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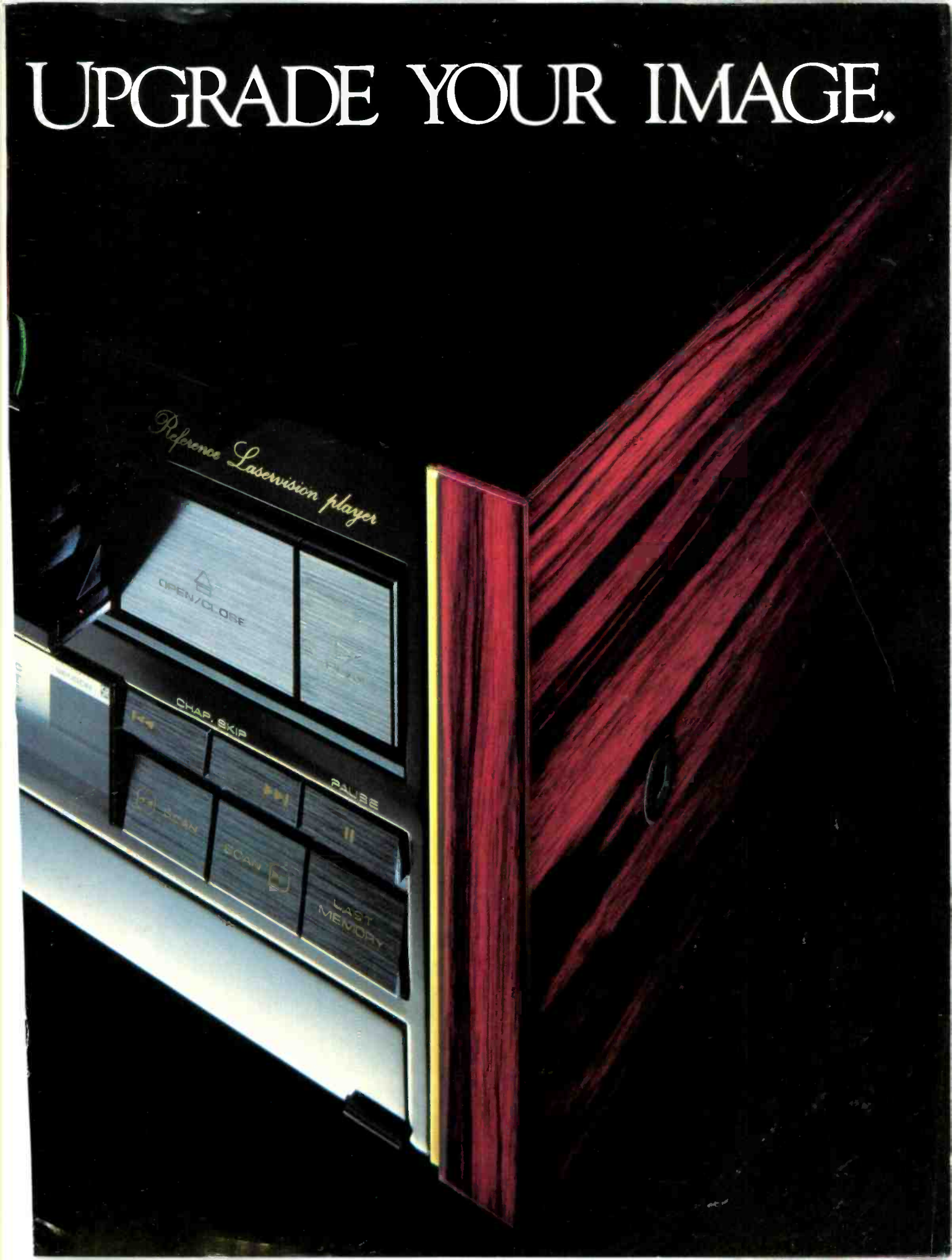

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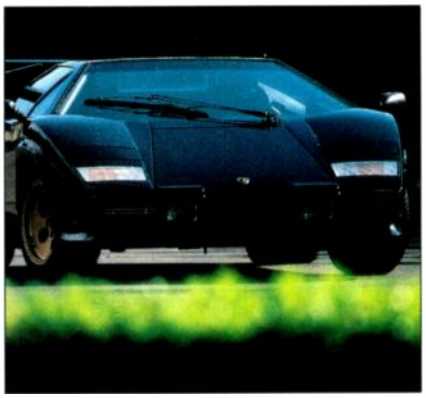

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TEST REPORTS

AUDIO & VIDEO

MUSIC

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COLUMNS

DEPARTMENTS

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"Literally a New Dimension in the Sound *Stereo Review Magazine*

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"Mindboggling, astounding, flabbergasting" *High Fidelity Magazine*

Words alone cannot fully describe how much more lifelike SDA TRUE STEREO reproduction is. Reviewers, critical listeners and novices alike are overwhelmed by the magnitude of the sonic improvement achieved by Polk's TRUE STEREO technology. You will hear a huge sound stage which extends not only beyond the speakers, but beyond the walls of your listening room itself. The lifelike ambience revealed by the SDAs makes it sound as though you have been transported to the acoustic environment of the original sonic event. Every instrument, vocalist and sound becomes tangible, distinct, alive and firmly placed in its own natural spatial position. You will hear instruments, ambience and subtle musical nuances (normally masked by conventional speakers), revealed for your enjoyment by the SDAs. This benefit is accurately described by Julian Hirsch in Stereo Review, "...the sense of discovery experienced when playing an old favorite stereo record and hearing, quite literally, a new dimension in the sound is a most attractive bonus..." Records, CDs, tapes, video and FM all benefit equally as dramatically.

"You owe it to yourself to audition them." *High Fidelity Magazine*

SDAs allow you to experience the spine tingling excitement, majesty and pleasure of live music in your home. You must hear the remarkable sonic benefits of SDA technology for yourself. You too will agree with Stereo Review's dramatic conclusion: "the result is always better than would be achieved by conventional speakers...it does indeed add a new dimension to reproduced sound."

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Where to buy Polk Speakers? For your nearest dealer, see page 80.

Gizmo Madness

By Michael Riggs

It's the day before we head off to the Winter Consumer Electronics Show (CES) in Las Vegas, where manufacturers will be demonstrating their latest creations to throngs of retailers, distributors, and journalists. The prospect of confronting all those flashing lights (both inside and outside the convention center) and a whole new crop of audio and video gear brings to mind a question that has nagged me for years: Why do so many components have so much stuff on them?

This would be easy to answer if all the features were useful, but many of them are just strange: bad stereo simulators (particularly popular on audio-video amps and receivers), bass expanders that make loud low-frequency sounds louder, most of the automatic level-setting systems I've seen on cassette decks, and feeble knockoffs of Carver's Sonic Hologram Generator, to name only a few. Even when the features do serve a real purpose, you sometimes have to wonder whether the venue is appropriate. The average component car receiver is so jammed with functions that it's nearly impossible to understand it without manual in hand.

At another CES a couple of years ago, I asked the product manager for a line of car-audio components why his company didn't make a unit more like the front end in the rental car I had been driving, which was a snap to use. It stuck to the basics—no fancy features requiring a multitude of tiny buttons to operate—and had a simple, open control layout. You could figure out how to work it almost without thinking. On the other hand, its performance was not so hot. Why not make a high-performance aftermarket receiver with a similar complement of features, I asked?

His answer was both illuminating and depressing. He agreed with me completely, except that he didn't think his company could get anyone to *buy* such a product. It would lack the appearance of value; mere substance was not enough. Unfortunately, he's probably right. I also remember a press conference at which another company's marketing manager bragged that its new components had lots of lights on them, which he said would make them sell better. The equipment was perfectly decent, but most of the lights in question were useless or merely decorative. I thought the guy had cream cheese for brains. A few months later, a friend announced she had bought one of these beasts. It had a lot of nice lights, she said.

This same logic impels manufacturers to use integrated amplifiers and tuners in their rack systems when receivers would be more cost-effective or to throw in a cheap equalizer when the money would be better spent on improving the loudspeakers. High "box count" is perceived as high value. If a cassette deck has fewer buttons than competing models in the same price range, the customer is going to wonder why.

Nonetheless, the situation may be improving. I expect to see a reverse trend at the upcoming show as the mainstream manufacturers bring out more high-end products designed to sell on construction quality and circuit refinement rather than button counts and light shows. Their relative austerity will distinguish them from the gaudy blandishments of lesser gear. Many of them, however, will be remarkably heavy. Increasingly, weight seems to rise in direct proportion to price. This is somewhat understandable in the case of amplifiers and speakers, but it's hard to see any technical reason for a Compact Disc player weighing 50 pounds or more. Yet, there they are. One manufacturer has a line of players whose prices and weights are in such lockstep as to make one wonder whether the assembly process involves pouring measured amounts of lead into special cavities in the chassis.

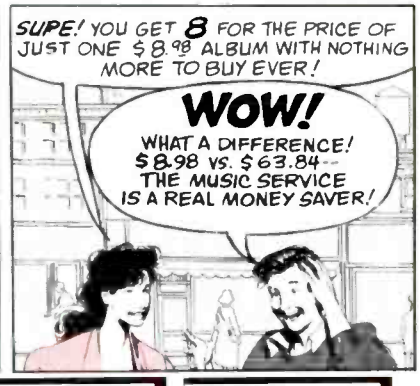
Part of the explanation for this apparent obsession with heft lies in the growing effort of Japanese engineers to suppress mechanical resonances and vibration in electronic components. They feel this leads to better sound quality (unlikely, in my opinion, but never mind that now). But fashion plays a role, and weight is associated with solidity and quality. Making equipment massive whether it needs to be or not caters to that perception.

In fairness, I should note that "bigger is better" has been a popular notion in this country longer than in Japan. Walk through the (mostly American) high-end exhibits at any CES, and you'll see a remarkable number of gargantuan power amplifiers. You come away with the feeling that a real man's amplifier should require two men and a boy to lift it. And then there's large-screen projection television—something I suspect only an American would have ever dreamed up.

In American high-end audio products, maximum weight often coexists with minimum features. Preamps are available with just three knobs (for volume, balance, and source selection) on the front panel, together with power and tape monitor switches. At least one I've seen even dispenses with the balance control, using instead separate volume pots for each channel. Will we see such minimalism in the new high-end components from the big Japanese companies? I doubt it, but who knows?

Does it matter? Yes and no. How any given component is designed is not particularly significant in the great scheme of things. But it is important that there be adequate variety. Given the sheer number of different products on the audio market, you ought to be able to find components that suit your needs and style. For the last several years, I've been disturbed by what I've viewed as a hole in the middle—a scarcity of components combining good performance and construction with adequate but not overwhelming or frivolous control functions. I'm hoping that the new equipment we're beginning to see (and expect to see more of in Las Vegas) is the start of a healthy trend to fill that gap. □

SMART SHOPPER



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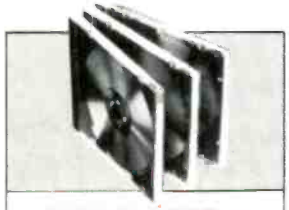

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L E T T E R S

AM EQ

In your review of the Blaupunkt Berlin car tuner/tape deck [October 1987], you state that the frequency response is "ruler-flat from the midrange up almost to 3 kHz. This captures every bit of fidelity that can be wrung from a good AM station." Elsewhere on the same page, you make reference to the NRSC time constant (except that you incorrectly call it "NCSC"). Your review of the Jensen JS-6400 car-stereo receiver/tape deck in the same issue describes the unit's frequency response as "unusually flat." Yet the response graph that appears in the report shows a 15-dB drop at 5 kHz.

I was surprised to read these statements. The response of the signal transmitted by an AM station typically extends to 10 kHz, and still wider bandwidth is not unheard of. The newly formed NRSC (National Radio Systems Committee) is recommending standards for AM transmissions, including pre-emphasis and bandwidth-limiting, to help overcome noise and to encourage receiver manufacturers to build better AM radios.

