCD-1560 shown with the optional side panels available for most Denon models. Prices quoted are manufacturer's suggested retail prices and may vary.

CIRCLE NO. 27 ON READER SERVICE CARD

by Rebecca Day and
William Livingstone

BEWARE: BAD WORDS

Since almost all record companies voluntarily agreed in March to adopt a uniform sticker to warn parents of possibly offensive language in song lyrics, lawmakers of thirteen states have dropped proposed legislation that would make such labeling mandatory. The wording on the voluntary label is: "Explicit Lyrics—Parental Advisory." Jason Berman, president of the Recording Industry Association of America, which supports voluntary labeling and opposes mandatory legislation, said: "No individual company or government action can replace the responsibility of parents in determining what their children listen to." At press time labeling legislation was still pending in Delaware, Florida, Missouri, and Pennsylvania.

DYNACO RETURNS

Panor Corp. has obtained the license for the highly esteemed Dynaco brand name (unused for about a decade) and is selling a line of audio equipment under that name through specialty audio retailers. The line includes the Options series of speakers (\$100 to \$450 a pair), the Amazing Bass subwoofer (\$100), a surround-sound decoder (\$50), in-wall speakers (\$150 and \$170 a pair), and an in-wall, flush-mount audio system (\$700). The company will also service old Dynaco units. For information write to Panor Corp., 125 Cabot Court, Hauppauge, NY 11788.

MAPPING AUDIO COURSES

A guide to more than eighty institutions offering courses in audio engineering and recording has been compiled by Mark Drews. Entitled *New Ears: A Guide to Education in Audio and the Recording Sciences*, the book is available for \$11.95 postage paid (New York residents add 70¢ sales tax) from Near Ear Productions, 1033 Euclid Ave., Syracuse, NY 13210. . . . To obtain

a free catalog of the Heath home electronics courses, write to Heath Co., Dept., 350-048, Benton Harbor, MI 49022.

MUSIC ON TV

The 3-hour "Earth '90" telecast on June 2 is expected to draw an audience of 1 billion people in one hundred countries. It will be hosted by Olivia Newton-John in Europe and by John Denver and Yu Hayami in Japan with participation by stars around the world, including Gilberto Gil (Brazil), the Jeff Healey Band (Canada), Kitaro (Japan), and Gorky Park (U.S.S.R.). Not a fundraiser, the program is intended to raise awareness of environmental problems.

From June 18 to 21, PBS will present Wagner's four-opera cycle *The Ring of the Nibelung* performed by the Metropolitan Opera with Hildegard Behrens, Christa Ludwig, Jessye Norman, Gary Lakes, James Morris, and other soloists, and the Met orchestra conducted by James Levine. Check local listings.

RECORD COMPANY TRENDS

The ubiquitous Teenage Mutant Ninja Turtles may have a hit in their movie-soundtrack album (SBK), but they have not taken over the record industry yet. Current trends include a spoken-word boom that continues with Rhino's release of the collected recordings of the Beat Generation writer Jack Kerouac. The success of the Bulgarian female chorus album "*Le Mystère des Voix Bulgares*" (Nonesuch) has prompted similar new recordings, such as "Songs of Amber" (Ryko) by Dzintars, a Latvian women's choir. The global trend is further supported by the flutist James Galway with "The Enchanted Forest" (RCA), a collection of Japanese songs, and Capitol has released "Cruel, Crazy, Beautiful World" by Zulu-rock star Johnny Clegg and his band Savuka from South Africa.

EQUIPMENT NOTES

ADC has introduced two combination receiver/CD changers

with six-disc magazines as well as single-disc drawers. The 60-watt-per-channel version costs \$700 finished in black, \$730 in white; the 25-watt model costs \$600 in black, \$630 in white. . . . Yamaha has extended the limited warranty on its component CD players from one to two years. The new policy covers all component models sold after January 1, 1990, and retroactively covers the CDX-420, CDX-520, CDX-720, CDX-820 and 820Ti, CDX-920 and 920Ti, CDX-1120, CDX-2020, CDC-500, and CDC-610. . . . Kenwood is bringing out a line of high-end separates including a tuner (\$1,100), a preamplifier (\$1,000), a power amplifier (\$1,300), and a CD player (\$1,200).



DIRTY DANCING

Heavily promoted in Europe as "the forbidden dance" from Brazil, the dance known as "lambada" is getting serious attention in the clubs, movie theaters, dancing schools, and record stores of the United States. Waiting in the wings is "vogueing," derived from fashion models' poses, a dance that originated in the black gay clubs of New York City. It is demonstrated in Madonna's video *Vogue*, which is tied in to the movie *Dick Tracy*. From the discos of Belgium comes "new beat," a music and dance form based on playing 45-rpm records at 33 $\frac{1}{3}$. PolyGram has issued a sampler, "This Is the New Beat," by such leading-edge groups as Jade 4U's 101, Miss Nicky Trax, S.M., Boy Toy, and Erotic Dissidents.



MM 1025
10 inch subwoofer



MM 6503
6 1/2 inch 3-way
2-piece system



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CAR STEREO REVIEW

November/December 1989



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Where to buy Polk Speakers? For your nearest dealer, see page 120.

CIRCLE NO. 90 ON READER SERVICE CARD

Stereo Review

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LETTERS

Recordable CD's

The compact disc format has many advantages over digital audio tape; topping the list are convenience, resistance to damage, and long-term durability. With this in mind, I've been waiting for recordable/erasable CD's (compatible with current players) and the machines to record them. A couple of years ago Tandy was developing a system called THOR. Has there been any word on progress in this area from Tandy or other manufacturers? If so, how long will we, "the CD faithful," have to wait?

JAMES EUBANKS
San Diego, CA

Senior Editor Rebecca Day replies: Don't hold your breath. A couple of years ago, Tandy announced that it would have its THOR-CD system on the market by the end of 1990. The company has since pulled back, however, and like other manufacturers will no longer discuss retail timetables for recordable CD's.

The format faces two major obstacles: (1) lack of standardization—there are as many as twenty different recordable-CD formats in development, and (2) the copyright issue, which is still dogging digital audio tape four years after that format's debut. According to Jan Timmer, head of Philips Consumer Electronics, "A standard, [reasonably priced] machine for consumer use is still quite a few years away."

Desert Rose Band

I ardently disagree with Alanna Nash's April review of the Desert Rose Band's new "Pages of Life," which she concludes is mediocre. I find it to be first-rate. I believe it is because of Chris Hillman's light tenor voice that he, Herb Pedersen, and John Jorgenson are able to blend such incredible harmonies. They are also backed by outstanding country-western musicians.

As for songwriting, where many country lyrics are trite or morose, Hillman's are generally substantive and optimistic. The Desert Rose Band is one of those groups that has truly renewed my interest in country music.

GEORGE GRANATA, JR.
Burley, ID

Hi-Fi VCR's

I found an error in "Three Top Hi-Fi VCR's" in the April issue that might account for the poor video response of the Mitsubishi HS-U71. Author Edward J. Foster said that the HS-U71 was the only one of the three machines tested that lacked a sharpness control. The HS-U71 does have a sharpness control, which is adjusted on screen by the

remote. I suggest that you recheck it with the sharpness set at maximum.

JOHN P. KING
Birmingham, MI

Editor at Large Michael Riggs replies: Thanks for catching that one: Yes, the HS-U71 does have a sharpness control. But since sharpness controls work on the playback signal, they increase the high-frequency video noise when they are turned up. We therefore make all video measurements with sharpness controls at their flat settings. In any event, we would not describe the HS-U71's video response as "poor" but as very good indeed for a VCR. You would have a hard time detecting a difference in resolution between it and the other VCR's Mr. Foster tested with normal program material, especially at the SP speed.

Neeme Järvi

Neeme Järvi is not a Finnish conductor, as Eric Salzman states in his May review of Järvi's recording of the Shostakovich Symphony No. 4. He was born in Estonia, still forcibly occupied by the Soviet Union.

JOHN F. SHINE
Glenview, IL

We regret repeating this unfortunately rather common error. Perhaps now that Maestro Järvi has been named music director of the Detroit Symphony Orchestra, American music lovers will become more familiar with him as well as his recordings.

Impedance Matching

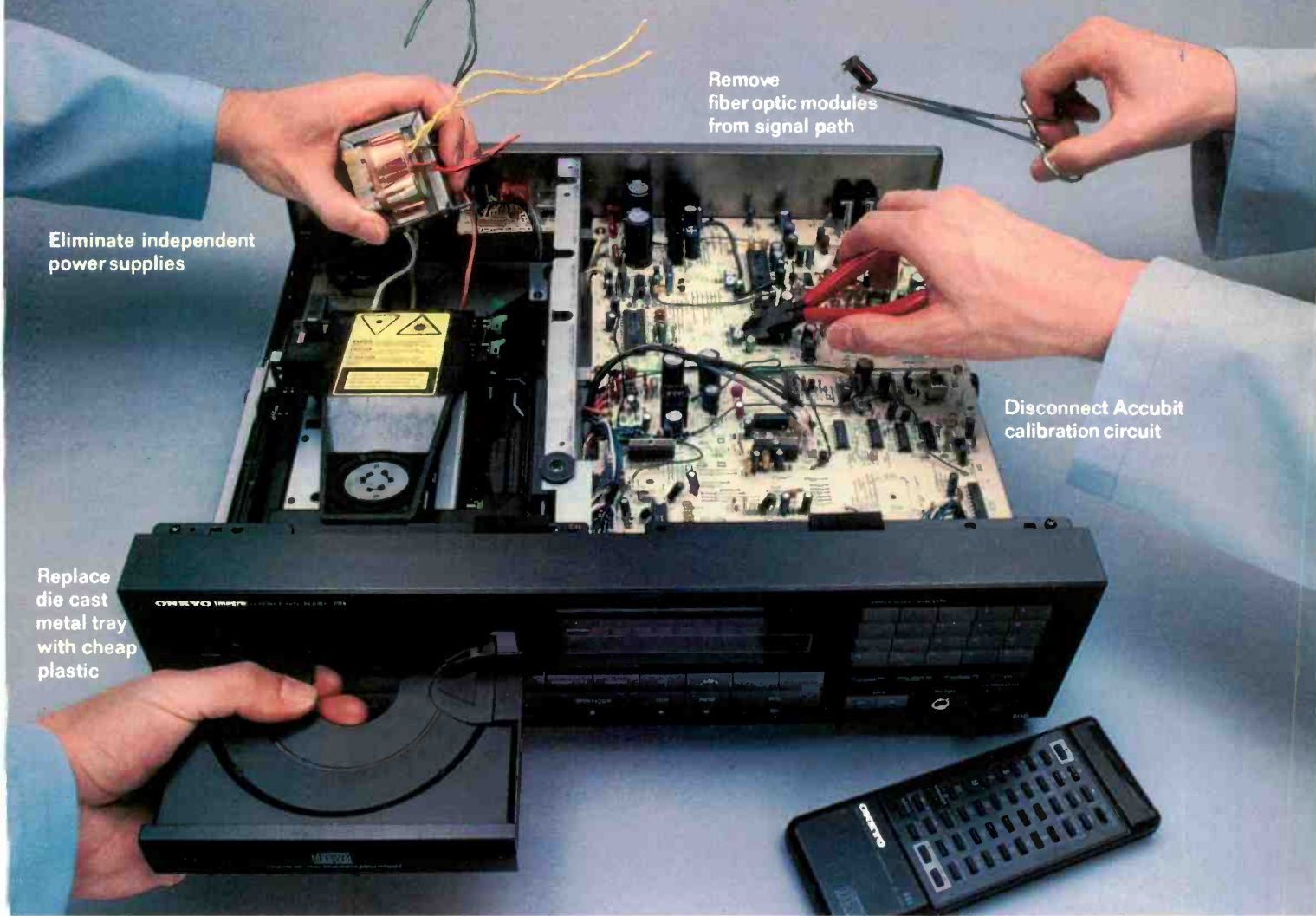
A recent issue of *Consumer Reports* warned that many American-made speakers are not compatible with audio electronics manufactured in the Far East. It seems that the impedances of American speakers rated at 4 ohms won't match Japanese and Korean receivers designed for 8-ohm or 16-ohm speakers. The magazine warned that such mismatching will overheat amplifier sections.

Since 4 ohms is half of 8 ohms, then half the resistance will draw twice as much power even when both components are matched. Using 4-ohm speakers thus seems costly and wasteful in terms of energy usage.

GEORGE NUSSBAUM
New York, NY

Editor at Large Michael Riggs replies: Not so. Severe mismatches between amplifiers and speakers are actually very rare. Almost all loudspeakers have complex impedances that are tricky to characterize with a single number (which is why impedance specifications are called

How to make an Onkyo CD player as good as its competition.



Eliminate independent power supplies

Remove fiber optic modules from signal path

Disconnect Accubit calibration circuit

Replace die cast metal tray with cheap plastic

If we wanted to make an Onkyo CD player as good as our competition, it wouldn't be too hard.

We'd have to remove our isolated transformer with its three independent power supplies for the transport, digital and analog circuits. As a result, tracking stability suffers, while signal interference measurably increases (turning music peaks into music mounds).

There'd be no need for Onkyo's proprietary Accubit calibration circuit. Which means there'd be no low level dynamics—no sense of depth or dimension to the music.

So Carnegie Hall sounds like Carnegie's closet.

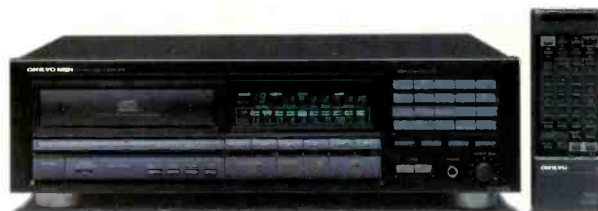
Taking out Onkyo's Opto-Coupling fiber optic

modules and using conventional circuit wiring would insure that a little harsh digital noise mixes in with the music. Perfect for "grate audio."

Gone would be the die cast aluminum tray Onkyo uses, replaced by a plastic version that leads to further diminished sound quality and a wear, tear, it's-due-for-repair syndrome.

Now, we could do all these things to an Onkyo CD player. But then we wouldn't have a component as masterful as our new DX-5700 with Dual Linear 18 Bit D/A Converters and Accubit² Calibration.

At Onkyo, all our CD players are built to be better. That's a difference you can hear—and see.



ONKYO

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CIRCLE NO. 47 ON READER SERVICE CARD

For Product Information



Call 1-800-888-8237

"nominal"). Speaker impedances often vary through the audio band from less than 4 ohms to more than 20 ohms at some frequencies.

Virtually all of the high-fidelity loudspeakers now on the market, regardless of where they are manufactured, have rated impedances between 4 and 8 ohms, with about as many at the high end of that range as at the low end. A small number do, in fact, present difficult loads that may cause some amplifiers to clip prematurely, overheat, or

shut down, but this is quite out of the ordinary. The vast majority of the modern amplifiers and receivers that *STEREO REVIEW* has tested will deliver more continuous power into 4 ohms than into 8 ohms; some even perform well into 2-ohm loads.

Finally, raising a speaker's impedance will not reduce the amount of power it draws unless you are willing to accept a lower listening level; it will simply force you to turn up the volume control to achieve the same level.

More on CD Care

In April "Letters," Lewis M. Davis, Jr., commented that the playing side of compact discs is the one without the label. I, for one, did not know this, and I have been cleaning only the label side. Am I wrong? Should I clean both sides, the nonlabel side, or what?

PAUL ANDREWS
Hingham, MA

The side without the label is the playing side of a CD, and it is normally the only side that may need cleaning. The only reason to clean the label side is if it gets so dirty that it becomes hard to read or if some sort of loose dirt gets deposited on it that might be thrown into the CD player's mechanism as the disc spins.

Rebecca Day's February article on "How to Care for CD's" inspired me to suggest another technique of handling them. A "jewel box" is designed so that its spindle works as a clutch. A disc can be uncoupled from the spindle by just pressing the spindle gently. Similarly, a CD is secured by placing its center hole on the spindle and pressing the spindle again. In this way touching and bending of the disc itself is minimized.

Also, a word of caution about CD cleaning solutions. There are some on the market that are claimed to remove a static charge permanently. This is accomplished by a greasy film of conductive residue left on the disc. As soon as your fingertip touches the disc, it becomes smeared much worse than it would be if there were no "protective" film at all. Besides, there are hardly any practical reasons why a CD should be rendered nonstatic.

LEO BACKMAN
Helsinki, Finland

Generally, you should avoid putting anything on a CD that leaves a residue.

Schubertian Footnote

Maxell's copywriters are smarter than Jay Austin's letter in March allows. Schubert's Seventh Symphony was sketched, but not orchestrated, qualifying it as an unfinished symphony, which was all that the advertisement in the January issue claimed.

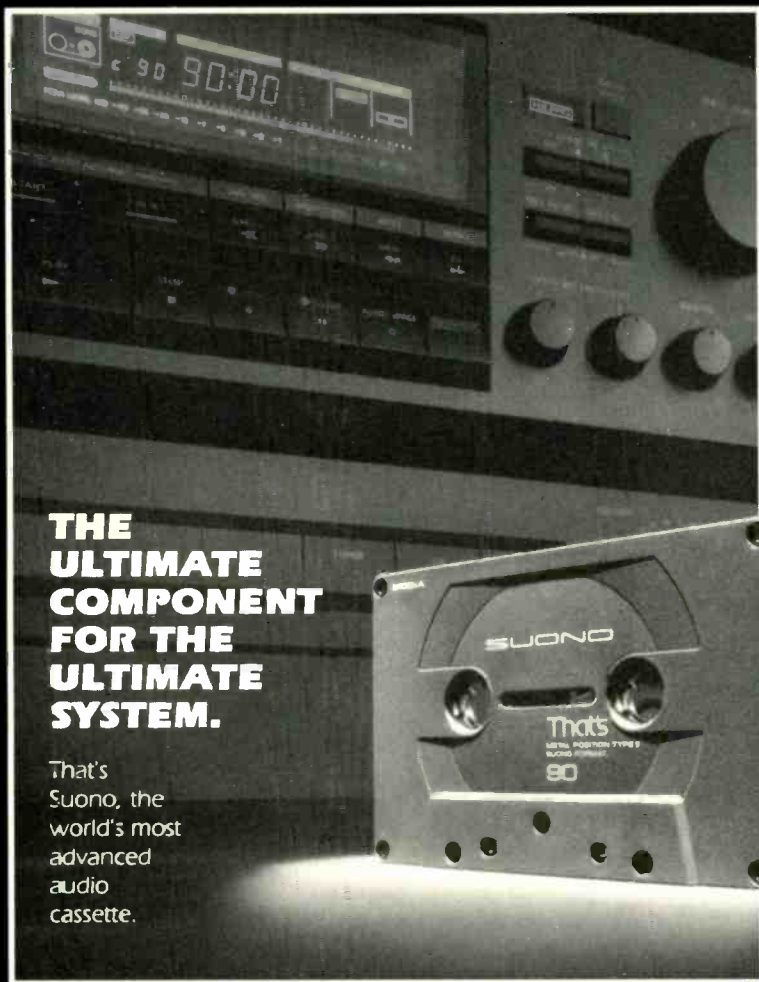
DAVE BAUM
Central Square, NY

The Owl Level

In the May review of the Sony CDP-X55ES compact disc player, I found a most unusual entry in the "Laboratory Measurements" box at the bottom of page 40: "ow-level linearity error." This must refer to linearity errors that only become apparent when you are listening at painfully loud volumes.

JON JEROME
Buffalo Grove, IL

S U O N O



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CIRCLE NO. 187 O-4 READER SERVICE CARD

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Conceived in total dedication to the pursuit of excellence, the time required to develop the research program for this system has spanned at least two decades. The elusive combination of variables required to yield a uniform field has been tantalizing researchers for many years. Finally, after McIntosh built one of the most advanced and best instrumented acoustical laboratories in the world was it possible to follow the many theoretical leads to their conclusion. Then, after this extensive effort of analyzing so many different approaches to uniformity of field, was it possible to synthesize all of this knowledge and in one flash of intuitive genius the director of our acoustical laboratory saw a seemingly simple solution in the correct matching of diameters, masses and compliances and what evolved is a new measure of accuracy and realism. The intellectual and emotional experience of listening to the XR 1052 is something you simply must enjoy in your own home.



For information on McIntosh products and product reviews please send your name, address and phone number to:

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CIRCLE NO. 29 ON READER SERVICE CARD

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What do you do after building the largest, most sonically-accurate speaker system in the world?

If you're Infinity, you take everything you've learned from the 7½ foot, \$50,000 Infinity Reference Standard V and apply it to the most sonically-accurate compact speaker system in the world.

And you call it Modulus. A speaker system for the 1990's. Technologically, it is an

encyclopedia of high science, from its time-aligned driver array to its servo-controlled subwoofer to its acoustically-inert, sand-filled pedestals.

Sonically, it has the power to drop jaws with its absolutely uncanny musical accuracy.

And visually, it would be as at home in the Museum of Modern Art as in any listening room. With or without its optional modular components.

To audition the new Modulus system, bring your favorite disc or tape to a selected Infinity dealer.

And experience Research and Development, Infinity style.

 **Infinity**

We get you back to what it's all about. Music.

For literature and the name of your nearest Infinity dealer, call (800) 765-5556. In Canada, call (416) 294-4833. H. Roy Gray, Ltd. © 1989 Infinity Systems, Inc. **H** A Harman International Company.

NEW PRODUCTS



BLAUPUNKT

The Blaupunkt Washington SQR 49 autoreverse cassette receiver incorporates the company's Ultra High-Definition tuner with twelve AM and eighteen FM presets, preset scan, and last-station memory. It also features TravelStore, which automatically memorizes the frequencies of the six strongest stations in an area. The cassette section includes a Super-Laminated tape head and Dolby B, Dolby C, and DNR noise reduction.

The amplifier section is rated at 25 watts a side into two channels or 7 watts per channel into four. There are four preamp outputs and a CD input. Several anti-theft features are included: electronic code protection, personal-identification-number storage, stamped-in serial numbers, and pull-out mounting. Price: \$650. Blaupunkt, Dept. SR, 2800 S. 25th Ave., Broadview, IL 60153. *Circle 120 on reader service card*



SHERWOOD

The CD-1192R is Sherwood's top-of-the-line compact disc player. It features an eight-times-oversampling digital filter, an 18-bit digital-to-analog converter, and an antishock chassis. The player comes with a ten-key infrared remote control and is compatible with Sher-

wood's Digi-Link remote system. Programming can be done either from the remote control or from the front panel. Price: \$299.95. Sherwood, Dept. SR, 14830 Alondra Blvd., La Mirada, CA 90638.

Circle 121 on reader service card



CASE LOGIC

The Case Logic CSC-1 is a portable protective case for removable car stereo cassette receivers. Made of nylon and padded with thick foam, it comes with a nylon shoulder strap. A double-flap closing system with a Velcro fastener holds the cassette receiver securely in place. The side pocket is designed to hold radar detectors or other accessories. Price: \$19.95. Case Logic, Dept. SR, 6930 Winchester Circle, Boulder, CO 80301.

Circle 122 on reader service card

AUDIOSOURCE

The AudioSource Video LC-1 is a disc with a built-in brush designed for cleaning the laser lens in a laserdisc player. When inserted in the player, the disc spins, aligning the lens with the brush. When the cleaning cycle is finished, the disc stops spinning. The company recommends cleaning a lens after every 10 hours of play. Price: \$49.95. AudioSource, Dept. SR, 1327 N. Carolan Ave., Burlingame, CA 94010.

Circle 123 on reader service card



MISSION ELECTRONICS

The Mission Cyrus One is a high-current integrated amplifier that is said to be compatible with any loudspeaker. It is rated at 25 watts per channel, with a 35-ampere peak-current capability. Total harmonic distortion at 1,000 Hz and full power is rated as 0.003 percent into 8 ohms, 0.004 percent into 4 ohms. There are inputs for a tape recorder, video and auxiliary sources, a CD player, and a moving-coil or moving-magnet phono cartridge. High-quality components such as metal-film resistors and polyester capacitors are used, and all RCA-type inputs and outputs are mounted directly to the single circuit board. Price: \$499. Mission Electronics USA, Dept. SR, 18303 8th Ave., Seattle, WA 98148.

Circle 124 on reader service card



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The Conductor.

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ADC

The ADC Soundshaper 310 ten-band graphic equalizer allows up to 15 dB of boost or cut in every octave. It includes an omnidirectional microphone, a pink-noise test-signal generator, and a real-time analyzer display. Its switchable 18-dB-per-octave infrasonic filter removes signals below the audible range that otherwise would waste power and

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The Allen Products compact disc and cassette stand, designed to be placed on or near stereo equipment, shows the recording you're currently playing. It is available in black, charcoal gray, gold, metallic silver, and royal blue with standard lettering in silver, white, and black. The words "FM in play" show when no disc or tape is displayed. The aluminum stand has padded feet. Price: \$14.95. Allen Products Co., Dept. SR, 1509 Adelia Ave. S., El Monte, CA 91733.

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MEMOREX

The Memorex DSS-100 is a Dolby Surround Sound system that includes a DS-10 four-channel amplifier delivering 5 watts per channel. Its three inputs can be used for a TV, VCR, laserdisc player, or any other line-level component. The amplifier has a stereo synthesizer that can create simulated stereo sound from mono inputs. A pair of Memorex Series 10 speakers, 45 feet of speaker cable, and an audio patch cable are included with the system. Price: \$249. Memorex, Dept. SR, P.O. Box 901021, Fort Worth, TX 76101.

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NEW PRODUCTS



TRIAD DESIGN

Triad Design's System Seven is a three-piece satellite/subwoofer speaker system. The midrange driver in each satellite has a 1½-inch voice coil, a cast basket, and a special magnet structure that's said to provide the advantages of electrostatic drivers without drawbacks such as low sensitivity. The 1-inch fabric-dome tweeter is isolated from the midrange by a damped, rotating mounting system. The bass module has a 12-inch woofer powered by a built-in 70-watt amplifier. Frequency response is rated as 140 to 20,000 Hz \pm 2 dB for the satellites and 28 to 110 Hz \pm 3 dB for the subwoofer. The satellites' midrange enclosures are 5½-inch cubes, and their height including the tweeters is 10 inches. The subwoofer is a 13-inch cube. Available finishes are lacquered light or medium oak and walnut veneers or black, white, red, yellow, blue, or green textured paint. Price: \$975 for the system. Triad Design, Dept. SR, 490 NE 219th Ave., Troutdale, OR 97060. *Circle 129 on reader service card*

MILLENNIUM

The Millennium line of Power Cell rechargeable batteries and battery chargers from Gates Energy Products is the company's first offering direct to consumers. The two- and four-position battery chargers, called RapidChargers, accommodate C, D, AA, AAA, and 9-volt batteries. They are said to charge Millennium Power Cells in 3 hours, or 33 percent faster than comparably priced chargers. Prices: Power Cells, \$4.99 to \$7.99; RapidChargers, \$15 to \$20. The Power Cells come with a lifetime guarantee. Millennium, Gates Energy Products, Dept. SR, P.O. Box 23649, Gainesville, FL 32602.

Circle 130 on reader service card



SANUS SYSTEMS

The Natural Foundations line of speaker stands is the midprice series from Sanus Systems. The stands include a concealed cable path and are available in 7-, 14-, 21-, and 28-inch heights. Standard construction is medium-density fibercore finished with three coats of hand-sanded black lacquer. The 14- and 21-inch stands are also available with solid oak or walnut pillars. Downward and upward steel spikes and neoprene isolation pads are included. Price: from \$50 to \$85 a pair. Sanus Systems, Dept. SR, 3178 Ryan Lane, Little Canada, MN 55117.

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KRELL DIGITAL

The design of Krell Digital's top-loading MD-1 CD player is said to eliminate virtually all sources of interference. An electronic sensor confirms that a CD is loaded, and a weight centers and stabilizes the disc. The transport is based on the Philips single-beam CDM-3 swing-arm motor-drive mechanism, originally developed for CD-ROM applications. Custom-designed toroidal transformers and two-stage regulation are used to limit internal noise. External noise is said to be minimized by the black acrylic mounting, which prevents extraneous resonances from reaching the assembly, and by the suspension design—each component is made from solid aluminum and mounted to a solid-aluminum base plate. The MD-1 has fiber-optic and coaxial digital outputs. Price: \$4,000. Krell Digital, Dept. SR, 20 N. Plains Industrial Rd., Suite 12, Wallingford, CT 06492.

Circle 132 on reader service card

SHIRT-POCKET DAT?

REPORTED BY BRYAN HARRELL

TOKYO—Two hours of digital recording on a cassette the size of a postage stamp? With a recorder the size of a candy bar?

Not surprising news in the year 2001, but quite a thrill earlier *this* year when Sony announced the development of just such a technology. Better yet, the company had a working prototype to prove it.

Though it will be at least another year until an actual product is put on sale, what Sony has created is an ultracompact voice-memo recorder using what must be the smallest digital recording medium yet apart from computer memory chips. The tiny cassette measures only 30 x 21.5 x 5 millimeters and houses a reel of metal-evaporated tape only 2.5 millimeters wide. More astonishing is the 2-hour recording time in a single direction.

Why this new format may be of significance to music listeners becomes obvious when you look at the audio specs: dynamic range of 80 dB, frequency response of 10 to 15,000 Hz—and in stereo. Not CD quality, but better (in terms of dynamic range) than existing stereo FM and better than low-price analog cassette machines.

Sony intends this format for use in voice recording (just as Philips originally intended its compact cassette format for dictation), and no doubt the first products will be expensive. But considering its high-fidelity audio quality *and* its astonishing compactness, it takes only a little leap of the imagination to envision a digital Walkman the size of a credit card that would more than satisfy the casual listener.

Car audio presents another set of possibilities for all but the most discerning audiophiles. With increasingly complex sound systems being installed in smaller and smaller cars, space is becoming more problematic than ever. But imagine how many of *these* cassettes could be stored in a glove compartment! For many, the format's advantages may make its somewhat higher distortion and smaller dynamic range acceptable.

How It Works

Like a VCR or full-size DAT deck, the memo recorder uses a spinning head drum, albeit one only 14.8 millimeters in diameter. The big difference, however, is Sony's new nontracking (NT) playback method.

During playback, the head drum rotates twice as fast as it does during recording, allowing the head to scan each segment of the recording twice; the information is stored in a semiconductor memory, where it is sorted and compiled for error correction and conversion into an analog signal.

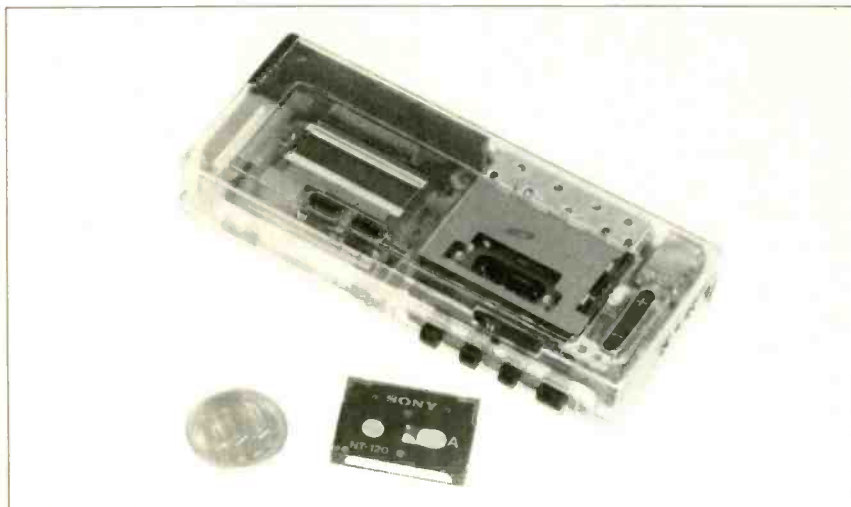
This system not only obviates the need for the extremely high precision necessary in conventional helical-scan tracking systems, but it also enables the simplification of loading and servo mechanisms. In fact, the pinch-roller and tape-guide pin are moved from the transport mechanism to the cassette so that the tape pass can be created by inserting the head drum directly into the cassette itself. The drum pokes into the cassette only about half way, and tape wrap is just 100 degrees.

History Repeats Itself

Personally, I look upon this new development with a little nostalgia. When I came to Japan in the late Seventies, my work required a lot of travel between Tokyo and Osaka on high-speed *shinkansen* express trains. To make the frequent journey more pleasant, I fitted a good pair of headphones onto a small cassette recorder and enjoyed stereo music tapes in mono.

The unit was a Sony Pressman, one of the most compact available at the time. Although the sound wasn't great by home standards, it was quite good considering the convenience. Better yet, I could slip the machine in a coat pocket and listen to music while walking.

A year or two later, Sony released the first Walkman, which was essentially a stereo playback-only version of the Pressman, but with a shiny blue finish. I can't help but think that once Sony markets a voice recorder in this new format, audio renegades will start using it for music. Who knows? The rest may be history. □



Sony's digital memo recorder with a 100-yen piece (slightly larger than a nickel)

THE FUTURE OF DIGITAL AUDIO IS BEING SHAPED BY TECHNICS TODAY.

MASH

multi-stage noise shaping



Technics MASH 1-Bit Multi-Stage Noise Shaping Technology

What is MASH Technology?

MASH technology, quite simply, is a radically new solution to the most stubborn problem in compact disc sound reproduction—the conversion of analog signals from the digital domain. With the creation of a new conversion system—MASH, or Multi-Stage Noise Shaping—we have taken a giant step toward realizing the true potential of digital audio. And this cutting-edge technology is available from Technics.

MASH converter technology uses a revolutionary method to perform conversions of digital signals into analog audio (D/A), a method that obsolesces all previous D/A conversion techniques. Instead of employing conventional "multi-stepped" converters

using 16, 18 or more bits, MASH uses only one bit to perform its task. This leads to the elimination of the errors that plague



Figure 1

conventional converters, errors create noise. As a result, MASH is digital audio technology of the highest caliber. In fact, MASH chips are among the most sophisticated audio circuits ever manufactured; Figure 1 shows a photograph of a MASH chip.

Compact disc players with MASH digital-to-analog circuitry are able to convert the digital data contained on CDs into cleaner, purer musical waveforms. This results in measured specifications that are superior to those of other conventional CD players. Someday, all digital audio devices may use circuitry as sophisticated as that employed in MASH. Technics has made this new technology available today.

The Musical Benefits of MASH

Although audio engineers love to devise new circuits, very few of them truly represent a breakthrough in sonic performance. MASH is just such a breakthrough. Foremost is the extremely clean audio signal which is output from a MASH circuit. While other converters suffer from low-level nonlinearity and offset errors, MASH is virtually free of these defects. As a result, low level signals are reproduced with great accuracy, even in the presence of high-level signals. Figure 2 shows the distortion characteristics of a conventional circuit

compared to that of a MASH 1-bit circuit. In a conventional circuit, low-level signals suffer an increase in distortion due to the amplitude of a larger signal. MASH circuits are largely free of this distortion.

With MASH, very soft sounds such as the ambience in a concert hall are more accurately reproduced, and elements of louder sounds such as the harmonics of musical instruments sound more faithful to the original. Throughout the entire MASH circuit, at all listening levels, distortion is

reduced to an extremely small value. This kind of sonic precision and musical fidelity is the hallmark of MASH technology.

Where conventional converters use analog technology, MASH uses digital technology. It enjoys all of the advantages that make digital audio superior to analog audio. For example, conventional converters must rely on laser trimming or manual adjustments of analog components to provide accurate performance. As a result, performance varies from unit to unit; the unit you purchase may not measure up to the one that was reviewed. With MASH, the digital processing is precisely duplicated in each unit, yielding excellent consistency. This high precision MASH technology allows design engineers to push the sonic performance almost to the theoretical limit.