AM broadcasters are fighting for their lives these days. The bias demonstrated against them in the media does not help matters; even worse is the ignorance. Please try to develop a more enlightened approach to AM broadcasting.

David P. Hebert
Dave Hebert Engineering
Pasco, Wash.

We agree that the NRSC standards are a step in the right direction, and if they lead to the manufacture of AM receivers that can deliver clean response to beyond 5 kHz, we will be absolutely delighted. Our experience to date has been that AM reception usually becomes unacceptably noisy and interference-prone when high-frequency response is pushed that far. The response of the Blaupunkt Berlin's AM section is 3 dB down at 5.7 kHz in its wideband mode, which is about as good as we've ever seen on a car tuner (or any other tuner, for that matter). Although the Jensen JS-6400's AM response does fall off rapidly above approximately 3 kHz, it is flat within a fraction of a dB from 20 Hz to nearly 2 kHz; most AM tuners roll off in the bass and are less smooth through the midrange and treble.—Ed.

THE DEATH OF BRIAN

Having read Mark Moses's reply to John Nagy's August 1987 letter, we must write to convey our outrage over Mr. Moses's inaccurate description of the death of Rolling Stone Brian Jones.

Mr. Moses states the following: "The hallucinogenic aura of *Their Satanic Majesties Request* comes off like the indulgence of privileged pop stars, one of whom might have made it a more interesting record if he weren't on his way to doping himself into the grave." For your information, Mr. Moses, Jones did *not* die of a drug overdose: Rather, he drowned while going for a late-night swim in his pool.

Included in a Westwood One radio program called "Rock and Roll Never Forgets: Brian Jones" are excerpts of an interview with Jones's father, who recalls that shortly before the drowning, Brian contacted him to say, "I am clean and have been since the second drug bust. . . . Please don't judge me too harshly. . . . Please don't worry." Brian's father says he could tell by Brian's voice that he was telling the truth: He *was* clean. Besides, some of the policemen who frequently raided Jones's house were convicted of planting drugs as they conducted their search.

As you should have figured out by now, Mr. Moses, we are *huge* Brian Jones fans. An incredibly talented musician, he played more than 13 instruments. Are you that talented, Mr. Moses? We expect a full apology.

As for Mr. Moses's comment about *Led Zeppelin IV*, we think he is wrong. You critics just can't get used to the fact that Led Zeppelin is one of the greatest bands ever—and that the band's fourth album is one of the greatest albums ever. Maybe someday you'll wake up and realize what Led Zeppelin *really* is: a true musical force.

The music of the late Sixties and early Seventies is the best music of all time. Don't cut down something you will just never understand.

Jeff and Greg Marsho
Milwaukee, Wis.

Mark Moses replies: Since I stated that Satanic Majesties *would have been more interesting if Brian Jones were alert during the sessions, I obviously must respect his musical contribution to the Stones, no? Still, it is common knowledge that his notorious drug intake contributed to his being replaced in the group, shortly after which he died. And according to Tony Sanchez's* Up and Down with the Rolling Stones, *the coroner in Jones's case attributed his death to "immersion in fresh water under the influence of drugs and alcohol" and then rendered an official verdict of "death by misadventure."*

As for my reference to Led Zeppelin IV, *of which I'm a big fan, I was merely using*

(Continued on page 12)

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High Fidelity Magazine

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After four years at Hewlett-Packard, we w

In 1983, Dr. Godehard Guenther, President of a/d/s/, issued an injunction to our engineers and designers. "Guys," he said, "somebody's got to come up with a new loudspeaker standard. Let's make sure it's us."

Understand: he wasn't suggesting our existing loudspeakers weren't good. Rather, he was challenging us to address the shortcomings present even in the very best speakers, ours included. Shortcomings made all the more apparent by the sonic demands of the compact disc.

What we sought to build were speakers that didn't sound like a set of drivers stuffed in a box. Our goal was to create speakers characterized by a stable sound stage, pinpoint imaging and sound that seemed to emanate from free space.

It was a tall order. But the technology that has resulted—Unisōn™ . . . *of one voice*—is the kind other speaker makers will be emulating for years to come.

At a/d/s/, we make our own drivers. Our high definition woofers feature new cones, magnets, baskets and voice coil assemblies—painstakingly crafted to eliminate coloration.

We finally had the tools to be as critical as we were inclined to be.

Our first task was to take a long, hard look at the limitations inherent in loudspeaker drivers. That required a powerful "microscope." And, fortunately, we had one—a high-resolution, super-fast computer from Hewlett-Packard, supported by a sophisticated mathematical program of our own devise.

Housed in a specially designed a/d/s/ acoustics laboratory, the computer gave us the ability to generate and analyze driver performance data with an accuracy, thoroughness and detail never attainable before.

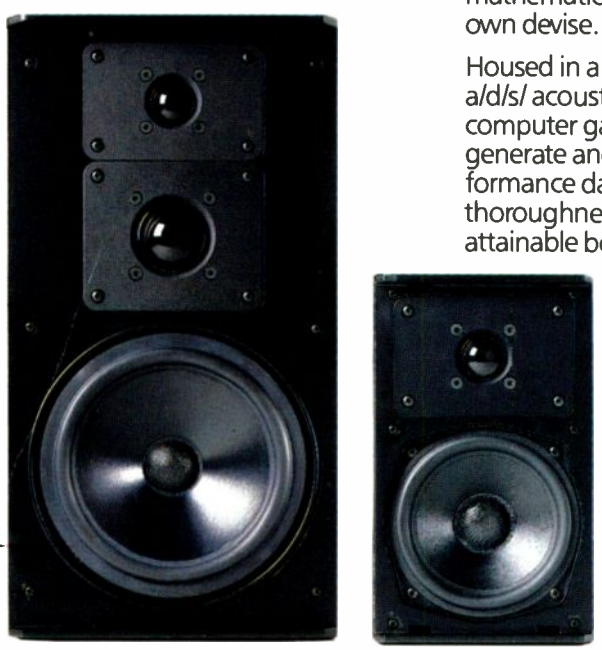
In this veritable mountain of information, acoustic truths resided.

The CM7's 4th-order, 24dB/octave crossover network. Complex, sophisticated and expensive to manufacture, it's a major reason why the speaker produces such a stable image.

If the drivers aren't flawless, no amount of camouflaging will hide the flaws.

One fact was obvious: the traditional materials used to construct woofers, tweeters and midranges —polypropylene, metal, cellulose compounds—were simply inadequate. So we set about to discover new ones ideally suited *at the molecular level* to the jobs they're required to do.

For the domes of our tweeters, we selected a proprietary copolymer that's exceedingly rigid, yet has superb internal damping and freedom from ringing. For the voice coil formers in our midranges, we adopted stainless



High technology enclosure materials enable us to make the new CM7 (left) and CM5 extremely compact without sacrificing interior volume. How compact? Consider that the CM5 measures a mere 9⅝" x 5¾" x 6⅞".

Unisōn is a trademark of Analog and Digital Systems, Inc

the keyboard of a ere ready for a Steinway.

steel. Strong and non-magnetic, it enabled us to produce a motor quick enough to resolve the finest detail, even at the highest volume level. And so our research went, until our drivers were as perfect as the laws of physics allow.

The crossover network. You don't see it. You shouldn't hear it, either.

When most speaker makers design crossover networks, their primary concern is the interaction of the drivers. We were more ambitious. We sought crossovers that optimize the relationship between the drivers and their enclosure, even with the room in which the system is played.

And we had an advantage: the excellence of our drivers allowed us to use *ideal* crossover points. Using these points, all the fundamental tones of the human voice can be reproduced by a single driver. With the computer, we evaluated countless prototypes of crossovers. A 4th-order network of the Linkwitz-Riley type proved the most appropriate. This type alone yields the response that satisfied our requirements for neutrality and realistic imaging. On a frequency response plot, the crossover points aren't even detectable.

How good it ultimately sounds depends on the box you put it in.

That's why we employed a polymer material filled with an extremely high mass compound to produce the rigid, aurally "invisible" enclosures of our Compact Monitor Series. You'll be amazed by the weight of these little beauties—they're heavy. You'll be floored by the sound.

With its stainless steel coil former and copolymer cone, the Unisōn midrange does something a cone midrange has never done before: span the fundamental range of the human voice—from 200 to 2,000 Hz.

Our tweeters' domes are made of yet another proprietary copolymer, giving them the unique ability to provide smooth, detailed, high frequency response at even the highest levels.

The M12 is the instrument on the right.

To our ears, our new speakers—the M Series and compact CM Series—offer convincing proof that Unisōn technology does indeed define a new era in speaker performance. For more information about a/d/s/ products, phone a/d/s/ toll-free, at 1-800-345-8112. (In PA, call 1-800-662-2444.)

a/d/s/

(Continued from page 8)
the group to point out that coming-of-age is a common ritual whether it's 1967, 1971, or, for that matter, 1988.

Popular Music Editor Ken Richardson replies: In case Mr. Moses's explanation of the death of Brian Jones is not enough for Messrs. Marsho and Marsho and any other readers, I'd like to provide some more evidence in standing by my writer's original choice of words—and please note that Mark did not *say Jones "died of a drug overdose." It is clear, however, that Jones was indeed "doping himself into the grave." According to Robert Palmer's* The Rolling Stones, *by May of 1969, only two months before his death, "Brian was taking so many different drugs and drinking such enormous quantities of alcohol that he simply transcended addiction as we know it." And the August 9, 1969, obituary in* Rolling Stone *magazine expands on Sanchez's cause-of-death reference as follows: "drowning by immersion in fresh water associated with severe liver disfunction caused by fatty degeneration and ingestion of alcohol and drugs." Not pretty—and certainly not a mere "late-night swim." All of which is not meant to slander Jones the musician—for whom I, too, have great respect—but simply to answer the Marshos' serious charge and set the record straight. Perhaps the best words I can quote to the Marshos are contained in the same* Rolling Stone *in Greil Marcus's fine reflections on Jones's life: "It happens. Traps for troubadours, and sometimes one doesn't stumble into them but goes looking for them. We grow up with death."*

By the way, I, too, love Led Zeppelin IV, *but that's another story.*

AMBIENT CONFUSION

I was quite shocked when I saw the boxed statement saying "Close miking can magnify ambient noises into a veritable jungle of bleeps, pings, buzzes, squeaks, and moans" in David Hurwitz's "Domesticating Digital" [October 1987]. I have recorded the master tapes of nearly a dozen Compact Discs, and my experience has been exactly the opposite. Close miking is only resorted to when the ambient noise is high, and "ambience" is unimportant. On the only occasion where I have had to resort to close miking—the two-clavichord pieces on *Antonio Soler: Six Concertos for Two Keyboard Instruments* (Titanic TI 152) —road noises made it impossible to back the microphones off from the clavichords. So, to get *more* signal-to-noise, the Schoeps cardioid microphones were brought within two feet of the soundboards of the clavichords, and "two-track mono" recording was employed. I think we achieved a remarkable verisimilitude to having two clavichords in one's listening room, with no squeaks or groans from the ambience added. On the other four tracks (scored for two organs and organ and harpsichord), a Blumlein array was used about 12 feet back and we got a nice balance of ambience—although we had to cut around various street noises in the editing.

Ralph Dopmeyer
Titanic Records
Somerville, Mass.

Your incredulity can, I believe, be traced to a definitional misunderstanding—and an understandable one it is—of David Hurwitz's use of "ambient" in the boxed sentence to which you refer. This quote was extracted, in slightly abbreviated form, from the last paragraph of text on the same page. Nestled in context, it is clear that by "ambient noises" Hurwitz meant performance-related "bleeps, pings, buzzes, squeaks, and moans"—gasping wind players, instrumental by-products of the notes on the page, and the like. It is these noises, and not stray street sounds, that are magnified by close miking.—Ed.