Conversion inaccuracy has been identified as the primary deficiency in the current generation of digital audio hardware. However, many manufacturers have continued to use conventional converters, increasing the number of bits and adding compensation

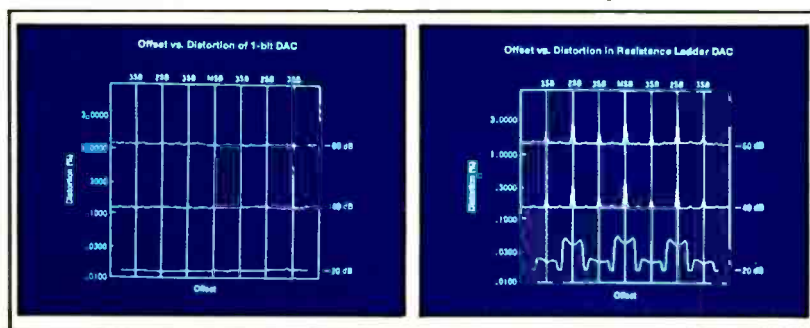


Figure 2

Technics

circuits to improve their operation. As these circuits become more and more complicated, they become more subject to error and failure. In particular, conventional converters suffer from degradation due to aging, vibration, heat, and humidity. Often, a compact disc player satisfactorily adjusted at the factory will be out of adjustment by the time it reaches the dealer's shelves. The superior MASH digital conversion system, however, eliminates many of these deficiencies and is not affected by normal environmental changes that plague conventional circuits. Because arithmetic processing is performed by digital signal processing (DSP)

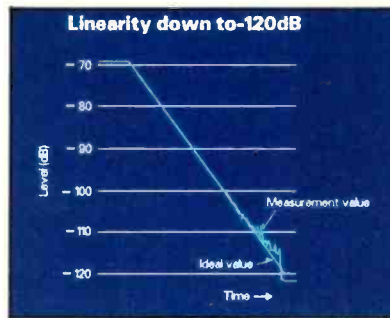


Figure 3

microprocessors, both performance and reliability are greatly increased.

Because of its better design principles and real-world robustness, MASH performs significantly better than conventional converters. For example, conventional converter nonlinearity can reach several dB at a -90 dB signal level. MASH circuits deliver unprecedented linearity, even at extremely low levels, as shown in Figure 3. And MASH technology will continue to deliver the same precise audio performance time after time, even in the harsh conditions to which portable and automotive audio products are subjected.



A Simple MASH Analogy

MASH is a highly sophisticated technology. It is not easy to see how one bit can take the place of 16 or more bits. Fortunately, a simple analogy may be employed to explain the operating principle behind MASH 1-bit conversion.

Conventional digital-to-analog converters, using a sequence of resistors, are like a row of lightbulbs, each connected to a switch. Sixteen bulbs, for example, each with a different brightness, can be lighted in various combinations to achieve many levels of room brightness. In fact, 2^{16} , or 65,536 different levels of brightness could be achieved. But relative differences in individual bulb intensities will introduce error into the

system. A certain switch combination will not always produce the desired room brightness. As the bulbs age and their output varies, the result can deviate even more. Similarly, conventional converters introduce error as they attempt to reproduce the audio signal.

MASH 1-bit technology uses a radically new approach. Instead of many bulbs and switches, only one high-intensity bulb, and one sophisticated high-speed switch are used. Room brightness is varied by simply switching the bulb on and off. For example, if the bulb is always off, the room is dark, and if the bulb is always on, the room is very bright. If the bulb is on half the time and off half the time, the average level of brightness in the

room is half of the maximum. If the bulb is turned on more than it is off, the average level of brightness will increase and vice-versa. Similarly, MASH uses only one bit to produce any level of sound. The one bit in the MASH D/A conversion method is analogous to the one high-intensity lightbulb being either on or off. Because the timing is very accurate, the switching very fast, and only one level step required, MASH produces sound with virtually no audible error. The advantage over a system with many bulbs (or bits), and the need to adjust for their relative levels is clear. One-bit technology is an inherently more accurate method of converting digital data to an audio waveform.

Technics

The Technology Behind MASH

MASH is a highly computational method, using the precision and reliability inherent in highly advanced digital signal processing. It specifically addresses a difficult problem in D/A conversion known as requantization noise. When digital data is converted to an analog waveform, an error or noise is introduced into the signal. This noise is significant, especially when measured at low signal levels. MASH uses a technique known as noise shaping to reduce this noise. In fact, MASH is an acronym derived from the term, Multi-Stage Noise Shaping. Using a multi-stage technique, the signal passes through both first-order and second-order noise shaping stages to achieve third-order noise shaping, as shown in Figure 4. This

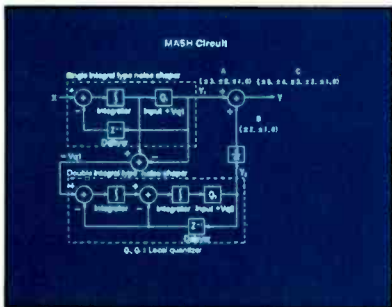


Figure 4

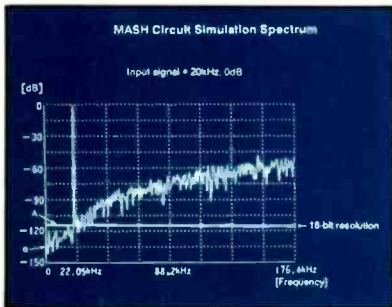


Figure 5

algorithm processes the requantization error, causing it to decrease dramatically in the audible audio band. As shown in Figure 5, the in-band noise (from 0 to 22.05 kHz) for a 16-bit conventional converter (line A) is much higher than for a MASH circuit (line B). Higher noise levels far beyond the audio band are eliminated by output smoothing filters. As a result, the audio requantization noise-floor is lowered significantly.

This DSP technique allows a signal to be conveyed with a fewer number of bits per sample. Yet the signal itself retains the performance level of many more data bits. To accomplish this, extremely high oversampling rates must be employed. In the MASH system, different oversampling rates are possible. For example, the SL-PC45 CD player uses a 32-times oversampling rate. Some versions of MASH use even higher sampling rates. Through noise shaping and high-order oversampling, noise is reduced to levels below those possible with conventional methods.

MASH uses pulse-width modulation (PWM) to deliver the noise-shaped audio signal to the output stages. The digital audio signal from the noise shaper is in the form of 11-value data. It in turn is converted into pulses each having a width corresponding to one of the eleven values. The width of each pulse determines the average amplitude of the output waveform, as shown in Figure 6. For example, a narrow-width pulse would produce a low average amplitude signal. This 1-bit pulse switches at a staggering rate of 33.9 MHz, or 768 times the original sampling frequency. It is this fast and accurate signal that controls the "light switch," that is, reconstructs the audio waveform. By converting the signal in terms of amplitude,

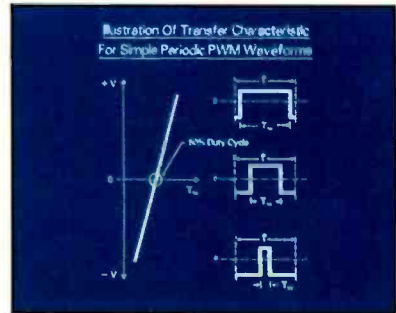


Figure 6

MASH performs the conversion in terms of time—an inherently more accurate method.

Instead of requiring an accuracy of 2^{16} along the amplitude axis, MASH outputs only two values (high and low), no adjustments are required, and in principle no differential error is produced along the amplitude axis. Precise switching is obtained along the time axis by using a quartz-crystal oscillator for the clock signal. Looked at in another way—conventional conversion is an analog type of conversion, whereas MASH is a digital conversion. Hence it is more precise. A MASH circuit can easily achieve the performance of 18- or 20-bit conventional converters, and deliver that performance with consistency that is otherwise impossible.

Because only one bit is used at the PWM output and a simple low-pass filter is employed for smoothing, problems with conventional converters such as differential nonlinearity, zero-cross distortion, offset error, switching noise, and the need for deglitching circuitry, are avoided entirely. Instead, the digital data is converted into an audio waveform with truly digital precision. Although it is a highly complex method, there is a great elegance in the MASH 1-bit approach.

Technics Leadership

A technology as superior as MASH cannot exist too long without competition. Other manufacturers have worked hard to devise their own 1-bit conversion methods similar to MASH. And although imitation is the highest kind of flattery, it doesn't always measure up. In this case, Technics maintains advantages over both conventional conversion

methods, and other 1-bit methods. Technics has extensive experience in this new technology. While other manufacturers have rushed their 1st generation 1-bit chips to market, Technics is now employing its 3rd and 4th generation chip sets. In fact, Technics began research on MASH in 1984, in collaboration with Nippon Telegraph and

Telephone Company (NTT)*.

MASH offers many significant advantages over conventional conversion methods, and is far ahead of the 1-bit offerings of other manufacturers. Clearly, Technics is the leader in 1-bit digital audio technology—a future technology that is here today.

*Note: Technics developed the MASH 1-bit DAC. NTT (LSI Labs) invented MASH technology. NTT has applied for trademark registration for MASH.

CD players and changers from Technics—musical accuracy through MASH Technology

"Thanks to technology such as that contained in MASH circuitry, CD playback has never been better. In particular the Achilles Heel of CD players, low-level non-linearity, has been overcome. A Technics MASH P570 CD player I recently measured showed a -90dB non-linearity error of 0.0dB compared to a 2- or 3-dB error typical in conventional players. This is an incredible technical achievement."

Ken C. Pohlmann,
Author of The Compact Disc Handbook

"The SL-P370 [using MASH 1 Bit Technology] is obviously a first-rate product, as nearly "state of the art" as any I know of, and surely one of the top values in home CD players."

Julian Hirsch, Hirsch-Houck Laboratories
STEREO REVIEW April 1990



Technics

Technics, Inc. 1 Panasonic Way Secaucus, NJ 07094



ANY CD CHANGER CAN CHANGE DISCS. THIS ONE WILL CHANGE THE WAY YOU HEAR MUSIC.

Technics introduces **MASH*** one-bit technology.

When you (and your friend) sit down to hear music, you want as much glorious sound with as little of anything else as possible.

Technics' MASH digital-to-analog converter system not only helps improve low-level reproduction during quiet passages, it also brings you more accurate reproduction of the harmonics in music

throughout the louder passages as well.

And because MASH delivers wider dynamic range, the expanded distance between the very quietest and loudest passages can give you more of the directness and dramatic impact of the original performance. With the virtual elimination of zero-cross distortion.

The net effect is that you're that much closer to the music. And that much further from distractions.

Of course, since all our CD changers play any combination of five

3-inch or 5-inch discs, they also bring you music for hours. Any way you like. Continuously. Only selected tracks. Random play from all discs. Or random only from selected tracks. All under the direct control of the wireless remote.

You can even – thanks to its top-loading design – change 4 discs while the fifth keeps playing. Because when you and a friend are having such a rich experience, who wants the music to stop.

Technics
The science of sound

*Technics developed the MASH one bit DAC. NTT (LSI Labs) invented MASH technology. NTT has applied for trademark registration for MASH.



CARVER M-2060 POWER AMPLIFIER

by Ken C. Pohlmann, Hammer Laboratories

FOR many people, a simple cassette receiver and four loudspeakers is sound system enough for a car. But the addition of an external power amplifier can represent a tremendously cost-effective step toward better fidelity; higher sound-pressure levels can be achieved, and, more important, relative distortion is reduced. You don't need a monster amplifier to realize the benefit—a reasonable amount of power will suffice—but the amp should be versatile enough to meet your installation needs. The Carver M-2060 is precisely on target, providing a pair of channels rated for 60 watts into 4-ohm loads as well as sufficient inputs, outputs, and bridging options to fit any existing car audio system.

As with most car power amplifiers, its appearance is strictly non-sense. The metal chassis is crowned by heat sinks, and the paint job is flat black to assist in heat dissipation. Operating con-

trols, inputs, and outputs are all arranged along one end of the chassis. A terminal strip provides four lugs for outputs to loudspeakers as well as three lugs (left, right, and common) for high-level inputs. The latter are used only for connecting the M-2060 to a receiver that has no line-level outputs. Normally, inputs are handled through a pair of line-level phono jacks.

There are two screwdriver holes on the end of the chassis that permit input-sensitivity adjustments from 250 mV to 4 volts, a wide enough range to accommodate virtually any upstream unit. Two recessed push-buttons allow for mono and bi-amplified operation. The mono button bridges the stereo channels, creating one 120-watt output channel. The biamp button engages an electronic crossover at 80 Hz, with a slope of 18 dB per octave, that splits the input signal into low- and high-frequency bands. The low band is fed to the M-2060, so it becomes a sub-

woofer amplifier, and frequencies over 80 Hz are passed through a pair of phono jacks to another power amplifier. For example, you could use two M-2060's—one in mono mode for the subwoofer, the other in stereo mode for the midrange and high frequencies.

The biamp mode is a great feature—amplifiers from some other manufacturers require a separate crossover for this kind of setup. Also, if an 80-Hz crossover point doesn't suit your system, you can shift the frequency through internal modification.

Buried deep inside the amplifier is an infrasonic filter, which attenuates 3 dB at 15 Hz to eliminate useless (and detrimental) woofer flapping. Of course, the M-2060 also contains protection circuitry that shuts down the amp in case of shorted speaker leads, thermal overload, or other stressful conditions.

At the other end of the chassis, far away from the audio wiring, is a terminal strip with three lugs for ground, power, and a remote turn-on lead so that the amplifier can be automatically powered via the on/off switch of a head unit. There is also a 10-ampere fuse and a power-on LED. Because car amplifiers are usually tucked away in the trunk, the LED is useful mainly as a diagnostic tool, to make sure the unit is being powered.

As with many other Carver power amplifiers, the M-2060 uses proprietary Magnetic Field technology involving an unusual switching power supply that monitors the power demands of the music and selects one of three bipolar power-supply rails to suit the signal's voltage needs. In this way, power is used only on demand, so less power is used overall. Because of its decreased average current draw, the amplifier's size and weight can be diminished, and it runs more efficiently and cooler than conventional amps. And that reduces the burden on the car's electrical system, allowing the user to add more amplification without needing a higher-capacity battery or a modified alternator.

A look inside the M-2060 revealed a combination of integrated circuits and discrete components, with many high-quality parts, in-

"Model Eleven...Exquisite Sound...Dwarfs Any Portable Stereo...A High Tech Wonder...Thumbs Up!"

Doug Simmons—*The Village Voice*

MODEL ELEVEN

BY HENRY KLOSS

Cambridge SoundWorks' Model Eleven is the world's first *transportable* full-range, high performance component system. It consists of a powerful 3-channel amplifier and two "satellite" mid/high-frequency speakers—all packed in a rugged "BassCase"™ that, when empty, serves as the system's subwoofer. Model Eleven's performance, when coupled with your portable CD or tape player,** rivals that of the most expensive component systems. And because we market it directly from our factory, it costs hundreds less than it would in stores.



- Fits under airline seats—23 lbs.
- Can be checked as luggage.
- Works on all electrical systems.
- Delivers the full range of music.
- Is backed by a unique 5-year warranty.
- Makes an ideal Father's Day or graduation gift.

Introductory Price: \$599

Valid until July 1, 1990

sound virtually identical to our acclaimed Ensemble® speaker system.

Model Eleven can be used virtually anywhere in the world—115- or 230-volt, 50 or 60 Hz AC or 12-volts DC. Because the entire system fits under an airline seat—or can be checked as baggage—you can take it just about anywhere. But Model Eleven's sound is so good, so "big," you may want to keep it home. It's an ideal second (or first) music system for a study, bedroom or kitchen. At \$599† we don't know of any combination of components near its price (transportable or not) that approaches its sound quality.



The drivers used in Model Eleven's two-way satellite speakers are no-compromise, high-performance components—just like you'd expect to find in the finest home speaker systems.

work with a room's acoustics for optimum performance. Remove the satellite speakers, amplifier and your portable CD player from BassCase. Place the satellites where they create a musical "stage" near ear level. Put the BassCase where it reinforces low frequency output—on the floor, even behind furniture. The result is musically accurate



Henry Kloss created the dominant speaker models of the '50s (AR), '60s (KLH) and '70s (Advent)—as well as our highly acclaimed Ensemble and Ambiance™ speakers. While packing a stereo system into a suitcase before a vacation, he realized that an amplifier, a CD player and two small speakers take up the same space required for an acoustic suspension woofer to reproduce really deep bass. That was the inspiration for BassCase. Model Eleven's bass speaker enclosure which doubles as the entire system's carrying case.

Performance that rivals the best home component systems.

Until now portable music systems were, at best, a compromise. Even the most expensive ones lack the deep bass necessary for full, natural sound. But Model Eleven delivers the all-out performance previously found only in high quality home component systems. Its three speakers are designed to

"We Know Of No Small Speaker That Surpasses The Overall Sound Of Ambiance." —Stereo Review

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 as our Ensemble and Model Eleven systems, Ambiance has more output in the

40Hz region than any "mini speaker" we've encountered. Stereo Review magazine described Ambiance as "...beautifully balanced, delivering a full-size sound image with not a hint of its origin in two small boxes...very few small speakers we have heard can match the overall sound of Ambiance, and we know of none that surpass it." Available in Nextel or primed for painting for \$109 each †, or in solid oak for \$129 each †—backed by our 30-day money-back guarantee—direct from Cambridge SoundWorks.



Ambiance is an ultra-compact speaker that proves high performance, small size and low cost need not be mutually exclusive.

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

David Clark—*Audio Magazine*

Ensemble

BY HENRY KLOSS

Ensemble is 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, it costs hundreds less than it would in stores.

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.

Your listening room works *with* Ensemble, not against it.

No matter how well a speaker performs, at home the listening room takes over. If you put a conventional speaker where the room can help the low bass, it may hinder the upper ranges, or vice-versa. 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 furni-

ture. 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.



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.

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

Unlike seemingly similar systems, Ensemble uses premium quality components for maximum power handling, individual crossovers that allow several wiring options and cabinets ruggedly constructed for proper acoustic performance. We even gold-plate all the connectors to prevent corrosion.

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

30-day money-back satisfaction guarantee.

At only \$499†—complete with all hardware and 100' of speaker cable,—Ensemble is *the* value on today's speaker market. *Esquire* magazine describes them by saying, "You get a month to play with the speakers before you either return them or keep them. But you'll keep them." *Stereo Review* said "It's hard to imagine going wrong with Ensemble." For literature, reviews or to order, write us at the address in the coupon, or call 1-800-AKA-HIFI.*

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*CD player not included in Model Eleven system.

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- Send _____ (qty.) Ambiance (Nextel), for \$109 ea.†
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Ambiance \$4-\$12). Delivery time usually 2-7 days.

We ship worldwide, including APO & FPO.

cluding precision resistors. Parts are mounted on a single circuit board, and output devices are pressed to the bottom of the heat-sink area, where the chassis is polished to bare metal to enhance heat conduction. Construction quality was good, but we noticed two last-minute resistor-capacitor pairs soldered to the circuit board by pigtailed—not the ideal technique for a mobile audio product subject to long-term shock and vibration. Price: \$370. Carver Corporation, Dept. SR, P.O. Box 1237, Lynnwood, WA 98046.

Installation

The M-2060 was installed in the front trunk of my Porsche 911 Targa, the amplifier's chassis firmly mounted to the floor of the trunk using the supplied screws. We were careful to allow clearance under the unit for air circulation (a higher standoff in the mounting-bracket design would have facilitated mounting over carpet). As with any installation, we prudently disconnected the negative battery lead, then attached a short ground lead, a remote turn-on lead, and a power lead to the battery. A common point was used for the ground leads from the amplifier and other audio components to prevent ground loops. In addition, we isolated the amplifier's chassis from the signal ground by rubber grommets on the mounting brackets.

Carver recommends inserting an in-line fuse in the power cable (but doesn't supply either fuse or cable), and we followed that advice, using a 10-gauge cable with a 20-ampere fuse located close to the battery terminal. Of course, we were careful to allow access to the amplifier's connections and sensitivity controls.

We used a Blaupunkt New York SCD 08 CD tuner as the head unit, making it a simple matter to con-

nect the head unit's line-level outputs to the amplifier's inputs with high-quality audio leads. (Good leads are important in a car audio installation to guard against induced noise, the bane of mobile electronics.) The amplifier was initially configured as a two-channel unit, driving a pair of Nakamichi SP-65C full-range loudspeakers. Subsequently, to evaluate its bi-amping abilities, we used it to drive a pair of Nakamichi SP-80 8-inch subwoofers while another amplifier handled the front speakers. In both cases we were careful to adjust the M-2060's sensitivity for optimal performance. For those unfamiliar with this simple procedure, the M-2060's owner's manual gives excellent step-by-step advice, and it is clear and helpful in all other respects as well.

Road Tests

My road tests always start in the garage with some careful static listening. Over the years I've installed and auditioned countless combinations of audio equipment in my 911, with results that vary all over the map. But over time I've come to know exactly what that car sounds like; in a matter of minutes after an installation, I can make a pretty fair appraisal of the component under test. In this case, it was immediately clear that the M-2060 amplifier was highly competent. For example, in the fine new Delos recording of Bartók's *Miraculous Mandarin*, engineered by John Eargle, the intricate musical details were distinctly audible, and I got an excellent sense of the Seattle Opera House. In particular, the percussion, celeste, and organ were almost as forcefully conveyed as by my home system.

Of course, the true test of a car amplifier is on the open road, where the ambient noise requires a high

power output. While musical details are obscured under road conditions, an amp's ability to deliver clean wattage, and lots of it, can be plainly evaluated. Once again, I was well satisfied with the M-2060's ability to pump out clean listening levels. For example, the new London recording of Shostakovich's Eighth Symphony engineered by Colin Moorfoot captures a dynamic live Chicago Symphony performance that demands the utmost from an audio system. The third movement (a favorite test cut of mine) has tremendous transient and frequency-response demands, and the M-2060 was able to cope nicely under most conditions. The orchestra and solo instruments sounded clean and natural, with particularly good brass. Less winning was the string sound, which was somewhat hard or pinched to my ears. Under driving conditions, the amplifier never showed any evidence of noise or interference problems.

As you might expect, a 60-watt amplifier can only do so much. At high levels, it plainly ran out of steam, and distortion rose quickly. That is not a criticism of the M-2060; it's a question of how much you want to spend on power. In fact, the high performance of the M-2060 is a good argument for adding one or two of these amplifiers to your system. The extra power is particularly important for loud listening under high ambient-noise conditions such as sustained highway driving.

Under most conditions the M-2060 clearly excelled. Its sound was smooth and dynamic, and it had the ability to drive speakers cleanly to the limits of its power delivery. It offers highly useful options such as bi-amplification and mono bridging. Its intelligent design minimizes the burden placed on a car's charging and battery system, and in our tests it was free of induced noise. In short, it appears that Carver has been successful in bringing its home (and commercial) power-amplifier technology to the car. With technology like this available at a moderate price, anyone can raise the performance of his car audio system by a substantial notch.

Circle 139 on reader service card

LABORATORY MEASUREMENTS

1,000-Hz output power at clipping: with 14.4-volt power supply, 51 watts into 8 ohms, 66 watts into 4 ohms; with 12-volt power supply, 35 watts into 8 ohms, 52 watts into 4 ohms
Frequency response: 20 to 20,000 Hz ± 0 , -2.1 dB

Maximum distortion (20 to 20,000 Hz at half rated power into 4 ohms): 0.36% at 20,000 Hz, 30 watts output
Sensitivity (for a 1-watt output into 4 ohms): 33 to 279 mV
A-weighted noise (referred to a 1-watt output): -88.4 dB



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INTRODUCING VERY HIGH TECHNOLOGY.

by Ken C. Pohlmann



WHAT IS REALITY?

MY office at the University of Miami, where I direct the music-engineering program, is rather unusual. It has three doors, each leading to an entirely different part of the audio world. The first door leads to a recording studio with a thirty-six-input console, a twenty-four-track recorder, and a digital editing system. This is a place where music is manufactured according to the latest trends in our pop culture. It is a place where the combined talents of musicians, producers, and engineers come together to hone the cutting edge of the recording art.

The second door leads into a six-hundred-seat concert hall with acoustics well suited to classical music. Musicians and conductors assemble on the stage and meticulously rehearse great compositions from the past in preparation for live performances. It is like a shrine to our classical culture.

The third door leads to an engineering laboratory where audio circuits are designed, constructed, and repaired. Music is far from the minds of this room's inhabitants. Instead, this is a world of oscilloscopes and soldering irons.

I pass through each of these doors

every day. In the studio I may watch as a producer synthesizes string parts, then drops them into a new pop tune. In the lab I might demonstrate how to perform a spectrum analysis. In the concert hall I might listen to a rehearsal of Beethoven's Ninth. Sound like fun? You bet it is. But there's also a big problem—each of these realms is exclusive of the others. It is virtually impossible to reconcile their differences.

A studio recording of a pop song is a wholly manufactured artifact, often without any basis in performance. Parts are recorded across parallel tracks without regard for their human, instrumental, or synthesizer origins. The signals on these tracks are processed during both recording and mixing, then balanced through a repetitive, automated process in which the console, at the final stage, does the mix itself. The result is, by design, an artificial creation. The recording itself is the music. Once the recorded song is made, it will never be made again. If the song is ever performed, the objective will be to reproduce the sound of the recording.

In the concert hall, musicians perform from a published score, following the interpretive guidance of the conductor. A recording of their performance is documentation of an acoustical event, made with little or no signal processing. To be successful, the recording must convey the impression of hearing the performance as it actually existed in the hall. While some recordings become legacies, it is the music itself and the spontaneous conditions of its performance that are prized.

These two listening experiences are in total opposition. A pop recording *should* sound artificial, because it is; it has no basis in any prior creation. A classical recording should sound live; it is a *re-created* event. Put on a pop recording and listen: The compressed dynamic range and electronic processing present an aural perspective entirely unlike everyday sound. Now put on a classical recording. If it is properly recorded and produced, the perspective will be very different. The two recordings are based on entirely different realities. Problems occur when these different kinds of reality

are blurred: You get things like artificial-sounding classical recordings with close miking, hundreds of tape splices, and overdubbed parts.

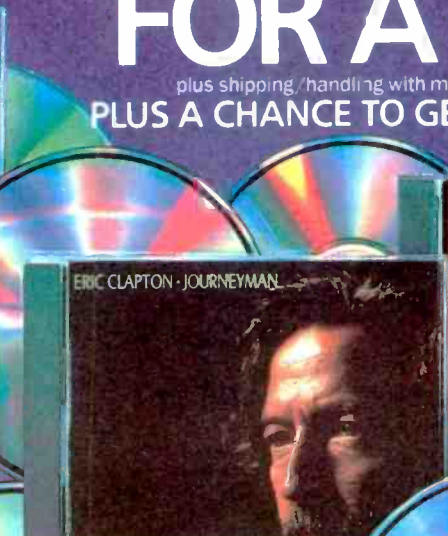
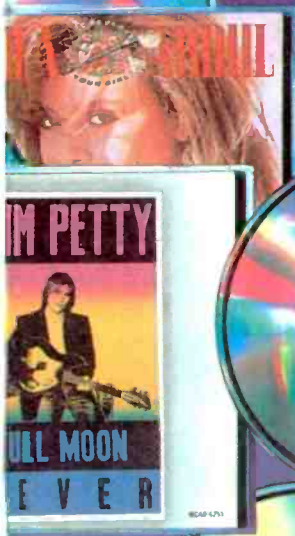
Therein lies the problem. Pop music rules the market; its sound is everywhere. As a result, the pop sense of reality has infiltrated many other aural environments. Close your eyes and listen to television; you'll notice how unreal it sounds compared with the world around you. That's because the production techniques seek to emulate the pop perspective. Next time you're listening to a concert (in a concert hall), take out a dollar bill and rustle it between your fingers. You'll get nasty looks from other people because the sound is so loud. Then repeat the experiment at home. Chances are you won't be able to hear the sound because at home you listen at a much higher average volume. In fact, we grossly distort most classical music during playback by raising the volume to levels never imagined by the composers. In both cases, the pervasive, exaggerated, hyper-real sound of pop recordings has changed our sonic expectations.

As audio technology rockets toward the twenty-first century, pop music will expand into entirely new forms of recording and playback. While this creativity and discovery is important for pop, it may be entirely inappropriate for other music and media. All of which brings us back to the third door and the engineers in the lab with their own little reality.

Formerly, their task was to reproduce some kind of reasonable facsimile of the original signal. Today, audio technology has largely achieved that goal and thus must move on to higher concerns. Engineers must create future consumer audio systems with different kinds of hardware and software, tailoring them to the kind of music the equipment will record and reproduce. With any luck, audio technology will splinter into specialties; only in that way can individual musical realities be preserved. Only then can listeners maintain fidelity to their perspectives and choose the kinds of sonic realities they wish to hear. Or, in the case of my office, which door to go through. □

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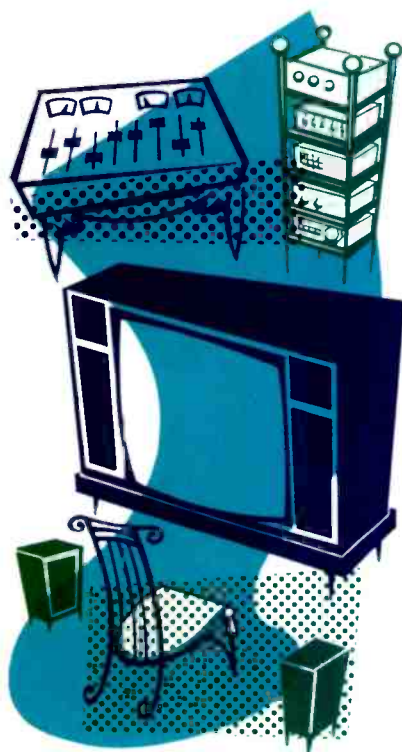
ADDING MACHINES

Specialized components
to enhance stereo
performance—the
ninth in a series on
the basics of audio.

BY IAN G. MASTERS

THE main building blocks of a stereo system are fairly simple: one or more signal sources, some form of control section, an amplifier to boost the signal to usable levels, and speakers or headphones to turn it all back into sound. These basic functions may be accomplished by a small number of components, each of which does several things, or the system may be made up of a greater number of separate pieces of equipment that do only one. Either way, what happens to a signal on its way from a tape or a disc to your ears doesn't vary a lot.

For many listeners, however, the usual techniques and capabilities are not enough. Some wish to fine-tune the performance of their existing components, while others simply want their systems to do more than a conventional stereo setup can manage. For both purposes, a host of devices, both active and passive, are available that can be added



to a conventional audio system. These are often lumped together as **signal processors**, although the range extends beyond the manipulation of electrical signals. Whatever they are called, they constitute a significant addition to the hi-fi arsenal, although not every listener will want or need them.

Making It Do More

One of the major developments in audio has been the increase in high-quality sources, and a number of new components have become available to allow access to them. For instance, the chronically low quality of television sound is largely a thing of the past, and more and

more users are integrating their TV and audio systems. In many cases, this means replacing the television set itself with one that includes more advanced audio capability or adding a videocassette recorder with appropriate circuitry. Alternatively, some buyers add to their systems an outboard MTS **decoder** capable of receiving the stereo sound broadcast with more and more TV programs and of capturing the **second audio program**, or SAP, as well. The SAP function, which forms part of the stereo-TV standard, has been relatively little used so far, but it enables broadcasters to add commentary or simultaneous translation to television programming.

Combined audio/video systems can also take advantage of the **surround sound**, or **Dolby Surround**, effects encoded in many videocassettes and videodiscs. The system uses a form of **matrix** to add ambient sounds to a conventional stereo soundtrack, which can be retrieved on playback by an appropriate **decoder**. A number of television sets and VCR's include surround-sound decoders of some sort, as do a few A/V receivers, but these are often fairly simple circuits. To carry the Dolby Surround logo, a decoder must provide certain minimal functions, but the most advanced circuitry is usually found in outboard units. These vary considerably in features, but the most elaborate ones include outputs not only for the stereo music tracks, a center-channel dialogue track, and the rear ambience signals but for at least one subwoofer output as well. Some also include low-power amplifiers for the dialogue and ambience signals and **variable time delay** for the rear-channel material. The best also

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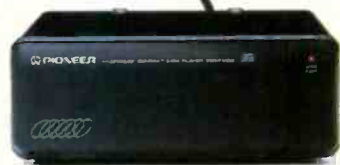
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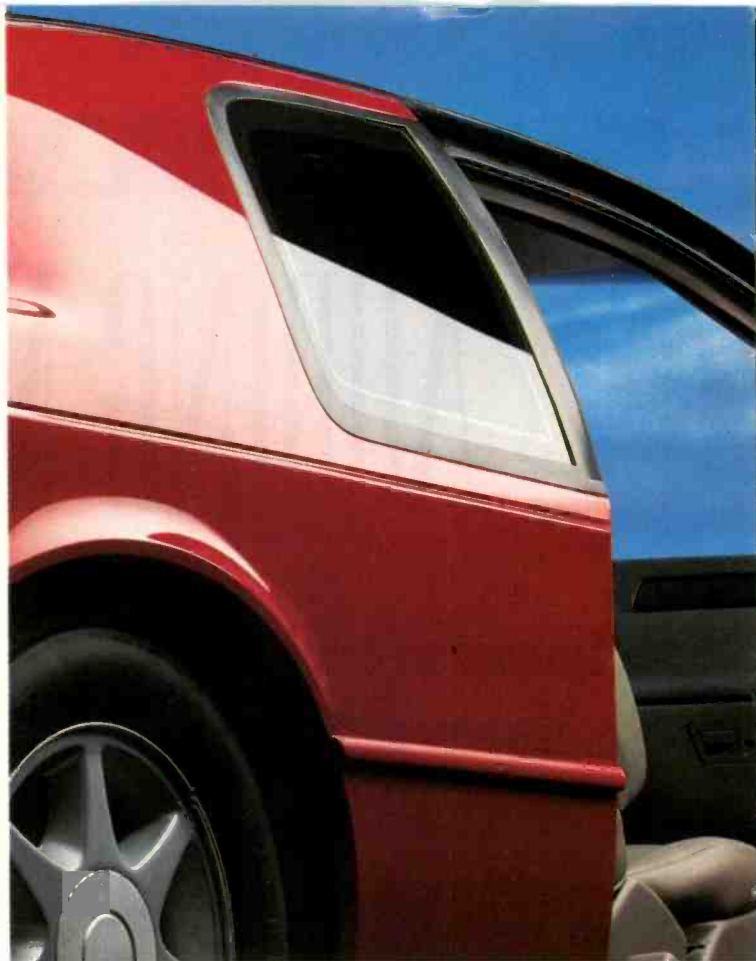
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have **Dolby Pro Logic** circuitry, which directs the dialogue exclusively to the center channel, providing a stable image from any listening position.

The surround-sound experience has also led a number of manufacturers to produce components that can create a similar effect from normal (nonencoded) stereo sources. Such **ambience enhancers** are sometimes combined with surround-sound decoders, but free-standing enhancers exist as well. Most use **digital signal processing (DSP)** to create simulations of various acoustic environments, from cathedrals to intimate jazz clubs, by electronic means. In a sense, the aim of ambience enhancers is to create a "three-dimensional listening experience" akin to the **four-channel**, or **quadraphonic**, systems of the Seventies, but unlike those systems (and unlike **Dolby Surround**), ambience enhancement is a single-ended function that doesn't require an encoded signal to work with. As with surround decoders, ambience devices require at least two extra speakers and channels of amplification.

Managing Signals

Not all users of audio equipment are content to take a passive role, just listening to (or watching) their equipment. Active audio is usually concerned with making recordings, and one of the most useful additional components for this is the **mixer**, which can combine signals from several sources and vary their relative levels. The simplest versions are **microphone mixers**, which accept signals from two or more microphones, combine them, and boost the output to a level compatible with the line-level inputs of a tape recorder. Often each input can be controlled by a **pan pot**, which distributes the mono signal from the microphone to both stereo output channels in differing amounts, enabling you to place the sounds it picks up anywhere on the perceived stereo stage. Most mixers also include one or more stereo line-level inputs, enabling you to combine, say, voice and recorded music. The most elaborate mixers also provide output-level meters, a master level control, and a **cue** or **preview** system

that enables the user to listen to a signal before combining it with the others in the overall output.

For most audiophiles, the need to combine signals in this fashion occurs rarely, if at all. Far more common, as the number of possible components that can be incorporated into a system rises, is the need to accommodate extra pieces of equipment. Various **switchers** are available to meet this need, enabling you to add extra signal processors or tape decks or just increase



the number of inputs your system can accommodate. For the truly complex system, it is even possible to buy a **patch panel** or **patch bay** that operates like an old-fashioned telephone switchboard to route audio signals from one component to another.

The need to route a signal may also extend well beyond the main components themselves as more and more audiophiles build systems intended to be enjoyed throughout the house. A number of **multiroom system controllers** have sprung up for this purpose in recent years, ranging from simple remote speaker-level controls to complex devices that enable the "host" system to be

operated from many different locations. The most advanced such systems involve considerable extra wiring from room to room, but much the same effect can be achieved by using a **remote extender**, which picks up the infrared signal from a normal remote control in one location and sends the code by wire to a retransmitter with the equipment in another room.

Since many of today's audio components are provided with remote controls, it is quite common to have three or four separate devices to operate a single system. To reduce the confusion this can cause, a number of companies produce **system remotes**, which can operate a number of separate components using only one keypad. These work well as long as all the equipment is made by the same company, but that's rarely the case. For systems made up of equipment from several sources, a **universal remote**, or **learning remote**, may be the answer. Such controls can be programmed to emulate the functions of almost any infrared remote control, whatever the source, and often permit a fairly complicated system to be controlled completely with a single handset.

Curing Audio Ills

Perhaps the commonest sort of add-on components are not designed to increase the number of things a system will do but to improve the performance of existing equipment. Such devices may be active (that is, electronic) or passive, but all are aimed at optimizing the sound from a stereo system.

Among these add-ons is possibly the most misunderstood component in audio: the **equalizer**. Basically elaborate tone controls, equalizers fall into two categories: **graphic** and **parametric**. A graphic equalizer divides the frequency spectrum into a number of fixed bands, each one with its own slider control that allows the signal in that band to be increased or decreased by as much as 12 dB. The positions of the slider controls form a rough visual representation of the equalizer's frequency-response curve, hence the name "graphic."

The most basic graphic equalizers

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THE BASICS

offer five bands of control, but some professional models divide the spectrum into as many as thirty bands, each one-third of an octave wide. Perhaps the most common format for home use is the **octave equalizer**, in which ten controls are provided, corresponding to the approximately ten octaves of the audio spectrum. Eight-band and twelve-band equalizers exist as well. Parametric equalizers are much less common than the graphic variety. They typically divide the spectrum into a smaller number of segments, usually two or three, but the width and center frequency of each band can be varied to allow very sophisticated spectral shaping.

Equalizers of either sort are useful to correct for spectral imbalances in recordings or equipment (especially speakers) or, to a lesser extent, to smooth out acoustic anomalies in a listening room. In special circumstances, such as recording from worn or peculiarly balanced recordings, equalizers can also be a creative tool for improving the sound of flawed material. Many listeners use **equalization** (commonly abbreviated EQ) to alter the sonic character of music to their taste, often by boosting the bass frequencies to create a more impressive sound. While equalizing to taste is a valid use, it does represent a decrease in fidelity and may overdrive an amplifier if taken too far.

In addition to broad-band equalizers, there are specialized versions as well, designed to perform specific tasks. One is the **dedicated equalizer**: A few speaker manufacturers design their products to be used in conjunction with a specific equalizer tailored to compensate for nonlinearities in the transducer. Another sort of specialized equalizer is a **filter**, designed to remove certain unwanted signals. An **infrasonic filter** (often incorrectly called **subsonic**) may be included in amplifiers with very good low-frequency response to remove signals generated by warps in vinyl records; these extremely low-frequency signals are not audible, but they are capable of using up a good deal of an amplifier's power reserve and generating distortion. At the other end of the spectrum, **ultrasonic filters** are

sometimes required to remove radio-frequency interference above the audio range.

While equalizers vary the frequency response of a system, another sort of add-on works on the dynamic range. In environments with high ambient noise levels, the quiet passages in a recording may become inaudible. To overcome this, a **compressor** can be used to reduce the spread from highest to lowest levels. On the other hand, signals that have been heavily compressed to begin with sometimes benefit from use of an **expander**, which increases dynamic range. Often, both functions are included in a single component.



One area where extra equipment can pay the highest dividends is in the reception of FM radio. The addition of an **antenna** is almost always worthwhile, whether a high-gain rooftop model or a directional indoor variety. Specific reception problems can also be corrected by the use of such devices as an **antenna booster**, which is a radio-frequency amplifier that strengthens low-level signals (and, occasionally, noise along with them), or an **attenuator**, which cuts back the level of strong local signals that might cause overloading of the tuner's early stages.

The digital age has given rise to its own type of add-on component, designed to isolate the digital parts of a compact disc player from its analog elements, reducing possible interference in the process. Several audio lines now include outboard **digital-to-analog (D/A) converters**, linked to the digital output of a CD player either by coaxial or fiber-optic cable. A number of integrated amplifiers contain their own D/A converters for the same reason.

Nonelectronic additions to an audio system are common as well. These include special **acoustic treatments** for problem rooms, **spikes** to improve the physical coupling of speakers and other components with the surfaces they sit on, various types of specialty **cables** to connect the components together (particularly the amplifiers and speakers), and **stands** to place speakers in the proper relationship with the listening room's floor and the listener's ears.

Necessary Additions

Most extra components are optional, but there are instances in using "conventional" equipment where the choice of a particular model demands the use of an add-on to make it work. One example already mentioned is the dedicated equalizer. Another is the moving-coil (MC) phono cartridge, which usually produces an output much lower than that of a standard moving-magnet design and so requires a boost if it is to be used with normal inputs. Many preamplifier sections now include special MC inputs to take care of this, but many do not. In such cases either a special **transformer** or an **MC head amplifier** (also sometimes called a **pre-preamplifier**) must be inserted in the signal path between the phono cartridge and the preamplifier input. Similarly, some speakers are designed to be **bi-amplified**, a process in which each driver is powered by its own amplifier. To accomplish this, an **active (or electronic) crossover** must be used to divide the signal into the proper bands before the amplification stage.

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by Julian Hirsch



THE AUDIO TIME MACHINE

ONE day in October 1954 I walked into a room in Manhattan's New Yorker Hotel, sat down, and remained for perhaps an hour. When I left, I felt certain that I had heard the future of high-fidelity sound in the home. As it turned out, I was right.

The occasion was the 1954 Audio Fair, and in the room was the exhibit of a newly formed company, Acoustic Research, Inc. In attendance were the company's principals, Edgar Villchur and Henry Kloss. Their initial product was a compact ("bookshelf") speaker system, the AR-1. As I recall the occasion, a single AR-1 was playing (stereo was still a few years in the future), and the sound was like nothing I had ever heard from a compact speaker, or indeed from almost any other speaker of any size.

To put the event into perspective, up to that time speakers had to be large, heavy, and expensive in order to reproduce low frequencies with reasonable effectiveness. There were attempts to reduce their size and cost using variations on the common vented (bass-reflex) en-

sure, but at best the results were not very good and rarely produced much clean fundamental output below 50 or 60 Hz. A few large "infinite-baffle" systems, from companies such as Bozak, could reach down another octave, though not always smoothly or with low distortion. The redoubtable Klipschorn, still manufactured today, gave a powerful bass output down to 40 Hz or a little below, but at considerable cost in space and dollars.

Villchur's "acoustic-suspension" speaker had a relatively "floppy" suspension, resonating well below the audio range. The speaker was installed in a small sealed cabinet, and the stiffness of the enclosed air supplied most of the restoring force for the cone and voice coil, a force that is normally provided by the cone's physical suspension. In contrast to physical suspension, the air had an essentially linear compliance even for very large excursions.

The acoustic-suspension design, together with a long-throw voice coil and an edge surround that allowed a peak-to-peak cone excursion of more than an inch, gave the compact AR-1 (25 inches high, 14 inches wide, and 11½ inches deep) the ability to generate clean, relatively flat bass down to 30 Hz or lower, with lower distortion than was then possible with most existing speakers. The AR-1 sold for \$185, a not inconsiderable sum in those days. Its 12-inch acoustic-suspension woofer was teamed with a Western Electric 755A 8-inch midrange/tweeter, crossing over at about 800 Hz.

The sound I heard that day in the AR demo room was awesome. Organ music was reproduced with a

sense of physical pressure that hardly any of the larger speakers achieved. Other program material was also reproduced with excellent quality, although it was obvious that the 8-inch "tweeter" was not of the same caliber as the AR woofer. A more fundamental disadvantage of the acoustic-suspension system

When I heard the Acoustic Research AR-1 speaker at the 1954 Audio Fair, I felt certain that I had heard the future of high-fidelity sound in the home. As it turned out, I was right.

was its low efficiency, which made the speaker difficult to drive with contemporary amplifiers limited to 15 or 20 watts. Even the large amplifiers of the day, such as the McIntosh MC-50, could easily be driven into clipping at relatively moderate listening levels.

Well, it didn't take too long for the rest of the speaker industry (and the buying public) to appreciate the significance of the AR-1, and within a few years bass-reflex speakers had largely been supplanted by a variety of acoustic-suspension models. Most of these, including those from AR itself, were designed for higher efficiency than the AR-1, at a slight sacrifice in extreme low-frequency response.

As most of you know, vented speakers are still very much a part of today's hi-fi scene. The comprehensive design methods developed by A. N. Thiele and Richard Small have made vented-speaker design a true scientific procedure instead of the old "cut and try" methods used in the past, and today there is a proliferation of remarkably good small and inexpensive speakers, both vented and sealed.

In 1955 I bought an early AR-1 (serial number 147), which I used for years and have stored in my garage for perhaps twenty-five years. Occasionally when I hear or test a particularly fine-sounding new speaker, I wonder how the old AR-1 would compare with it. After all,

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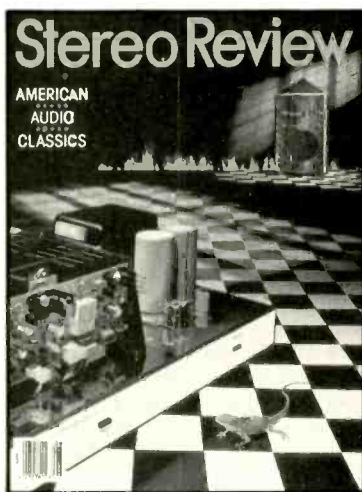


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AUTHORIZED DEALERS

both technology and listening taste have evolved over the past thirty or thirty-five years—is it possible that a speaker I had considered to be a milestone at the time of its introduction would be outclassed by some of today's speakers? Or that I would no longer be so impressed by its quality?

Luckily, I was able to relive some of that original listening experience without requiring the services of a general-purpose time machine. I took the old AR-1 from its shelf in the garage (no easy task, given its 60-pound weight!), cleaned its exterior, and installed it in the lab next to a couple of good modern speakers. Unlike my early years with the AR-1, when I drove it with a home-built 10-watt Williamson amplifier that was really not up to the job, I now had 100 watts or more available to me. I would also be able to measure the speaker's performance using the instruments and techniques of 1990.

First, the sound. Since I had only a single AR-1, all listening had to be done in mono. Naturally, the AR-1 did not sound exactly like any of the speakers with which I was able to compare it, but that is true of any speaker comparison. Its bass was still superb, but I was impressed by how well some of today's speakers compared with it, even in the low bass. From the beginning, everyone recognized that the higher frequencies from the AR-1 were not of the same quality as its bass output (a problem that AR later rectified with the AR-3, which is another story). That judgment is still valid today, when we expect (and often get) smooth, well-dispersed highs even from inexpensive speakers. Nevertheless, the early acoustic-suspension woofer is still able to shake the room and massage the skin, the qualities that caught my attention on that day in 1954.

Today, with the benefit of cheap amplifier power, clipping is no longer a problem. Much to my surprise, what had seemed like a grossly inefficient speaker in 1954 is actually of average efficiency compared with typical speakers of 1990. There is apparently a deliberate design trade-off by today's speaker manufacturers, extending low-frequency re-

sponse by sacrificing efficiency, because of the low cost of amplifier power today.

The measurements were equally interesting. The AR-1's woofer response was ± 1.5 dB from 50 to 800 Hz, falling to -6 dB at 35 Hz and -14 dB at 20 Hz. The composite room response was within ± 2.5 dB from 36 to 6,000 Hz, falling to -14 dB at 20 and 20,000 Hz. The upper-middle and high frequencies were strongly "beamed," as would be expected from an 8-inch cone driver. But the acoustic-suspension woofer showed its mettle in its low distortion measurements, made with an input of 2.83 volts (equivalent to a

How many household appliances do you know of that can still function 100 percent after thirty-five years?

90-dB overall sound-pressure level at 1 meter). From a maximum of 8 percent at 20 Hz, the distortion dropped to 3 percent at 30 Hz and remained at about 0.3 percent from 70 to 350 Hz.

The AR-1 is basically a 4-ohm system, but it has connections for 8-ohm operation as well (you add a series 4-ohm resistor that dissipates half the power it receives from the amplifier). My tests and listening were done in the 8-ohm mode, in which the actual impedance varied between 8 and 17 ohms from 20 to 20,000 Hz. I also found that connecting the speaker for boosted high-frequency response (about 2 dB more drive to the 8-inch driver) improved the overall balance considerably.

It was gratifying to find that my memories of the sound from this speaker were not entirely colored by nostalgia. And how many household appliances do you know of that can still function 100 percent after thirty-five years, most of that time spent in an unheated garage? Perhaps I will rummage around among some of my other accumulated hi-fi components (none as old as the AR-1, unfortunately) and reactivate my audio time-travel system on other occasions. □

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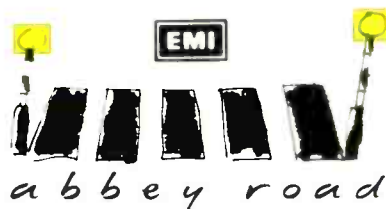
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PHILIPS FC-60 CASSETTE DECK

Craig Stark, Hirsch-Houck Laboratories

ALTHOUGH Philips of the Netherlands invented the compact tape cassette, very few of its own recorders have been marketed in this country. The FC-60 is thus the first Philips cassette deck we have had the opportunity to test. A three-head unit with Dolby B and Dolby C noise reduction and switchable Dolby HX Pro headroom extension, the FC-60 heads the company's new line.

The FC-60's recording and playback heads are physically separate but bonded together in a single case. Such a design does more than just enable the user to switch between source and tape for instant comparisons between the input signal and its recorded result. It also enables each head element to be optimized for its function. In the FC-60, for example, the recording head has a relatively large 4-micrometer gap width (the distance between the head's two pole pieces), which enables the recording signal to penetrate the full depth of the oxide layer on the tape. By contrast, the gap width of the playback element is a properly narrow 0.6 micrometer, enabling the deck to reproduce the highest audible frequencies. The

same attention to detail carries through to the electronics as well. The playback head, for example, is connected to a low-noise FET differential amplifier by oxygen-free, continuously cast pure copper wire.

The FC-60's dual-capstan, closed-loop transport isolates the section of tape that is actually passing across the heads to minimize flutter. Both capstans are equipped with balanced flywheels and driven by a single DC motor. A second DC motor is used for high-speed tape winding.

The cassette-well door is removable to facilitate head cleaning and demagnetizing and, as in most decks, contains a clear panel intended to let the user see how much tape remains on a side. Unfortunately, the cassette well is unilluminated and has no rear reflector. Moreover, the optical distortion caused by the curvature of the panel was so great that we found it impossible even to see whether the reels were moving.

Although many decks today incorporate the Dolby HX Pro headroom-extension circuit, very few besides the Philips FC-60 enable the user to switch it in or out. Dolby HX Pro operates by varying the

recording bias according to the high-frequency signal level, reducing bias slightly during just those moments when strong treble signals might otherwise cause the tape to saturate. The lower bias level enables the tape to hold more treble energy. We have never encountered any instance in which the varying bias levels produced by Dolby HX Pro caused any audible ill effects; indeed, our experience with the system has been entirely positive.

The FC-60's dual recording-level indicator system is in some respects unique. Peak signal levels from -35 to +12 dB are shown conventionally on a sixteen-segment-per-channel display, with the 0-dB point calibrated to the standard Dolby recording level (200 nanowebers per meter). Supplementing this bargraph indicator, however, is a second display that reads out recording levels of 0 dB and higher in alphanumeric characters. This display also stores the highest level previously reached in a recording and will flash that value for a period of 5 seconds when the M CALL button is pressed.

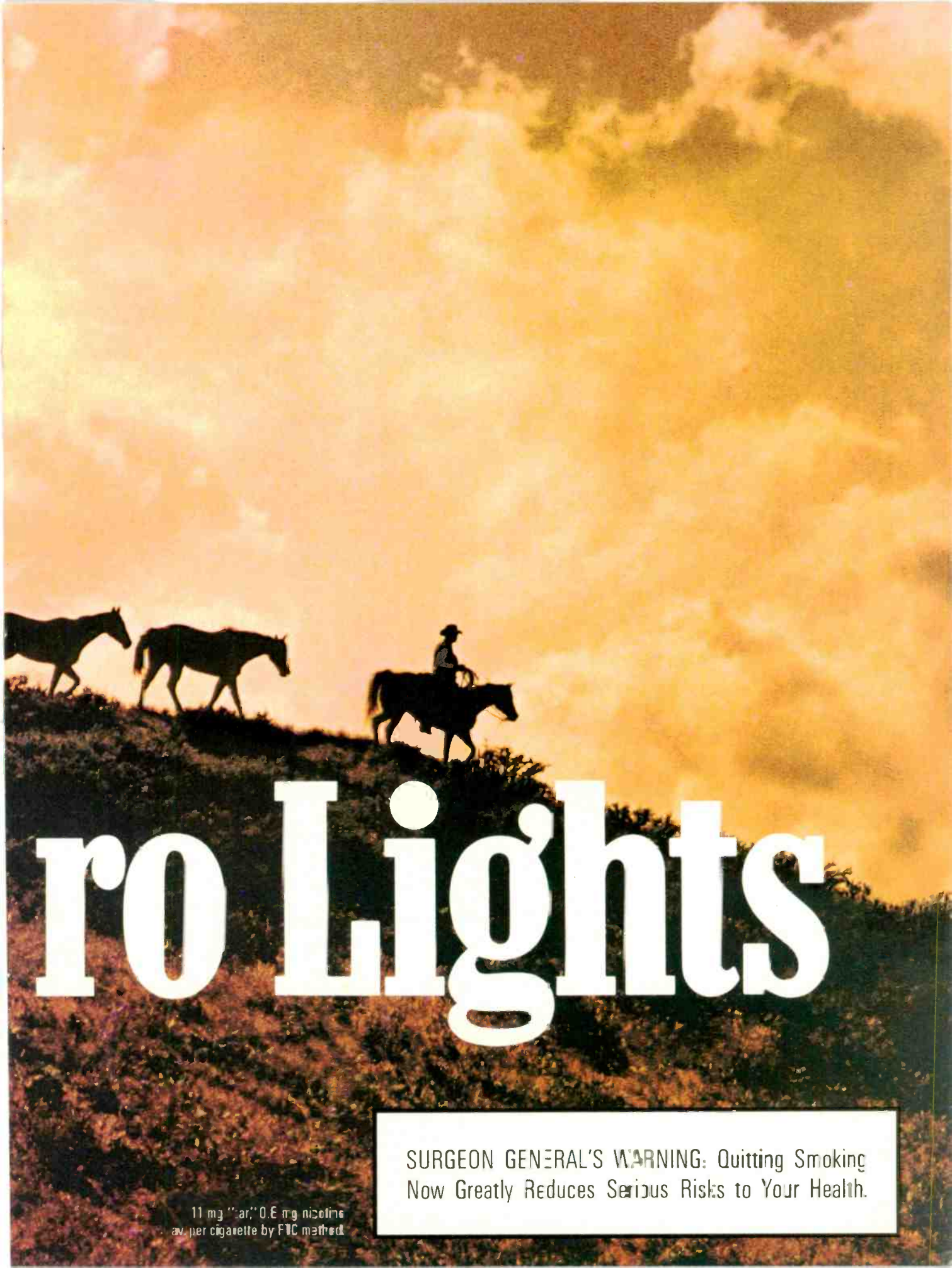
Bias-trim and tape-sensitivity (Dolby-calibration) controls are provided to flatten frequency response and assure accurate operation of the noise-reduction systems. These adjustments must be made by ear, however, using low-level FM hiss or some similar source as a test signal since no calibrating oscilla-



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- User-adjustable bias and tape sensitivity
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- Four-digit electronic counter shows elapsed time or counter units
- Alphanumeric display of transport modes
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- Fifteen-selection program memory with automatic music search
- Switchable FM-multiplex filter
- Front-panel headphone jack with volume control
- Facilities for external timer activation in recording or playback mode

LAB MEASUREMENTS

Fast-forward time (C-60): 77 seconds

Rewind time (C-60): 76 seconds

Speed error: +1.82%

Dolby tracking error: Dolby B and Dolby C, +1, -0.5 dB

Wow-and-flutter: 0.046% wrms, 0.087% DIN peak-weighted

Line input for indicated 0 dB: 75 mV

Line output at indicated 0 dB: 0.633 volt

Meter indication at IEC-standard 0 dB: +2 dB

Tape: TDK AD (Type I, ferric)

IEC 0-dB distortion: 0.81%

Meter indication at 3% THD + noise: +6 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR/ARM
NR off	55.4	58.8	55.2
Dolby B	63.1	68.5	65.7
Dolby C	66.3	76.3	75.1

Tape: TDK SA (Type II, chrome-equivalent)

IEC 0-dB distortion: 1.9%

Meter indication at 3% THD + noise: +3 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR/ARM
NR off	57.5	61.6	58.3
Dolby B	63.1	70.8	68.7
Dolby C	65.8	78.4	77.5

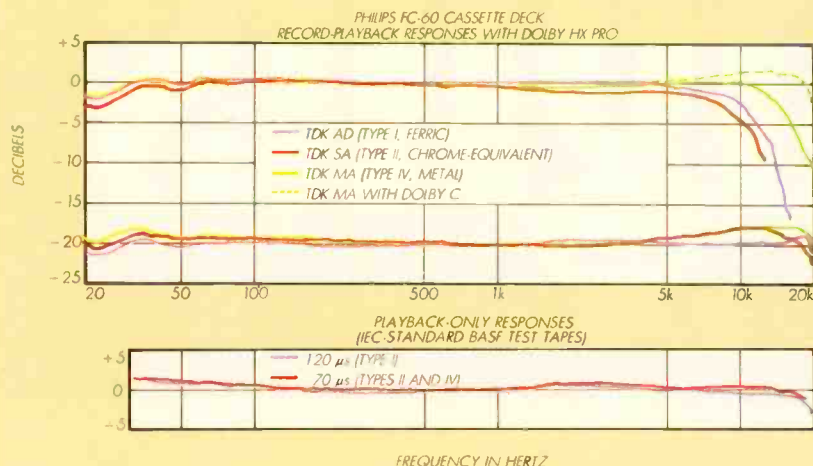
Tape: TDK MA (Type IV, metal)

IEC 0-dB distortion: 2.0%

Meter indication at 3% THD + noise: +4 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR/ARM
NR off	56.2	59.6	56.0
Dolby B	62.5	68.9	66.5
Dolby C	65.1	77.0	75.6



tors are provided. The FM-multiplex filter is pushbutton-defeatable; leaving it on when unneeded will roll off the deck's response at extremely high frequencies.

Additional pushbuttons control the memory-rewind/replay circuitry and the fifteen-selection program memory, which will skim through the tape at high speed and find recorded selections separated by 4 seconds or more of silence. Thereafter, you can choose the selection you want to hear by keying in its program number. Recording levels are set by a single master control, supplemented by a smaller channel-balance control. The front-panel headphone jack has its own volume control, but there's no playback-level control for the line outputs.

In addition to the usual rear-panel input and output connectors, the FC-60 has a pair of jacks for a wired remote control (not supplied). Overall, the deck measures 16½ inches wide, 13¼ inches deep, and 6 inches high, and it weighs a little more than 14 pounds. Price: \$549. Philips, Dept. SR, P.O. Box 14810, Knoxville, TN 37914.

Lab Tests

The FC-60's playback frequency response, measured with our BASF calibrated IEC-standard test tapes, was very flat with both 120-microsecond (ferric) and 70-microsecond (chrome and metal) equalization. There was a very slight bass rise (1.2 dB at 31.5 Hz) and a comparable falloff in the extreme treble (-1.4 dB at 18,000 Hz), with the range from 100 to 10,000 Hz varying by only ±0.5 dB.

The overall record/playback frequency-response curves with samples of TDK AD (ferric), TDK SA (chrome), and TDK MA (metal) tapes are shown in the accompanying graph. Measurements were made with Dolby HX Pro switched on as this produced the best treble response at high levels and enabled comparison with decks where the HX Pro circuit cannot be defeated. (The inevitable rolloff at the highest frequencies began approximately 2,000 Hz lower when Dolby HX Pro was disengaged.) The upper curve, for TDK MA, shows that high-level treble response can be improved

even more with Dolby C. At the usual -20-dB measuring level, TDK AD produced the best frequency response, down only 1 dB at 20,000 Hz and 1.5 dB at 24 Hz.

The signal-to-noise ratios were extremely good, particularly with the chrome-equivalent TDK SA. Flutter figures were less impressive, however, and the absolute speed error (1.8 percent fast) was poor. On the other hand, the Dolby noise-reduction systems exhibited almost no frequency-response error; this excellent result is partially attributable to the FC-60's inclusion of a sensitivity adjustment, which makes possible exact source/tape level matching during recording. Fast-winding speeds were average, and input sensitivity and output levels were entirely normal.

Comments

Given so large a front panel, Philips could have done a better job of sizing and arranging the FC-60's many pushbutton switches. We found them rather awkward to locate and use. We also found it annoying that we couldn't get into the recording mode simply by pressing the record and play buttons simultaneously. You have to press one and then the other, as we learned when we missed the beginning of several recordings thinking the machine had started while it remained in record-pause mode.

Ergonomic matters aside, we were pleased with the FC-60's overall sound quality. We cannot rank it among the very top decks (which tend to cost two or three times as much), however, for a slight but detectable graininess was audible on high, hard piano notes, and the stereo image was not quite as tightly focused as that produced by our reference deck.

Nonetheless, considered by itself or in comparison with other decks in the same price class, the Philips FC-60 held its own and then some. Its imaging was good, its sound was solid and musical, and we often caught ourselves having to check whether the monitor was set to source or tape. That's quite enough to satisfy all but the most super-critical ear.

Circle 140 on reader service card



ADVENT HERITAGE SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

ADVENT loudspeakers have historically been two-way systems featuring acoustic-suspension woofers. The new Heritage follows in that tradition. It is a columnar floor-standing speaker with two 8-inch acoustic-suspension woofers that cross over at 3,500 Hz to a 1-inch soft-dome tweeter cooled by ferrofluid. The woofers are high-excursion drivers whose voice coils are wound on aluminum forms. The drivers occupy

the upper two-thirds of the front panel, placing the tweeter close to the ear level of a seated listener.

The sides and rear of the enclosure are made of a black-finish particleboard, but the front and top appear to be ¾-inch-thick solid wood (our test samples had an attractive oak-grain finish). The drivers are concealed behind a removable black cloth grille, and the bottom 2½-inch portion of the front panel is finished in black to give the

TEST REPORTS

visual effect of a base or pedestal, although the cabinet is actually constructed as a single integral unit. The input terminals (five-way binding posts on 3/4-inch centers) and a protective fuse are recessed into the lower part of the back panel.

The manufacturer's specifications for the Heritage include a frequency response of 42 to 23,000 Hz \pm 3 dB. The tweeter's dispersion over an angular range of 30 degrees (either vertical or horizontal) is said to produce an output variation of less than \pm 1 dB up to 13,000 Hz. The nominal system impedance is 6 ohms, with a rated minimum value of 4 ohms.

The system's sensitivity is rated at 89.5 dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts. It is rated to handle continuous inputs up to 150 watts and peaks up to 600 watts. The bass resonance frequency is given as 55 \pm 5 Hz, with a usable frequency extension to 34 Hz at $-$ 8 dB in the bass and up to 23,000 Hz at $-$ 3 dB in the treble. The total harmonic distortion (THD) is given as less than 0.5 percent above 75 Hz with a 1-watt input.

The Advent Heritage measures 37 3/4 inches high, 10 1/2 inches wide, and 13 1/8 inches deep (plus an additional 3/8 inch for the grille). Each speaker weighs about 45 pounds. Price: \$699 a pair. Advent, Dept. SR, 25 Tri-State Int'l Office Ctr., Suite 400, Lincolnshire, IL 60069.

Lab Tests

The Advent Heritage proved to be somewhat more sensitive than its ratings would indicate (although our live-room measurements could account for much of the difference). The speaker developed an SPL of 93 dB at 1 meter with a 2.83-volt pink-noise input signal. With a 2-volt sine-wave input (equivalent to a 90-dB SPL in our sensitivity measurement), the woofer distortion was very low when the microphone was placed close to the speaker board and midway between the woofers. From only 5 percent THD plus noise at 20 Hz, the distortion decreased to 1.3 percent at 30 Hz and to 0.45 percent from 80 to 130 Hz, and it remained less than 0.8 percent up to 1,000 Hz.

The system impedance was a

minimum of 3.2 ohms at 20 Hz and in the 90- to 200-Hz range, reaching a maximum of 22 ohms at 1,800 Hz. The bass resonance was at 52 Hz, where the impedance rose to 10 ohms. The composite corrected frequency response of the system showed an elevated bass and lower-midrange output between 40 and 400 Hz, and a somewhat lower average level from 400 to 4,000 Hz, where the output varied over a \pm 2.5-dB range. In the tweeter's range, above 5,000 Hz, the response was unusually flat and smooth, with a variation of about \pm 1.75 dB from 4,000 to 20,000 Hz.

The tweeter's dispersion over a 45-degree horizontal angle was excellent, with virtually no divergence between the on-axis and 45-degree off-axis response at frequencies below 12,000 Hz. The woofer's output fell off at 12 dB per octave below its maximum output point at about 65 Hz and was down about 8 dB from the 50- to 300-Hz average value at 35 Hz. The system's group delay varied \pm 0.4 millisecond from 20,000 Hz down to 1,500 Hz, increasing somewhat at lower frequencies.

In single-cycle pulse-power tests, the 100-Hz woofer output distorted audibly at a 525-watt input into its 3.2-ohm impedance. At 1,000 Hz (still in the woofer's range), the amplifier clipped at 600 watts into 11

ohms before the cone reached its linear limits, and at 10,000 Hz the amplifier clipped at 260 watts into 5.6 ohms before the tweeter was overloaded.

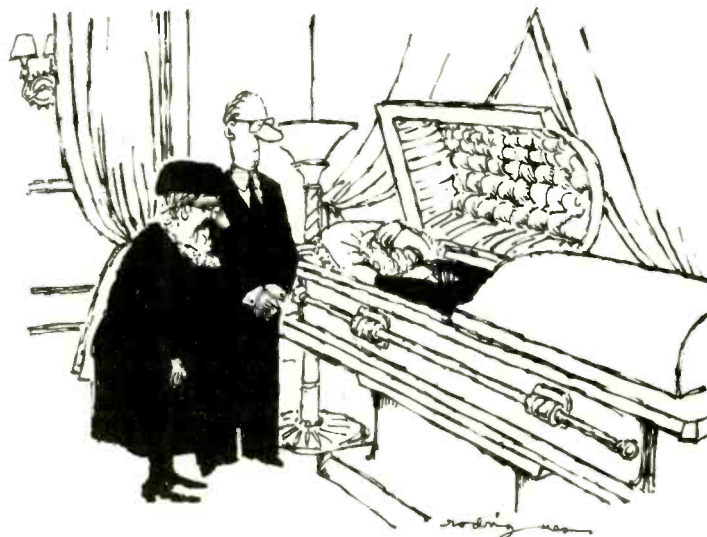
Comments

The Advent Heritage was one of those rare speakers whose sound closely matched the way its measured response curves looked. It had a mildly warm, rich bass and lower midrange, with a startlingly deep low-bass extension given the right program material. The highs were obviously extended, smooth, and well dispersed. If I had drawn a frequency-response curve for this speaker from listening to it (normally a foolhardy project), it would have come out very much like the one my instruments produced.

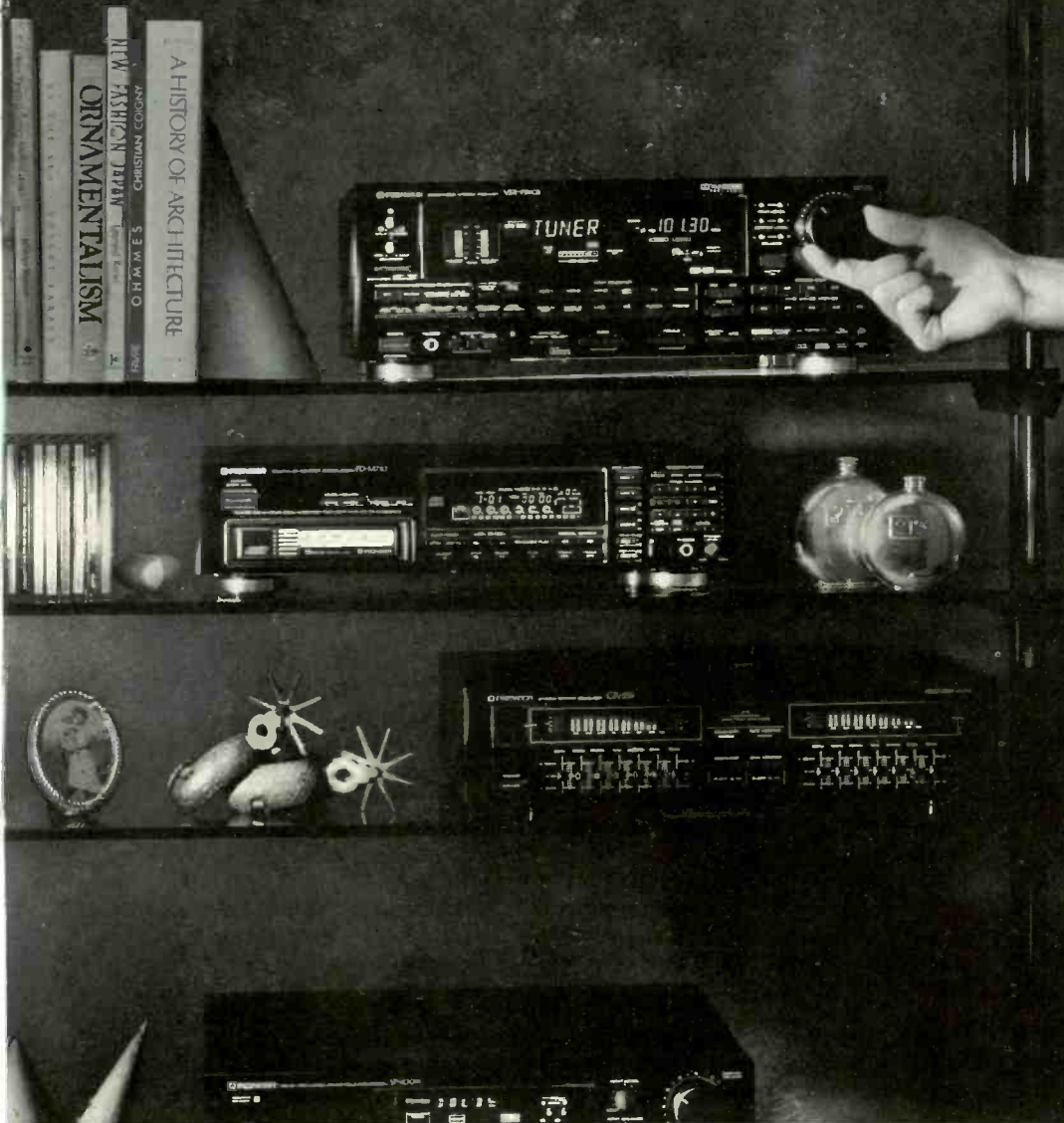
Possibly because of its very low distortion in the deep bass, the speaker gave the impression of greater bass extension than it really had. The lowest frequencies were as likely to be felt as heard, an unusual quality among speakers with modest-size woofer complements.

The Heritage was one of the limited number of speakers that I hated to pack up after tests were concluded. It is both attractive and highly listenable, two qualities that are not always found in the same speaker.

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ONKYO INTEGRA DX-5700 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

THE Onkyo Integra DX-5700 is a versatile compact disc player with a number of circuit features designed to minimize extraneous noise pickup and distortion at all signal levels. It has separate 18-bit digital-to-analog (D/A) converters for each channel and optical coupling between its digital and analog sections to eliminate noise from leakage of digital signals into the analog audio circuits. The D/A converters are hand-trimmed for greatest accuracy in the two most significant bits to reduce distortion, and the converters are preceded by eight-times-oversampling 18-bit digital filters.

A twenty-key track-selector panel provides single-touch access to any track of most CD's and two-button access to tracks numbered from 21 to 99. As many as twenty tracks can be programmed for playback in any desired order, with a music-calendar display showing the remaining unplayed tracks. An EDIT feature enables you to modify a program sequence by adding or deleting tracks. The bright fluorescent display

shows the current track and index numbers as well as the status of several controls and elapsed or remaining time for either the current track or the entire disc. A slide switch can dim the display or shut it off entirely. A button on the panel provides direct access to any numbered index point, although index numbers cannot be included in a program sequence.