UPDATES AND CORRECTIONS

For our test report on the Allison IC-20 loudspeaker (December 1987), the speaker's response was measured at a distance of about five meters (15 feet), not one meter as indicated in the review.

In our January test report on the DBX Soundfield 50 loudspeaker, our description of the speaker's driver complement came out a little mangled. The Soundfield 50 is a four-way (not three-way) system, and its tweeters are ½-inch (not 3-inch) drivers. Also, the response was measured from a distance of approximately five meters (15 feet), not one meter.

Just after we went to press, the price of the Magnat MSP-60 loudspeaker (test report, January) went up from the $650 per pair we reported in our review to $700 per pair.

All letters should be addressed to The Editor, HIGH FIDELITY, 825 Seventh Ave., New York, N.Y. 10019. Letters are subject to editing for brevity and clarity.

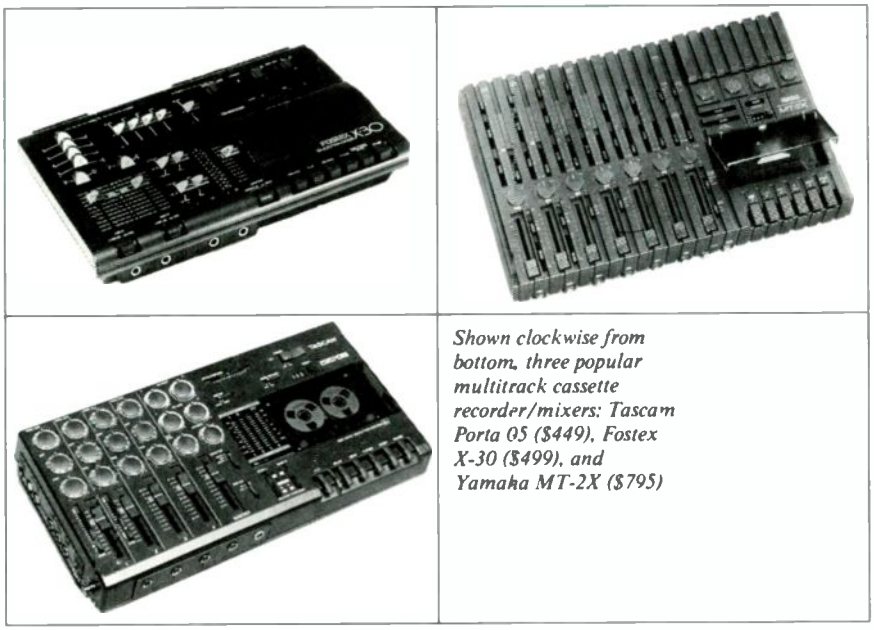
Not for Listeners Only

Last October, in the first installment of this series on electronic musical instruments, the subject was electronic keyboards and the MIDI (Musical Instrument Digital Interface) standard. MIDI inputs and outputs permit electronic keyboards to communicate with other connected musical devices (as well as with computers) in order to facilitate composing, recording, and performing. Although applications for MIDI are still being explored by musicians and recording professionals, the new technology promises to leave a lasting impression on the music business. But for the amateur music-maker who is just starting to put together a basic home studio, MIDI can at first seem like an overdose of technology. This month's topic is more down-to-earth: affordable multitrack recorder/mixers.

Whether you are an instrumentalist, a singer, or both, a multitrack recorder is a must for your home studio setup. Multitrack recording—the ability to build a composition layer by layer—is now standard practice in the studio. No longer is it necessary to assemble an entire band to record a song together, as was the case not much more than 20 years ago. Expensive reel-to-reel tape decks were previously the only way for the music hobbyist to get into multitrack recording. But in the last few years, companies such as Tascam (the professional arm of Teac) and Fostex have popularized the multitrack *cassette* recorder. These decks record four monaural tracks unidirectionally over the full width of a standard audio cassette—in other words, onto the stereo tracks from both "sides." You can record tracks individually (while monitoring any previously recorded tracks) and combine ("bounce"), for example, three recorded tracks onto the fourth, thus freeing those three for additional material. Simple bouncing results in a seven-track capacity; some decks can record a live track during bouncing, further increasing that number.

Mixer functions such as level-setting, panning, and equalization are included so that a recorded piece can be mixed down to a regular two-track stereo cassette deck. More sophisticated models contain extra inputs and an "effects" loop (analogous to a tape-monitor loop on a preamp) for inserting the effects from a signal processor (such as a reverb) during recording or mixdown.

The fidelity of multitrack cassette recorders is not quite up to the standards of good home decks, but most users will find the sound more than acceptable for home-made compositions. The use of DBX noise reduction in some cassette "multitracks" greatly diminishes the audibility of the tape hiss generated by the narrow cassette tracks and repeated bounces. Many aspiring recording artists create their demo tapes on multitracks, rather than pay for expensive studio time. In fact, the best models, when carefully used, can produce results good enough to put on a record.



Shown clockwise from bottom, three popular multitrack cassette recorder/mixers: Tascam Porta 05 ($449), Fostex X-30 ($499), and Yamaha MT-2X ($795)

When I first heard a demonstration of a multitrack cassette deck a few years ago, I was immediately sold. Using just a microphone and an acoustic guitar, the owner had recorded a simple folk ballad with his own three-part harmony. I was astounded—it sounded so *professional*. I once heard someone credit the new generation of inexpensive music equipment—and this includes cassette multitracks—with the "democratization" of music.

An increasing number of manufacturers offer cassette multitracks, some selling for as little as $350. Many are designed for optional portable use and run on batteries as well as on house current. Separates are also available: recorder plus mixer, offering greater flexibility of operation and the potential for upgrading either component as your needs expand. Considering that a fairly sophisticated electronic keyboard can be had for as little as $250, you can see that a basic home studio will cost no more than a decent audio system.

Information on the models pictured above can be obtained by writing to the manufacturers at the following addresses:

Tascam Div., Teac Corporation of America, Dept. HF, 7733 Telegraph Rd., Montebello, Calif. 90640.

Fostex Corporation of America, Dept. HF, 15431 Blackburn Ave., Norwalk, Calif. 90650.

Yamaha Music Corp., U.S.A., Dept. HF, P.O. Box 6600, Buena Park, Calif. 90622.

Christopher J. Esse ▶

FLASH! Sony Adds VHS

As we go to press, Sony of Japan has announced plans to market VHS-format VCRs, first in Europe and later this year in Japan and the U.S. But before you dig a grave for your Beta machine, hear this: Sony's vice-president of corporate communications, Jason Farrow, says the company will "continue even more strongly to support the Beta and 8mm formats." In fact, Sony's new ED Beta system—which surpasses Super VHS in horizontal resolution—is due here this spring in deck form and in July in camcorder trim. The prospect of success with ED Beta may explain why Sony has no plans as yet to market S-VHS decks and absolutely no intention of making camcorders of any VHS variety. Besides, we keep suspecting that the 8mm format will receive some sort of "super" treatment down the line.

Surprisingly—but not uncommon today—Sony's first VHS decks will be made by another major VCR supplier.

Sansui Selections

Sansui's range of new home-audio products is led—on at least a creative basis—by the Vintage Model SP-100i two-way bookshelf loudspeaker ($1,400 per pair), which features innovative "inner-frame mounting" of the drivers to reduce vibrations normally transmitted to the front baffle. The 8¼-inch woofer is mounted on a baffle located just inside the enclosure. The goal of this arrangement—and additional antiresonant construction features—is to ensure that the speaker diaphragms are the only source of sound generation. In addition, the surround is attached behind the edge of the woofer diaphragm, an approach Sansui says eliminates the spurious radiation of traditional rolled surrounds.

Digital outputs are featured on two new remote-controlled Compact Disc players, the CD-X501i ($600) and the CD-X701i ($850). Both use dual digital-to-analog converters and four-times-oversampling digital filters. In keeping with the high-end vogue, the CD-X701i has six separate power supplies, antiresonance construction, and a second digital output for optical connection. *Sansui Electronics, 1250 Valley Brook Ave., Lyndhurst, N.J. 07071.*

Advent Speakers

The Baby II two-way bookshelf loudspeaker ($250 per pair) has a new dome tweeter said to offer better dispersion and imaging than the original Baby. Sensitivity has also been improved.

The new Prodigy Tower loudspeaker ($350 per pair) takes up less than a square foot of floor space. Its tweeter and 8-inch woofer are located toward the top of the 29-inch-tall enclosure.

The new Mini Advent loudspeaker ($200 per pair) shares the look of the company's other designs but in an enclosure less than one foot high. A pair of Minis can be supplemented at the low end by an almost equally compact subwoofer, also priced at $200. The subwoofer will extend the rated system response down to 60 Hz at −3 dB (compared to 110 Hz with the Minis alone); a built-in crossover assigns frequencies above 220 Hz to the connected Minis. *International Jensen, Advent Division, 4138 North United Parkway, Schiller Park, Ill. 60176.*

Advent's latest edition, the Mini Advent

8mm Camcorders

Canon, which designs and builds its own 8mm camcorders, has a new top model, the E-708 ($1,800). Among its impressive array of features are two high shutter speeds, a built-in character generator, a sepia-image mode, and digital playback effects. The latter include jitter-free stills and slow motion, six-speed strobe (a series of stills), and three "oil painting" image effects. A wireless remote control operates all recording and playback functions (including the digital effects), as well as lens zooming and the recording of items stored in the character generator's memory. The camcorder weighs 3½ pounds without its battery.

A second 8mm model, the ultra-compact E-70 ($1,599), features one high shutter speed, a ten-second-delay self-timer, an interval timer, and an audio-video fader. It weighs less than 2½ pounds without battery. Both new camcorders include connections for playback on any TV set. *Canon U.S.A., Inc., One Canon Plaza, Lake Success, N.Y. 11042.*

Canon's E-708 has digital special effects.

Revised 901

Bose's venerable 901 Direct/Reflecting loudspeaker is marking its 20th anniversary with an improved Series VI incarnation ($1,485 per pair). The new 901's outboard equalizer has revised circuitry that is said to reflect the latest research in acoustics. In addition, the back of the cabinet is now trimmer, which, according to Bose, results in an improvement in spatial reproduction. *Bose Corp., The Mountain, Framingham, Mass. 01701.* ▶

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351122. Europe—The Final Countdown. (Epic)
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346957. Steve Winwood—Back In The High Life. (Island)
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348318. The Police—Every Breath You Take—The Singles (A&M)
336222. Dire Straits—Brothers In Arms. (Warner Bros.)
341073. Steely Dan—A Decade of Steely Dan. (MCA)
348110. Buddy Holly—From The Original Master Tapes. (Digitally Remastered—MCA)
348987-398982. Linda Ronstadt—'Round Midnight (Asylum)
358127. Kronos Quartet—White Man Sleeps. Volans, Ives, Bartok, etc. (Digital—Nonesuch)

344721. Lionel Richie—Dancing On the Ceiling. (Motown)
355156. Vladimir Horowitz Plays Favorite Chopin (Digitally Remastered—CBS Masterworks)
352948. Wynton Marsalis—Carnaval. Hunsberger, Eastman Wind Ensemble (Digital—CBS Masterworks)
353946. Bryan Adams—Into The Fire. (A&M)
355362. Whitesnake. (Geffen)
354829. Lisa—Lisa And Cult Jam With Full Force—Spanish Fly. (Columbia)
362236. Tony Bennett—Bennett/Berlin. (Columbia)
356279. Gloria Estefan And Miami Sound Machine—Let It Loose. (Epic)