There are four repeat modes: entire disc, programmed tracks, A-B (any user-defined segment of the disc), and shuffle play (reshuffled for each repeat). The INTRO feature, available only from the remote control, plays the first 7 seconds of each track. A TIME EDIT feature automatically selects the tracks that will fit on the A and B sides of a cassette (for tape durations up to 90 minutes). The DX-5700 goes into its pause mode after the tracks assigned to the A side of the tape have been played; when the tape has been turned over, pressing pause resumes playback of the tracks assigned to the B side.

The DX-5700 can be operated

from an external timer. It has a front-panel headphone jack with a volume control, which also adjusts the output from the variable-level analog jacks on the rear apron. The rear apron also has fixed-level analog output jacks, coaxial and optical digital outputs, and remote-control jacks to connect the DX-5700 to a compatible Onkyo tape deck, amplifier, or receiver.

The DX-5700's remote control duplicates all of the player's front-panel controls except for the display dimmer and the power switch. During remote volume adjustment a motor rotates the player's knob, which has no visible index marker or other visual indication of its setting. The remote control provides one other feature not present on the front panel: an AUTO SPACE button that inserts 4 seconds of silence between tracks for taping.

The Onkyo DX-5700 is a fairly large and heavy unit that measures 17 1/8 inches wide, 14 1/2 inches deep, and 5 1/8 inches high and weighs just over 18 pounds. Price: \$580. Onkyo, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

Lab Tests

The Onkyo DX-5700's frequency response was flat within ± 0.03 dB from 20 to 20,000 Hz, with channel levels matched within 0.04 dB. Maximum interchannel phase shift



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was 0.42 degree, in the 8,000- to 12,000-Hz range. The output voltage from a 0-dB recorded track was 2.01 volts.

Channel separation was 110 to 120 dB at 100 Hz, 100 dB at 1,000 Hz, and 75 dB at 20,000 Hz. The 1,000-Hz total harmonic distortion (THD) plus noise was -86 to -88 dB (0.005 to 0.004 percent) from 0 to -60 dB. At a 0-dB level, the distortion was a nearly constant -88 dB (0.004 percent) from 20 to 20,000 Hz.

The linearity of the player's response to low-level dithered test signals on the CBS CD-1 test disc was very good. The error (departure from the ideal signal level) was -0.4 dB at -70 dB, -0.3 dB at -80 dB, -1.5 dB at -90 dB, and -2.5 dB at -100 dB.

The DX-5700's noise spectrum when playing an infinity-zero (unmodulated) test track was highly uniform with frequency, reading about -120 dB or slightly better

from 30 to 10,000 Hz and rising to -102 dB at 20,000 Hz. The A-weighted wide-band noise was about -105 dB, and quantization noise was about -88.5 dB. Dynamic range (EIAJ) was -96.5 dB, and frequency (speed) error was -0.0032 percent.

The player's headphone volume was excellent, one of the best we have tested in that regard. Slew time of the linear-drive laser transport was relatively fast, requiring 2 seconds to go from Track 1 to Track 15 of the Philips TS4 test disc. Fairly strong impacts on the case did not produce audible mistracking (it took a hard blow directly over the disc transport to do that). The player tracked the 750-micrometer defect section of the Pierre Verany #2 test disc, but it totally mistracked on the 1,250-micrometer section.

Comments

The performance of the Onkyo Integra DX-5700 was very good

compared with that of most other CD players using conventional D/A converters. Although some of the new 1-bit-conversion machines we have tested have produced lower noise or distortion readings than the DX-5700, the differences are minuscule and certainly not audible under normal listening conditions. In an informative brochure on CD-player technology, Onkyo expresses skepticism concerning the advantages of 1-bit converters. To their credit, the company's engineers have done a first-rate job with their 18-bit ladder converters, and the DX-5700 delivers a level of performance that is usually found only in somewhat more expensive conventional players.

I feel that it makes more sense, however, to select products having this level of refinement by their operating conveniences rather than their circuit configurations or their performance measurements (which are all fantastic even by the CD standards of a couple of years ago). Any features that you have no intention of using should obviously be given little or no weight in the selection process. There is also the important matter of reliability, which unfortunately cannot be evaluated during a short-term test program. One can only infer the reliability of a product, to a limited degree, from its obvious physical ruggedness and the reputation of its manufacturer, and the DX-5700 earns excellent marks in both respects.

This player also has such desirable qualities as fast slewing and access times and very good impact resistance. Its ability to track through defects on a disc is satisfactory, though somewhat below the level of performance we have found with a number of players during the past few months. It is easy to operate, with an uncluttered and well-marked control panel. In fact, the only ergonomic feature that I found wanting was the lack of an index mark on the motor-driven volume-control knob. Certainly a white dot could be applied to it without difficulty. That quibble aside, however, the DX-5700 provides the feel, appearance, features, and quality of a high-price machine at a mid-price level. □

FEATURES

- Dual 18-bit, hand-trimmed D/A converters
- Optical coupling between digital and analog sections
- Eight-times-oversampling (352.8-kHz) digital filters
- Programmable to play as many as twenty tracks in any order
- Direct single-key access to tracks numbered 1 to 20
- Direct access to index points
- Shuffle play
- Intro scan to play first 7 seconds of each track
- Auto Space to insert 4-second interval between tracks
- Repeat of disc, programmed sequence, user-defined segment (A-B repeat), or shuffled tracks (reshuffled for each repeat)
- Time Edit to select tracks to fit tape cassette
- Headphone output with volume control
- Display of track and index numbers, elapsed or remaining time on track or disc, status of special modes; music calendar indicating unplayed tracks
- Dimmer switch to reduce display brightness or shut it off
- Can be operated from external timer for unattended playback
- Fixed- and variable-level analog audio outputs
- Coaxial and optical digital outputs
- Remote-control connectors for integrated operation with compatible Onkyo components
- Wireless remote control

LABORATORY MEASUREMENTS

Maximum output level: 2.01 volts
Total harmonic distortion at 1,000 Hz: between -86 dB (0.005%) and -88 dB (0.004%) from 0 to -60 dB
Signal-to-noise ratio (A-weighted): 105.3 dB
Channel separation: 110 to 120 dB at 100 Hz, 100 dB at 1,000 Hz, 75 dB at 20,000 Hz
Maximum interchannel phase shift: 0.42 degree at 10,000 Hz

Frequency response: ± 0.03 dB from 20 to 20,000 Hz
Low-level linearity error: less than 0.5 dB down to -80 dB, 1.5 dB at -90 dB, 2.5 dB at -100 dB
Cueing time: 2 seconds
Impact resistance: top and sides, A
Defect tracking: tracked 750-micrometer defects on Pierre Verany #2 test disc

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WHARFEDALE COLERIDGE SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

WHARFEDALE, a respected British loudspeaker manufacturer founded in 1932 by Gilbert Briggs, has developed a new speaker system that combines classically uncolored English (BBC-type) sound with the greater dynamic capability typical of the best American designs. The Wharfedale Coleridge is a compact two-way system whose 8-inch woofer operates in a ported enclosure. High frequencies (above an unspecified crossover frequency) are radiated by a 1-inch titanium-dome tweeter whose directivity is said to match that of the bass driver in the crossover region. The tweeter's voice coil, wound on an aluminum former, is cooled by ferrofluid.

The woofer cone is formed of a special polypropylene material called "mineral-filled homo-polymer" (MFHP). Wharfedale says that MFHP produces less coloration and has better dynamic qualities than other cone materials. Also used is a "sandwich mount," which clamps the woofer chassis firmly to both sides of the front panel, stiffening the cabinet to minimize its effect on the sound.

The Coleridge cabinet is available

finished in either natural or black ash on all visible surfaces except the top, including the front and back panels. The removable gray cloth grille is sculptured to reduce the apparent bulk of the speaker. The top is covered in a water-proof, mar-resistant gray laminate. The cabinet also has an integral 1½-inch-high base, which conceals the port opening and the connection terminals (multiway binding posts that accept dual banana plugs).

The Wharfedale Coleridge measures 19 inches high, including the base, and 10½ inches square (plus a half-inch front grille extension). Each speaker weighs 30 pounds. Price: \$700 each. Wharfedale, Dept. SR, 20600 Nordhoff St., Chatsworth, CA 91311.

Lab Tests

We placed the Wharfedale Coleridge speakers on short stands that raised their tweeters to slightly below a seated listener's ear level. They were 2 feet from the back wall, 7 feet apart, and 5 to 6 feet from the side walls. The composite frequency-response curve, formed by splicing a close-miked woofer response to the averaged room response of the left and right speakers, was very

smooth and notably free of the usual irregularities caused by room-boundary reflections. Output varied only 2.5 dB overall between 50 and 1,000 Hz, sloped down gently (about 6 to 7 dB) from 1,000 to 3,000 Hz, and remained nearly constant up to 10,000 Hz. The curve rose about 8 dB in the uppermost octave, from 10,000 to 20,000 Hz. The overall response variation was ±4.5 dB from 33 to 20,000 Hz.

Quasi-anechoic FFT response measurements clearly revealed the cause of the high-frequency rise. The tweeter had a large, undamped resonance at about 23,000 Hz, with an amplitude of at least 16 dB. In the FFT measurement, the lower skirt of this peak affected the response at frequencies as low as 8,000 Hz. The Coleridge's phase linearity was excellent, however, with an overall group-delay variation of less than 0.1 millisecond from 4,000 to 20,000 Hz and a maximum of 0.5 millisecond at 400 Hz.

Horizontal dispersion was good up to about 18,000 Hz except in the region between 2,000 and 3,000 Hz (apparently the crossover to the tweeter). In that range, the output measured at 1 meter from the speaker varied about 6 to 8 dB over an angle of 45 degrees off the forward axis. At other frequencies, such as from 4,000 to 10,000 Hz, the response curves taken on-axis and 45 degrees off-axis were very similar except for a level difference of about 3 dB.

Sensitivity was a very high 92 dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts of pink noise. The speaker's impedance descended to 7 ohms between 200 and 400 Hz and reached a maximum of 24 ohms at 100 Hz. Although the impedance did fall to 4.5 ohms between 12,000 and 15,000 Hz, a rating of 8 ohms would be justifiable.

The bass distortion, measured at the woofer cone with an input of 2.25 volts (equivalent to a 90-dB SPL in our sensitivity measurement), was about 7 percent at 25 Hz, falling to between 1 and 2 percent from 40 to 65 Hz and varying from 0.2 to 0.7 percent between 100 and 1,000 Hz. Since the effective crossover to the port was at approximately 100 Hz,

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we also measured the distortion there and found that it dropped off smoothly from 15 percent at 20 Hz to 1 percent at 44 Hz and 0.4 percent at 100 Hz.

The woofer cone bottomed with a single-cycle input of 160 watts into its 24-ohm impedance at 100 Hz. Few amplifiers, however, can deliver that much power into such a high impedance. At 1,000 and 10,000 Hz, the amplifier clipped at respective outputs of 470 and 1,285 watts before the speaker distorted seriously.

Comments

The sound of the Wharfedale Coleridge was very smooth and balanced, making it an easy speaker to listen to. It had no obvious emphasis or lack of output at any frequency, and the 23,000-Hz tweeter resonance peak had no audible effects that we could discern. Comparisons with a comparably priced pair of Celestion SL-12si speakers showed a fairly close match in tonal balance between the two, although their spatial qualities were very different (the width of the sound stage produced by the Coleridge system was essentially equal to the spacing between the two speakers).

Despite its small size, the Coleridge could be played at high volumes without sounding strained. Its

high sensitivity enables high levels to be achieved with almost any amplifier; a few watts should be sufficient to satisfy the most hard-of-hearing listener, yet we felt no hesitation in driving it with a 350-watt amplifier.

The discrepancy between the speaker's on-axis and off-axis response in the region between 2,000 and 3,000 Hz was one of the few respects in which our measurements appeared to be at odds with the claimed performance of the Wharfedale Coleridge, although we may have misinterpreted some statements concerning the woofer and tweeter's matched directivities in the crossover region that are made in Wharfedale's very interesting and informative booklet describing the system's features. We have seen similar crossover irregularities with other speakers, but they carried no specific claims for freedom from this common effect.

Nevertheless, the Coleridge impressed us as a distinctly above-average small speaker, combining attractive styling and very good sound, including unusually deep and distortion-free bass for its size. Though priced considerably above Wharfedale's standard line of speakers, it nevertheless represents a reasonable value today.

Circle 142 on reader service card



"Fourteen years ago this coming Tuesday, he took the tubes from his amplifier and went looking for a drugstore with a tube tester, and that's the last I've seen or heard of him. . . ."

Some people can never leave well enough alone.



Optional: RM-3 rack-mount adapters; white front panel & knobs

Shortly after it was introduced, the Adcom GFP-555 preamplifier won widespread critical acclaim for outperforming other preamps costing two and three times more.

Never satisfied to rest on its reputation, Adcom has upgraded this superior product to make it better than ever. Born from the lineage of the affordable GFP-555 and inspired by the no-compromise GFP-565, the new GFP-555 II, together with any of Adcom's power amplifiers, will provide the serious music listener with a new, higher level of musical performance at a very reasonable cost.

Superior Dynamics

By increasing the size of its power supply and by lowering the output impedance, musical contrasts are dramatically detailed and lifelike.

Adcom's new custom-designed linear gain amplifiers are many times faster than the frequency components in musical signals, easily meeting the demands of the latest digital recording technologies.

A new tone control circuit has also been created for greater symmetry. And for audio purists, the tone controls are out of the signal path except when needed.

Altogether, these improvements deliver the thrill of an emotionally satisfying, live performance.

Improved Performance Features

The new GFP-555 II has been enhanced by several improvements:

1. A front panel control for easy and instant use, on demand, of signal processors.
2. 1% Roederstein resistors and film capacitors to reduce noise and distortion to inaudible levels.
3. Front panel, six-source input controls allow listening to one source while recording another.
4. Choice of two outputs: MAIN allows the use of tone controls and filters with the protection of coupling capacitors; or BYPASS (the purist's approach), a direct coupled output for the shortest, simplest gain path.

A Better GFP-555 or a Less Expensive GFP-565?

The GFP-555 II is both. Designed to take the place of the highly successful GFP-555, it is actually an ingenious, less costly version of the GFP-565, with undiminished musicality and sonic impact.

Ask your authorized Adcom dealer for a demonstration of this remarkable stereo component. You'll be glad that Adcom can never leave well enough alone.

ADCOM[®]
details you can hear





STEREO TO GO

Summertime,
and the music
is easy...
the portable has
come of age.

BY
IAN G. MASTERS

WE can thank the gods of audio that the months without "r" in their names are no longer months of low-fi. It was not very long ago that the urge to be out in the summer sun automatically meant we had to leave serious audio behind. People who insisted on having music on the beach or by the pool found themselves lugging a "portable" about the size—and weight—of a concrete block, with sound quality to match. The explosion of miniature audio components over the past decade has changed all that, fortunately, and it has become routine to have very respectable sound indeed wherever we happen to be. In fact, the huge popularity of portable stereo has produced such a proliferation of equipment that it's often hard to make a choice.

It's ever harder to keep up with the technical developments as the audio companies close the gap between home and portable performance and capabilities. The first portable tape players were remarkable, certainly, but few would argue that their quality matched that of even a modest home deck. That's not necessarily true any more, as refinements such as Dolby C noise reduction, metal-tape capability, autoreverse operation, speed-stabilization devices, and the like show up even on some quite inexpensive tape players. The digital revolution has affected the portable market as well,

and a wide range of portable CD players are now available, some with exotic circuitry that echoes developments in home audio. And the omnipresent boombox has shared in this progress too: Most models with any pretensions to quality—as opposed to those that are simply *loud*—contain CD players.

The Analog Majority

Portable audio was built around the ability to listen to tapes on the go by means of lightweight headphones, and that is still the most crowded part of the field, although more and more tape players include AM/FM tuner sections as well.

One fairly recent development resulting largely from the addition of radio is the increase in tape units with recording capability. Most of these have built-in microphones; the Emerson CRR 100CS, for example, can record in mono from its mike or from the included tuner. Sanyo's MP 40R comes with a detachable microphone that permits mono recording, and the unit also features a built-in piezoelectric speaker for monitoring. Both machines list for a very modest \$60. Similar models are available from a variety of companies, including Hitachi and Panasonic. More ambitious is another Sanyo recorder, the MGR 95R (\$90), which has a detachable stereo microphone and can also record stereo from its built-in

FM tuner. Sony's WM-D6C also provides a stereo microphone input and offers such niceties as Dolby C and a quartz-controlled tape drive for speed accuracy as well. This useful recorder sells for \$400.

Perhaps the most elaborate model among the affordable recording devices is the EM-P2 from Sansui, which the company describes as a "player/mixer/amp." Designed for use by musicians, this unusual portable can accept a feed from an electric musical instrument (through the headphone jack) and also offers pitch variation and "echo control," all for \$175. The ultimate in terms of sound quality and flexibility, though, is probably an advanced portable cassette recorder from Uher, the CC 160AV (often used by professionals), but you'll have to cough up \$1,800 to get it.

Recording machines are in the minority, however, and audio manufacturers have not neglected the more usual functions of a tape player. A number have introduced autoreverse units, for instance, such as the Citizen CC-1R (\$35) or the Lloyd's PS 883 (\$40), and several have even incorporated ways to overcome the tendency of such mechanisms to suffer from head-alignment variations from one side of the tape to the other. JVC's CX-F40, for example, uses a fixed head with four gaps, two for each direction, while the Aiwa HS-PX900A offers azimuth adjustment in both directions. The Aiwa player, which sells for \$290, is also one of the growing number with Dolby C circuitry.

Another is the Kenwood CP-C7, which lists for \$249. The most unusual feature of this autoreverse player is that the company claims a playing time of 12½ hours from a single charge of its internal battery. Panasonic doesn't claim incredibly long operating times for its RQ-V505, but it will run on a single AA battery. Alaron's RY-280 (\$24) uses a solar cell to recharge its internal battery, and the Sony WM-A52, at \$63, contains a solar-powered calculator and clock.

While all of these portables acknowledge that much of the listening will be done under the sun, a few units also take into account the possibility that the weather will not be so clement. Realistic's \$30 SCP-26 player is weatherproof, as is the somewhat more ambitious Sony WM-AF79 (\$160).

Sony's water-resistant WM-AF79 (\$160) is an AM/FM/cassette Walkman from the Sports line.



Quasar's CD8959 portable CD player (\$250) has four-times oversampling and a bass-boost circuit.



Panasonic's RX-DS30 (\$320) is a complete system with AM/FM radio, cassette deck and CD player.



Bits on the Run

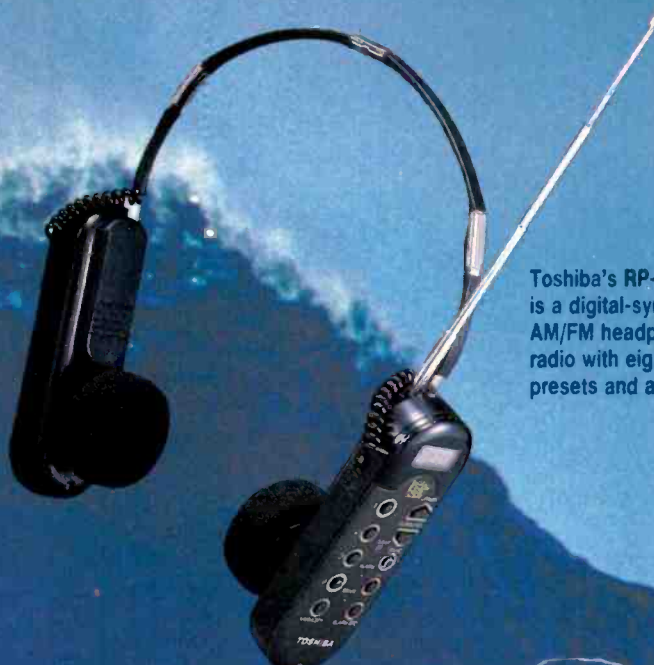
The combination of portable stereo and the compact disc seemed to be made in heaven, and the two have been living happily together for several years. At first, the portables were short on quality and features compared with their home equivalents, though they did tend to have greater immunity to physical shocks. In the past couple of years however, portable CD players have been catching up quickly, and many of the advances made in tabletop players have been showing up in their peripatetic cousins.

Numerous machines, for instance, now feature at least double-oversampling digital-to-analog (D/A) converters and digital filtering. Whether or not the high-frequency phase shifting that oversampling is intended to cure would ever be audible through headphones is debatable, but it was inevitable that the technique would show up in portable units because a large number of them are used with home systems as often as in the field. Both the Kenwood DCP-80 (\$450) and the Technics SL-XP6 (\$380) offer four-times oversampling, as does Toshiba's XR-9459. The latter is a \$450 player that also features circuitry for a surround-sound effect. Panasonic's SL-NP12 features 16-bit D/A conversion, as did its predecessor, the NP11. Denon's introduction to the world of portable CD ups the ante to eight-times oversampling combined with dual 16-bit D/A converters, as does the latest from Sony, the D-35. Both list for \$400.


Sony's top-of-the-line Discman D-555, which retails for \$450, made quite a splash when it was introduced because it was the first portable to include digital signal processing (DSP). In addition, this unit is right up there with home models in offering an optical digital output for use with amplifiers containing their own D/A conversion circuits.

Features that are being seen more and more in portables are three-beam lasers and the ability to play 3-inch CD's without adaptors. This ability may or may not be an appealing feature, depending on whether the smaller CD format ever captures the public's imagination.


While programmability is not as advanced in most portables as it is in full-size players, the ability to select fifteen or sixteen tracks is now common. Magnavox offers twenty-



Toshiba's RP-2068 (\$80) is a digital-synthesis AM/FM headphone radio with eight presets and a clock.



Aiwa's HS-PX900A cassette player (\$290) has Dolby C and a 15-minute quick-charge battery system.



Denon's DCP-100 (\$400) has eight-times oversampling and a 20-bit digital filter with noise shaping.



Kenwood's CP-C7 (\$249) plays for 12½ hours on a single charge of its internal battery.

JVC's PC-X300 (\$550) has dual cassette decks, an AM/FM radio, and a synchro-start CD player.

track programming in its \$280 D6800, and Denon's DCP-100 has memory for thirty-two tracks.

Better Booming

Of all the ways audio is packaged, the boombox is the one most often regarded with horror, at least by people who don't own them. And while there are still plenty of models on the market designed for quantity of sound rather than quality, most hi-fi companies have applied the same sort of technical advances to their top systems as they have to headphone portables. As a result, it is possible to achieve very decent sound from a boombox, and their flexibility usually outdoes all but the most elaborate home systems.

In this top segment of the market, practically all systems now include compact disc players. Sharp and its sister brand Optonica have taken this a step further by including double CD players in several models. The Sharp CD-X99 offers random play from two discs and sells for \$900, while the Optonica WQ-CD83 features not only dual players but dual 16-bit D/A conversion for \$700. Sanyo's \$800 MCD950 also has two CD players, along with passive radiators for bass oomph.

JVC has also addressed bass performance in its PC-X300, which not only includes a five-band equalizer but a powered subwoofer as well. The JVC sells for \$550 and offers a very useful synchro-dubbing feature to aid in transferring music from CD to cassette. This feature is offered on the \$400 Fisher PHD 800 system

as well, along with a separate CD output. Fisher's PHW1000 (\$140) and PHW3000 (\$170) have the same feature but without the built-in CD player; CD line inputs are provided instead. Panasonic's RX-CT830 (\$110) has a similar input along with a phono input.

Another approach has been taken by Soundesign in its Model 4979, which sells for \$300. In addition to dual cassette transports, it includes a CD player that fits into a well on top; away from the boombox the player can be used with headphones.

A couple of the more distinctive portable systems are not really boomboxes, though they have handles and offer much of the same flexibility. The Cambridge SoundWorks Model 11 is a suitcase that contains a 30-watt integrated amplifier, two satellite speakers, and all necessary cables—and the suitcase itself is a subwoofer. Just drop a portable CD player or cassette deck into the foam cutout in the Bass-Case, and you're ready to go. Factory-direct price is \$599. Citizen's CBM 5000LT is smaller, only briefcase-size, but it contains a CD player that can handle 3-inch CD's without an adaptor and has thirty-track programming. Both CD and amplifier output jacks are provided. It weighs less than 6 pounds and sells for \$350.

At the other end of the size scale is a glitzy system from Technidyne, the TD-10000 (\$500), that the company says may be the world's biggest portable system. It contains 10-

inch woofers, a ten-band equalizer, and—no kidding—wheels! The designers included wheels because they were sure no one would want to carry this massive unit around. Whether anyone will want to listen to it is another matter.

Extension Speakers

If you ever want to make your portable a little less than personal, all you really have to add is a good pair of small external speakers. Many manufacturers offer small speakers—both powered (with built-in amplifiers) and passive—designed to be used with portables instead of headphones. Among the best known are the Partners series from Acoustic Research, comprising six powered and nonpowered models ranging in price from \$470 to \$200 a pair.

Another noteworthy entry is Sony's SRS-77G (\$200 a pair), small water-resistant speakers whose built-in amplifier and volume control can be bypassed so that you can make adjustments from the portable source component. And Bose's RoomMate II and Video RoomMate powered speakers (\$339 a pair) are also small enough for portable use and have a wide range of carrying accessories available.

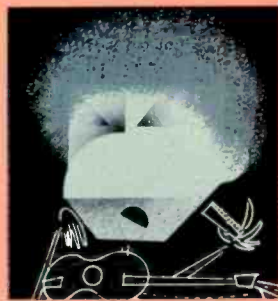
Every year with the beginning of summer, the urge to have music wherever we go becomes stronger. Today, audio designers' success at cramming high technology into ever-smaller boxes means that we can have *good* sound away from home. □

mix, match, & T A P E

BEING a professional rock critic is low-paying work with few fringe benefits—no groupies, no medical insurance, no respect from relatives—but at least one material advantage: you get lots of free records, tapes, and CD's. This, of course, has its own drawbacks (your apartment starts to resemble a flea market), but it does allow you a nifty leisure-time activity: programming custom cassettes, both for your own amusement and for the edification of friends with lesser collections.

Actually, I used to make tape anthologies all the time, but I'd gotten out of the habit in recent years and didn't get into it again until after a recent vacation. Before I left, a friend presented me with a tape, and it saw me through ten days in Greece. The selections were eclectic to the max—Gene Pitney, John Coltrane, Janáček's *Sinfonietta*—but somehow they all made sense in context and made lying on the beach seem somehow, well, productive. I wasn't being decadent; I was widening my cultural horizons.

Still, the taping bug didn't hit me anew until after I got home and found myself browsing at a certain well-known record store in New York City. There, I happened across something you might have seen at other stores: the Personics System for making custom cassettes of up to 90 minutes of music. It seemed like a pretty good deal. All you had to do was pick a bunch of songs out of the PS catalog, hand the list to a clerk, and *voilà*—in (usually) 5 minutes you got a digitally duplicated cas-



All you need to make
tape anthologies is
a little imagination,
a couple of doodads,
and a lot of music.

by

Steve Simels

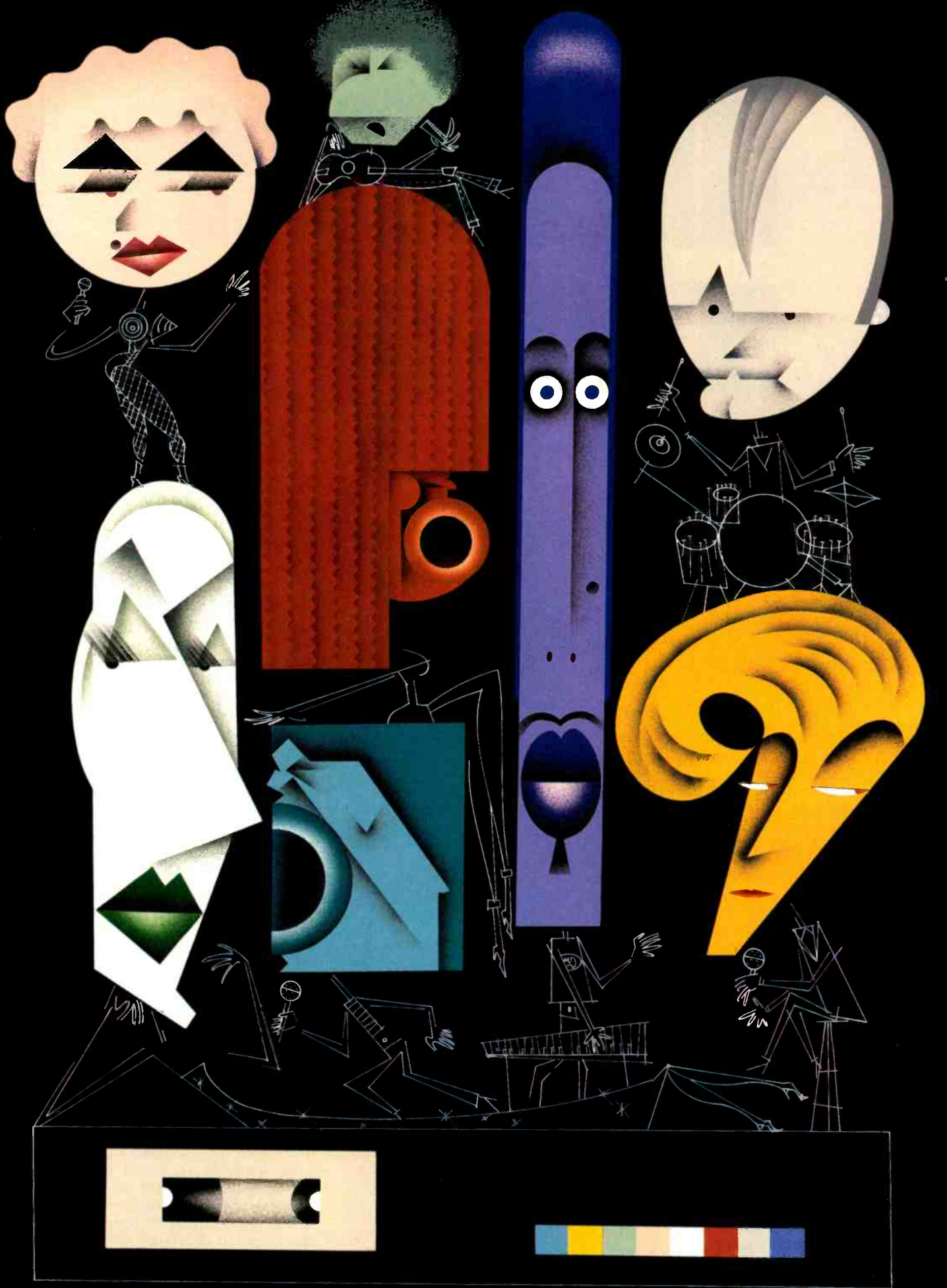
sette with your name and the song selections printed on the label.

A browse through the PS catalog, however, dampened my enthusiasm; the selections available were less than encyclopedic (nothing, for example, by the Rolling Stones, although you could get the Jaggerz and their 1970 hit *The Rapper*). And when I got down to it, my own record collection was far more comprehensive than what Personics offered. So I figured: Why let these guys program my tapes? Why not go home and—gasp!—do it myself?

So I did, churning out homemade anthologies by the score in the last few months. Here, then, are a couple of tricks of the trade that I've picked up in the course of the experience to help you do the same. Amaze and astound your friends, or just keep yourself busy on a night when HBO is running a Robby Benson festival. It's easy. All you need is a little imagination, a couple of technical doodads, and access to a lot of music. Incidentally, for purposes of this discussion, we'll assume that your stereo system includes a turntable, a CD player, and a dual-transport cassette recorder.

Get to know your pause switch.

You'd be surprised how many people forget to use this simple feature. In case you're one of them, a quick recap: If you press stop after each song you include on one of your home tapes, you'll probably get a resounding click after each selection. Hit the pause switch instead and remain untroubled by anything but the sound of music.



Remember to match source volumes.

Once you've mastered the pause switch and the click-free transition, the other thing you've got to watch out for is jumps in volume (that's because different records, tapes, and CD's may be mastered at wildly different levels). Face it, there's little in life, or music, more annoying than having a quiet folk song burst out of your speakers at twice the volume of the heavy-metal track that preceded it. So remember: Each time you change your source (that is, the song you're recording from, in whatever format), see how it registers on your tape deck's level meters and adjust the record level accordingly. Again, keep the record-pause switch on until you've had a chance to match those levels. Bear this advice in mind, and you can put Vladimir Horowitz up against Bon Jovi, decibel for decibel.

Use a real-time counter.

How many times has this happened to you? You're near the end of side one of an absolutely brilliant anthology, but 20 seconds before the side-closing song is due to end, you run out of tape. Oh, the frustration! A simple, if somewhat pricy, way to avoid this embarrassment is to get a cassette deck with a real-time counter. That will tell you how much time is available at any given spot on your cassette so you can pick a song that will fit the slot.

How does this work? "Simple," said my friend and fellow tape-maker Glenn Kenny. "A 45-minute tape actually gives you about 46 or 47 minutes. So when I get to around 41 minutes of music, I'll reset the counter to zero and play the tape out. That tells me exactly how much recording time is left, minus about 6 seconds for leader. Then the trick becomes finding a song that will fit thematically and also fit the amount of time left."

Invest in a mixer.

If you've ever been to a dance club, you've noticed that songs don't just start and stop—they fade in and fade out underneath each other. If you're feeling really creative, you can achieve much the same effect with your home tapes. How? Get a cheap mixer. A mixer will let you control multiple sources more or less simultaneously, so that, for example, you can turn down some obnoxious 12-inch

dance single at the same time you turn up a track from that Beatles CD you just got for Christmas. Radio Shack sells a four-channel mixer with sliding level controls for around \$70 that's ideal for this job; it adds a little noise to your signal but not enough to be problematic. And using it is simple verging on idiot-proof. All you do is connect the mixer between your audio sources and your recorder. Then you wait till, say, the LP track you're recording from starts to end, start up the tape or CD selection that you want to follow it, and slide the turntable volume control down as you bring the tape or CD volume up.

Think about tape configurations.

Despite advances in tape technology, this rule of thumb remains valid: The longer the tape, the less reliable it is in terms of stretching, audio dropouts, and so on. In other words, don't use a C-120. Practically speaking, your best bet remains a C-90, which gives you 45 minutes a side. But the new C-100's, designed for taping two longer-than-average CD's, give you an extra 5 minutes a side to play with that's basically risk-free, and I find they work well for the kind of Cuisinart anthologies we're discussing. And while we're on the subject, use the highest-quality cassettes you can find. Of course, good tapes may reveal the sad shape your old records are in.

Keep a clean machine.

Before making your tape, be sure to clean your tape heads and capstans with isopropyl alcohol (*not* rubbing alcohol) or a good commercial cleaner. And if you're really feeling high-tech, maybe you should use a head demagnetizer as well.

What about your VCR?

Yeah, what about it? Well, though you may not have realized it, your hi-fi VCR may provide better sound than your cassette deck. In fact, if you have only a mid-fi cassette machine, you'll find your VCR a very attractive alternative. Even at a slow setting, a hi-fi VCR records audio with a sound quality surprisingly close to that of a CD. Moreover, a VHS T-120 videocassette recorded at the EP speed gives you nearly 6 hours of high-quality audio—ideal for that "Wagner's Greatest Hits" tape you've been planning. So if your VCR is already hooked up to your receiver, why not

just route your signal through it and then follow all the other steps here exactly as you would with a conventional cassette deck?

Pop those tabs!

You've made the tape—still more songs, say, about buildings (John Cougar's *Pink Houses*) and food (Dee Dee Sharp's *Mashed Potatoes*)—and now you're ready to dupe another copy for yourself or simply give it to a friend. Now take one final precaution: Pop out the erase tabs on the top of the cassette. That way you'll never accidentally record over the results of your time, effort, and creativity. Or maybe you really like doing the same work twice?

Think thematic—up to a point.

Half the fun of making these tapes is finding some connection between the various selections you plan to include. These, of course, are limited solely by the reaches of your collection and your imagination. A rock-and-roll collector I know, for example, once made me a tape containing thirty-six different versions of *Let the Good Times Roll*, as recorded by obscure New Orleans r-&-b acts. A classical buff of my acquaintance once gave me a similar tape consisting of the same Italian *verismo* aria done by twenty-one tenors, in chronological order beginning with Edison cylinders.

My own best efforts, however, the ones people have enjoyed the most as gifts, have always been improvisations, with few clues going in. For example, once I decided to do a tape with the general theme of Jingle Jangle Twelve-String Guitars—songs that in some way featured the sound prominent on Sixties folk-rock records. So I began with a few cuts by the Byrds, segued into Hall and Oates's *How Does It Feel* and the Pretenders' *Talk of the Town*—and suddenly found myself adding on old r-&-b songs (*Dr. Feelgood*, *You Talk Too Much*) that had nothing whatever to do with my original idea but sounded terrific anyway and made a weird kind of sense. See, there are no rules here, except perhaps one: Don't get hung up on your concept. Or as my fellow taper Glenn puts it, "Don't plan ahead. The fun of it is to free associate. Usually I'll plan maybe the first three songs and then see where the connections are going to take me." Smart guy. □

SYSTEMS

Urban housing solution

by Rebecca Day

HENRY KLEEMAN'S 5-foot, 7-inch Kindel PLS-A speakers took up just enough space in the living room of his two-bedroom apartment that the Chicago attorney decided he had to house the rest of his equipment somewhere else. Still, he wanted to be able to operate the components from the living room and to coordinate the look of his system with the design of his contemporary furnishings.

By utilizing the walk-in closet behind his living-room wall, Kleeman was able to achieve all three objectives. He designed adjustable, indis-



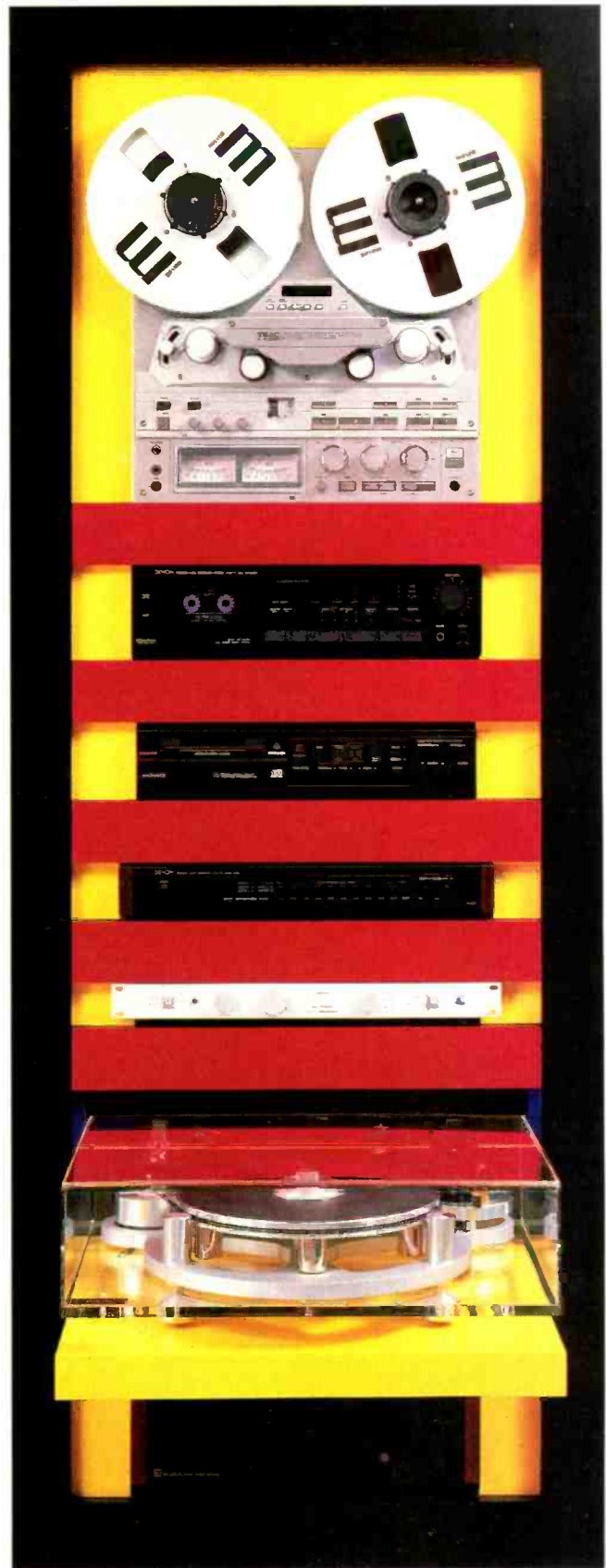


trial-type metal shelves to hold his components inside the closet and had faceplate-size holes cut in the wall so that only the front panels would be visible and accessible from the living room. His J. A. Michell Gyro turntable sits on a sturdy, inch-thick birch sliding shelf. The colorful framing panel, also made of birch, is painted with high-gloss acrylic.

From top to bottom the system features a Teac X-2000R open-reel tape deck, a Denon DR-M30HX cassette deck, a Magnavox CDB560 compact disc player, a Denon TU600 tuner, a Perreaux SA3 preamplifier, the Gyro turntable fitted with a Zeta tone-arm and an Ortofon MC20 Super moving-coil cartridge, and a Belles Research Model 250 power amplifier.

The Kindel speakers are positioned on the opposite wall, connected to the system by 18-foot lengths of Straight Wire flat Music Ribbon 32 that run under the rug. Kleeman stores his tapes and accessories in the closet. His seven hundred LP's and twenty-odd CD's rest on shelves cantilevered off a living-room wall.

Although the openings to the component closet were custom cut to fit, Kleeman says that the similar sizes of most comparable components will allow him to upgrade when the mood strikes. Finding an exact-fit replacement for his 6-inch-high Belles amp might be a tougher undertaking, however, so he plans to hold on to it for a while. □



PHOTOS BY BEN ALTMAN



A SPECIAL TEST REPORT

INFINITY MODULUS SPEAKER SYSTEM



THE new Infinity Modulus speaker system defies easy classification. Basically, it is a three-piece system consisting of two small satellite speakers and a subwoofer module powered by a built-in 250-watt amplifier. A small outboard Electronic Control Unit (ECU) supplied with the subwoofer allows for considerable adjustment of the relative contributions of the subwoofer and satellites to the overall system sound. But unlike the satellites in most three-piece systems, the Modulus speakers are full-range units in their own right, with a rated response of 80 to 45,000 Hz \pm 2 dB. Priced at \$1,000 a pair, they can be purchased and used independently of the \$2,000 Modulus subwoofer.

The Satellites

The Modulus satellite speakers measure only 12 inches high, 7 inches wide, and 10 $\frac{5}{8}$ inches deep, and each weighs 14 $\frac{1}{2}$ pounds. They

can be placed on any suitable surface, including shelves or tables, and can even be wall-mounted using special brackets available from Infinity (\$125 a pair). But they are said to deliver their best performance when mounted on the pedestal stands designed for them (\$300 a pair) and placed well away from the room walls.

The cabinets are made of rigidly braced high-density fiberboard, laminated with a special internal sound-deadening material and providing a tightly sealed enclosure for the acoustic-suspension woofer. The glossy exterior finish, available in either black or white, is similar in appearance to a fine piano lacquer but is less easily damaged; the multilayer plastic coating on the Modulus speakers is relatively resistant to scratching. The removable black fabric grille is retained by plastic fasteners.

The woofer has a 5 $\frac{1}{2}$ -inch injection-molded graphite (IMG) cone;

BY JULIAN HERSCH

the material is said to provide a high ratio of stiffness to mass. The curvilinear cone has a butyl surround mounted on a die-cast aluminum basket. At 4,000 Hz there is a crossover to Infinity's proprietary EMIT k high-frequency driver. All of Infinity's EMIT (for Electro-Magnetic Inductance Tweeter) drivers are planar push-pull magnetic designs in which the diaphragm is suspended between arrays of powerful neodymium magnets. The EMIT k drivers used in the Modulus and other higher-price Infinity

which therefore minimizes reflections off the woofer rim.

On the rear of each cabinet is a tweeter-level adjustment with a nominal range of about ± 2 dB. There are two pairs of gold-plated binding posts connected by gold-plated metal straps that can be removed for bi-amplified or bi-wired operation of the system.

The Modulus pedestals, made of die-cast aluminum, support the speakers 25 inches off the floor. The hollow pedestals can be filled with sand or lead shot to increase their

similar covers for the feet on the speakers can be used to protect a shelf or another supporting surface if the pedestals are not used. The necessary Allen wrenches and adhesives for fastening protective covers in place are also furnished.

The Modulus satellites' nominal impedance is 5 ohms, and they are recommended for use with amplifiers delivering between 50 and 200 watts. The rated sensitivity is a relatively low 84 dB sound-pressure level (SPL) measured at 1 meter with an input of 1 watt.

The Subwoofer

Although a pair of the Modulus satellite speakers can deliver full-range high-fidelity sound from most recordings, there can be a considerable amount of energy in the two octaves below their 80-Hz effective limit. In the full Modulus system, the range below 140 Hz is channeled to the Modulus subwoofer, which also has the beneficial effect of increasing the undistorted playing level of the satellites, whose small woofers are no longer required to handle the large excursions required for reproducing bass frequencies.

The Modulus subwoofer is a nearly cubical box, 17½ inches square and 19 inches high, finished to match the satellite speakers. It weighs nearly 80 pounds and has a single 12-inch long-throw woofer whose IMG cone is similar in construction to that of the 5½-inch satellite woofers. The woofer is on a side of the box that is normally covered by a removable black grille. The fluted black-metal corner post on one of the adjacent cabinet edges is actually the heat sink for the built-in 250-watt amplifier that drives the subwoofer. The amplifier, normally in a stand-by condition, turns on automatically when the ECU is switched on.

The subwoofer is driven by a servo amplifier, with negative feedback supplied from an accelerometer on the speaker's voice coil. The system is said to provide a flat frequency response (± 3 dB) through the subwoofer's operating range of 22 to 200 Hz. The feedback system



The full-range Modulus satellites have EMIT k tweeters and 5½-inch cone woofers.

speaker models feature diaphragms made of ultralight Kapton, which is said to extend their response to about 45,000 Hz.

In the Modulus satellites, the tweeter is stepped back a few inches from the woofer plane to provide accurate time alignment across the full frequency range at the listening position. When used with conventional dome tweeters, a stepped speakerboard design can cause reflections that degrade the imaging qualities of the system. The EMIT k driver, however, has extremely wide horizontal dispersion but is quite directive in the vertical plane,

mass and more effectively dissipate sonic energy. Each pedestal base has four pointed iso-tip feet that are individually adjustable for leveling the system. The top plate contains butyl cups shaped to fit the iso-tip feet supplied with the Modulus speakers, which screw into their bottom surfaces. The speaker rests freely on the top plate of the stand, secured by outer retaining screws that allow a moderate amount of movement relative to the stand. Covers are supplied for the pointed feet of the pedestals so that they can be used on a bare wooden floor without damaging its surface, and

also keeps distortion very low through the speaker's operating range. The subwoofer handles a mono signal, formed by summing the two stereo channels (stereo imaging is maintained by the harmonics of low-frequency fundamentals, which are reproduced by the satellites).

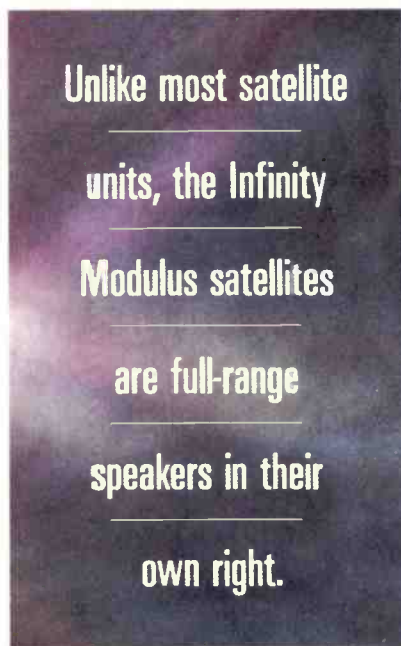
The small Modulus electronic control unit (ECU) provides the subwoofer's interface with the rest of the system and controls its crossover frequency and level. The ECU accepts stereo inputs from the system preamplifier (it can be connected to tape-recording outputs, external-processor outputs, or between the preamplifier and power amplifier) and returns the frequency range above 140 Hz to the main amplifier from its own high-pass outputs. A DIN socket supplies the range below 140 Hz to the subwoofer through a furnished 25-foot cable. The ECU measures 7¼ inches wide, 4 inches deep, and 1¾ inches high.

The 140-Hz crossover uses a passive 6-dB-per-octave network whose capacitors are switchable over a wide range by miniature DIP switches on the rear apron of the ECU. The switchable capacitance allows the crossover network to be matched to the input impedance of the main system amplifier, which could otherwise affect the crossover frequency. (The system's comprehensive installation and instruction manuals explain the process.)

The front panel of the ECU contains two toggle switches, three knobs, and a power pilot light. One switch controls line power to the subwoofer, and the other selects the subwoofer's low-frequency limit, either 22 or 35 Hz (with a 12-dB-per-octave cutoff slope). The higher frequency is recommended for most listening, since there is little signal content below 35 Hz, and in full-range operation the 12-inch cone's excursion limits can sometimes be exceeded by turntable rumble or very loudly played music.

The level knob varies the subwoofer's volume to match that of the Modulus satellites. The continuously variable crossover control

adjusts the crossover frequency (with 12-dB-per-octave slopes) between 40 and 210 Hz. This simplifies matching the levels of the subwoofer and the satellites if their high-pass crossover switches are not set correctly or if the room environment affects their relative outputs in the crossover range. The last knob, marked PHASE, has calibrated limits marked 0 and 180, indicating degrees of adjustment in the blending between the subwoofer and satellite outputs in the crossover region. Used when the subwoofer can-



not be placed in the acoustically optimum location in the room, the phase control actually varies an electronic delay in the subwoofer's signal path, electronically shifting the relative positions of the subwoofer and the satellite units.

Like the Modulus satellites, the subwoofer comes with a set of heavy-duty pointed feet and plastic isolating protectors and adhesives. Besides the cable that links the ECU to the subwoofer and cables between the ECU and the main amplifier, only the normal system wiring from the main amplifier to the Modulus satellites is required for a complete installation.


The Measurements

We tested the Modulus satellites alone, as full-range speakers, and with the subwoofer and ECU as a complete three-piece system. The satellites were installed on Modulus stands about 7 feet apart, at least 3 feet from any wall, and the subwoofer was against a wall about 2 feet to the left of the left-channel speaker.

We established control settings during several days of listening to the complete system. In most cases, there were no clear-cut indications of a "correct" setting, which depends in great measure on the program material as well as personal taste. We finally settled on the suggested 12 o'clock tweeter-level setting. For the subwoofer, we used a 35-Hz low-cutoff frequency, a 70-Hz crossover frequency, and 12 o'clock level and phase settings. In addition, Infinity recommends experimenting with placement of the subwoofer, moving it in increments as small as a few inches. Its 80-pound weight discouraged us from such an effort; in our listening room, almost no alternative locations were available anyway.

The averaged room response of the two Modulus satellites was ± 5 dB from 70 to 20,000 Hz (actually to well above 20,000 Hz, the upper limit of our response plotter). The response of the complete system was ± 3.5 dB from 20 to 20,000 Hz. The major part of the tweeter's audible range, from 3,000 to 12,000 Hz, was flat within ± 1.25 dB. The close-miked response of the subwoofer alone was ± 2.5 dB from 20 to 200 Hz with the 22-Hz cutoff setting and ± 3 dB over the same range with the 35-Hz setting. The principal difference between the two was that in the 22-Hz mode the output reached its maximum at about 23 Hz, while in the 35-Hz mode the maximum occurred in the 50- to 60-Hz range.

The crossover control settings corresponded closely to the actual -6-dB response frequencies (confirming the manufacturer's claims). The tweeter-level control's range, at



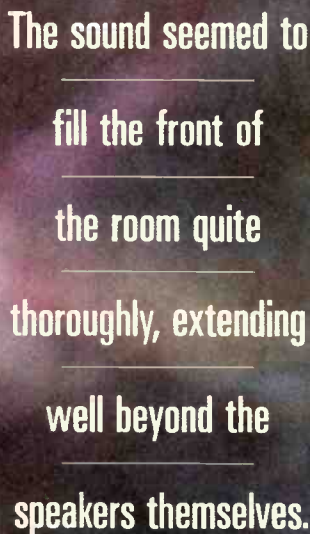
frequencies above 4,000 Hz, was ± 2 dB. The phase control varied the delay time over a range of 5 to 8 milliseconds, corresponding to an effective shift in the subwoofer's position of 5 to 8 feet relative to the satellite speakers. We were unable to hear any effect on music material over this range, although the character of pink noise was affected audibly by the phase control.

The minimum impedance of a satellite speaker alone was 4.4 ohms at 250 Hz, with a maximum of 21 ohms at its bass resonance of 85 Hz. The horizontal dispersion was excellent up to 20,000 Hz, although there was a sharp output dip (apparently from interference between the driver outputs) at approximately the tweeter crossover frequency in a measurement 45 degrees off-axis. The quasi-anechoic FFT response of the Modulus satellite on-axis was the flattest we have ever measured from a speaker, ± 1.5 dB from 180 to 30,000 Hz. The group delay (a measure of phase linearity) was also the best we have yet seen, with less than 0.1 millisecond overall variation from 500 to 29,000 Hz. A "waterfall" plot of the output of the speaker over the full frequency range during the 2.75 milliseconds following the narrow-pulse driving signal was closer to the ideal than any other we have made, showing a rapid decay of the output at all but the lowest frequencies. Every other speaker we have tested in this manner has had prolonged ringing at one or more resonant frequencies during this period.

The satellite's sensitivity, somewhat higher than rated, was 89 dB SPL measured at 1 meter with a 2.83-volt input of pink noise. Its woofer-distortion measurements (as a full-range system, without subwoofer) with an input of 3.18 volts (corresponding to a 90-dB SPL at 1,000 Hz) produced impressively low readings for a driver of this size. From 6 percent at 50 Hz, the distortion fell off to 1 percent at 100 Hz and about 0.2 percent in the 400- to 700-Hz range. The subwoofer's distortion, also at a 90-dB SPL equivalent input level, was 15 percent at 20

Hz, 4 percent at 25 Hz, 1 percent at 35 Hz, and from 0.5 to 1 percent from 35 to 130 Hz.

In single-cycle pulse measurements, the satellite's 5 $\frac{1}{4}$ -inch woofer "bottomed" with a 100-Hz input of 57 watts into its 14-ohm impedance. At 1,000 Hz, our amplifier clipped before the speaker reached its limits, at 625 watts into 8 ohms,



The sound seemed to
fill the front of
the room quite
thoroughly, extending
well beyond the
speakers themselves.

and at 10,000 Hz the amplifier again clipped first, at 860 watts into the 7-ohm impedance of the tweeter.

Listening Tests

Obviously, the Infinity Modulus system invites—actually, requires—the use of superlatives. The Modulus satellites themselves, without the subwoofer, clearly outstripped every speaker we have previously tested in several important measured characteristics, including response range (except in the low bass), response flatness, and phase linearity. The subwoofer had the essential properties of a good subwoofer, including very low distortion, deep bass extension, and flat response. When the entire system was operating, there was never an audible hint of the presence of a separate subwoofer.

With much of the program mate-

rial we used, switching off the subwoofer made no audible change in the sound. When used down to their lower limit of 70 or 80 Hz, the diminutive Modulus satellite speakers have the essential qualities of a very fine full-range speaker system. Their flat response in the upper bass and lower midrange eliminates chestiness or heaviness on male voices, a common flaw in the speakers we have tested over the years.

Best of all, turning the subwoofer on again usually made no difference in the sound. Why "best of all"? Because this demonstrates that its contribution was limited to the true low-bass range, which is actually present in a much smaller proportion of recorded music than many people think. When we were listening to recordings containing string bass, percussion, or organ sounds, however, it was clear that the subwoofer was doing its job, with a room-shaking effect when that was called for.

Describing the sound of the Modulus system is not easy, at least not in any universally understood terms. It was balanced, smooth, remarkably uncolored, with the clarity and freedom from edginess that comes with a flat tweeter response to beyond the limit of audibility. The sound stage was excellent, with the sources seemingly disassociated from the Modulus speakers on their pedestals. The sound seemed to fill the front of the room quite thoroughly, extending well beyond the speakers themselves. The subwoofer was *never* audibly localizable, and its output was so well integrated with the satellites' output that one could easily overlook its presence and merely assume that all the sound miraculously came from the Modulus satellites alone. That would not be an unreasonable conclusion given the remarkable performance of these handsome little speakers.

Infinity says that it has invested a great deal of time and money in the development of the Modulus system, and the results confirm the success of those efforts. It is really an impressive achievement. □

GETTING WIRED



Today's designer cables are a far cry from the old 22-gauge "speaker wire."

AUDIO engineers often describe the ideal audio amplifier as "a straight wire with gain." That definition, however, sparks one of hi-fi's hottest arguments: What type of wire? Many perfectionists would argue against a straight wire; others would dispute the merits of stranded versus solid wire. Two somewhat different camps have formed among manufacturers of premium wire. One might be called the "materials" group, the other the "geometry" group. Of course, a few companies combine precious materials with proprietary geometry. And all agree that gold-plated connectors on the ends are best.

At the dawn of the stereo era, in the early Sixties, audio dealers began providing cheap "speaker wire" as an afterthought with system purchases (and unfortunately some people still wire their systems with the same thin, 22-gauge wire). The con-

BY RICH WARREN

nectors were usually molded, shielded RCA plugs from Switchcraft. A decade later a new awareness of the importance of speaker wire developed, and dealers began providing 18-gauge "zip" or "lamp" cord. The gauge system (formally AWG, for American Wire Gauge) works in reverse logic: The smaller the number, the larger the diameter of the wire. Common 18-gauge wire serves as a reference point, since most lamps and small appliances are wired with it.

In 1976 a small, Baltimore-based company, Polk Audio, forever changed the way we think about wire. Polk introduced an "audiophile" product called Sound Cable consisting of precut pieces of braided litz wire (a special kind of multistrand wire with separate insulation around each strand). It sold for \$1 a foot in roughly a 12-gauge thickness and introduced hi-fi enthusiasts to the product category of high-end wire for stereo systems.

LATER, in 1979, Monster Cable introduced the first widely sold line of premium speaker cable. The first Monster Cable used the equivalent of 12-gauge copper wire shining brightly inside clear plastic insulation. Other than being big and beautiful, it was not radically different from existing cables although it was very flexible when compared with ordinary 12-gauge wire. But when audio enthusiasts were given the choice between Monster Cable with its "high-quality copper" and the kind of 12-gauge ordinary copper wire in brown insulation sold by any hardware store, they made Monster Cable a monster success.

Monster Cable wasn't alone for long. It was soon joined by Vampire Wire, Kimber Kable, Straight Wire, LiveWire, and a bundle of others. As the competition between cable companies heated up, each tried to develop unique features to differentiate its products from the others—much to the confusion of the consumer. Moreover, fat, fine-stranded cables were no longer enough. Once these companies convinced consumers that better speaker wires improved sound, it was a small step to introduce superior interconnect cables for other components.

Since those early days, audiophile wires have become as popular as bottled drinking waters and as complex as an IRS tax form. To give you

an idea of where we stand at the beginning of a new decade of designer wire, here's a look at some of the different cables you can buy and what they claim to do.

The newest Monster Cable speaker cable utilizes separate conductor paths for the high and low frequencies to achieve "wider dynamic range, tighter bass, and smoother high-frequency response." Monster Cable calls its approach "amplitude-balanced multi-network conductor technology." The new cable is somewhat flatter than the original Monster Cable for easier installation under carpets and around corners. Also from Monster Cable is the more expensive M Sigma Series. This "linear-phase, balanced-impedance, high-current" cable comes in a woven round jacket, and prices begin at \$750 for a pair of 8-foot lengths compared with \$35 for two 10-foot lengths of standard Monster Cable. There are also M Sigma interconnects, which are said to incorporate "balanced-bandwidth, MicroFiber technology in a balanced-impedance design." According to Monster Cable, however, "details of this new technology are undisclosed." A pair of 1-meter interconnects costs \$750.

AudioQuest's LiveWire comes in several grades. Oxygen-free, high-conductivity copper is used in the Blue and Midnight cables (\$2.50 and \$6 a foot, respectively). "Functionally perfect copper" is used in the Hyperlitz series, which includes Green and Clear cables (\$25 and \$50 a foot). All these LiveWire cables use several small "surface-only" conductors in order to eliminate "skin effect" (see the box on page 78). In its literature, AudioQuest says that "Speaker cables need to be broken in. The dielectric [insulation] material in speaker cables requires about a week of use to fully 'form.' The cables will sound significantly better after the break-in period."


Audio Research Corporation's cable is available both in interconnects and as speaker wire. The four-conductor LitzLink interconnects are bundles of individually insulated, oxygen-free copper (OFC) wires. According to Audio Research, the "strand thickness, count, and winding geometry were evaluated and specified for maximum sonic purity and articulation at all frequencies." The company further proclaims that the superior sound

qualities of its LitzLink interconnects and LitzLine speaker cables "aren't due to arcane wire theory or marketing hype. They're simply the result of painstaking attention to detail and high-quality component materials." Shielded LitzLink interconnects range in price from \$195 for 0.5 meter to \$395 for 9 meters; LitzLine speaker cables range from \$455 for 0.5 meter to \$795 for 9 meters.

SIGNET offers three grades of Music Line Advanced speaker cable and four grades of Component Linkage Systems interconnects. The speaker cable uses 258 strands of oxygen-free copper per conductor leg. The Music Line Ultimate series uses two conductors per channel, each fabricated from a different gauge of pure copper by Ohno continuous casting (PC-OCC). Signet trumpets PC-OCC because it has "virtually no transverse crystal barriers to impede signal transmission or color sound." The Maximum Transfer Ultimate interconnect, as its name implies, is Signet's top-of-the-line interconnect, with both conductors composed of PC-OCC. This mono-crystal design is said to have an incredibly low resistance of 0.007 ohm per foot and an equally low capacitance of 0.0257 nanofarad per foot. The less expensive Maximum Transfer Premium interconnects have center conductors of PC-OCC but an OFC shield. At \$125 per 3-foot pair, the Maximum Transfer Ultimate is a veritable bargain compared with some of the competition.

Discrete Technology Laboratories silver-plates the oxygen-free copper in its Platinum-Plus and Dreadnaught speaker cables, which also feature Teflon insulation. The connectors are crimped on and soldered with silver solder. The company's interconnects are built the same way. A 10-foot length of Platinum Plus speaker cable sells for \$875, while a 2-meter Platinum interconnect costs \$180.


Music Interface Technologies, a California company that likes to go by its initials, MIT, has no relation with the prestigious university also known by those initials. The company has published an impressive "white paper" on the audibility of speaker cables. It considers the predominant sonic errors to be in the areas of tonal balance, lucidity, sound staging, and transient re-




MIT Shotgun Series cables (left, center) and Madrigal's Co-Planar Copper flat speaker cable (right)



Clockwise from left, Sumiko Premier, Signet MTU-6, Audio-Technica Atus AC-122-A2, Discwasher FG-1085, Signet MTS-6, and Discrete Technology Dreadnaught Platinum interconnects



Top to bottom, Signet MCS-1000 speaker cable, Nakamichi's Oxygen-Free High-Conductivity speaker cable, AudioQuest Livewire Ruby cable, and Signet's MLU-250 cable



Discrete Technology's Balanced-Line Silver interconnects (top left), 312SC speaker cable (top right), and Platinum Series interconnect (lower right) and Audio Research's LitzLink 2 interconnects (lower middle) and LitzLine cable (lower left)

CUTTING THE CONFUSION



CHOOSING cables to hook your equipment together used to be one of the easiest parts of buying an audio system (if you had to choose at all). Now it is arguably one of the most confusing. Today's stereo shopper confronts a bewildering variety of cables, boasting all sorts of exotic materials and construction techniques for which their makers claim astonishing virtues. Is it possible that you really can hear wire? If so, what makes one kind better than another?

The most basic electrical characteristic of a wire is its impedance, which has three components: resistance, capacitance, and inductance. Resistance, measured in ohms, impedes the flow of an electrical current equally at all frequencies. Inductance, which is expressed in henries or millihenries (mH), is similar except that its effect increases with frequency. Capacitance, rated in farads, microfarads (μF), or picofarads (pF), goes the other way, attenuating low frequencies more than high ones. The interaction of these different types of impedance can yield other results—for example, a series resistance in parallel with a capacitance rolls off high frequencies—but until recently no one claimed that they could not, taken together, adequately describe the electrical characteristics of an audio cable.

In speaker cable, what is usually most important is the resistance, which should be as low as possible to minimize power loss. A low cable resistance also helps keep the overall impedance of the source (the amplifier's output impedance plus the cable's) low relative to that of the speaker. If the ratio of the source and speaker impedances, called the damping factor, is too low, it can cause small frequency-response errors.

Resistance in a given length of cable decreases as the diameter of the wire

increases, so the greater the distance between your amplifier and your speakers, the thicker the cable should be. For runs of up to about 20 feet, 16-gauge or even 18-gauge copper wire is usually good enough and easy to handle. Avoid thinner wire (larger gauge numbers) and wire made of aluminum, which is a significantly poorer conductor than copper. If you must use very long cables, move up to 14- or 12-gauge wire. One advantage of some of the thick specialty cables is that they're made of many fine strands wound to maintain flexibility; heavy gauges of ordinary wire tend to be stiff and difficult to manage.

Cables conveying line-level signals between electronic components (CD player and receiver, for example) don't have to carry large currents, making resistance less of an issue. For unusually long runs, it is a good idea to make sure the cable is a low-capacitance variety, to prevent any loss of high frequencies within the audio band. This is a very uncommon problem, however.

A more likely source of difficulty is interference picked up by an interconnect cable and fed into an amplifier along with the audio signal, creating noise. For this reason, all line-level audio cables have a shield around the conductor, which is grounded through the outer portion, or "skirt," of an RCA-type pin connector. The best shields are foil, but they are also relatively stiff and easily damaged. More popular are braided-copper shields, which work very well if they are dense enough. Probably the most important differences between interconnect cables are in the quality of their shields, the sturdiness of their plugs, and the security of the connections between the plugs and the conductor and the shield.

Gold-plated connectors are popular on high-end components and cables, and they are worthwhile insofar as they

prevent corrosion. But you can get much the same benefit by periodically unplugging and reinserting ordinary connectors, which scrapes away any crud that may have accumulated at the junction between plug and jack.

The claims made for certain cables go far beyond such ordinary considerations, however, and are often based on theories more relevant to transmission of radio-frequency signals over miles of wire than to audio frequencies traveling only a few feet. Such concepts as "characteristic impedance" and "skin effect," to take a couple of prominent examples, are simply not applicable to anything that goes on in an audio system. (Characteristic impedance has to do with standing waves in long transmission lines; skin effect is the tendency of very high-frequency signals to travel along the surface of a conductor rather than through it.) Some cables have been promoted on the basis of their ability to reduce waveform distortions that occur only at frequencies of several megahertz—far, far above the range of human hearing. Other dubious claims have included the ideas that an audio signal actually travels through the insulating portion of a cable, rather than the conductor, and that wires should be as skinny as possible to minimize random motion of electrons (promulgated by someone with a very poor grasp of the size of subatomic particles).

Controlled listening tests have so far failed to reveal any audible differences between cables that meet the traditional standards outlined above. That does not mean you should take the cables in your system for granted. Make certain they are well made and—in the case of speaker cable especially—adequate to the task. But before you lay out a lot of money on fancy wire, be sure that you're getting a real return on your investment.

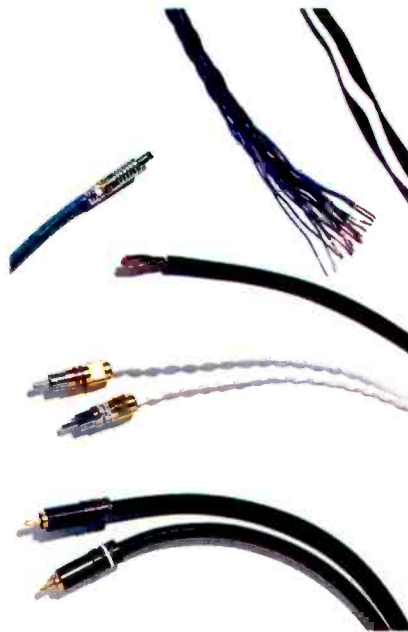
—Michael Riggs

sponse. According to the paper, electrical signals do not all travel along a wire at the speed of light. The velocity of the signal, the company says, is frequency-dependent, and it views "skin effect" as a critical factor in designing proper cables. MIT has coined the term "phase noise" for all forms of frequency and phase instability caused by cables. The company claims to eliminate phase noise with its Vari-Lay Construction, in which a large number of fine conductors are wound around the core wire at a much steeper pitch than the heavier conductors. The ultimate expression of this design approach is the Constant Velocity Transmission series, in which a CVT coupler in every cable is calibrated to eliminate delay distortion and phase noise. A 1-meter pair of CVT interconnects sells for \$1,100. Musical Interface Technologies sells three other grades of cable: Zapchord (\$3.95 a foot), PC Squared (\$8.50 a foot), and Shotgun (\$9.65 a foot, 8 feet minimum).

AUDIO cable manufacturers in Great Britain are more likely to espouse the opposite view, advocating solid (rather than multistrand) copper wire, sometimes as thin as 24 gauge. DNM represents the prevailing opinion in the U.K. by offering cables consisting of flat, solid-copper ribbons. The company says that "to transfer complex AC information accurately we need a good conductor, just large enough in cross section to carry the current peaks with acceptably low power loss." DNM's solid-core speaker wire and interconnect cable sell for \$3 per foot, with pre-terminated interconnects going for \$85 in 1-meter lengths and \$100 for 2 meters.

Madrigal Audio Laboratories represents the flat, solid-wire faction in the U.S. with its Teflon-insulated Helical Planar Copper and Co-Planar Copper cables. According to Madrigal, "... solid conductors of rectangular cross section would do a better job of carrying musical signals" than multistrand wire.

Kimber Kable wins the award for the most visually interesting cables. Each twisted set interweaves either four or eight color-coordinated wires. Kimber's wire is also one of the flattest multistrand cables we came across. Its LPC series is woven from up to sixteen individual strands and is ideal for under-carpet installations. In explaining the pre-



Clockwise from top, Kimber Kable Teflon Composite speaker cable, AudioQuest F-14 flat cable, Nakamichi High-Current Ground wire, Kimber Kable's KCAG interconnects, JVC's CN710-Pro interconnects, and Madrigal's Helical Planar Copper cable

mium TC (Teflon Composite) series, Kimber says that "TC is not just our own insulation; it is also the complex process of placing that insulation on the conductor."

The most extravagant cables come from Dutch physicist A. J. van den Hul, whose phono cartridges are well known and highly respected. Van den Hul's standard cables use "matched crystal copper," but his MC Gold and MC Silver interconnects are truly something else. In MC Silver cable, each copper strand is clad in silver. The MC Gold cables go one step further, coating the silver with gold. The 1-meter MC Silver interconnects cost \$1,300 a pair.

Discwasher Gold-Ens serve the music listener who wants decent interconnect cables without becoming caught up in any controversy, not to mention stratospheric prices. Discwasher reserves the gold in the name for the plating on the connectors, not the wires. These rather conventional interconnects cost a mere \$22 for a 1-meter triple strand.

There are numerous other cable manufacturers, among them Audio-Technica, Sumiko, Boulder, Calrad, and DB Systems. Like many other audio fetishes that keep the field interesting, esoteric cables engender

ardent support and vehement rejection. All concerned agree that interconnects need to be physically well constructed and made from a high grade of copper. Furthermore, all concur that the connectors at the ends of the cable are exceptionally important.

R. A. Greiner, a professor of electrical engineering at the University of Wisconsin in Madison, provided the most detailed analysis yet of audio cables in his paper "Amplifier-Loudspeaker Interfacing," published in the *Journal of the Audio Engineering Society* in May 1980. He analyzed both ordinary and esoteric cable, measuring resistance, inductance, and capacitance. The paper presents many mathematical formulas describing the characteristics and behavior of cables. His major conclusion is that speaker cables do *not* behave as transmission lines, the theory subscribed to by many, if not most, esoteric cable designers.

The sonic effects claimed by cable partisans may not, however, be entirely psychological. A disadvantage of component stereo systems is that the amplifier's designer never knows the characteristics of the speakers that will be connected to it, and vice versa. Amplifier/speaker mismatches are more common than we would like to admit. In some rare cases, the capacitance or inductance of a cable may coincidentally yield a better interface between the amplifier and speakers, resulting in better sound. On the other hand, some cables have been known to cause amplifier oscillation.

ARE there real sonic differences between audio cables? We leave that up to each individual to decide. What we can say is that there are some valid reasons, described in the box on the facing page, to use good cables in your hi-fi system. Which theory you choose to subscribe to and how high a price you're willing to pay for cable comfort is up to you.