357616-397612. The Best Of The Doors. (Digitally Remastered—Elektra)
357657. Beethoven: Piano Concerto No. 5—Murray Perahia (Digital—CBS Masterworks)
357640. Wynton Marsalis—Marsalis Standard Time. Columbia)
356501. Benson/Klugh—Collaboration. Warner Bros.)
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361147. Rodgers And Hammerstein's Carousel. Barbara Cook, Samuel Ramey (Digital—MCA Classics)
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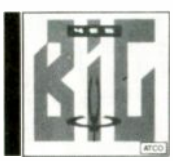
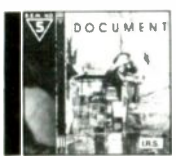
359612. Elton John's Greatest Hits, Vol. III 1979-1987. (Geffen)
357939. Original Soundtrack—"La Bamba". (Slash/Warner Bros.)
359521. The Cars—Door To Door. (Elektra)
358507. Who's That Girl (Orig. Soundtrack). (Sire)
357087. Grateful Dead—In The Dark. (Arista)
349985. Johnny Mathis/Henry Mancini—The Hollywood Musicals (Columbia)

346643. Andreas Vollenweider—Down To The Moon. (CBS)
346478. Madonna—True Blue. (Sire)
244459. Santana's Greatest Hits (Columbia)
359018. Pat Metheny Group—Still Life (Talking). (Geffen)
246868. Jim Croce—Photographs And Memories—His Greatest Hits. (Saja)
314443. Neil Diamond's 12 Greatest Hits, Vol. 2. (Columbia)
360149. Echo & The Bunnymen. (Sire)
355115-395111. Prince—Sign 'O' The Times. (Paisley Park)
358937. Handel: Music For The Royal Fireworks—Yehudi Menuhin, Royal Philharmonic Orchestra (Digital MCA Classics RPO)
359208. Loverboy—Wildside. (Columbia)
318089. Michael Jackson—Thriller Epic)
314997-394999. Stevie Wonder's Original Musiquarium I. Tamla)
349571 Boston—Third Stage. (MCA



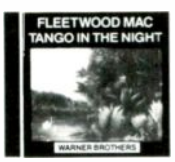
361170. Yes—Big Generator



361139. R.E.M.—Document

359075. Aerosmith—"Permanent Vacation"

360107. Billy Idol—Vital Idol



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Panasonic S-VHS Hi-Fi deck comes with a bar-code programmer.

Super VHS Deck

Panasonic's PV-S4764 S-VHS Hi-Fi VCR ($1,000) includes an MTS (stereo TV) tuner, four video heads with an enhanced slow-motion effect, and the company's bar-code scanner for timer programming. A special sheet printed with bar codes representing programming information (time on/off, channel, date, etc.) is supplied, and the user simply scans the appropriate codes and transmits the information to the VCR by pressing a single button. *Panasonic Co., One Panasonic Way, Secaucus, N.J. 07094.*

More Zenith/Bose

You may recall the Zenith TV sets that incorporate a Bose sound system ("Currents," December 1986). Now, a new 27-inch Digital System 3 set, the ZB-2755S

New Zenith/Bose set, shown with vertical VCR

($1,795), features a sound system based on the technology employed in Bose's AM-5 Acoustimass three-piece loudspeaker system (test report, June 1987). A pair of midrange/high-frequency drivers are installed toward the top of the Zenith's cabinet, and the Acoustimass woofer module is integrated within the base. A three-channel amplifier powers the system, providing a bigness of sound not normally associated with a TV set (to say the least). Other features include MTS tuning, an S-VHS-compatible input, and a storage space on one side for a Zenith vertical VCR (see "Currents," November 1987). *Zenith Electronics Corp., 1000 Milwaukee Ave., Glenview, Ill. 60025.*

H/K Receivers

The amplifiers in Harman Kardon's four new receivers can be switched between high- and low-voltage modes, the former for driving speakers with nominal 8-ohm impedances and the latter for lower-impedance or reactive loads. The company says this enables the amp to perform at its best with any loudspeaker. In addition, each receiver has identical 4- and 8-ohm power ratings.

At 90 watts (19.5 dBW) per channel, the HK-990Vxi ($949) tops the list. It features the company's Active Tracking FM tuning, which delivers remarkably high adjacent-channel selectivity (judging by this issue's test of the TU-920, an H/K component tuner of similar design). The 990 includes a large complement of audio and video switching and monitoring functions, as well as a motorized volume control operated by a comprehensive remote control.

A remote control is also supplied with the 60-watt (17.8-dBW) HK-880Vxi, which has fewer switching options and no Active Tracking tuner circuitry. Rounding out the new line are the 45-watt (16.5-dBW) HK-550Vxi ($479) and the 30-watt (14.8-dBW) HK-440Vxi ($349), neither of which is remote-controlled. *Harman Kardon, 240 Crossways Park West, Woodbury, N.Y. 11797.*

Blaupunkt Innovation

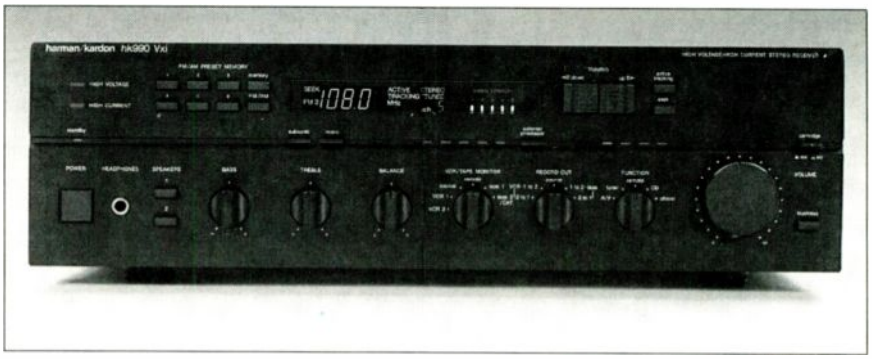
In cooperation with Rinspeed, a Swiss automobile customizer, Blaupunkt is offering a steering wheel with a center control panel that can operate several of the company's radio/cassette-players, its CDP-05 CD player, and its MT-9000 cellular telephone. The modified steering wheel, based on the renowned Momo design and said to fit most cars, has 24 buttons whose functions are set according to the devices being controlled. A dash-mounted infrared sensor, which is wired to the components, receives the wheel's commands. Cost for the wheel is $995

(plus installation by an authorized Blaupunkt dealer). *Robert Bosch Corp., Blaupunkt Division, P.O. Box 4601, North Suburban, Ill. 60198.*

Ford Has a Better Idea

Dateline: Dearborn? Beginning this June, Ford plans to offer a playback-only DAT deck (made by Sony) as an option in its slick new 1988 Lincoln Continental sedan. The deck will be integrated with the

(Continued on page 80)



Harman Kardon's top receiver features Active Tracking tuner.

Answers to Readers' Questions

By Larry Klein

Tape Expectations

Like so many parents, I've been videotaping my children during their preschool years. How can I ensure maximum longevity for my tapes? And under the best possible conditions, how long can I expect my tapes to last?

Peter Cornel
Morton Grove, Ill.

Current opinion is that given reasonable care—and assum-

by a head cleaner? Ranada also reports that head clogging is extremely rare when high-quality tapes are used. Unfortunately, the tape stock used in prerecorded cassettes sometimes leaves much to be desired.

If I had followed the advice of those advocating factory service, I would have by now paid for at least six cleanings of my VCR (at perhaps $50 a shot) in addition to the inconvenience of getting it to and from the service organization. Since my machine doesn't seem to have suffered any ill effects from my at-home cleanings, it's clear that the money

Analyzers: Show and Tell

By Robert Long

You have no idea how much fun a real-time analyzer can be until you've used one. More to the point of this column, you have no idea how much an analyzer can illuminate the subject of optimum recording techniques. Judging by our correspondence, this subject—full of murky corners and pitfalls for the unwary—is endlessly confusing to most readers. If most recordists had spectrum analyzers, most of the questions simply wouldn't arise.

Take the recurring query about frequency response at a 0-dB recording level. Some magazines publish a record/play curve at that level for the tape decks they test. We don't. Diversified Science Laboratories, which supplies our test data, does make curves at 0 dB, but all we do is comment on the results. Readers sometimes seem to think we're shortchanging them by not printing 0-dB curves, but they wouldn't leap to that conclusion if they were used to seeing music signals on an analyzer.

The first thing that strikes you when using an analyzer is how low the highs are. If you set your analyzer levels so that the midrange reads near the top of the display and if the display's total range is a typical 20–30 dB, you'll rarely find enough energy in the bands lying at and above 10 kHz to register on the display at all, at least with most classical music. That means the signal is at least 20 dB weaker at high frequencies than it is in the midrange. So, to retain an impression of flat frequency response—that is, to keep all parts of the spectrum in their correct amplitude relationships with all other parts—a tape medium must be able to handle midrange tones at least 20 dB stronger than those in the top frequencies.

That's why those who regularly test tapes and tape equipment show record/playback curves made at −20 dB. It's not done to make the tape or the deck look good; rather, it's done because this is what you need to know. A 0-dB trace won't tell you what the frequency response of a tape/deck combination will be in any useful sense, although it will give you some additional information. Again, a real-time analyzer will demonstrate why.

If we seek out musical examples where the ultrahighs really do rise higher than that −20-dB mark on the display, we'll find two kinds. The first and probably most common is the zingy high-frequency transient. Cymbals and triangles are among the instruments traditionally used to demonstrate high-frequency clarity, but many other instruments also pose problems in this regard. Bells have horrendous high-frequency transients, as do close-miked brass, particularly solos. (Several identical instruments playing together will blur the transients in time and thus reduce the effective peak-to-average ratio.)

It should be obvious that jazz buffs are particularly at risk in this regard. If you take an aggressive jazz number and watch it on an analyzer, you'll see the highs stabbing upward from time to time. When they leap into the high-frequency overload region, they will be compressed when taped. In fact, this is the way you tend to hear such effects—more as "squashed" or "blunted" transients (a dynamic phenomenon) than as dulled high frequencies. From this point of view, it's less important how *flat* the 0-dB curve is than how closely it parallels that at −20 dB. That is, you should be looking at the compression rather than the response. Hence, a conventional interpretation of a 0-dB curve can be quite misleading.

The other type of overload may be called the shrieking-synthesizer syndrome, characterized by sustained high tones unlikely to be encountered in acoustic music because of the way overtones are produced in resonating objects. Just how much lower you will have to record such sounds to avoid high-frequency overload is hard to guess—unless you use an analyzer. If you do, you'll see how the spectrum bulges too far to the upper right of the display to fit within a typical tape's high-frequency headroom curve—the sound may be too difficult to record without sacrificing signal-to-noise ratio.

Knowing the characteristics of the tape and the music signal is the key, no matter what you record. If you have an analyzer and memorize the high-frequency headroom curves we publish in our reports on blank tape, you can mentally superimpose on the display the curve for the tape you're using. (You might even draw it on the glass with a grease pencil, depending on what sort of display it is.) Once you've tried recording this way, a conventional display seems downright obscurantist; it supplies little specific information about how the tape may be coping with the signal.

In 1978, we tested the JVC KD-85, a deck with a rudimentary built-in real-time analyzer called the Spectro-Peak indicator. Evidently as a sop to the sentimental or to recordists who fancy "professional" features, the deck also had VU meters, but the Spectro-Peak display made them look silly and thoroughly redundant. The display followed the instantaneous peak value of the signal in five bands, and even though each band resolved only five levels—+6, +3, 0, −5, and −10 dB—it was a beginning. Unfortunately, it also was an end; I don't remember any other home model, from any company, following the KD-85's lead.

Recording on analog cassette is rather like a high-wire act. Spectrum analysis gives you a tool that, like the long pole carried by circus performers, makes it relatively easy to balance the factors involved. By contrast, Dolby C and DBX noise reduction give you something more like a safety net. If you're worried about overload, back off a few dB and hope that the noise reduction system will keep the hiss from intruding. It usually works. But there's a lot to be said for the more "analytical" approach of spectrum analysis. □

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Dr. Sidney Harman, Founder and Chairman of Harman Kardon.

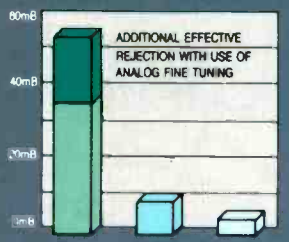
Steeped in audio breakthroughs and advanced designs, Harman Kardon's Citation division introduced the world's first Ultrawideband amplifier in 1963—the Citation 2 vacuum tube amplifier. In 1972, the Citation 14, the first FM stereo tuner with Phase Locked Loop (PLL) MPX decoding was introduced. In 1977, the 150-Watt-per-channel Citation 19 became the first power amplifier to feature low negative feedback. 1981 saw the introduction of the Citation XX. Its exclusive High instantaneous Current Capability (HCC) design provided the instantaneous current required to precisely drive and control any loudspeaker system.

Now, just as the original Citation separates established design innovations that were years ahead of their time, the new Citation series sets the standards for the decade to come.

The new Citation twenty-three makes tuner design history as the world's first Active Tracking tuner and the world's first synthesized tuner with Analog Fine Tuning. This patented system delivers two aspects of tuner performance that were previously mutually exclusive: high selectivity and high fidelity. Its superior adjacent and alternate channel rejection lets you tune in more stations with more fidelity than was ever before possible.

A thorough analysis of internal layout and a strict code of symmetrical circuitry ensure rapid, accurate reproduction of the music signal.

**20Hz-20kHz < 0.08% THD into 8 Ohms and into 4 Ohms.*



ADJACENT CHANNEL SELECTIVITY

CITATION TWENTY-THREE ■ TYPICAL SINGLE IF TUNER
NARROW MODE OF TYPICAL WIDE/NARROW TUNER

In contrast to traditional methods, the Citation twenty-three's Active Tracking circuitry provides previously unheard of adjacent channel selectivity, with little or no sacrifice in stereo separation or THD.

As the world's first High Voltage/High Current power amplifiers, the 200-Watt-per-channel Citation twenty-two and the 100-Watt-per-channel* Citation twenty-four redefine amplifier design. With just the flick of a switch, their exclusive High Voltage/High Current technology lets you select the optimum mode for driving either 8-Ohm or 4-Ohm loudspeakers. The result is higher power output and cleaner, clearer sound than any traditional design, without distortion, overheating or current limiting.*

In an area where the smallest interference can result in the biggest problems, the new Citation twenty-one preamplifier further ensures accurate signal reproduction. Its symmetrical circuitry and many design refinements offer the most precise amplification, for a difference you can hear.

Gold-plated input jacks on the Citation twenty-one preamplifier provide reduced signal loss and improved long-term conductivity.

Citation's attention to detail can be seen as well as heard. The heavy rolled-steel, rubber-mounted chassis creates a solid, vibration-free environment that combines world class styling with sophisticated American industrial design.

The new Citation series from Harman Kardon. The next generation of the world's premier high fidelity components.

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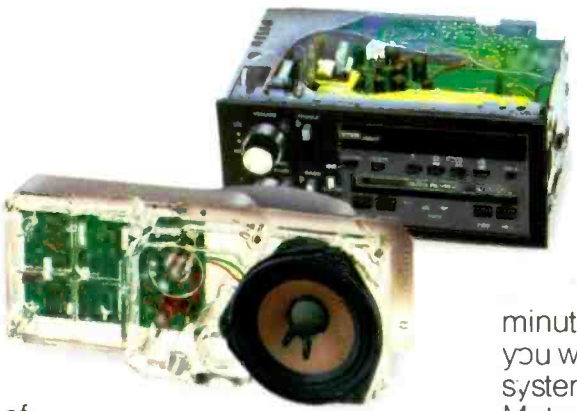

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Sound so real, it will change how you feel about driving.

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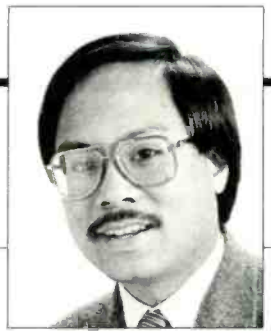


Camera's Eye: Pixilated Pixels

By David Ranada

A major camera company recently introduced a couple of versatile, high-quality 8mm camcorders. At the press conference announcing these units were posters that seemed to make much ado about the number of "pixels" incorporated into each model's solid-state image sensor (or CCD, for charge-coupled device). If I understood it correctly, the poster for one of the cameras implied that the model's 360,000-pixel CCD enables it to deliver a horizontal luminance resolution of 400 lines. However, horizontal resolution of more than 260 lines is *not* possible with any current 8mm video recording device. In this case, as in other recent instances of the burgeoning pixel race, it's best to ignore the pixel count altogether rather than be distracted by the false implications of better performance a higher number may generate.

Let me back up a bit. "Pixel" is the modern contraction for *picture element*, a concept dating from the beginning of television. Donald G. Fink's classic 1940 *Principles of Television Engineering* defines a pixel as "a small area of light or shade which constitutes the basic structure of [an] image." Fink gives two examples of picture elements: the microscopic silver grains in a photographic print and the tiny printed dots making up a printed halftone picture. In both cases, the amount of fine detail that can be conveyed by the image depends on the number and size of the picture elements.

Within limits, the same principle holds for CCD pixels—the more (and the tinier) the merrier. With a CCD imager, the image's pixels derive from the output of a rectangular array of small, light-sensing semiconductor devices (either phototransistors or photodiodes). In the 360,000-pixel camera, the light sensors are in a 492-by-682 (vertical by horizontal) array measuring about ½ inch across.

For several reasons, simply increasing the pixel count of a camcorder's CCD will not necessarily gain anything. For a full broadcast-quality NTSC picture of 330 lines of resolution, the pixels in a CCD should number at least 216,480. To obtain the 400-line resolution claimed for Super VHS machines, the pixel count should exceed 262,400; for the allegedly 500-line ED Beta system, the count would have to be at least 328,000. The imagers in quite a few recent 8mm and VHS camcorders have surpassed the calculated minima, yet their pictures usually are far less detailed than theory would predict. Once you get above these minimum pixel counts, the maximum possible resolution of a camcorder's tapes will, for the most part, be limited by the specs of the recorder section. For example, the technical standard for the 8mm system limits the luminance bandwidth to 3.33 MHz, which thereby limits the maximum horizontal resolution of all present-day 8mm VCRs or camcorders to about 260 lines (80 lines per megahertz of luminance bandwidth).

To the credit of the manufacturer of that 360,000-pixel camcorder, the spec sheet issued with the press kit gives the following complete, precise, and credible specification for horizontal resolution: "Maximum 230 TV lines (at center with VCR output)." This is precisely the same specification given for the company's recent 270,000-pixel 8mm camcorder. An increase of 33 percent in the number of pixels has therefore resulted in *no* change in the off-tape horizontal resolution spec, as can be predicted.

Another reason to be wary of a pixel-count race is that increasing willy-nilly the number of pixels in a CCD can actually have detrimental effects. The most important one is increased cost. A doubling of the number of pixels will decrease the manufacturing yield of the CCDs by a factor of ten, and the cost per chip will increase by at least tenfold (it takes only one bad pixel for the whole chip to be rejected). And because of the way the light-sensing action occurs on a solid-state sensor, the video noise level depends on the area of the chip devoted to each pixel. Raising the pixel count without increasing chip dimensions (in order to avoid reduced yields) can lead to increased picture graininess at low light levels because of the reduced pixel size.

The last major reason for ignoring very high pixel counts is that camcorder optical systems often deliberately limit the resolution of the image transduced by the sensor. The regularity of the light-sensor array can create visual-interference (moiré) patterns if the image likewise contains regular, closely spaced patterns (like the stripes of a shirt). This effect is precisely the same as aliasing in digital audio, in which the sampling rate (the spacing of the sensor points) is less than twice the frequency to be reproduced (the spacing of the stripes in the image). Such interference patterns also occur when the image contains patterns that produce video frequencies close to the color-subcarrier frequency. To prevent occurrences of moiré patterns from either mechanism, camcorder manufacturers pass the image through an optical low-pass filter to blur the tiniest details before the image hits the CCD. In one professional CCD camera, the filter even uses "double refraction to achieve a form of polarized beam-splitting."

There are other aspects of camcorder visual performance that are more important than raw CCD pixel count, yet these are harder to numerically specify and therefore receive less attention by manufacturers and their public-relations representatives. Color accuracy and balance under different types and levels of light, the ability to maintain color and resolution at low light levels, the creative flexibility of manual iris and white-balance adjustments (if they are available)—all of these greatly exceed sheer pixel count, even horizontal resolution, in visual importance. □

Technics Car CD Changer

By Christopher J. Esse

Since entering the autosound field less than two years ago, Technics has developed a full line of products, most aimed at the upper end of the market. The head units, in particular, are distinguished by extensive operating features and, in some cases, unconventional and daring control layouts. The company's new flagship, the CX-DP10 car CD changer, is in keeping with this design approach. It brings two elements characteristic of home CD changers—flexible programming and wireless remote control—into the car.

In basic form, the CX-DP10 system ($1,000) consists of three items: a half-DIN control unit, a changer, and a wireless remote. An optional half-DIN AM/FM tuner, the CR-TU10 ($250), can be installed with the control unit to fill one DIN space (the tuner is not operated by the remote). Technics has designed the control unit to integrate with your existing head unit as well, whether the latter has preamp outputs or only speaker (high-level) outputs. Such an arrangement would put the control unit in charge of volume, balance, fader, bass, and treble settings for the whole system (radio, tape, and CD). If you elect to install a new head unit, you might consider one of the three Technics models (the CQ-R9400, CQ-R9500, and CQ-R9600) that provide automatic source-switching with the CX-DP10.

The handsome 11-pound changer measures about 12 inches wide by 6½ inches deep by 7¼ inches high. A hinged top swings up to reveal the loading area for the 12-disc magazine. To load the magazine, you lay it flat and push downward, initiating the automatic mechanism that drops it into place. But before loading any of the discs, you'll get to use the most unusual feature of the CX-DP10: the wireless remote programmer.

Technics rightly believes that CD programming is not something you should do while driving. In fact, the company feels you shouldn't have to be in the car at all: Before loading the CX-DP10's changer, you can pick out as many as 12 CDs, decide which selections you want to hear and in what order, and program the remote at your leisure at home. Then, when you're ready to hit the road, simply aim the remote toward the control unit and push a button to "transfer" the programming information.

There are five separate program-memory groups (labeled A through E). Group A is intended for long trips and holds as many as 35 disc/track selections. The four other groups, which hold five selections each, are for short trips (such as to the nearest CD store for replenishment). The dash-mounted control unit accepts only one group at a time and will retain that sequence in its memory until another group is loaded. The memory-play button on the remote calls up the existing program.

The remote's programming controls are located behind a slide-down cover that prevents you from accidentally changing an existing program. When closed, the cover cuts off power to the LCD readout, preserving the battery and therefore the program memory. The readout shows the group letter, the slot within that group, and the disc and track selected. You can review what you've programmed by pressing the recall button.

Besides the usual transport functions, the remote also includes a 10-second song-preview function and random play. The latter plays selections at random from among all of the loaded discs—great fun for pop recordings. Another memory button, not part of the remote's main programming array, enables you to preset as many as 35 disc/track selections directly into the control unit (in other words, you must be in the car). This is a conventional but far slower alternative to the memory-transfer method.

Ordinarily, you might think having so many of the changer's controls on the remote would be redundant. But the control unit itself can only start and stop play and initiate the random-play mode. So if you go cruisin' without the remote, you can still play CDs, but your programming and cueing options will be lost. To cite a familiar motto, "Don't leave home without it."

For the "Autophile" test drive, Technics pulled out all the stops. The company equipped a red (naturally) 1986 Porsche 944 Turbo with the CX-DP10 changer and control unit, a CQ-R9500 receiver/cassette-player ($600), a CY-EQ14 14-band graphic-equalizer/subwoofer-crossover ($270), and a generous complement of Technics amps and speakers. The entire system, including the installation, cost close to five grand. Add that to the $35,000-plus sticker price for the car, and presto! Instant yuppie.