For those curious about the future, Vampire Wire hints that the whole cable business may be moving to a new playing field, fiber optics, and is already selling fiber-optic cable. Theoretically, fiber optics will usher in a brave new world without the worries of wire. But you can be sure that in a few years you'll be able to choose between several esoteric optical fibers to connect your digital components. □

**“Jazz teaches you
to go with the
flow, but it also
prepares you
to stop and turn
on a dime.”**

BY ELIOT TIEGEL

THINK you should live in every inch of your skin and do everything you feel you'd like to do and know how to do," Quincy Jones told me recently in the quiet of his home in Bel Air, California—a few doors up from Zsa Zsa Gabor and a philosophical mile from his other near neighbors, Ronald and Nancy Reagan. "But I'm against the so-called Peter Principle of rising to your own level of incompetence. I'm not going to mess with anything I don't feel I can do, anything I won't be proud of."

Considering his long list of credits as a performer, composer, arranger, and producer, it's clear there isn't much that Jones can't do. His latest accomplishment was the Top 10 album "Back on the Block," in which some thirty-two guest artists joined him to show the connections of gospel, jazz, soul, and rap to "the mother of it all," African music. Originally planned for release in 1981 on Jones's then-new Qwest label, "Back on the Block" was held up because of his involvement in a number of other projects, including albums by Michael Jackson and Frank Sinatra, the movie *The Color Purple*, and the benefit single *We Are the World*, with its own cast of thirty-five megastars.

The many performers who appear together in "Back on the Block" were never assembled in the same studio at the same time the way they were for *We Are the World*. Instead, Jones grabbed artists as they became available. "Nobody knew who else was on the record," Jones said with a chuckle. "It was a nightmare in scheduling, but I never let it get me down." The album includes duets by artists who were never actually in the studio together: Ella Fitzgerald sings with the late Sarah Vaughan, Miles Davis plays with Dizzy Gillespie.



"It was easier to put the pieces together one at a time than dealing with a room full of stars," he explained. "But I also didn't have any choice, because I couldn't get them together at the same time anyway. Bobby McFerrin was off doing things, Ella was in Paris, *Take 6* was in Nashville, Miles played four days before Dizzy cut his part, Al Jarreau came in on a Sunday, Herbie Hancock came directly to the studio after flying in from New York before he packed and headed off to a gig in Japan . . ."

Now, with "Back on the Block" behind him, Jones is free to concentrate on building up Qwest. This year he plans to produce Qwest recordings by veteran singer/pianist

Ray Charles (a long-time friend who was featured in "Back on the Block"), Tevin Campbell, a twelve-year-old Michael Jackson sound-alike from Texas, and singer/composer Seidah Garrett. He'll also be the executive producer for albums by the Winans and New Order.

But record production alone isn't enough to keep Jones busy. He's also working on a Broadway musical about Arthur Mitchell, founder of the Dance Theater of Harlem, which he hopes "to get moving this year," and he's involved in movie and TV production as well. For the big screen, there's a \$35-million joint venture with a Russian company based on the life of the writer Alexander Pushkin. The movie will

QUINCY JONES

be shot in Moscow and Leningrad and will draw on music by Russian composers for its soundtrack—though Jones would like to write the main theme himself (he's scored thirty-seven films since *The Boy in the Tree* in 1961). He isn't sure yet who'll do the music for the Broadway show, but he also plans to write the theme music for his small-screen project, a syndicated talk show with the Rev. Jesse Jackson coming up this fall.

If there's one strong musical element that permeates all of Jones's work, it's jazz. He started out as a jazz trumpeter, played with the Lionel Hampton and Dizzy Gillespie bands, and led his own ensemble in the Fifties. "Jazz teaches you to go with the flow and let natural impulses happen," he said. "But it also prepares you to stop and turn on a dime. You're not going to say, 'Hey, man, we said we're gonna go this way. What do you mean changing direction?'"

Skilled in using every recording-studio technique to add bite and a beat to his music, Jones incorporated synthesized sounds as well as the scratching sounds associated with rap in "Back on the Block." "A lot of the technology can actually dictate the style of music you use," he said. "Sequencers can take something that's almost humanly impossible to execute and allow you to alter its velocity."

Still, Jones is aware of the dangers of going overboard. He admits he's concerned, for example, about the trendy technique called "sampling," in which a band will take snippets from recordings by other artists and use them to enhance its own work. "Is it ethical to use other people's material?" he asks. "I don't think it's legally right; it's an infringement, a violation. [Rappers and others who use sampling] have con-

vinced themselves it's a creative process, like a mosaic, a collage. But I say, 'Write your own stuff, man.'"

Jones writes his own stuff. He co-wrote three songs in "Back on the Block" and came up with the concepts for three of the others. Himself a virtuoso in the art of planning a recording, he credits Sinatra, with whom he's worked on several albums, with helping him understand how to sequence songs.

"Most shows by star singers like Sinatra have fourteen songs," he explained. "Sinatra would have fourteen cards with big black letters for the titles. There was something psychological about being able to move the songs around so easily with the cards."

As an example of how the system worked, he recalled a time when he was with Sinatra and the Basie band in Las Vegas in the mid-Sixties. "I rewrote the charts for *My Kind of Town* and had it rompin'. It was definitely designed to pull out the Marines. In the first show, Frank opened with it and did *Fly Me to the Moon*, which I'd also arranged, at the end. I felt it was lopsided, so I went to Frank after the performance and said I thought we'd have a better show if we reversed the two songs and opened with *Fly Me to the Moon*. He said, 'No problem, let's do it.' And man, it tore the show to pieces. We closed with *My Kind of Town*, and it was a killer. It was designed to close the show, and it comes from having those cards."

"When I started thinking about sequencing my new album, I made up cards. It's a process that doesn't strangle you. Sequencing is really important. I think, psychologically, that listeners are very affected by sequencing. A solo singer could never get away with what I did on that album: The whole first half is up-



Ray Charles is a long-time friend.

tempo songs. A solo singer can't get away with that because there's no variety.

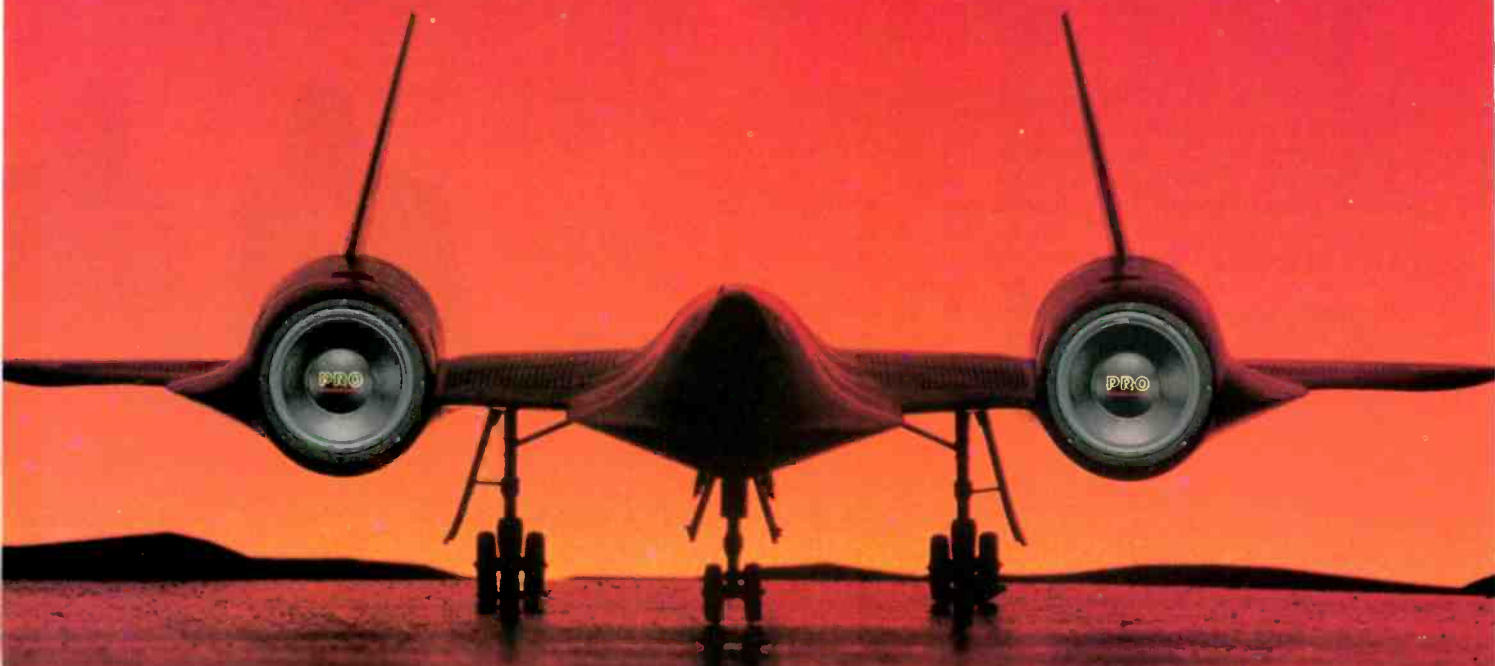
"But if you've got four rappers, and Joe Zawinul on keyboards and Tevin Campbell and Andraé Crouch and his gospel choir and Seidah Garrett and Herbie Hancock and Ray Charles and Chaka Khan duetting, your ears are constantly being tickled. I could never do that with a Michael Jackson sequence."

One project that will not involve any complicated sequencing is the soundtrack for the two-hour documentary on Jones's life that Warner Bros. Pictures is preparing. Some 600 hours of material have been assembled, covering every person Jones has worked with and ranging from his early days as a trumpet player to his years as a vice president of Mercury Records to his current eminence as songwriter, producer, and arranger.

"I'd like my next album to be the music of my life," he said. "I'm not talking about an ego trip but something that will illustrate the last forty years of American music through my life." □

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BEST RECORDINGS OF THE MONTH

Stereo Review's critics choose the outstanding current releases

SHOES RETURN WITH "STOLEN WISHES"

THE story so far: Back in 1978, at the dawn of the punk explosion, four Sixties pop/rock obsessives who called themselves Shoes (from an obscure Paul McCartney joke) recorded an album in their living room in Zion, Illinois. Released on their own Black Vinyl label, it proceeded to garner rave reviews on both sides of the Atlantic and ultimately led the band to sign a deal with Elektra. Three above-ground albums followed—all excellent—but the band's airy harmonies and Beatlesque romanticism must have seemed out of step with the then-prevailing alternative rock trends, and Shoes wound up back in Zion with little to show for their efforts except the original master tapes. Undaunted, however, they built a successful local recording studio, wrote new songs, and hoped.

And now, after all this time and against all the odds, Shoes (down to a trio) has returned with yet another self-produced and self-marketed album, "Stolen Wishes," that just may be their masterpiece. Time may finally have caught up with them, too. Not only has no more gorgeous aural product been released anywhere in the world in recent memory, but "Stolen Wishes" should have no trouble making itself heard on radios already accustomed to Tom Petty's "Full Moon Fever."

Actually, the years in the wilderness may have been good for this band. As breathtaking as a lot of their earlier work was, their trademark mélange of massed fuzz guitars, glorious melodies, lost-love lyrics, and angelic vocals had a whiff of unreality about it, a hot-house pop-museum sound that could be cloying over the space of an album.

Not so in "Stolen Wishes." For whatever reason—more sophisticated technical resources, a new drummer, simply having lived a little—the new songs here sound less like the work of three brilliant formalists and more like the musings of a bunch of real guys who just happen to have unimpeachable pop gifts. In short, they appeal to both heart and head—melodic, touching, and impeccably crafted all at the same time. And while the basic parameters of the Shoes' music remain the same as before—Sixties song structures, guitar-focused high-gloss production—this time out they sound as if they mean what they're singing, and the combina-

tion is irresistible. In fact, there's just so much to admire here—the haunting McCartneyisms of *I Don't Know Why*, the Cars-ish percolation of *Torn in Two*, the soaring guitar that slices *Your Devotion* in half—that it's hard to get through the album without playing individual tracks over and over again, like when you were sixteen and every new song was the most beautiful you'd ever heard.

This is, in short, one hell of an album, and the fact that it isn't on a major label speaks volumes about the sad state of the record business. But a great band can persevere in spite of it, which means that for both musical and extramusical rea-

Gary Klebe, John Murphy, and Jeff Murphy of Shoes



BEST RECORDINGS OF THE MONTH

sons, "Stolen Wishes" is inspirational. I'm not sure "sublime" is an adjective that really applies to any rock-and-roll record, but if it does, this one certainly deserves it.

Steve Simels

SHOES: *Stolen Wishes*. Shoes (vocals and instrumentals); Ric Menck (drums). *Feel the Way That I Do; I'll Follow You; Love Does; Let It Go; Your Devotion; I Knew You'd Be Mine; Want You Bad; Torn in Two; She's Not the Same; Untangled; I Don't Know Why; Inside of You; I Can't Go Wrong; Love Is Like a Bullet; Never Had It Better*. BLACK VINYL © BV10189-4, © BV10189-2 (54 min). From Black Vinyl Records, 2269 Sheridan Rd., Zion, IL 60099 (\$10 for cassette, \$15 for CD, postage and handling included).

SONGS FROM "DES KNABEN WUNDERHORN"

Someone at Teldec had the brilliant idea of recording song settings of verses from the collection of German folk poetry called *Des Knaben Wunderhorn*—songs not only by Mahler, with whose name that source is most strongly connected, but by no fewer than eight other composers, ranging as far back as Weber and as late as Schoenberg—and had the similarly commendable idea of getting the young American baritone Thomas Hampson to record them with the pianist Geoffrey Parsons. Hampson has already presented his Mahler credentials in his splendid Deutsche Grammophon recording of the *Kindertotenlieder* with Leonard Bernstein and the Vienna Philharmonic. There is probably not another singer anywhere today who could have brought these assorted songs to life so fetchingly.

And how enchanting these *Wunderhorn* songs are, all eighteen of them. Not unexpectedly, Mahler is the most heavily represented composer in the group, with six songs positioned at various points in the collection. Some of his material will be familiar from other contexts: The music for *Ablösung im Sommer*, for instance, found its way into the



Thomas Hampson: Mahler and more

scherzo of the Third Symphony. Mendelssohn's *Jagdlied* is familiar enough in its own right, though few of us connect it with the *Wunderhorn* source, and even fewer among the millions who know the Brahms piece that concludes the program, the *Lullaby* known even to people who avoid music, would even have heard of that source.

There are two additional Brahms songs earlier in the sequence, both utter charmers, and a substantial *Abendsegen* by Weber that, in its own narrative style, comes closest to the spirit of the famous lullaby. The Zemlinsky song, *Das bucklichte Männlein* (*The Little Hunchback*), is especially poignant. The Schumann and Strauss selections are endearing, too, but perhaps the single most ingratiating piece is Carl Loewe's characteristic ballad setting of *Herr Oluf*.

It is not necessary, of course, to evaluate these songs in respect to one another: They are all delightful, and I found myself being happily swept up in the evident affection they inspired on the part of Hampson and Parsons. Both the singer and the pianist are blessed with superb technical facility and uncommon musical intelligence, and their response, not only to the material itself but to each other in performing it, makes for a remarkably fulfilling experience. The annotative leaflet includes a concise but truly informative background piece

and full texts, all in excellent translations. And Teldec's engineers have provided an object lesson in how to record a singer and pianist in recital together. Richard Freed

THOMAS HAMPSON: *Songs from "Des Knaben Wunderhorn."* Mendelssohn: *Jagdlied; Aldeutsches Frühlingslied.* Mahler: *Scheiden und Meiden; Ablösung im Sommer; Nicht wiedersehen!; Ich ging mit Lust; Um schlimme Kinder; Zu Strassburg auf der Schanz.* Schumann: *Marienwürmchen.* Brahms: *Der Überläufer; Liebesklage eines Mädchens; Wiegenlied.* Loewe: *Herr Oluf.* R. Strauss: *Himmelsboten; Jungesellschwur.* Zemlinsky: *Das bucklichte Männlein.* Schoenberg: *Wie Georg von Frundsberg von sich selber sang.* Weber: *Abendsegen.* Thomas Hampson (baritone); Geoffrey Parsons (piano). TELDEC © 244 923-2 (54 min).

LUKA BLOOM'S "RIVERSIDE" ODYSSEY

Luka Bloom is an Irishman with a guitar, a head full of ideas, and an unquenchable thirst for life. He wrings more music and feeling from an acoustic guitar than most bands manage to pull out of a roomful of plugged-in equipment. "Riverside," his debut album, is the story of a young man's odyssey to America that is refreshingly free of postmodern disenchantment. Here, instead, is a boundless vitality.

The album opens with a hearty chuckle, then Bloom launches into *Delirious*, a song whose kindling warmth and vigor set a positive tone for the eleven numbers that follow. What emerges from the passionate vocals, fanciful lyrics, and forceful, percussive strumming is an affirmation of being and a sense of possibilities. A hot-blooded desire to bore into the marvelous mystery of existence permeates Bloom's music, in which a Celtic folk style is spiced with rock dynamics. Beyond his own guitar, the accompaniment is sparse—typically little more than an Irish *bodhrán* or an Iranian finger drum—but powerful.

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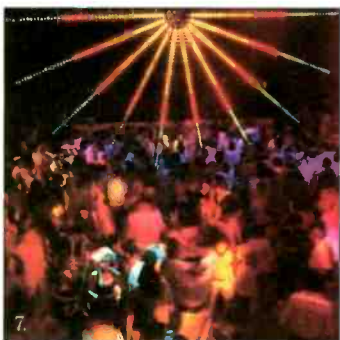
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BEST RECORDINGS OF THE MONTH



Luka Bloom: *American odyssey*

relationship or to a new life in a new place, holds both excitement and fear of the unknown in equal measure, and it is this tingly borderline of discovery that Bloom's songs explore with so much magic and feeling. The breadth and scope of "Riverside" is best captured in the cinematic *Dreams in America*. Incorporating U2-style atmospheric in a song that builds in drama like Fairport Convention's epic *A Sailor's Life*, *Dreams in America* expresses in metaphor the expansiveness, loneliness, and promise of this vast country. As Bloom surveys the territory in subsequent numbers, his mood ranges from exultant (*An Irishman in Chinatown*) to reflective (*Rescue Mission*).

At times, as in the tender, mournful *Gone to Pablo*, Bloom recalls the visionary intensity and romanticism of the late Nick Drake, though Bloom never succumbs to despair. Even in a moving song about his father's death, he concludes, "The man is alive, alive and breathing... in me." Similarly, in *The One*—a song obviously addressed to the Pogues' Shane MacGowan—he argues with compassionate ardor against self-destruction. All in all, "Riverside" is a remarkable, uplifting album from a troubadour with abundant talent and, more important, soul. *Parke Puterbaugh*

LUKA BLOOM: *Riverside*. Luka Bloom (vocals, guitar); instrumental accompaniment. *Delirious; Dreams in America; Over the Moon; Gone to Pablo;*

The Man Is Alive; An Irishman in Chinatown; Rescue Mission; The One; Hudson Lady; This Is for Life; You Couldn't Have Come at a Better Time; The Hill of Allen. REPRISÉ 26092-1, © 26092-4, © 26092-2 (45 min).

BLOMSTEDT'S NIELSEN SYMPHONIES

THIRTY-THREE years separate Carl Nielsen's First Symphony from his sixth and most startling essay in the genre, and light-years separate them in mood. Indeed, the Sixth Symphony has remained the least recorded of the composer's symphonies, perhaps in part because it is so different from the others. The First is a genial, post-Brahmsian work, and even the fiercely dramatic Fourth and Fifth have upbeat, triumphant endings. Not the Sixth.

At the time he wrote his Sixth Symphony, Nielsen was plagued by ill health, by the sense of being unappreciated by his Danish countrymen, and by a feeling of perplexity over the music of the post-World War I era. The first movement, with its cunningly crafted linear textures, seems coldly sardonic. The *Humoreske* that follows, scored for winds and percussion only, is a savage take-off on "the new" in music. The slow movement is a despairing lam-

entation for strings and winds, linearly stated, and the finale is a picturesque set of variations ranging from the simplistic to the macabre, concluding with a sardonic coda. The icy quality of much of the music is underlined by the touches of triangle and snare drum.

In the second release in their Nielsen cycle on London, Herbert Blomstedt and the San Francisco Symphony give us readings of the First and Sixth (the latter in its first all-digital recording) that are fully equal to their landmark versions of Nos. 4 and 5. The tempos in the First Symphony are beautifully judged, especially in comparison with the exaggerated contrasts found in Esa-Pekka Salonen's recent version on CBS. High points of the Sixth are the intensity of the string playing in the slow movement and the brilliant wind and percussion work in the *Humoreske*. The recording as a whole is superb in body and textural detail. As with Blomstedt's earlier San Francisco recording of the Fourth and Fifth Symphonies, I can recommend this coupling without reservation. I look forward to the cycle's completion with the Second Symphony (*The Four Temperaments*) and the Third (*Sinfonia espansiva*). *David Hall*

NIELSEN: *Symphony No. 1, in G Minor, Op. 7; Symphony No. 6 ("Sinfonia semplice")*. San Francisco Symphony, Herbert Blomstedt cond. LONDON © 425 607-4, © 425 607-2 (67 min).

Herbert Blomstedt: *Scandinavian landmarks*



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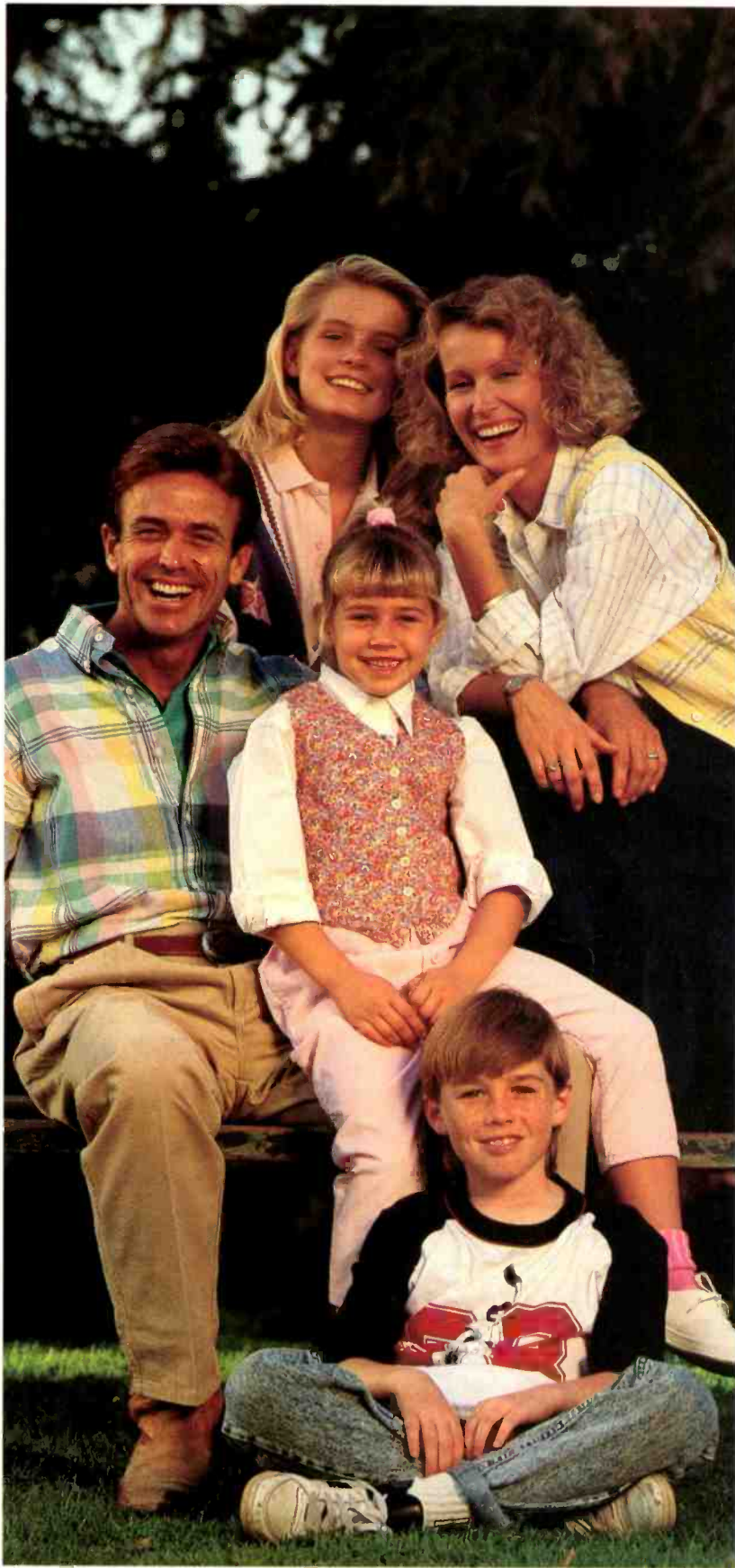
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Puterbaugh, Steve Simels*

BASIA: *London Warsaw New York.* Basia (vocals); Danny White (keyboards, drum programming); other musicians. *Cruising for Bruising; Best Friends; Brave New Hope; Baby You're Mine; Ordinary People*; and five others. EPIC E 45472, © ET 45472, © EK 45472 (42 min).

Performance: *Superb*
Recording: *Excellent*

If Poland can be credited with igniting the movement toward democracy in Eastern Europe, Basia Trzetrzelewska should be cited for helping to revitalize popular music. Born in the remote industrial town of Jaworno, she won a talent contest in her teens and toured behind the Iron Curtain. In 1981 she moved to London, where she dropped her last name and joined forces with the gifted keyboardist and arranger Danny White. Together they produced her commercially and artistically successful debut album, "Time and Tide," released in 1987. The release of her superb new album, "London Warsaw New York," should solidify her position as a major international artist.

As before, Basia and White have collaborated as writers and arrangers, coming up with a delightful group of original compositions. Basia performs the vocals in styles ranging from the pensive to the teasing, but she is always irresistible, and White handles the instrumentals with unobtrusive brilliance. The songs themselves have the same kind of immediate appeal as those of Stevie Wonder, who is one of Basia and White's idols. The melodies flow naturally yet evolve into all sorts of unexpected shapes, beckoning you to take flight along with them. Frequently they are underscored by a propulsive Latin beat, as in the scintillating *Bruising for Cruising*. When the rhythms grow hot and saucy, as in *Not an Angel*, they defy you not to dance.

Most of the songs deal with romantic themes, though there is a longing for



MARTI JONES

MARTI JONES first came to our attention as a sort of post-New Wave Linda Ronstadt. She hung out with her producer, Don Dixon, himself the post-New Wave Peter Asher. She was as cute as a bug's ear, had incredible pipes (a honeyed alto capable of genuine suburban soul), and sang intelligently chosen pop/rock tunes written by writers she admired, from the dB's to David Bowie. She was, in short, a delight, and her three previous albums, on A&M, contain some of the most seductively romantic music anybody made in the Eighties.

Someone must have told Jones, however, that you don't get no respect unless you write your own material. So for her new RCA album, "Any Kind of Lie," which will be her commercial breakthrough if there's anything remotely like justice in this world, she kept the outside tunes to a minimum and wrote most of the thing herself, along with producer Dixon. When the songs work, which is most of the time, the effect is something like seeing Sam Shepherd acting the lead in one of his plays—a near-perfect match of actor and script. And even when they don't, you almost don't care, because there's That Voice.

By and large, the music in "Any Kind

of Lie" is written in a kind of hybrid style nobody's thought of a name for yet. It's pop, of an arty variety, but it's hard to pin down; tracks like *Living Inside the Wind* and the title tune have vague soul influences, Sixties structures, and eccentric, mostly acoustic arrangements. If you want to call it Nineties folk rock, that's as apt a handle as any. Whatever you call it, however, it's unflaggingly tuneful and accessible, and Jones sings the proverbial pants off all of it, including the two cover tunes—Any Trouble's *Second Choice* and Loudon Wainwright's *Old Friend*.

But I keep coming back to "Any Kind of Lie," finally, because of That Voice. Marti Jones is the most hauntingly expressive "girl singer" since Chrissie Hynde, and listening to her is uncomfortably like falling in love. Higher praise than that I can't imagine, and I can't imagine your wanting to be without this album, either. *Steve Simels*

MARTI JONES: *Any Kind of Lie.* Marti Jones (vocals, guitar); Don Dixon (guitar); other musicians. *Living Inside the Wind; I've Got Second Sight; Any Kind of Lie; Second Choice; Cliché; My Tears Are Poison; Read My Heart; Is This the Game?; One Shade Darker; It's a Crime; Old Friend.* RCA 2040-1-R, © 2040-4-R, © 2040-2-R (39 min).

EXPLANATION OF SYMBOLS:

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lost roots in *Reward* and the agitated folklike melody of *Ordinary People* accompanies lyrics that address the feeling of being a stranger in a strange land. The only selection that is not an original is Wonder's *Until You Come Back to Me*, which is offered up in such an imaginative arrangement that it takes on a new life. Overall, popular music doesn't get much better than this. *P.G.*

LUKA BLOOM: *Riverside* (see Best of the Month, page 84)

COWBOY JUNKIES: *The Caution Horses*. Cowboy Junkies (vocals and instrumentals). *Sun Comes Up, It's Tuesday Morning; 'Cause Cheap Is How I Feel; Thirty Summers; Mariner's Song; PowderFinger*; and five others. RCA 2058-1-R, © 2058-4-R, © 2058-2-R (45 min).

Performance: *Haunting*
Recording: *Okay*

When RCA released Cowboy Junkies' "The Trinity Session" in 1988, critics and record buyers alike responded to the album with fervent, if divided, passion: They either embraced its slow-paced, "ethereal nature" as an intellectual alternative to the beer-bellied rapidity and four-chord simplicity of much of contemporary country music, or they declared that its instrumental sparseness and sameness of mood and tone—"a kind of shyness and innocence," as lead singer Margo Timmins described it—was as exciting as watching water boil.

Now comes "The Caution Horses," which should reaffirm both camps' convictions. Recorded in the same manner

as "The Trinity Session" (although this time in a studio instead of a church), "The Caution Horses" utilizes an Ambisonic microphone in a live, off-the-floor taping completed in one day. And, like its predecessor, it focuses on a single theme—this time, the rite of passage from innocence to experience.

Eight of the ten songs are originals, written by band member Michael Timmins (the two covers are by fellow Canadians Neil Young and Mary Margaret O'Hara), and, understandably, they are written from a man's perspective. Interpreted by Timmins's sister, Margo, however, they emerge from a woman's point of view.

And therein lies the crux of the Junkies' schizoid nature. Michael's lyrics suggest a nonromantic acceptance of life's invariable setbacks and heartaches. But Margo's dreamy vocals infuse even the bleakest lyric with optimism and hope, holding out a lingering possibility of the renewal of love. Somehow the protagonist in *Where Are You Tonight?* disassociates herself from reality long enough to end up eventually with a man she recognizes as "not the prince to grant all my wishes/Just another lonely cowboy grown weary of the night."

This basic conflict of vision also helps to account for the Junkies' monotony of tone. Except for *Where Are You Tonight?*, *Rock and Bird*, and Young's *PowderFinger*, the entire program hovers on one very long and low-key mood note, so that it's sometimes difficult to tell where one song ends and another starts up. The plants in your window would wither from such low-level nourishment, but the Junkies—and especial-

ly Margo Timmins—have an otherworldly quality that is, in its way, quite spellbinding, a certain "freak appeal" that will keep most listeners tuned in.

Much of this would be easier to get a handle on if Margo's vocals were more intelligible. But with the Ambisonic mike, she is often overshadowed even by a lone acoustic guitar, and her whisper-soft singing and questionable enunciation receive little definition in the final mix: It's a strain to hear much of what comes out of her mouth.

In the end, therefore, "The Caution Horses" is both haunting and frustrating—what is really going on in this band's head? The Timmins siblings offer no clear-cut answers. *A.N.*

EARTH, WIND & FIRE: *Heritage*. Earth, Wind & Fire (vocals and instrumentals); vocal accompaniment. *Takin' Chances; Heritage; Good Time; Anything You Want; Wanna Be the Man; Daydreamin'*; and nine others. COLUMBIA C 45268, © CT 45268, © CK 45268 (51 min).

Performance: *Uneasy mix*
Recording: *Very good*

After twenty years of brilliant innovation, Maurice White and his trend-setting Earth, Wind & Fire have decided to follow rather than lead. In "Heritage" they have come down from their ethereal perch and tried to mix it up in the street. To long-time fans, the recording will come as a shock, for the group's delicate kalimba solos give way to rap and street funk. While this obviously represents an attempt to reach a younger audience, the mix of the new with the sophisticated stylings of old generally does not work; it's like wearing unlaced sneakers with a tuxedo.

The disparate styles do manage to fuse somewhat in the title track, a high-minded tune with contributions from the rap group the Boys, and in the off-beat *Good Time*, a sassy play on words and music featuring the distinctive growl of Sly Stone. But the album is at its best when White and his gang stop trying to be lowbrow and go back to making the sort of richly textured, memorable music that originally won them popularity, as in *Daydreamin'*, *I'm in Love*, and *Welcome*. Aside from such moments, however, "Heritage" is likely to disappoint the group's old fans without winning many new ones. *P.G.*

EVERYTHING BUT THE GIRL: *The Language of Life*. Tracey Thorn (vocals); Ben Watt (vocals, guitar, piano); other musicians. *Driving; Get Back Together; Meet Me in the Morning; Me and Bobby D; The Language of Life*; and five others. ATLANTIC 82057-1, © 82057-4, © 82057-2 (42 min).

Performance: *Reserved*
Recording: *Glossy*

There's a thin line between compelling, gossamer pop-jazz and homogenized



Cowboy Junkies: rites of passage

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background music, and Everything But the Girl has fallen on the wrong side of that line with "The Language of Life." Working with a slick American producer and sessionmen wasn't such a hot idea after all, because the duo has wound up with a purely superficial coat of polish and little substance. Granted, the album's pleasant and even appealingly breezy in places, but most of the time Tracey Thorn and Ben Watt are so wrapped up in finessing nuance-perfect arrangements that the music sounds bloodless and vacuum-packed. Thorn's mannered delivery, for instance, is formally precise but emotionally dessicated.

In the midst of this 40-minute program of buffed-up dinner music for swank yuppie couples comes a real lyrical anomaly called *Me and Bobby D.* If I'm reading it correctly, the song accuses Bob Dylan of being a wife-beating, booze-loving womanizer whose feckless bohemianism led a generation astray. There's also a similarly disapproving verse about Jack Kerouac. The moral of the story is, "Sure, I'd love a wild life, but every wild man needs a mother or wife." *Sheesh.* I think I'll put on a Mötley Crüe album just to clear the air.

P.P.

VINCE GILL: *When I Call Your Name.* Vince Gill (vocals, guitars, mandolin); Emmylou Harris, Patty Loveless, Kathy Baillie, Herb Pedersen (background vocals); vocal and instrumental accompaniment. *Never Alone; Sight for Sore Eyes; Oh Girl (You Know Where to Find Me); Oklahoma Swing; When I Call Your Name; Ridin' the Rodeo; Never Knew;* and three others. MCA MCA-42321, © MCAC-42321, © MCAD-42321 (36 min).

Performance: *Still not there*
Recording: *Very good*

When Emmylou Harris was building a band and launching her quest to be-

come the country angel extraordinaire, she received a magnificent piece of advice: "If you want to be the best, you need to play *with* the best."

That bit of wisdom was certainly never lost on singer/songwriter/guitarist Vince Gill, an acolyte of the entire school of progressive country music as practiced by Harris, Rodney Crowell, Rosanne Cash, and producers Tony Brown and Emory Gordy, Jr., all of whom have welcomed Gill into the fold and attempted, in varying degrees, to foster his solo career.

Where Gill appeared to go wrong, even though his albums have yielded some Top 10 singles, was in failing to forgo imitation (of Crowell, especially) and stake out some musical ground of his own. When he finally attempted to do that, in his 1988 single *Everybody's Sweetheart*, a tongue-in-cheek complaint about the success of his wife, Janis, who is one-half of Sweethearts of the Rodeo, he began to establish his own personality.

Unfortunately, that streak fails to continue in "When I Call Your Name." While producer Brown pulls out all the stops—inviting such big-name pals as Harris, Patty Loveless, and Reba McEntire to drop by for vocal and moral support, and taking pains to showcase all of the soloist's vocal and instrumental talents—Gill's songwriting simply cannot thrust him into equal status with his heroes. Tuneful but shallow, his songs are greeting-card sentiments without substance, presenting no clues about the man behind the music or the complexities that fuel his creative life. Even when performing the album's few cover tunes, which point up his own songwriting deficiencies, he comes across as a nice man singing nice, friendly, unthreatening music. In the end, Gill, a good-headed and good-hearted musician, appears to be a second-string talent, a sideman in everything but ambition.