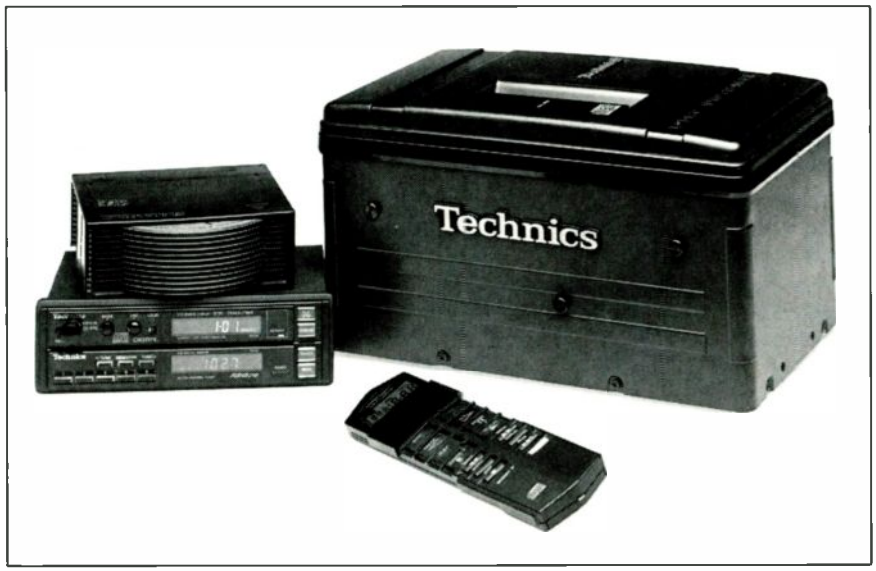
For editorial purposes, the Porsche was a bit of a distraction. It can go more than twice as fast as you need to get arrested. On Thanksgiving eve, I took it out for a late-night run on a local road that's perfect for occasional warp-speed maneuvers. Well, usually perfect: I ran straight into my first-ever DWI checkpoint. (Honest, officer—this *is* part of my job.)

The CX-DP10's changer mechanism was mounted in the car's trunk (actually, under the hatch), along with the amplifiers and some of the speakers. Because of the space needed to open the changer's lid, it's unlikely that a suitable location could be found within the passenger area of a car. The control unit was installed above the center console, beneath the CY-EQ14 equalizer and the CQ-R9500 radio/cassette-player (together, the three occupied two DIN spaces). When a CD is played, the CQ-R9500 automatically stops radio or tape play; when CD play is stopped, the radio or tape resumes.

Before exploring the CD programming features, I took the car to the torture track to check the changer's

ability to withstand vibration. For a car CD player, this is where the rubber meets the road—and the CX-DP10 met the road with poise, mistracking only on a couple of severe bumps taken at high speed. Keep in mind that I was *looking* for a bad trip, whereas one normally tries to avoid bruising one's kidneys, especially in a $35,000 car. In normal driving, no mistracking occurred. It should give you an idea of how far car CD players have come in suspension design that I was unable to induce mistracking by shaking the changer with both hands. (I'm glad no one witnessed this grisly assault, especially the guy from Technics.)

Programming the remote is simple: You select the group letter, punch in the disc and track numbers, and press the memory button after each entry. I was impressed by this intuitive procedure, which is as simple as that for most home CD players. Transferring a programmed group from the remote into the control unit worked as promised: You start the CD player, aim the remote, and press TRANSFER. The control unit confirms the selections on its display and automatically enters the pause mode; play will start when you hit the pause button on the remote. To save handset battery power, audible cueing works in an on/off fashion, not requiring that you hold down one of the search buttons.



The CX-DP10's remote control (foreground) sends commands to the in-dash control unit, shown at left above the matching optional tuner. The top panel of the changer mechanism opens to reveal the loading area for the 12-disc magazine.

This last, unusual aspect serves to illustrate the potential for misusing the remote control while driving. Each time you want to scan through a disc, you must push a button twice—that's two operations while your eyes are off the road. And if you want to skip a track or select a new disc, you have to locate those buttons on the remote. It's a trade-off. By having the remote, you get extensive and convenient programming features and an uncluttered, half-DIN control unit that might very well fit below or above an existing head unit. In return, you are expected to exercise restraint in the use of the remote while driving. The basic transport-control buttons are large and have raised symbols, making it reasonably easy to feel for the appropriate button without looking. Of course, if you have a passenger, he or she should do the work for you.

Since you can start and stop a disc and initiate the random-play mode from the control unit itself, you don't necessarily have to bring along the remote every time. But I wish Technics had provided a button on the control unit for starting memory play. After all, once you transfer a memory group, that information is retained by the control unit.

Using a stopwatch, I found that the changer takes between 15 and 22 seconds to go from playing one disc to playing another, depending on how many discs you skip. In comparison, it would probably take at least 15 seconds to reload an in-dash single-disc player. However, in the random-play mode, the silent periods will occur after almost any selection. I'm not sure the mechanical loading action could be significantly quicker, though, given the restraints of building an ultrastable mechanism.

Although it's not the subject of this review, the Technics CQ-R9500 radio/cassette-player performed well and made a good companion for the CX-DP10. As installed in the system, its four-way amplifier was bypassed in favor of the more powerful component models. The front-channel amp is built-in; the back-channel section is relegated to a separate hideaway chassis. Tape features abound and include all three flavors of noise reduction: Dolby B and C and DBX. A few functions are programmable between different operating modes (a fairly involved procedure); however, the most frequently used controls (tuner scanning, tuner presets, and tape scanning) are straightforward and easy to locate without looking. And the conventional knob arrangement for the preamp functions (volume, etc.) is particularly welcome.

The Technics CX-DP10 car CD changer system certainly has personality. So much, in fact, that one needs to be reminded that its basic performance is nearly flawless and its sound quality beyond reproach. But it takes time to adjust to the idea of a remote control in the car. As a driver, it calls for a certain degree of discipline. That's why Technics's simple programming procedure is particularly important: You are compelled to prepare your listening menu in advance, therefore keeping use of the remote to a minimum while driving. Used in that manner, the Technics CX-DP10 will be a rewarding choice.

For more information on Technics autosound products, contact Technics, Dept. HF, One Panasonic Way, Secaucus, N.J. 07094. □

Brain vs. Bulk.

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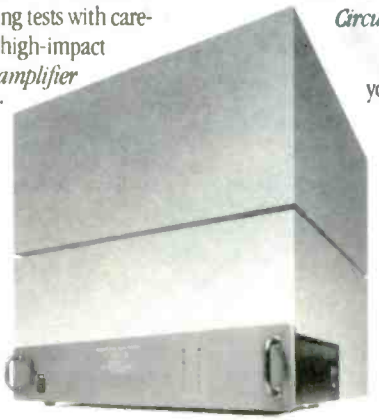
Bob Carver recently shocked the staid audiophile world by winning a challenge that no other amplifier designer could ever consider.

The new M-1.0t was judged, in extensive listening tests by one of America's most respected audiophile publications, to be the sonic equivalent of a PAIR of legendary, esoteric mono amplifiers which retail for $3000 each!

CARVER'S GREAT AMPLIFIER CHALLENGE. Bob Carver made an audacious offer to the editors of *Stereophile Magazine*, one of America's exacting and critical audio publications. He would make his forthcoming amplifier design sound exactly like ANY high-priced, esoteric, perfectionist amplifier (or amplifiers) the editors could choose. In just 48 hours. In a hotel room near *Stereophile*'s offices in New Mexico! As the magazine put it, *"If it were possible, wouldn't it already have been done? Bob's claim was something we just couldn't pass up unchallenged."*

What transpired is now high fidelity history. From the start, the *Stereophile* evaluation team was skeptical *("We wanted Bob to fail. We wanted to hear a difference".)* They drove the product of Bob's round-the-clock modifications and their nominees for "best power amplifier" with some of the finest components in the world. Ultimately, after exhaustive listening tests with carefully selected music ranging from chamber to symphonic to high-impact pop that led them to write, *"...each time we'd put the other amplifier in and listen to the same musical passage again, and hear exactly the same thing. On the second day of listening to his final design, we threw in the towel and conceded Bob the bout. According to the rules... Bob had won."*

BRAIN vs. BULK. Pictured is a photo of the 20-pound, cool-running M-1.0t. Above it are the outlines of the *pair* of legendary mono amplifiers used in the *Stereophile* challenge. Even individually, they can hardly be lifted and demand stringent ventilation requirements. And yet, according to some of the most discriminating audiophiles in the world, Bob's new design is their sonic equal.



The M-1.0t's secret is its patented Magnetic Field Coil. Instead of increasing cost, size and heat output with huge storage circuits, Magnetic Field Amplification delivers its awesome output from this small but powerful component. The result is a design with the dynamic power to reproduce the leading edge attacks of musical notes which form the keen edge of musical reality.

A DESIGN FOR THE CHALLENGES OF MODERN MUSICAL REPRODUCTION. The M-1.0t's astonishingly high voltage/high current output and exclusive operation features make it perfect for the demands of compact digital discs, video hi-fi and other wide dynamic range playback media. The M-1.0t:

Has a continuous FTC sine-wave output conservatively rated at 200 watts per channel into 8 ohms 20 Hz to 20 kHz with no more than 0.15% THD.

Produces 350-500 watts per channel of RMS power and 800-1100 watts momentary peak power (depending on impedance).

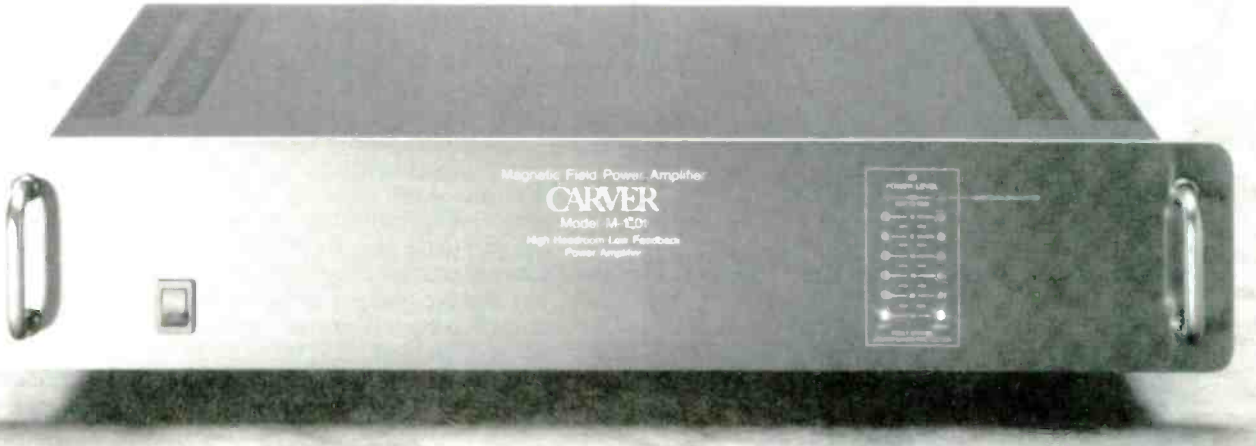
Delivers 1000 watts continuous sine wave output at 8 ohms in bridging mode without modification.

Is capable of handling unintended 1-ohm speaker loads.

Includes elaborate safeguards including DC Offset and Short Circuit Power Interrupt protection.

SHARE THE RESULTS OF VICTORY. We invite you to compare the new M-1.0t against any and all competition. Including the very expensive amplifiers that have been deemed the M-1.0t's sonic equivalent. You'll discover that the real winner of Bob's remarkable challenge is you. Because world class, superlative electronics are now available at reasonable prices simply by visiting your nearest Carver dealer.

Specifications: Power, 200 watts/channel into 8 ohms 20Hz to 20kHz, both channels driven with no more than 0.15% THD. Long Term Sustained RMS power, 500 watts into 4 ohms, 350 watts into 8 ohms. Bridged Mono power, 1000 watts into 8 ohms. Noise, -110dB IHF A-weighted. Weight, 20 lbs.



CARVER

POWERFUL MUSICAL ACCURATE

P.O. Box 1237, Lynnwood, WA 98046

Distributed in Canada by: evolution technology

Report preparation supervised by Michael Riggs, David Ranada, Christopher J. Esse, Robert Long, and Edward J. Foster. Laboratory data (unless otherwise indicated) is supplied by Diversified Science Laboratories.

Onkyo DX-G10 Compact Disc Player

One word best describes Onkyo's DX-G10 Compact Disc player: "imposing." We hasten to add that this description does not apply to the controls, which are as easy to use as those of most other CD players. Instead, what impresses us is the solidity and conservatism—with one exception—of the unit's design and construction.

DAVID WAGNER

Dimensions: 18¾ by 5½ inches (front), 16 inches deep plus clearance for connections.
Price: Approximately $2,200.
Warranty: Not available at press time.
Manufacturer: Onkyo Corp., Japan.
U.S. Distributor: Onkyo U.S.A. Corp., 200 Williams Dr., Ramsey, N.J. 07446.

There is only one major innovation in the unit, but it's an important one: This is the first CD player we've tested that uses true 18-bit linear digital-to-analog converter (DAC) integrated circuits. These chips, made by Burr-Brown of Arizona, are used with their full factory-recommended trimming circuitry and are individually calibrated in production for each player. The trimming circuit adjusts the four least-significant bits in the converter for maximum linearity (which leads to minimum distortion). The initial reference current used by each DAC to establish the "scale" of the conversion process is stabilized by a unique regulator using an LED/phototransistor link. Working backward in the circuit path, the digital input to the DACs comes from the player's four-times-oversampling digital filter. The DACs and the filter are connected by fiber-optic data links for maximum circuit isolation and minimum noise. There are separate regulated power supplies (including separate power transformers) for the disc-transport and electronics sections.

For minimum noise (and to make the volume-setting operation available on the supplied wireless remote control), the G10's back-panel variable output and the front-panel headphone output are controlled by a motorized potentiometer. In addition to the variable output, there are a fixed output, a coaxial (pin-jack) direct-digital output, and a

(Continued on page 31)

IF BI-AMPLIFIED SOUND IS THE CAT'S MEOW, GET READY FOR THE LION'S ROAR.

ALTEC LANSING INTRODUCES PENTAMPLIFIED™ SOUND.

Audiophiles have long been purring over the benefits of bi-amplified speakers. They point to the incredibly lifelike dynamic range. The reduced intermodulation distortion.

At Altec Lansing however, we've been pursuing much bigger cats.

Introducing the Altec Lansing BIAS™* 550. The first loudspeakers in the world with Pentamplified Sound.

The 550 is a system unlike any other. With discreet amplifiers for each of 5 bandwidths. A total of ten driver-dedicated amplifiers delivering 1400 watts of power. (.05% THD/1 Watt to rated power)

And because you can adjust the volume of each amplifier by remote control, you can tailor the sound perfectly for the nuances of your room.

From the very first moment, you'll hear subtleties you've never heard before. Startling dynamics. Airy sound staging. Reproduced without any noticeable coloration.

But of course, sophisticated technology demands equally sophisticated materials.

To complement our woven carbon fiber cones, we developed mid and high frequency drivers coated with diamond particles. Producing an astonishingly accurate high frequency response.

To eliminate resonance, we designed a unique double enclosure cabinet. Literally a cabinet within a cabinet separated by a layer of acoustical foam rubber.

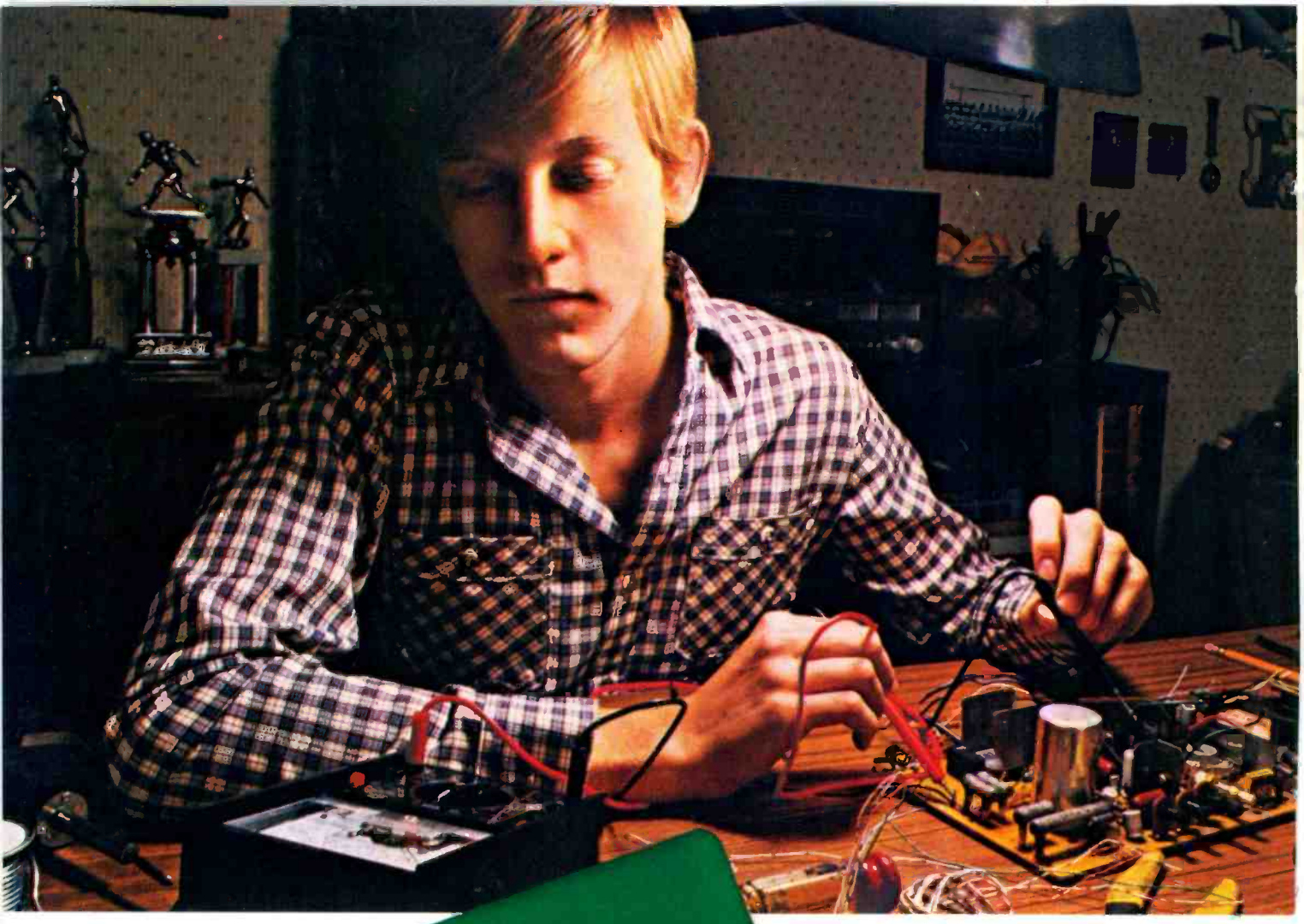
We believe the 550 to be the finest loudspeaker system in the world. For more detailed information and complete specifications call 1-800-ALTEC 88** and ask about our special demonstrations.

They'll be easy to find. Just follow your ears.

ALTEC LANSING®

Loudspeakers for the well trained ear.

*Built-in Amplification System **In PA or Canada call 717-296-HIFI.



Even if college isn't for you, the G.I. Bill Plus the Army College Fund can be.

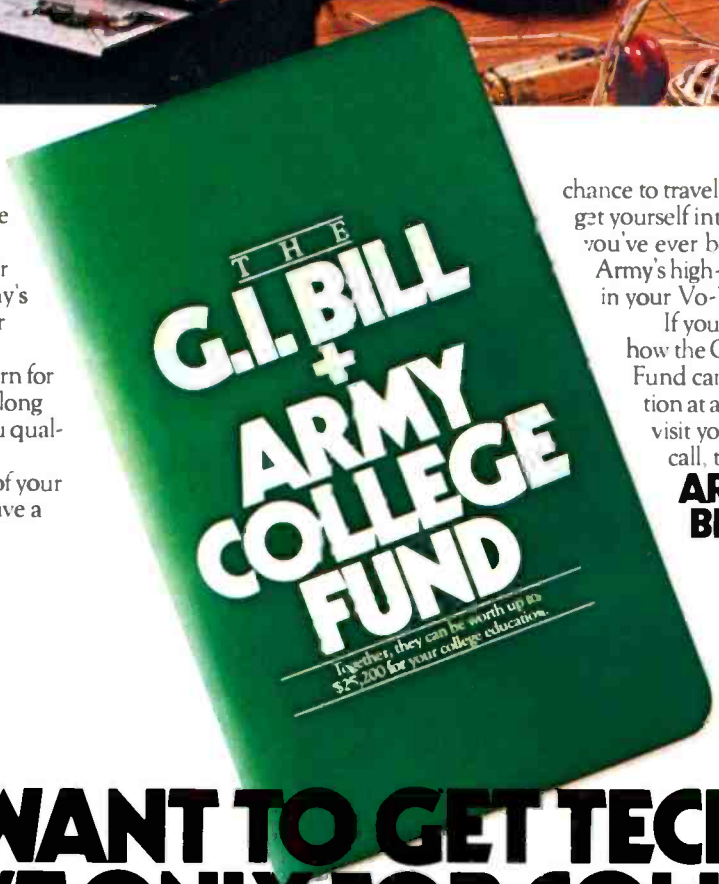
You can earn $17,000 for your Vo-Tech schooling with the Army's special Two-Year Enlistment. Or $25,200 if you serve four years.

Of course, how much you earn for your schooling depends on how long you serve and which specialty you qualify and enlist for.

But you'll get a lot more out of your enlistment than money. You'll have a chance to travel. To meet new people. To get yourself into the best physical shape you've ever been in. And, you'll get the Army's high-tech training that can help you in your Vo-Tech major and your career.

If you'd like to learn more about how the G.I. Bill Plus the Army College Fund can help pay for your education at an accredited Vo-Tech school, visit your local Army Recruiter. Or call, toll free, 1-800-USA-ARMY.

ARMY.
BE ALL YOU CAN BE.



IF YOU WANT TO GET TECHNICAL IT ISN'T ONLY FOR COLLEGE.

fiber-optic direct-digital output. The remote duplicates every front-panel function except the power switch and the large knob labeled SHUTTLE SEARCH.

Best used in conjunction with the pause control, SHUTTLE SEARCH controls the G10's audible-scan cueing function and is continuously variable in speed in both directions: The further you rotate the knob left or right, the faster the player scans backward or forward, respectively. This takes some getting used to, especially since the knob is spring-loaded to return to the center "neutral" position. But once you get the hang of it, you'll find it difficult to go back to the standard two-speed scan buttons found in other CD players. Very fast track-to-track access is provided by the linear-drive mechanism for the laser assembly. The laser scanner itself is a three-beam device.