A.N.

ERNIE ISLEY: *High Wire.* Ernie Isley (guitars, drums, bass, keyboards, percussion, vocals); instrumental accompaniment. *Song for the Muses; High Wire; Love Situation; Diamond in the Rough; Deal with It; In Deep;* and six others. ELEKTRA 60902-1, © 60902-4, © 60902-2 (51 min).

Performance: *First-rate funk*
Recording: *Very good*

Ernie Isley was the youngest of the Isley Brothers, the powerhouse soul group for which he played guitar and drums. With Jimi Hendrix, a one-time Isleys sideman, as his tutor from the age of twelve, Isley absorbed a lot in the way of inspiration, if not technique, from the master. Those lessons have evidently stayed with him. Isley's first solo album, "High Wire," erupts with forceful, clearly focused songs and fiery, impassioned playing. His solo voice on the guitar is his most distinctive signature, consisting of skittering, trebly notes flowing frictionlessly toward a transcendent peak and then massaged back down to earth.

Mixed in among the aspirational guitar playing, reminiscent of Hendrix, Carlos Santana, and John McLaughlin, is a generous slab of uncut funk, which keeps "High Wire" grounded in hard, danceable grooves. The songwriting is impressively varied. Witness the stunning one-two-three of *Song for the Muses*, a high-flying, pop-flavored groove thang; *High Wire*, sly, sassy soul in the style of the Isleys' best Seventies dance singles; and *Love Situation*, a silky love ballad without a hint of artificial sweetener. The song quality doesn't taper off, either—and neither do the blistering solos. A hot one.

P.P.

HUGH MASEKELA: *Uptownship.* Hugh Masekela (flugelhorn, cornet, percussion, background vocals); other musicians. *Uptownship; If You Don't Know Me by Now; Now or Never; Hold On; Ooo, Baby, Baby; Egoli;* and five others. NOVUS 3070-1-N, © 3070-4-N, © 3070-2-N (62 min).

Performance: *Superb*
Recording: *Excellent*

In "Uptownship," Hugh Masekela has tapped the rich mine of musical influences that have shaped his style, from the spirited and distinctively rhythmic township jive of his native South Africa to the more familiar cadences of American rhythm-and-blues and jazz. The result is a consistently engaging and musically exciting autobiography in sound.

Although Masekela became the first South African instrumentalist to gain a broad international following, back in the Seventies, he is enjoying a greater popularity than ever today because of the current focus on political events in his homeland and the success of the musical show *Sarafina*, for which he was co-composer and lyricist. The



Hugh Masekela: musical ambassador

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HIGHWAYMAN 2

SEQUELS, as anyone who goes to the movies knows, are usually best left undone. The reason, as Andy Rooney might put it, has to do with the watering down of story lines and intelligence—the *Rocky*-fiction of a good thing gone squishy-soft.

That genetic pattern often holds true with recorded music as well. There are exceptions, of course: "Will the Circle Be Unbroken, Volume II" was probably country music's premier album of 1989. And now Willie Nelson, Johnny Cash, Waylon Jennings, and Kris Kristofferson have rendered a dandy follow-up to their million-selling collaboration of 1985, "Highwayman."

Like the original record, "Highwayman 2" pays tribute to the spirit of the American hero throughout history, as well as to the codes of brotherhood that bound the fraternalities of the nineteenth-century settlers and vagabonds.

Like much of its predecessor, "Highwayman 2" also captures a Ghost Riders in the Sky quality, as if the four singers were mythic horsemen somehow riding through time. *American Remains*, reminiscent of the title cut on the first album (although without the reincarnation theme), presents four quintessential American characters—a stagecoach shotgun rider, a riverboat gambler, a Midwest farmer, and a Cherokee Indian—and promises that they "live in many faces and answer many names," a testament to the grit and strength of their modern counterparts.

Aside from the joy of an unusually solid program (very few fillers) and the first-rate instrumental performances (the album employs the same producer, Chips Moman, and musicians as the

original "Highwayman"), what comes across here with moving clarity is what fine musical actors these four are. Whether they're trading verses in the story-songs or simply singing together, there's a believability to their readings—particularly Nelson's and Jennings's—that doesn't quite happen in their solo recordings: It's as if they're playing ensemble in a western movie, and each one's good performance sparks the other players to find the best within themselves.

There is also something grand and noble about this record, and part of that stems from the singers' realization that they are quickly moving into the roles of country music's elder statesmen. As such, they are full of folk wisdom and advice, both to the rootless young troubadours who have followed their paths (*We're All in Your Corner*) and to their own contemporaries. Looking back a decade or two, when Joni Mitchell, Roy Orbison, and Mickey Newbury were at their peaks, Cash and Company see that they all sang *Songs That Make a Difference*—and they know that they can do it again somehow. "Highwayman 2," it would seem, is a lovely place to start.

Alanna Nash

WILLIE NELSON, JOHNNY CASH, WAYLON JENNINGS, AND KRIS KRISTOFFERSON: *Highwayman 2*. *Silver Stallion*; *Born and Raised in Black and White*; *Two Stories Wide*; *We're All in Your Corner*; *American Remains*; *Anthem '84*; *Angels Love Bad Men*; *Songs That Make a Difference*; *Living Legend*; *Texas*. COLUMBIA C 45240, © CT 45240, © CK 45240 (33 min).

Together again: Jennings, Cash, Nelson, Kristofferson



SEAN MCGUIRE/COLUMBIA

source of his appeal has always been his ability to adapt the infectious beat and captivating melodies of his own land to suit Western ears.

The new album's title is a play on the words "township," which refers to South Africa's black ghettos, and "uptown," a term commonly applied to New York City's Harlem. Both places have been sources for Masekela's musical magic. Several of the selections, most notably the ebullient title song and several of those bearing African titles, have the irrepressible dancing quality we have come to associate with the Masekela sound. Some of the best moments are in familiar numbers. *If You Don't Know Me by Now*, a ballad by the Philadelphia team of Gamble and Huff, is carried to new heights by the extraordinary vocal solo of Branice McKenzie. Also outstanding are Smokey Robinson's evergreen *Ooo, Baby, Baby*, served up as an instrumental with vocal backing, and Bob Marley's *No Woman, No Cry*, a reggae favorite that seems to blend naturally into Masekela's overall scheme. But "Uptownship" is full of musical delights that confirm his standing as an ambassador of freedom who does much to serve the cause of good music.

P.G.

DELBERT McCLINTON: *I'm with You*. Delbert McClinton (vocals, harmonica); vocal and instrumental accompaniment. *That's the Way I Feel*; *My Baby's Lovin'*; *Go On*; *Got You on My Mind*; *Crazy 'Bout You*; *I'm with You*; and four others. CURB/CAPITOL D1-77252, © D4-77252, © D2-77252 (34 min).

Performance: *Punchy*
Recording: *Very good*

Bonnie Raitt isn't the only blues-based rocker who returned from the dead last year. Delbert McClinton made one of the sweetest albums of his career. "Live from Austin," a rough-and-ready set that overcame his tendency to lay back a little too much in his studio recordings. Happily, he's captured that full-throttle, roadhouse style in "I'm with You," a studio album that holds nothing back. His lean, ripsaw vocals cut a powerful r-&-b swath through these earthy tunes. In *My Baby's Lovin'*, he moans and groans his way through an amorous rundown of his lady, who's "gonna get me with a heart attack," then he boasts that he'll be "smilin' all the while I'm dyin'." The band is with McClinton every twitch of the way. He pants, and the horn section loses control. He wails, and the guitar takes off for glory. He burns, and the piano pumps for all it's worth. On the last song, McClinton complains, "I'm about to EX-plode." It's a wonder it takes him that long.

R.G.

RYUICHI SAKAMOTO: *Beauty*. Ryuichi Sakamoto (vocals, keyboards); vocal and instrumental accompani-

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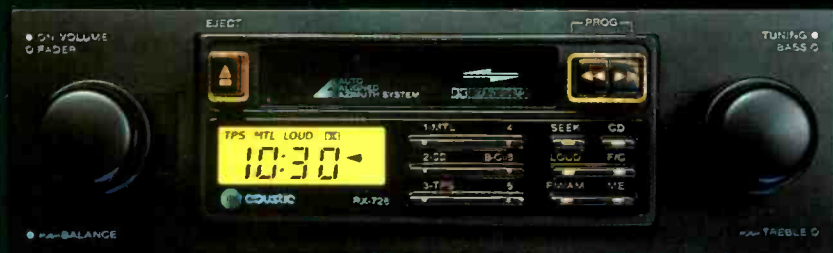
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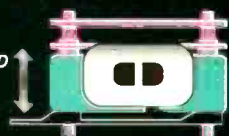
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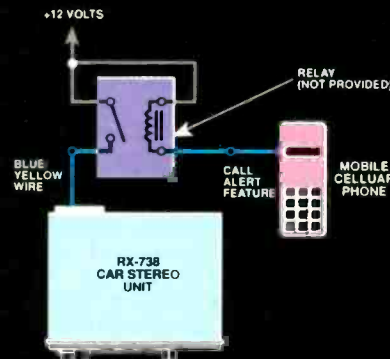
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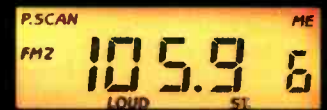
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Ricky Van Shelton: believable sincerity with a personal spin

ment. *You Do Me; Calling from Tokyo; Rose; Asadoya Yunta (My Wife Is as a Flower); Futique; Amore; We Love You;* and four others. VIRGIN 91294-1, © 91294-4, © 91294-2 (56 min).

Performance: *Global*
Recording: *Very good*

In the bridge of one song, *Calling from Tokyo*, from his new album, Ryuichi Sakamoto calls upon a United Nations of pop. A Senegalese man, Youssou N'Dour, sings a melodious counterpoint to a chorus of high, piping Japanese women while a Jamaican drummer and an Indian tabla player combine for a jackhammer backbeat with embroidered percolations. In moments like this, "Beauty" lives up to its name. Sakamoto is a keyboardist who likes to create set pieces through unusual juxtapositions. As a composer, he's a colorist who stops at nothing. It's not surprising that he's successfully written music for films, sharing an Academy Award for scoring *The Last Emperor*. The weakest songs here are the ones that attempt to make "poetic" use of lyrics in English, a lingual barrier Sakamoto has perhaps yet to overcome. But whether he's merging Eastern and Western styles—Japanese string instruments and American funk rhythms—in a wondrous dialectic or drawing upon musical elements from all over the globe, Sakamoto says much more when he doesn't use words. R.G.

SHOES: *Stolen Wishes* (see *Best of the Month*, page 83)

THE SILENCERS: A Blues for Buddha. The Silencers (vocals and instrumentals); vocal and instrumental accompaniment. *Answer Me; Scottish Rain; The Real McCoy; A Blues for Buddha; Walk with the Night;* and six others. RCA 9960-1-R, © 9960-4-R, © 9960-2-R (54 min).

Performance: *Brooding Celtic soul*
Recording: *Very good*

The world has been waiting for another "Joshua Tree" since U2 planted the first one four years ago. U2 itself has avoided the issue of a follow-up by releasing a mostly live album and then taking time off. The closest anyone's come to that idiosyncratic mixture of Celtic soul and ethereal rock is the Silencers' "A Blues for Buddha," their second album. It's a haunting collection with moments of transcendence balanced by songs with a darker, more forlorn and bluesy cast.

Refreshingly, the Scottish Silencers are a few platitudes less pretentious than the Dublin messiahs have become in their hour of fame. That's not to say that the Silencers are simply U2 Lite, just that their songs and personas are a bit more modestly scaled. A case in point is the title tune, a quiet acoustic blues that effectively makes its point—"The dollar is our king"—with terse images of fear, violence, and exploitation in the world. Elsewhere, vocalist and guitarist Jimmie O'Neill disdains racism in the edgy *Skin Game* and moans the solitary blues in *Wayfaring Stranger*, a folk-gospel traditional.

Answer Me, Scottish Rain, and Walk with the Night reveal the band's more luminescent and meditative side, each song gradually taking shape as it accrues an exultant, subtly anthemic power. The group rocks a little harder in the spirited, upbeat *The Real McCoy*, the ironically titled *Razor Blades of Love*, and the bulleting, r-&-b-flavored *Sacred Child*, which boasts great harmonica playing and a stunning a cappella intro. Poised somewhere between earthly concern and heavenly transcendence, the Silencers have managed to communicate their yearning well in "A Blues for Buddha." P.P.

JO-EL SONNIER: Have a Little Faith.

Jo-el Sonnier (vocals, French accordion, harmonica); vocal and instrumental accompaniment. *The Scene of the Crime; If Your Heart Should Ever Roll This Way Again; Ooh, Ooh, Ooh; Have a Little Faith in Me; I'll Never Get Over You; Hurt in My Heart;* and three others. RCA 9718-1-R, © 9718-4-R, © 9718-2-R (31 min).

Performance: *Hitting his stride*
Recording: *Very good*

After a major-label debut album that proved to be too much of a sampler—and made too little use of his Cajun roots—Jo-el Sonnier returns with one that comes closer to defining the sound and the image he hopes to present now. Sonnier, long a respected sideman and songwriter (recorded by Johnny Cash, George Strait, and others), got his RCA contract largely on the strength of the Cajun mania that swept the country (well, maybe only its kitchens) several years ago. But while RCA was quick to play up his heritage in its promotion, Sonnier's first record for the label, 1988's "Come On Joe," used the French influence more as a condiment than as the base for a major feast. Perhaps the company felt that too much of an ethnic accent would doom the album commercially.

In "Have a Little Faith," only one song, *Evangeline Special*, gets the full Cajun treatment, with Sonnier's French accordion pumping away like crazy, but he is more successful overall here than in "Come On Joe" at weaving both the accordion and a Cajun sensibility into a personal sound that relies mainly on blues, rockabilly, Fifties rock-and-roll, and soul. The tunes, too, are jumpier this time out, from John Hiatt's *Have a Little Faith in Me*, reminiscent of Sam Cooke at his smoothest, to Delbert McClinton's jaunty *Solid Gold Plated Fool* and Sonnier's own *Ooh, Ooh, Ooh*, a sizzling sample of roadhouse rock. Sonnier will never win any vocal contests, but his expressive voice carries this material with integrity and sparkling grace. A winner. A.N.

RICKY VAN SHELTON: RVS III. Ricky Van Shelton (vocals); vocal and instrumental accompaniment. *Love Is*

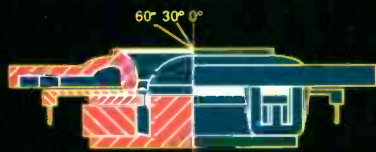
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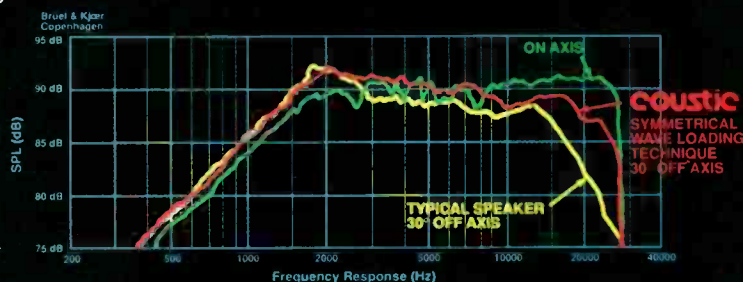
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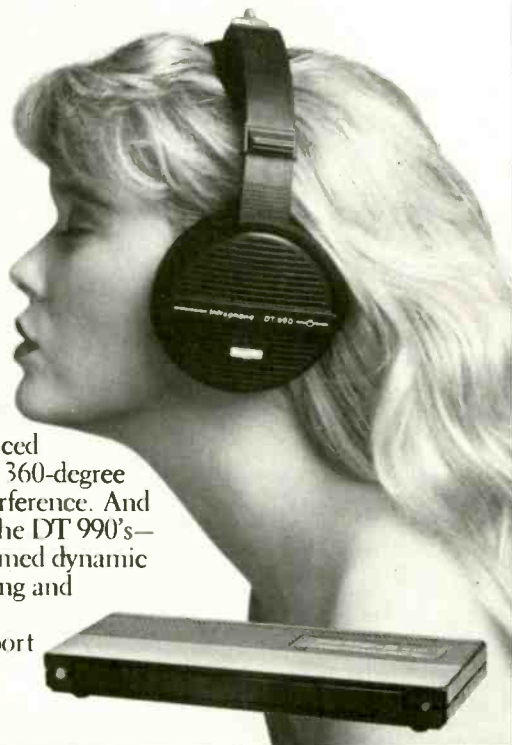
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Burnin'; I've Cried My Last Tear for You; Statue of a Fool; You Would Do the Same for Me; Life's Little Ups and Downs; I'm Starting Over; and four others. COLUMBIA C 45250, ©CT 45250, ©CK 45250 (35 min).

Performance: *Right on target*
Recording: *Excellent*

Ricky Van Shelton, whose very name must make Randy Travis's blood pressure rise, won more awards in 1989 than any other country artist. In his 1987 debut album, Van Shelton was a young performer still groping to find himself, but he has demonstrated remarkable growth since then, not only maturing into a first-rate interpreter and crooner but putting the stamp of his own personality and musical taste on the material, rather than that of his producer, Steve Buckingham.

"RVS III," Van Shelton's third solo album (not counting a Christmas album), is by far his most successful artistically. He marries a sterling program—consisting of overlooked oldies and newer songs written in the older honky-tonk and ballad tradition—with a vocal style that finds him developing a sound of his own. Reworking older songs has become a specialty of Van Shelton's, but with the exception of Roy Orbison's *Oh, Pretty Woman*, he never fails to put a personal spin on them or to find a certain beauty and energy somehow buried in the original versions. Certainly that's true here in his robust renditions of Jack Greene's *Statue of a Fool*, Cindy Walker's *Not That I Care*, and Margaret and Charlie Rich's *Life's Little Ups and Downs* (where he demonstrates a talent for r-&-b phrasing).

Van Shelton's real long suits, however, are his believable sincerity and his projection of a big, masculine kind of pain—the sort endured only by men of character who work out their disappointments in more internal ways than drunken carousing. Whether moving swiftly through a shuffle such as *I've Cried My Last Tear for You* or in the very Elvis-like rockabilly of *Love Is Burnin'* or languishing over his own impassioned ballad *I Still Love You*, Van Shelton's hearty baritone seems guided by a true heart: When he sings, in *Life's Little Ups and Downs*, "She wears a gold ring on her finger/And I'm so glad it's mine," he trembles at the idea that it might not be there forever.

Increasingly, Van Shelton is presenting himself as a throwback to Conway Twitty and Ray Price—as someone who understands what women really want in a man and concerns himself more with building a loving and lasting relationship than in flexing his machismo. It's no wonder, then, that his first two albums have been certified Platinum. "RVS III," a record superior to those in every way, will doubtless reinforce the fact that Van Shelton is country music's man of the hour. And, as it turns out, for all the right reasons. *A.N.*

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CHET BAKER: *The Best Thing for You*. Chet Baker (trumpet); Paul Desmond (alto saxophone); Kenny Barron (piano); Ron Carter (bass); Tony Williams (drums); other musicians. *The Best Thing for You; I'm Getting Sentimental over You/You've Changed; Oh, You Crazy Moon*; and three others. A&M © CD 0832 (41 min).

Performance: *Superb*
Recording: *Quite good*

Reissues of recordings by the American trumpeter Chet Baker, who died overseas in May 1988, seem to be coming to market at an accelerated pace. This may be coincidental—Baker was a formidable player whose work ought to be available at all times—but some releases have undoubtedly been inspired by last year's much talked-about documentary film on Baker's life, *Let's Get Lost*. Whatever the motivation, we can only rejoice that some excellent music is re-entering the catalog.

The material in A&M's Baker release, "The Best Thing for You," dates back to 1977. Seventeen of its forty-one minutes are devoted to *El Morro*, a typical Don Sebesky composition and arrangement of the period, complete with bullring atmosphere, Hubert Laws on flute, and Michael Brecker on tenor saxophone—a bit stagy but rather pleasant. The other five selections feature Baker in an excellent quintet that also boasts alto saxophonist Paul Desmond, pianist Kenny Barron, and the persuasive rhythm of Ron Carter and Tony Williams. This is a fine example of Baker's fresh-as-spring-water tone and crisp, sprightly style. C.A.

Maynard Ferguson: a welcome return



KEVIN EUBANKS: *Promise of Tomorrow*. Kevin Eubanks (guitars, keyboards); instrumental accompaniment. *Angel with the Blues; Promise of Tomorrow; This Place in Time; Eyes of a Lost Child; Cullerton Street*; and five others. GRP © GRC-9604, © GRD-9604 (48 min).

Performance: *Bland*
Recording: *Souped-up*

Once a promising jazz guitarist, Kevin Eubanks has, on records at least, crossed over to pop, playing pure yuppie fodder and producing sounds that are not unlike what's programmed into ROM chips on my MIDI keyboard. Many popular, highly marketable guitarists are simply incapable of generating the musical excitement that distinguishes jazz from elevator fare, but Eubanks is not among them; his considerable talent would indeed allow him to rise above the sort of thing he plays here. But while there are flashes of substance, his musicmaking here is as predictable as a sunset. C.A.

MAYNARD FERGUSON: *Big Bop Nouveau*. Maynard Ferguson (trumpet, flugelhorn); orchestra. *Blue Birdland; Cherokee; Caught in the Current; But Beautiful; Cruisin' for a Bluesin'; The M. F. Hit Medley*. INTIMA/ENIGMA 73390-1, © 73390-4, © 73390-2 (40 min).

Performance: *Rompy*
Recording: *Very good*

Maynard Ferguson's bands have always come on like Gangbusters, and this one is no exception. Ferguson, though, is not

as exhibitionistic as he used to be, and that's all to the good; in fact, "Big Bop Nouveau" is a lot warmer than the machine-like drill teams he used to front, and even the arrangements are less showy. Ferguson himself contributes some good solos, but the album's musical highlight has to be alto saxophonist Christopher Hollyday's breakneck reading of Ray Noble's *Cherokee*. Ferguson's older fans will welcome his return to an acoustic band and take particular delight in the 12-minute medley of the leader's past hits, comprising *Chameleon, MacArthur Park, Frame for the Blues, Maria*, and Joe Zawinul's *Birdland*. C.A.

EARL KLUGH: *Whispers and Promises*. Earl Klugh (acoustic and electric guitars); instrumental accompaniment. *What Love Can Do; Master of Suspense; Water Song; Strawberry Avenue*; and six others. WARNER BROS. 25902-1, © 25902-4, © 25902-2 (43 min).

Performance: *Like a fresh breeze*
Recording: *Very good*

There is something charmingly unneurotic about Earl Klugh's music, beginning with the quaintness of his fascination with the acoustic guitar in this era of electronic overkill. We can count on him to write buoyantly upbeat instrumentals with singable melodic lines, even if the guitars do the singing. He does not let us down this time, for "Whispers and Promises" is consistently tasteful and tuneful, featuring ten new Klugh originals. He works in a variety of settings, from the crystalline clarity of *Water Song*, which he plays alone, to *Strawberry Avenue*, which is powered by a big band arranged and conducted by Dave Matthews. Klugh offers an appealing oddity at the end, a classic tango with Dominic Cortese on accordion and Michael Urbaniak on violin. It is representative, however, of the kinder, gentler music Klugh always gives us. P.G.

BARBARA LEA: *You're the Cats*. Barbara Lea (vocals); Yank Lawson (trumpet); Bob Haggart (bass); John Bunch (piano); Jake Hanna (drums); Bucky Pizzarelli (guitar); other musicians. *You're the Cats; Do What You Do; True Blue Lou; Moonshine Lullaby; Waiting at the End of the Road*; and eight others. AUDIOPHILE © ACD-252 (52 min).

Performance: *Her best yet*
Recording: *Close and bright*

As she enters her fourth recording decade, Barbara Lea is in better voice than ever—and that's saying a lot about a singer who has long been a not-so-secret favorite of so many other jazz-influenced singers. What's more, she now has few equals singing the ballads

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of our classic pop songwriters, as this new album proves. It especially displays her right-on knack for capturing both the exact meaning and feeling of a song's lyrics without having to play around with (and mess up) the melodic line.

"You're the Cats," which Chip Deffaa's exceptionally good liner notes tell us was recorded in Atlanta in one 5-hour session with plenty of single takes (not surprising with Lea), is divided about equally between sultrily mellow ballads and jauntily swinging uptempo tunes. Lea's gift for digging up long-forgotten but A-1 songs is much in evidence—including the rarely heard Rodgers and Hart gem that gives the album its title (it comes from their first original movie score, 1931's *Hot Heir-ess*), Fats Waller's *There's a Man in My Life* and *Dixie Cinderella*, Johnny Mercer's *Love's Got Me in a Lazy Mood* and *I'm Building Up to an Awful Let-down* (the latter co-written with Fred Astaire, still much too underrated as a songwriter), and two bafflingly neglected Irving Berlin movie songs, *Waiting at the End of the Road* and *(Hand Me Down) My Walking Stick*. The great Lawson-Haggart Jazz Band serves up just-about-perfect backings, never intrusive in the ballads and with the right blend of drive, bite, bounce, and sparkle elsewhere. *R.H.*

COURTNEY PINE: *The Vision's Tale*. Courtney Pine (soprano and tenor saxophones); Ellis Marsalis (piano); other musicians. *In a Mellow Tone; Just You, Just Me; A Raggamuffin's Stance; There Is No Greater Love; Skylark; I'm an Old Cowhand from the Rio Grande*; and three others (five others on CD). ANTILLES 91334-1, © 91334-4, © 91334-2 (69 min).

Performance: *Solid Pine*
Recording: *Very good*

Saxophonist Courtney Pine is the best-known member of a growing group of young British musicians who seek inspiration from the likes of John Coltrane and Lee Morgan. "The Vision's Tale," Pine's first album to be recorded in the U.S., is largely a homage to the pre-Coltrane era, incorporating strong elements of swing with more than a touch of what followed. Pine sails through the kaleidoscopic program, lovingly revealing the same appreciation for the past that marks the music of America's neo-boppers and their unofficial leader, Wynton Marsalis. Not surprisingly, the album was produced by Wynton's brother, Delfeayo Marsalis, with rhythm accompaniments led by their father, pianist Ellis Marsalis. The production could have been a bit tighter; Delfeayo likes to include extraneous bits of chatter and false starts (and to write wordy, pontificating liner notes). That sort of thing soon wears thin, but don't let it get in the way of your enjoyment of this album. It's a fine one. *C.A.*

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by Christie Barter
& Maryann Saltser

Michael Stipe of R.E.M. took center stage recently at the Anthology Film Archives in New York City to announce his latest project: "Direct Effect," a series of TV public-service announcements about such controversial issues as abortion, racism, and AIDS education. But don't look for Stipe in the spotlight when the announcements air. You will find him, instead, *behind* the cameras, directing.

The brainchild of Stipe and filmmaker Jim McKay, the "Direct Effect" series departs from the typical public-service spots seen on network television. Stipe and McKay hope to shake things up a bit, and they've enlisted a host of other talented people, including Natalie Merchant of 10,000 Maniacs and rapper



Kid Creole ("I Love Girls") and the Coconuts

One of the hardest-working bands in the business, Kid Creole and the Coconuts were featured in the film *Against All Odds* and contributed to the soundtrack for Francis Ford Coppola's segment of *New York Stories*. Recently the band could be seen on the big screen doing their own version of the lambada in *The Forbidden Dance*. But you can catch them live on their U.S. tour this summer. □

A CLARINETIST embarking on a solo career is faced with a pretty limited repertory, but that never stopped the legendary Benny Goodman, who commissioned a number of works specifically to expand that repertory. One of those works was Bartók's

Stoltzman and friend



Contrasts for clarinet, violin, and piano, first performed by Goodman fifty years ago. **Richard Stoltzman**, one of today's leading clarinetists, has observed that anniversary by recording the piece for BMG Classics, with violinist **Lucy Stoltzman**, his wife, and pianist **Richard Goode**. □

OF particular interest among the first ten titles in the release that officially launched the Sony Classical label last month was "Horowitz: The Last Recording." Taped just before **Vladimir Horowitz** died in New York last November at the age of eighty-five, the album contains a Haydn sonata, works by Chopin and Liszt, and one of the pianist's signature pieces, Liszt's transcription of *Isolde Liebestod* from Wagner's *Tristan und Isolde*.

Also included in the Sony Classical release was a new recording of Mahler's *Songs of a Wayfarer* sung by veteran baritone **Dietrich Fischer-Dieskau** with the Berlin Philharmonic under **Daniel Barenboim**. □

DRUMMER, vocalist, and songwriter **Terri Lyne Carrington** has updated her résumé—again. Please add:

First woman *ever* to be nominated for a Grammy Award in the Best Jazz Fusion Performance category. The nomination was for her debut solo recording, "Real Life Story," released last year by Verve/Forecast. Guest artists included **Gerald Albright**, **Dianne Reeves**, **Patrice Rushen**, **Carlos Santana**, **Wayne Shorter**, and **Grover Washington, Jr.**

Carrington's résumé is a pretty long one for a twenty-four-year-old. At the age of ten she was sitting in and jamming with such greats as **Clark Terry**, **Dizzy Gillespie**, and **Oscar Peterson**. She went on to graduate from Boston's prestigious Berklee School of Music and last year became the new house drummer on the *Arsenio Hall Show*. Watch for her second album, due in stores sometime this summer. □



KRS-1, Stipe, McKay, and Merchant

KRS-1 of Boogie Down Productions, to help direct the spots. Each guest director will choose which issue to take on, and the results, according to Stipe, will be "direct messages from a concerned community seeking involvement and action." □

DEFINITELY in the spotlight these days are **Kid Creole and the Coconuts**. Their latest album, "Private Waters in the Great Divide," marks the band's Columbia Records debut. In addition to the song *I Love Girls*, featured in the 1989 Miss Teen USA pageant, the new album includes *The Sex of It*, written exclusively for August "Kid Creole" Darnell by Prince.



Vladimir Horowitz (1904-1989)

BRITISH-BORN guitar hero established his American reputation as a core member of **Miles Davis's** jazz team and subsequently went on to form the Mahavishnu Orchestra, is making his debut as a classical artist in a Sony Classical recording of his own First Guitar Concerto, subtitled *The Mediterranean*. He's accompanied by the London Symphony Orchestra under **Michael Tilson Thomas**.

The concerto was commissioned by the Los Angeles Philharmonic, which gave the work its first performance in 1985. The orchestra had initially asked McLaughlin to

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play Rodrigo's popular *Concierto de Aranjuez* in a Hollywood Bowl concert, but he politely declined, saying, "I'm not a classical artist. I don't think I could do [the Rodrigo] justice. If I were going to do something like that, maybe I would just write something." And that's what he did.

Word is that McLaughlin has just finished his Second Guitar Concerto and will be performing it in Germany in the not too distant future. □

AFTER years of touring as the rhythm section for various other bands, Scotsmen **James Locke** (drums and keyboards) and **Mike Peden** (bass) were ready to form one of their own. When early auditions failed to yield a lead singer, the two were naturally discouraged. Then friends put them in touch with London-based singer **Pauline Henry**, and **Chimes** was born.

Now critics everywhere are "ringing" their praises, calling **Chimes** the British soul discovery of the year, and the first single from the group's CBS debut album, *1-2-3*, produced by **Jazzie B.** and **Nellee Hooper** of *Soul II Soul*, climbed to No. 1 on *Billboard's* dance chart. At press time the second single, *Heaven*, was heading north in the Top 10. As for live performance, Henry said, "I wanna get on stage and sweat and scream. I intend to tear it up and let rip." □



McLaughlin: crossing over

COLUMBIA HOUSE, the mail-order division of CBS Records, has come up with a new series devoted to "The Great American Composers," meaning the great popular songwriters. The double albums, in all three formats, are available on a

subscription basis, beginning with a compilation of songs by Cole Porter sung by such artists as **Doris Day**, **Rosemary Clooney**, **Johnny Mathis**, and **Dinah Shore**. Other albums in the series feature the songs of **Irving Berlin**, the **Gershwins**, **Frank Loesser**, and **Harold Arlen**. □

Carrington: jamming



GRACENOTES. The music of Cole Porter also turns up in an ambitious AIDS benefit album involving a number of leading rock artists, including **Fine Young Cannibals** (singing *Love for Sale*), **U2** (*Night and Day*), and **Lou Reed** (*I Get a Kick out of You*). The two-disc set, "Red-Hot and Blue," will be issued in conjunction with a BBC-produced television show being broadcast worldwide on December 1. . . . **Leonard Bernstein** has signed a new, long-term, exclusive contract with **Deutsche Grammophon**. . . . **Columbia Records** and rockers **Midnight Oil**

want it known that the LP jacket and inner sleeve, as well as the CD outer box, for the group's album "Blue Sky Mining" are made from 100 percent recycled paper. . . . **Riccardo Muti's** concert performances of Puccini's *Tosca* next season, with the Philadelphia Orchestra and with **Carol Vaness** singing the title role, will be recorded by **Philips Classics**. . . . **André Previn** has just completed his second jazz album for Telarc. His first for the label, "After Hours," was still among the Top 10 on *Billboard's* jazz chart at press time. . . . The second annual International Rock Awards ceremony is being telecast from New York on June 6 by ABC. Winners of the awards receive an "Elvis." . . . **Ray Charles** has been signed to an exclusive, worldwide contract by **Warner Bros.** . . . President **George Bush** and the Friends of the Capital Children's Museum in Chevy Chase, Maryland, have cited **Michael Jackson** as Entertainer of the Decade for his philanthropic activities on behalf of children. . . . **Janet Jackson** has underwritten a Rhythm Nation Scholarship for the United Negro College Fund. □

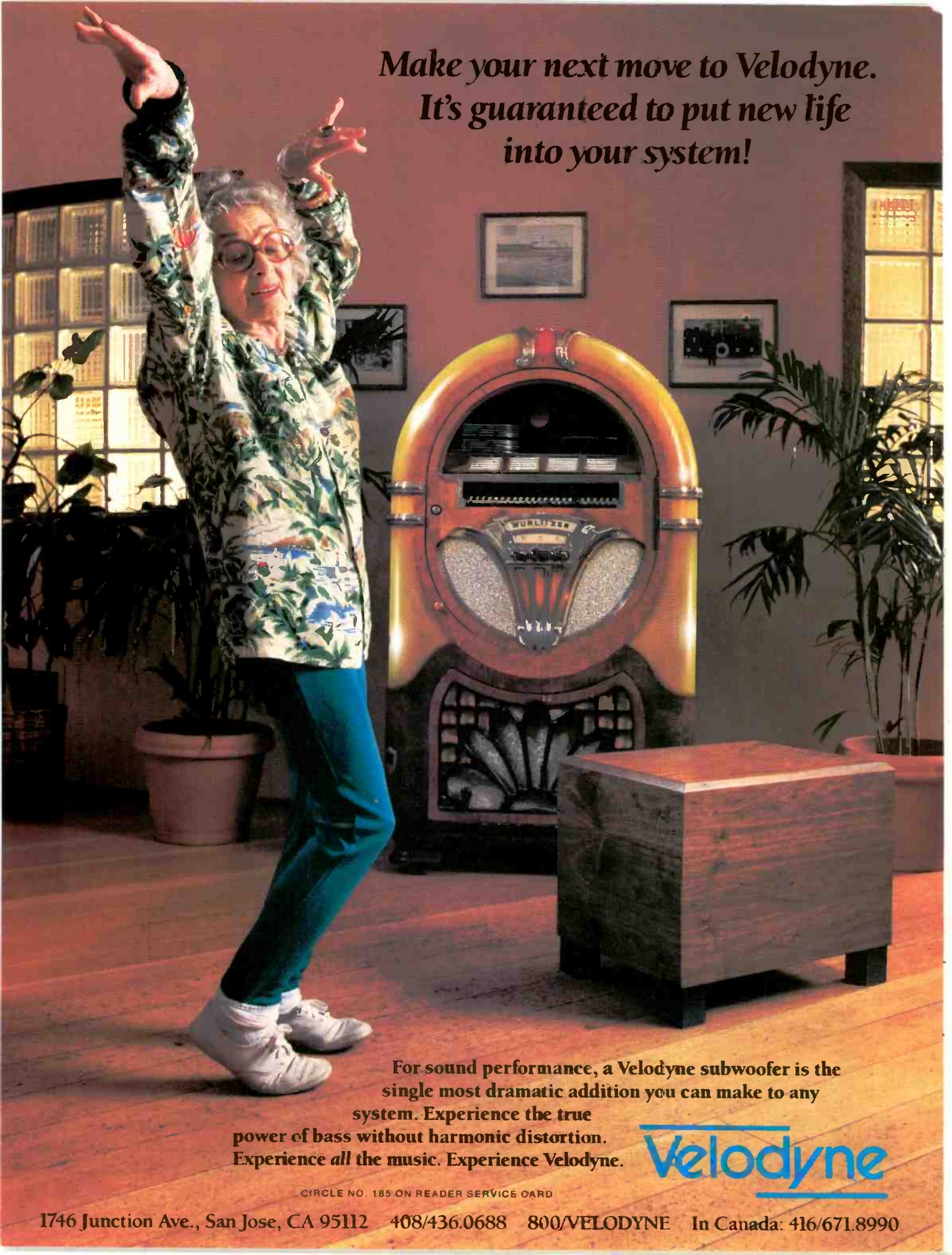
Chimes: let it rip



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Discs and tapes reviewed by Robert Ackart, Richard Freed, David Hall, Stoddard Lincoln, Eric Salzman, and David Patrick Stearns

BERLIOZ: *Les Nuits d'été*, Op. 7.
MAHLER: *Five Rückert Songs; Five Songs from "Des Knaben Wunderhorn."* Jan DeGaetani (mezzo-soprano); Eastman Chamber Ensemble, David Effron cond. BRIDGE © BCD 9017 (65 min).

Performance: *Committed*
Recording: *First-rate*

The death of Jan DeGaetani last September, at the age of fifty-six, seriously depleted America's, and the world's, never overabundant supply of great vocal artists—the sort of musician who “makes a difference.” Since then numerous tributes and appreciations of the great singer have been published, but the most significant memorials—the most durable and the most poignant—are those she left in the form of recordings. Not that she intended them as “memorials”; this last one, taped at the Eastman School a year ago and issued now on the Bridge label, is, like all its predecessors, more in the nature of a celebration of life.

Between 1983 and 1988, DeGaetani's husband, Philip West, arranged the orchestral accompaniments in Berlioz's cycle *Les Nuits d'été* and ten of Mahler's songs—the *Rückert-Lieder* and five from *Des Knaben Wunderhorn*—for chamber orchestra as presents for his wife, who introduced them, at various times, at the Aspen Festival. While she was justly celebrated as a champion of the music of her own time and her own country, she was no less intimately associated with this material, which quite aptly forms the contents of this valedictory disc. The accompaniments are performed by the Eastman Chamber Ensemble under the very sympathetic direction of David Effron. West himself took part as a member of the ensemble, playing the oboe, English horn, and oboe d'amore.

Here and there DeGaetani's voice may seem a little smaller than some of us remember, but there is no mistaking



Ruggero Raimondi as Boris

BORIS GODUNOV

TO say that a particular recorded performance of *Boris Godunov* is “the best” makes no more sense than to say that such and such a version of *Hamlet* is the finest possible. But you can say that a particular performance is the most satisfying you have seen or heard, and that is where I stand in regard to the new *Boris* conducted by Mstislav Rostropovich for Erato.

The opera has long been a battleground for editors and orchestrators. Rimsky-Korsakov, Ippolitov-Ivanov, Shostakovich, and others have had a crack at it, “correcting” the presumed faults in Mussorgsky's original score and completing the orchestration he left unfinished. The present recording, though, is based on the 1975 edition by David Lloyd-Jones, which is widely considered to come the closest to the composer's intent, and the international cast headed by the Italian baritone Ruggero Raimondi delivers a *Boris* that is tightly knit and musically gripping. Raimondi, in fact, makes perhaps the most startling contribution, for he seems to understate the part. He replaces the usual stentorian utterance with an inward, reflective delineation of the character as power-driven, alone, afraid, and guilt-ridden, but it is no less vital or effective for all that.

It is a pleasure to hear soprano Galina Vishnevskaya, as both Marina and the Innkeeper, in a tessitura she easily commands and in a dramatic context she most surely enlivens. Paul Plishka's Pimen, familiar to Metropolitan Opera audiences, is vocally full-bodied and

expressively sung. Vyacheslav Polozov sings Grigori/Dimitri with fervor and a controlled abandon that illuminates this character, Kenneth Riegel's Shuisky is properly insidious and cunning, and Romuald Tesarowicz provides a kind of black-comic relief to the austere and portentous plot with his amiably drunken Varlaam. Last, but far from least, is Nicolai Gedda's prophetic Simpleton. Now retired from the operatic stage, Gedda sings here with the ease, technical sureness, and sensitivity we have come to expect from him. The choral work is exciting, and the National Symphony plays with passion and sweep.

Ultimately, it is Rostropovich who deserves most credit for the recording's success. His palpable involvement with the music is fully communicated to soloists, choruses, and orchestra alike. And although the excellent recording was made in part to serve as the soundtrack for what turned out to be a severely truncated film version of the opera, Erato has released it complete on three compact discs.

Robert Ackart

MUSSORGSKY: *Boris Godunov*. Ruggero Raimondi (baritone), Boris; Galina Vishnevskaya (soprano), Marina/Innkeeper; Nicolai Gedda (bass), Varlaam; Paul Plishka (bass), Pimen; Vyacheslav Polozov (tenor), Grigori/Dimitri; Kenneth Riegel (tenor), Shuisky; Romuald Tesarowicz (bass), Varlaam; others. Choruses; National Symphony Orchestra, Mstislav Rostropovich cond. ERATO © 2292-45418-2 three CD's (212 min).

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its soundness, its purity, its genuineness. The special pathos in the last song on the disc, Mahler's *Ich bin der Welt abhanden gekommen*, derives simply and irresistibly from the total commitment of a great interpretive artist to the material she chose to sing. It is not really surprising, then, that the disc is not so much a "goodbye" as a living reminder of the uniquely *live* character of music among all the arts. The sound quality is first-rate, and the booklet has a superb essay by David Hamilton as well as full texts and translations. R.F.

DEBUSSY: *Three Nocturnes (Nuages, Fêtes, Sirènes); Prélude à l'après-midi d'un faune; Printemps; La Mer.* Women's Voices from the Choeurs de Toulouse Midi-Pyrénées; Orchestre du Capitole de Toulouse, Michel Plasson cond. EMI/ANGEL © CDC-49472 (74 min).

Performance: *Good to outstanding*
Recording: *Splendidly spacious*

I was particularly taken here by the performances of the Nocturnes and the *Prelude to the Afternoon of a Faun*, not only because Michel Plasson is an unusually sensitive interpreter of Debussy but also because the open space of the Halle-aux-Grains at Toulouse turns out to be ideal for capturing the effects of

distance and acoustic localization so essential to the realization of the composer's sound images. For once the wordless voices of *Sirènes* are truly offstage yet clearly audible, as are the trumpets that usher in the processional episode in *Fêtes*. *Nuages* is hypnotically magical from beginning to end, and the *Faun*, which follows, is done with great sensitivity and restraint yet no loss of sensuous quality.

The balance of this well-filled disc is a letdown on two counts: First, *Printemps*—originally for wordless chorus, piano four-hands, and orchestra but first performed, in 1913, in an orchestration by Henri Büsser from a surviving piano score—is simply not very interesting as music. And second, for all the interpretive excellences of Plasson's reading of *La Mer*, in this work the Toulouse players are simply outgunned in terms of sonority and virtuosity by the CD versions of at least half a dozen world-class orchestras and conductors, starting with the Berlin Philharmonic under Herbert von Karajan. D.H.

GLAZUNOV: *Violin Concerto in A Minor* (see SHOSTAKOVICH)

KERN: *Overtures; Swing Time, Suite* (arr. Bennett). Ambrosian Chorus; Na-

tional Philharmonic Orchestra, John McGlenn cond. EMI/ANGEL © 4DS-49630, © CDC 49630 (66 min).

Performance: *Authentic*
Recording: *Very good*

John McGlenn continues his monumentally valuable project of reviving and recording the original versions of important musical-theater works that have long been presumed lost, or in some cases, just ignored. While this new Jerome Kern album is less even in quality than his recent Gershwin set, it gives us, in up-to-date sound, a generous, authentic sampling of the medleys that audiences heard before the curtain went up on Kern shows in New York and London between 1914 and 1939—both before and after the historic *Show Boat* (recorded, complete, by McGlenn last year).

There are a few surprises—most notably that the overture to Kern's last Broadway musical, *Very Warm for May* (1939), omits the now-classic song by which that show (a flop) is best known today: *All the Things You Are*. And, curiously, the overture to *Sweet Adeline* (1929) comprises a batch of *non-Kern* songs from the turn-of-the-century era of the show's story rather than such great Kern songs introduced in that

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show as *Why Was I Born?*, *Don't Ever Leave Me*, *Here Am I*, and *'Twas Not So Long Ago*. The gems of the set are the virtually unknown overtures to *Have a Heart* (1917) and *Sitting Pretty* (1924), both filled with unmistakably elegant and appealing Kern melodies. The extended dance orchestrations (by long-time Kern collaborator Robert Russell Bennett) for the Astaire-Rogers film *Swing Time* (1936) should have been the highlight, but McGlinn and his London musicians (and choristers) don't give them quite the snap and crackle that Nathaniel Shilkret got from his RKO Radio forces in the original soundtrack recording. *R.H.*

MAHLER: Songs (see **BERLIOZ** and **Best of the Month**, page 84)

MOZART: Don Giovanni. Thomas Hampson (baritone), Don Giovanni; Edita Gruberova (soprano), Donna Anna; Hans Peter Blochwitz (tenor), Don Ottavio; Roberta Alexander (soprano), Donna Elvira; László Polgar (bass), Leporello; Anton Scharinger (baritone), Masetto; Barbara Bonney (soprano), Zerlina; Robert Holl (baritone), Commendatore. Chorus of the Netherlands Opera, Royal Concertgebouw Orchestra, Nikolaus Harnoncourt

cond. TELDEC © 244 184-2 three CD's (172 min).

Performance: *Brilliant, but . . .*
Recording: *Fine*

Don Giovanni by Nikolaus Harnoncourt ought to be the real thing. Given the conductor's reputation, most of us might be forgiven for expecting an orchestra of period instruments, a meticulous edition, and authentic performance practice. But that is not the case here. The orchestra is the perfectly modern Royal Concertgebouw, the edition is the standard merge of the Prague and Vienna versions effected in the nineteenth century, and eighteenth-century performance practice seems to be limited to the somewhat dubious idea of restricting the harpsichord rolls in the recitatives to short, sharp chops.

But this is overstating the negative. The recording features a fine cast of youngish singers and a brilliantly accomplished orchestra. The dynamic of eighteenth-century music is realized with brilliant tempos, elegant and mostly flawless fioratura, and an overall energy that moves the opera along. Musically, that is. Rarely dramatically.

The problem is a simple one. This is a brilliant concert reading, not a theatrical one. There is a music director, and

every musical direction is clearly laid out, but there seems to be little *dramatic* direction. Only the Donna Elvira, the weakest performance from a vocal standpoint, is created as a character—the creation, no doubt, of the singer in that role, Roberta Alexander. The result is odd: curiously lacking in force or character in many places where some such would seem to be demanded, but filled with life in many of the score's odd corners and cracks. The *opera buffa* aspect of the work emerges as energy and vigor rather than humor; the *opera seria* side seems to be more about annoyance and anger than anything more truly serious. Where are the beautiful apoggiaturas and other embellishments that opera singers always put into their music? Are Mozart and *Don Giovanni* so sacred that the holy text must always be repeated verbatim—even by Nikolaus Harnoncourt?

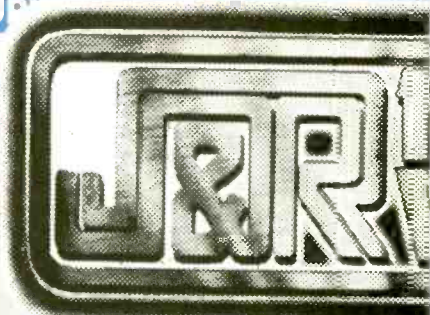
Nevertheless, this is a gorgeous performance—*Don Giovanni* done as if it were the *Prague* Symphony. Harnoncourt is most impressive with the *opera seria* numbers, the big dramatic-soprano arias that still have a whiff of the Baroque about them. Here he is in his element, and the singers are well cast for their roles. In a way, it's a performance that suits the medium of high-quality,

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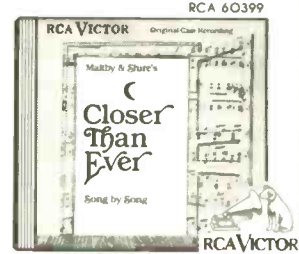
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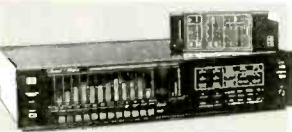
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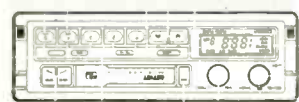
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modern recording. It sparkles, and it drives ahead. It bears casual listening extremely well. It holds up on rehearsals. It only falls short as dramatic art, and perhaps that is too much to ask—that every opera recording be a faithful echo of a theatrical experience.

Still, I miss dramatic continuity and coherence. This need not be dramatic coherence of the Romantic or modern variety. On the contrary, someday I hope to hear *Don Giovanni* performed and recorded by great singers who understand the profoundly dramatic art of the *apoggiatura*, of the expressive, improvised ornament that once sparked and personalized theater music as it does the jazz and popular music of our own day. *E.S.*

MOZART: *Serenade in G Major (K. 525, "Eine kleine Nachtmusik"); Divertimentos in D Major (K. 136), B-flat Major (K. 137), and F Major (K. 138)*. Moscow Virtuosi, Vladimir Spivakov cond. RCA © 60066-4-RC, © 60066-2-RC (64 min).

Performance: *Highly polished*
Recording: *Very good*

The three divertimentos composed by the sixteen-year-old Mozart for a 1772 visit to Milan, on the occasion of the première of his opera *Lucio Silla*, make for an album of wholly beguiling party music of the period, with the ever-popular *Eine kleine Nachtmusik* serenade by way of appetizer. Vladimir Spivakov and his Moscow Virtuosi, recorded in Paris, offer readings that are burnished to the last degree but are decidedly wanting at times in genuine Classical style, what with cadential ritards and a flexibility of phrasing that borders perilously on the outright Romantic. The sound is lovely throughout, but those who want a purer Mozartian style may prefer Neville Marriner with the Academy of St. Martin-in-the-Fields in the same program plus the *Serenata notturna* on Philips. *D.H.*

MOZART: *Symphony No. 21, in A Major (K. 134); Clarinet Concerto in A Major (K. 622); Symphony No. 27, in G Major (K. 199)*. Michel Portal (clarinet); Vienna Chamber Orchestra, Philippe Entremont cond. HARMONIA MUNDI © 901304 (62 min).

Performance: *Pleasant*
Recording: *Excellent*

Philippe Entremont has by now established himself as an accomplished conductor, but while these Mozart performances are by no means prosaic, they are fairly ordinary. In the concert hall, you'd be happy to encounter music-making this tasteful and well tempered, but for home listening any number of other recorded performances win out. Moreover, Michel Portal's playing as clarinet soloist in the concerto is certainly pleasant and suave enough, but it is also pretty monochromatic. *D.P.S.*

MUSSORGSKY: *Pictures at an Exhibition (orch. Ravel); A Night on the Bare Mountain (arr. Rimsky-Korsakov); Khovanshchina, Introduction (arr. Rimsky-Korsakov)*. Oslo Philharmonic Orchestra, Mariss Jansons cond. EMI/ANGEL © CDC 49797 (49 min).

Performance: *Very good*
Recording: *A mite cramped*

Mariss Jansons and the Oslo Philharmonic deserve the Red Badge of Courage just for putting themselves in competition with the host of more celebrated orchestras and conductors that have recorded these works, but they also acquit themselves most creditably. Their taut yet fluent performance of



Vladimir Spivakov: beguiling Mozart

Pictures at an Exhibition is notable throughout for the splendidly spirited yet precise playing of the orchestra's woodwinds. The "Old Castle" movement is imbued with a particularly otherworldly atmosphere, and the portrait of the two Jews comes off with great vividness thanks to fine solo-trumpet work. The same expert wind playing is the most effective aspect here of *A Night on the Bare Mountain*, and the always lovely and atmospheric *Khovanshchina* prelude comes off to excellent advantage. What is lacking, however, in the large-scale episodes is the full-throated sonority that they need. A comparison with the justly celebrated Lorin Maazel-Cleveland Orchestra recording of *Pictures* for Telarc tells the story, in terms of orchestral tone and untrammelled acoustic ambience. *D.H.*

NIELSEN: *Symphonies Nos. 1 and 6* (see Best of the Month, page 88)

POULENC: *Sextet for Piano and Winds; Clarinet Sonata; Flute Sonata;*

Oboe Sonata; Trio for Oboe, Bassoon, and Piano. Pascal Rogé (piano); Patrick Gallois (flute); Maurice Bourgue (oboe); Michel Portal (clarinet); Amaury Walz (bassoon); André Cazalet (horn). LONDON © 421 581-4, © 421 581-2 (72 min).

Performance: *Seductive*
Recording: *Excellent*

It's easy to see why Francis Poulenc preferred winds to strings in his chamber works: Winds lent themselves particularly well to his playfully anarchistic style but also accommodated the melting lyricism that was another important part of his musical personality. It's not so easy, though, to find his wind-instrument sonatas collected together as they are here, probably because they adhere to somewhat predictable compositional formulas. But any confirmed Poulenc lover is perfectly happy with more of the same, and besides, the more attentively you listen to these sonatas, the more apparent the differences between them become.

Pascal Rogé's performances here are just as winning as those in his superb album of Poulenc's solo piano music on London released in 1988. His piano tone may be riper than the dry sound that Jacques Février favored in his well-known Poulenc recordings, but Rogé never allows the music to become sentimental or overripe, and he flatters it immensely with his wider coloristic palette. Temperamentally, these performances by Rogé and his colleagues are hotter, tighter, and more incisive than others on discs. Comparisons suggest that it helps to be French to show these works at their piquant best. *D.P.S.*

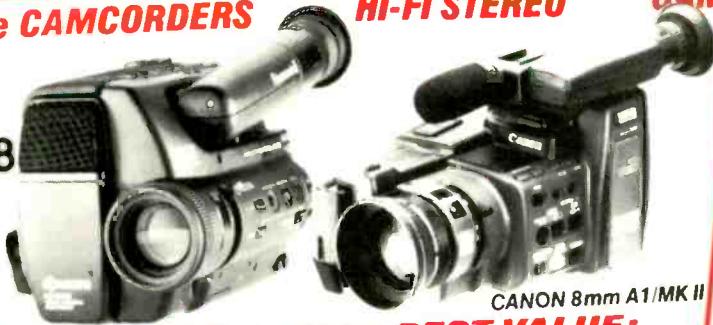
SHOSTAKOVICH: *Violin Concerto No. 1, in A Minor, Op. 99*. GLAZUNOV: ***Violin Concerto in A Minor, Op. 82***. Itzhak Perlman (violin); Israel Philharmonic Orchestra, Zubin Mehta cond. EMI/ANGEL © 4DS-49814, © CDC-49814 (55 min).

Performance: *Splendid*
Recording: *Impressive*

The Shostakovich Violin Concerto No. 1, begun in the late 1940's but brought to performance by its dedicatee, David Oistrakh, only in 1955, after the death of Stalin, is one of the major works of the literature. The deeply intense opening nocturne is followed by an astringent scherzo of the utmost brilliance. Next is the capstone of the entire work, the noble *passacaglia*. A 4-minute cadenza, replete with technical hurdles yet musically of a piece with the whole, paves the way for the fiery razzle-dazzle finale. Because the work was written for him, and he made three recordings of it (only the late-1950's Leningrad performance has been transferred to CD), Oistrakh may be said to have "owned" this concerto. Itzhak Perlman, however, here offers what is by far the most formidable reading of the post-Oistrakh

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era—a performance of blazing intensity. He is supported with the utmost conviction by Zubin Mehta and the Israel Philharmonic, recorded in concert in Tel Aviv in 1988.

Stylistically, the mellifluous concerto by Glazunov is an incongruous coupler, but it is historically justified in that Glazunov was mentor to the young Shostakovich in his student years at the Leningrad Conservatory. While Perlman's hot-toned approach is ideal for the Shostakovich, in the Glazunov I prefer Heifetz's more "classic" treatment in his late-1930's recording (included in EMI's Heifetz-Barbirolli concerto anthology). Nevertheless, on its own terms the Perlman reading is splendid. The solo violin is balanced closely front and center in these live performances, but not intolerably so, and the orchestral presence is impressive, in the Shostakovich particularly. *D.H.*

R. STRAUSS: *Till Eulenspiegels lustige Streiche, Op. 28; Metamorphosen; Tod und Verklärung, Op. 24.* Staatskapelle Dresden, Herbert Blomstedt cond. DENON © CO-73801 (68 min).

Performance: *Very good*
Recording: *Mostly excellent*

Herbert Blomstedt and the Dresden Staatskapelle display their Straussian mettle to fine effect here, beginning with a *Till Eulenspiegel* that's full of wit and fancy—a real fairy-tale treatment with superb first-chair horn and clarinet characterizations.

If the poignantly elegiac *Metamorphosen* here lacks something of the searing emotionality of Herbert von Karajan's reading on Deutsche Grammo-

phon, it still stacks up as an excellent version, notably in its delineation of instrumental texture. The reading of *Tod und Verklärung* is well worked out and dramatically cogent, though the violins seem somewhat recessed relative to the overall sound picture. Whether this effect is inherent in the acoustics of Dresden's Lucaskirche, where the recording was made, I cannot say, but I now realize that the same thing bothered me in Blomstedt's recording for Denon of *Also sprach Zarathustra*, which was otherwise a resplendent interpretation. That minor reservation aside, this sequel is an excellent production on all counts. *D.H.*

WEILL: *Der Zar lässt sich fotografieren (The Tsar Has His Photograph Taken).* Barry McDaniel (baritone), the Tsar; Carla Pohl (soprano), Angèle; Marita Napier (soprano), the False Angèle; Thomas Lehrberger (baritone), the Assistant; Ulla Tocha (mezzo-soprano), the Boy; others. Cologne Radio Chorus and Orchestra, Jan Latham-König cond. CAPRICCIO 60 007-1 (46 min).

Performance: *Fun*
Recording: *Excellent*

It's hard to imagine that such a fascinating little opera as this would have remained a mere footnote in Kurt Weill's output for so long. First performed in Leipzig in 1928, *The Tsar Has His Photograph Taken* bears a certain similarity to the absurdist satires of Jean Cocteau, though there's a Germanic seriousness to the libretto by Georg Kaiser. The plot concerns a fashionable Parisian photographer's studio that is suddenly taken over by a band of conspirators who plan to assassinate the Tsar as he poses for his portrait. Weill generates genuine suspense musically as the Tsar flirts with the woman who is trying to kill him, yet the piece never loses a certain flippant quality thanks to the series of highly rhythmic ostinatos the composer uses to move each scene swiftly along. This must also be one of the first works in musical theater to use prerecorded music: Near the end, the Tsar is seduced by a tango record played onstage, giving a languid air to the opera's farcical crosscurrents.

Although a more stage-seasoned cast might have made a more convincing case for this opera, there's much to enjoy in this performance. Barry McDaniel gives a wonderfully mercurial interpretation of the title role, and Marita Napier is a beguiling and vulnerable would-be assassin. Conductor Jan Latham-König captures the urbane but slightly seedy tone of this distinctive, engaging work. *D.P.S.*

COLLECTIONS

THOMAS HAMPSON: *Songs from "Des Knaben Wunderhorn"* (see Best of the Month, page 84)

DMITRY PAPERNO. *Russian Piano Music.* Tchaikovsky: *Meditation, Op. 72, No. 5. The Seasons, Op. 37a: August (Harvest Song); September (The Hunt); October (Autumn Song); November (Troika).* Liadov: *Variations on a Polish Theme, Op. 51.* Rachmaninoff: *Preludes, Op. 23: No. 7, in C Minor; No. 10, in G-flat Major. Preludes, Op. 32: No. 5, in G Major; No. 10, in B Minor; No. 11, in B Major; No. 12, in G-sharp Minor.* Scriabin: *Sonata No. 2, Op. 19 (Sonata-Fantasy).* Medtner: *Forgotten Motives, Vol. 1, Op. 38: No. 61 (Canzona serena); No. 7 (Danza silvestra); No. 8 (Alla reminiscenza).* Dmitry Paperno (piano). CEDILLE/ALLEGRO IMPORTS © CDR 90000 001 (71 min).

Performance: *Affectionate*
Recording: *First-rate*

Dmitry Paperno, born in Kiev in 1929, was a pupil of the famous piano pedagogue Alexander Goldenweiser. He had an active career in the U.S.S.R. until 1977, when he came to the United States; since then he has been on the faculty of De Paul University in Chicago and has toured this country and Western Europe. In Russia, he recorded several LP's for Melodiya, and since arriving here he has recorded some Scriabin works and *The Seasons* by Tchaikovsky. Any collection of piano music in which the *Troika* (November) from that Tchaikovsky cycle is the most familiar piece has at least the attraction of novelty to recommend it. This one has a good deal more, for the least-familiar items of all—Liadov's *Polish Variations* and the three Medtner pieces—are especially intriguing discoveries, and all the performances convey the most affectionate conviction.

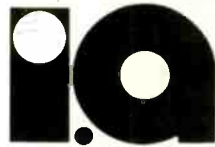
Anatoly Liadov is a composer most of us know only by a few orchestral miniatures in which he exploited that medium with notable imagination and taste. The charming, Chopinesque variations here show him to have been every bit as idiomatic a writer for the piano and eminently capable of sustaining a more extended form. Nikolai Medtner may be remembered for having recorded some Beethoven sonatas and some of his own music after he settled in England in 1936; his music is an unknown quantity for most of today's listeners, but the three warmhearted, substantial pieces offered here should make anyone eager for more.

Paperno's pacing of the Tchaikovsky *Troika* is a little more leisurely than what we are accustomed to, but it gains a touch of poetry. That quality makes itself felt throughout the program, in fact, in the least aggressive way: You feel the pianist is really finding it in the music rather than imposing it from outside. It's a lovely program, lovingly presented. The sound quality, too, is first-rate. As far as I know, this is the first and so far only release on the Cedille label; given some radio play it could become one of this year's sleepers. *R.F.*



Itzhak Perlman: intense Shostakovich

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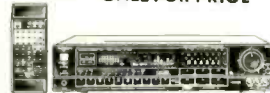
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THE TOSCANINI LEGACY

by William Livingstone

WHEN compact discs were introduced in the United States in 1983, some audio journalists and music critics who welcomed the advance in technology also lamented that many great performances of the past would cease to circulate because they would never be transferred to CD.

"Exactly the opposite has been the case. Almost everything ever recorded is now being reissued," said Guenter Hensler, president of BMG Classics, when we chatted recently in his New York office. BMG, which owns RCA Records, is taking a leading role in those reissues. Referring to the RCA archives, Hensler added, "We have the most fantastic catalog in the world, and it is very satisfying to go back to those treasures and make them available again in optimal form."

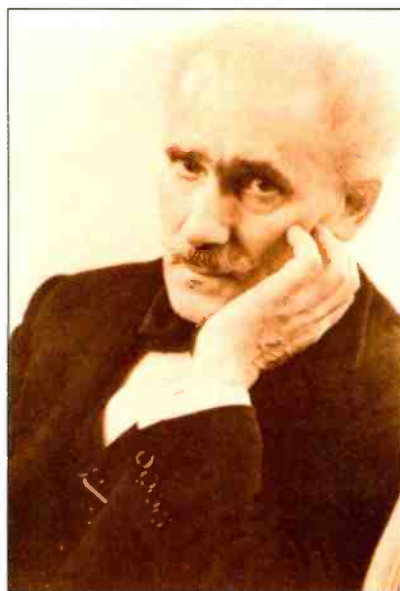
BMG Classics has just begun the most impressive reissue project thus far in the compact disc era, the Toscanini Collection, which will include all of the official recordings made for RCA by the great Italian conductor Arturo Toscanini (1867-1957). Hensler sees the Toscanini Collection not just as a major reissue project, but as "one of the most important releases in the history of recording."

The first part of the collection was issued in April, and when it is completed early in 1992 (to observe the 125th anniversary of Toscanini's birth), it will include seventy-one titles released in various forms—the audio programs on eighty-one cassettes or eighty-two compact discs and the video on nine VHS tapes or ten laserdiscs. Then for the first time all of Toscanini's recordings will be available simultaneously.

A uniform black-and-white look has been designed for the series, with historic photographs by Robert Hupka. The transfer from original discs or tapes has been supervised by John Pfeiffer, BMG's resident expert on engineering and remaster-

ing older recordings. The whole project has the cooperation of the Toscanini family, including the conductor's daughter Wanda, the widow of the pianist Vladimir Horowitz.

Announced with great fanfare at press conferences in New York, Rome, and Tokyo, the Toscanini Collection has gotten a lot of publicity. As the initial sound of trumpets and drums dies away, a number of questions come to mind concerning the value of a project like this. Why bother with these analog mono recordings and black-and-white videos? Will people buy them even at mid-line prices? Who cares about Toscanini today?



Arturo Toscanini

BMG cares, of course, because Toscanini was one of the most important artists in building the prestige of RCA Red Seal records—like the pianists Horowitz, Artur Schnabel, and Van Cliburn and the singers Enrico Caruso, Rosa Ponselle, and Leontyne Price. And Hensler clearly has a strong sense of the history of his company. One of his first administrative acts as president of BMG Classics was to restore to all RCA releases the logo of Nipper, the famous dog listening to the old phonograph horn.

Gratifying sales of other BMG historic reissues have made Hensler optimistic about the public response to the Toscanini Collection.

"Even though the Beethoven symphonies have been recorded many, many times by later conductors, Toscanini's interpretations hold up well today. His name is still synonymous with conducting. He was one of the most influential musicians of the twentieth century, and not to keep his work available in the best possible form would be a crime."

The documentary implications are obviously immense. I welcome the reissues because they will demonstrate clearly how much styles change in the interpretation of classical music. They should help us to understand that what is important is not adherence to any particular trend in performance practices but the artistic abilities of a given performer. It will be interesting to compare Toscanini's Beethoven symphony recordings with those of, say, Roger Norrington.

In addition to his tyrannical personality and the intensity of his performances, Toscanini was famous for his belief in the sanctity of the printed text as the expression of the composer's intentions. In this he has had a tremendous influence on subsequent musicians, particularly those who search for authentic performance practices of the Baroque and Classical periods.

Musicians will also care about these reissues. André Previn, who made a videotaped celebrity endorsement of the project, attended a few Toscanini performances as a child. He said it was shattering to see him conducting again in the newly released videos.

Although I never heard Toscanini live, I think today's collectors will care about the reissues too. As I watched the video of a concert performance of *Aida* and the ghostly figure of Toscanini moved about on my TV screen, it struck me that this man had played cello at the premiere of *Otello*. He conducted *Falstaff* in the presence of its composer and conducted such important premières as those of *La Bohème* and *Turandot*. I was overwhelmed by a sense of history and connection with the distant past when I realized that Toscanini's intense eyes had looked into the eyes of Verdi and Puccini, and that was truly awe inspiring. □

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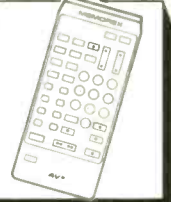
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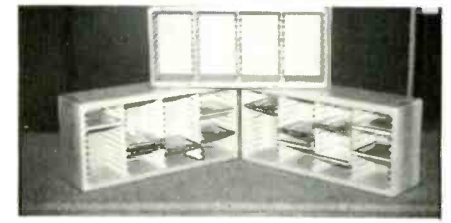
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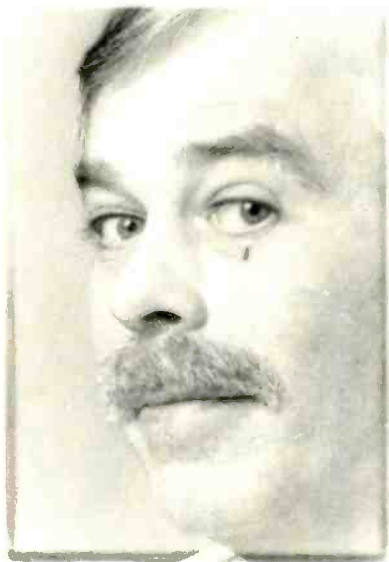
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by *Ralph Hodges*



NONMUSIC TO YOUR EARS

MORE bad news from the *New York Times*: The country is getting noisier rapidly, and nobody seems in a position to do much about it. Of some 1,100 state and local noise-abatement programs existing in the past, a mere fifteen are active today, and researchers have quit the field in droves since federal funds for problem-noise studies were cut off by the Reagan administration.

Recently something called a consensus conference, attended by representatives from the U.S., Canada, and Europe, was held in Washington, D.C., and a twenty-page draft report on the noise situation, not yet available as I write, resulted. Preliminary indications suggest, however, that it can be no more than a list of recommendations of the sort that lawmakers like to line their wastebaskets with.

Frustratingly, although there is a general perception among experts of a marked increase in our opportunities to hear louder and longer-duration noise every day, with research stalled, nobody seems sure how to identify the major offenders. There

may not really be any in an average day; we could be caught in a cumulative din from numerous secondary sources rather than a few primary ones. Certainly some of the traditional noise barrages have changed character. Some of the new (Japanese-made) subway cars now in use are a shining revelation of what can be done—and a stinging commentary on what was neglected in the past. But sirens and air horns on emergency vehicles are getting louder as they try to blast their way through gridlocked traffic with sheer wind power. And with many communities recycling rubbish, the visits of multiple sanitation trucks are a sad example of how one environmental program can trip up another.

Noise has psychological and physiological consequences that many experts consider profound. Pulse rates vary and the volume of blood pumped per heartbeat decreases. Vasoconstriction hinders the blood in clearing poisons from the system and raises the blood pressure. Concentration goes, task performance suffers, cooperation diminishes, tempers flare. And, of course, you can go deaf.

But noise needn't be loud to be stressful. Think, but not too long, about a fingernail on a blackboard. (Interestingly, researchers I've queried about this phenomenon have all expressed great interest, but no explanation of the mechanism completely satisfactory to them has emerged. At the University of Miami, Dr. Ernest Peterson believes that improper processing of the dissonant overtones by the cochlea is certainly at the root of it, but how this translates into shudders and wincing is not clear. Some day, when I'm feeling brave, I'll record the sound and see what must be filtered out to ease the agony.)

Some noise is fashioned to calm and relax instead of the opposite, and this seems to work for some people but hardly all. Surf-noise recordings are available to induce sleep, and background hiss ("sonic perfume") is generated to soften the clatter of business machines and the babble of nearby conversation. A certain California beachfront restaurant plays the surf recordings because the real ocean sound does not

penetrate its plate-glass windows. That the visible waves and the sound are always out of sync drives me crazy, but it doesn't seem to bother others. Some years ago I endured, but not comfortably, many visits to a physician whose waiting room had a mechanical hiss machine meant to soothe. The acoustics firm Bolt Beranek and Newman had already diagnosed my problem. Such hiss has to be in "stereo"—that is, derived from two entirely separate generators and reproduced by at least two speakers—in order to work. Human response to noise can be subtle.

The perceived loudness of noise—and of sound in general—is a function of its duration, center frequency, and bandwidth as well as of simple intensity. A noise spanning three octaves in the midrange sounds roughly twice as loud as a noise spanning one octave, even though a sound-level meter declares the two equivalent. If the noises were identical in center frequency and bandwidth, twice as loud would correspond to about a 10-dB increase, and since it is the decibels that do the damage when it comes to hearing loss, we have something worth paying attention to. A noise that is absolutely shattering, such as a buzz saw screaming its way through an oak plank, may actually be relatively innocuous, whereas a simpler noise, loud but not unpleasant in character, might pose a grave risk. Fortunately, the majority of loud noises in our civilization are complex and grating, urging us to quit their vicinity before damage is done.

Why have I chosen to string together these somewhat disconnected data on noise? Because noise inevitably influences music. Janáček and Varèse, to name only two, quite literally composed music to the environmental noise of their worlds. That is the positive side. On the negative side, many people, myself included, have been enjoying concerts less because we arrive stressed out and deafened by the blare of the city en route. Someone should do something about it—and that means you and me. It is probably time for a little less Varèse and a little more Janáček. □

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