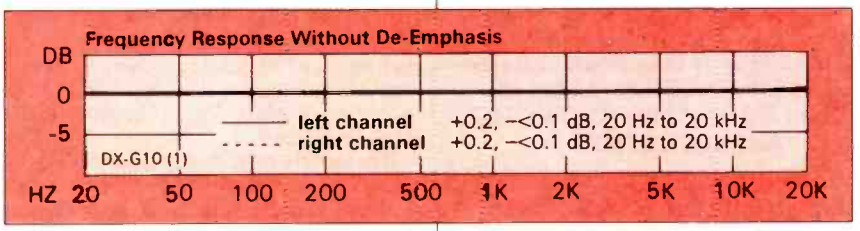
Most of the unit's other controls are behind a flip-down door running across the bottom of the front panel. These controls include a numerical keypad used to directly enter track cues and to enter selections in the player's 20-slot programmed-playback memory. Two repeat modes are available: whole disc (or program) and A–B looping. Index points can be reached upward or downward, in sequential order, using a pair of buttons, and the cueing system can also find specific times either within a track or in relation to the entire disc's playing time. The vacuum fluorescent display can be dimmed or shut off altogether with another button. A mode control cycles the track/time display through three settings: time remaining in the track, time elapsed in the track, and time remaining on the disc or in the programmed sequence. Lastly, for those concerned with absolute phase, a press of a button inverts the polarity of the outputs. Since the inversion is performed digitally, before the bit stream is fed into the DACs, the two digital outputs are also affected by the polarity button.

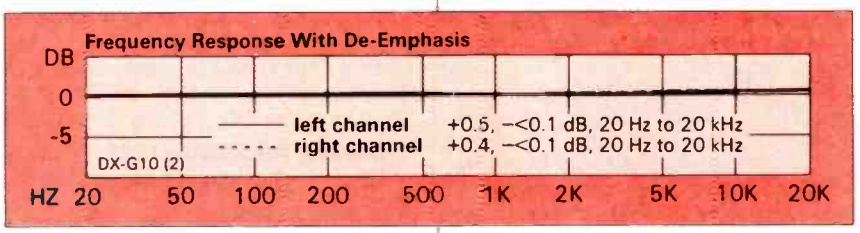
More surprising than the use of 18-bit electronics is the G10's size and weight: At approximately 50 pounds, the G10 is certainly the most massive CD player we have tested, in addition to being the largest. The weight comes mainly from the cast steel-alloy chassis, a construction used for strength, rigidity, and vibration isolation. The effectiveness of the design was shown by our informal "shock" tests, which consisted of blows to the top and side of the unit while it was playing a disc. Our fists reached their threshold of pain before play was interrupted.

As could be predicted from the use of high-quality 18-bit DACs, the G10 provided some outstanding lab-test results, even though our sample was an extremely early production unit (with a Japanese model number). For example, Diversified Science Laboratories reports that the unit's harmonic distortion at 0 and −24 dB was consistently below our already inaudible reporting threshold of 0.01 percent. Linearity was also outstanding, especially at the lower levels. Despite the lab's finding that the player skipped once at the 800-micrometer point during the surface-obstruction test, use of our pressing of the tracking-test disc (they are all slightly different) showed perfect tracking performance at that damage level. All the other electrical measurements were also good or better, and they show that, with the 18-bit G10, we are finally approaching true 16-bit performance.

As could also be predicted by the sound quality of contemporary CD software—which can provide, at best, only 16-bit performance—we were unable to hear anything in the G10's superb sound quality that could be definitely attributable to the use of 18- rather than 16-bit converters. We thought we could hear a difference when toggling the phase-inversion feature with the remote, but, in addition to being an uncontrolled test, any audible differences with this feature cannot be attributed to the increase in DAC resolution. If your ears are better than ours or if your music software actually is accurate to 16-bits (which is *extremely* unlikely, considering the comparatively poor conversion accuracy of professional digital recorders), you may be able to hear the two-bit difference. In any case, the lab measurements, the solid feel, the luxurious construction, and the smooth, accurate sound quality of the DX-G10 prove that it represents the state of the art in CD-player design and construction. ▶

All data were obtained using the CBS CD-1, Sony YEDS-7, Technics SH-CD001, Philips 410 055-2, and Philips 410 056-2 test discs





Channel Separation (at 1 kHz)	99 dB
Channel Balance (at 1 kHz)	± <0.1 dB
S/N Ratio (re 0 dB; A-weighted)	
without de-emphasis	≈ 107 dB
with de-emphasis	≈ 108 dB
Harmonic Distortion (THD+N; 40 Hz to 20 kHz)	
at 0 dB	<0.01%
at −24 dB	<0.01%
IM Distortion (70-Hz difference; 300 Hz to 20 kHz)	
0 to −30 dB	<0.01%
Linearity (at 1 kHz)	
0 to −80 dB	no measurable error
at −90 dB	± 1 dB
Tracking & Error Correction	
maximum signal-layer gap	>900 µm
maximum surface obstruction	≈800 µm
simulated-fingerprint test	pass
Maximum Output Level	
fixed output	2.23 volts
variable output	2.22 volts
Output Impedance	
fixed output	200 ohms
variable output	300 ohms

Reality Realized.

SONIC HOLOGRAPHY TRANSFORMS EXCITING NEW PROGAM SOURCES AS WELL AS FAMILIAR OLD ONES INTO TRULY LIFELIKE MUSIC EXPERIENCES.

Watch a movie on a 13" black and white TV. Now see it in 70 millimeter Technicolor with Surround Sound.

Listen to your favorite musicians on a portable radio. Now sit three rows back from the stage at a live concert.

The difference is dimension: Width, depth, breadth and detail that turn flat sensory input into breathtaking reality. They're the missing ingredients of live musical performance that Sonic Holography restores to records, compact discs and even hi-fi movie soundtracks.

The most experienced and knowledgeable experts in the audio industry have concurred. Julian Hirsch wrote in *Stereo Review*, *"The effect strains credibility – had I not experienced it, I probably would not believe it."*

High Fidelity magazine noted that *"...it seems to open a curtain and reveal a deployment of musical forces extending behind, between and beyond the speakers."* According to another reviewer, *"It brings the listener substantially closer to that elusive sonic illusion of being in the presence of a live performance."*

All this with your existing speakers and music collection.

HOW SONIC HOLOGRAPHY WORKS. Unfortunately, conventional stereo cannot isolate the output of left and right speakers and send their output only to your left and right ears. Left and right versions of a sound occurrence also cross in the middle of your listening room, confusing your ears with additional extra sound arrivals a split second apart. Stereo imaging and separation suffer because both speakers are heard by both ears, confusing your spatial perception.

The Sonic Hologram Generator in the Carver 4000t Preamplifier, C-1 Preamplifier and Carver Receiver 2000 solve this muddling of sound arrivals by creating a third set of sound arrivals. These special impulses cancel the objectionable second sound arrival, leaving only the original sound from each loudspeaker.

The result is a vast sound field extending not only wider than your speakers, but higher than your speakers as well. Sounds will occasionally even seem to come from behind you! It is as if a dense fog has lifted and you suddenly find yourself in the midst of the musical experience. Or, as the Senior Editor of a major electronics magazine put it, *"When the lights were turned out, we could almost have sworn we were in the presence of a live orchestra."*

IMAGINE THE POSSIBILITIES. Thanks to VHS and Beta Hi-Fi stereo soundtracks (found even on rental tapes), and the increasing number of stereo TV broadcasts, Sonic Holography can put you inside the video experience, too.

It's a breathtaking experience. Without the need for additional rear speakers, extra amplifiers or decoders, the visual experience is psychoacoustically expanded by lifelike sound that envelops you, transforming stereo from monochromatic flatness into vibrant three-dimensional reality. Instead of being at arm's length from the action, you are immersed in it.

Then there are the familiar audio sources which Carver innovation has further improved upon, each of which gains character and heightened impact through Sonic Holography.

Compact discs, whose potential is still trapped in the two-dimensionality of conventional stereo, are even more lifelike with Sonic Holography.

Thanks to the Carver Asymmetrical Charge-Coupled FM Detector, FM stereo broadcasts can be received hiss- and interference-free, ready to take on an astonishing presence and dimension through Sonic Holography.

Even AM stereo can actually become a three-dimensional phenomenon with Sonic Holography and the new Carver TX-11a AM/FM tuner which delivers AM stereo broadcasts with the same dynamics and fidelity as FM.

ENHANCE YOUR SPATIAL AWARENESS WITH CARVER COMPONENTS. When considering the purchase of a new preamplifier or receiver, remember how much more you get from the Carver 4000t, C-1 and Receiver 2000. Or add Sonic Holography to your existing system with the C-9 add-on unit.

Each can transcend the limits of your listening (and viewing) experiences by adding the breathtaking, spine-tingling excitement that comes from being transported directly into the midst of audio-video reality.

Visit your nearest Carver dealer soon and expand your range of experiences with Sonic Holography.

CARVER PO Box 1237, Lynnwood, WA 98046

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Test Reports

DCM Time Frame TF-1000 Loudspeaker

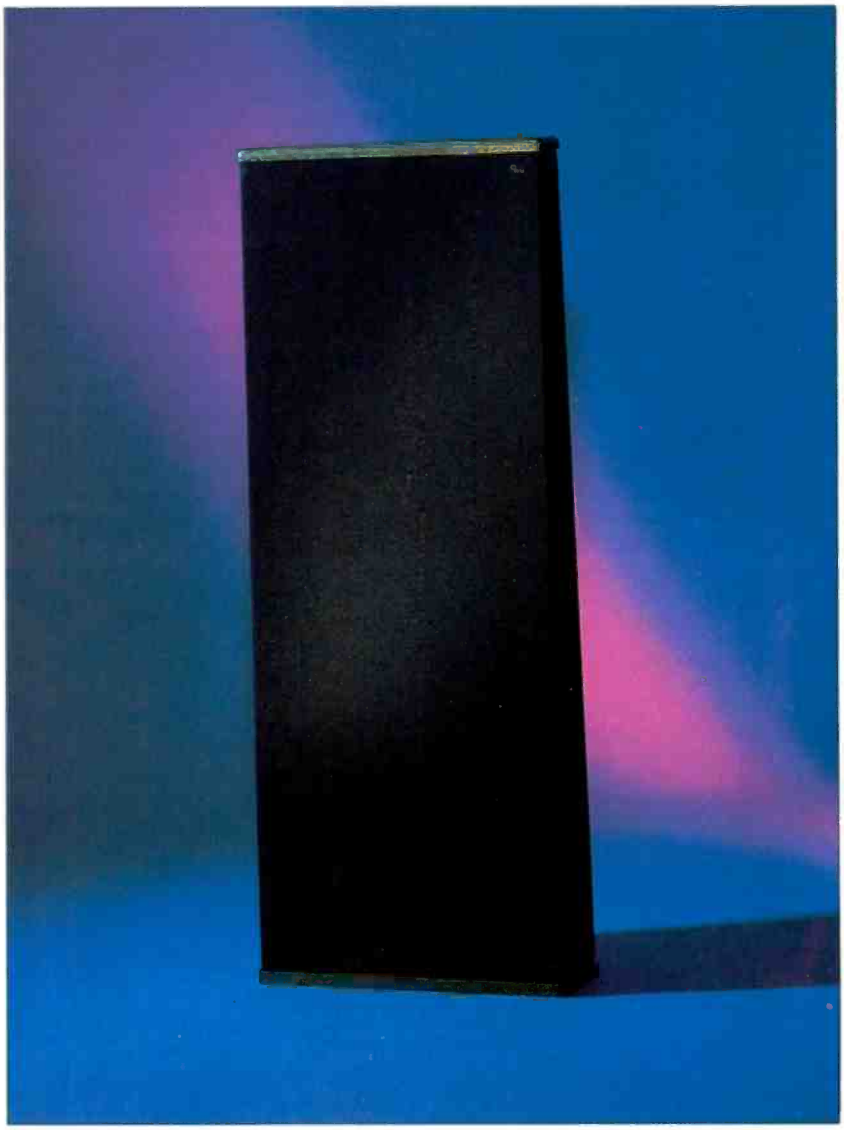
Last June, we reviewed DCM's TF-250 loudspeaker, the smallest and least expensive in the company's Time Frame series. Although the TF-1000 stands just one rung down from the top of that line, it nonetheless bears a strong family resemblance to the TF-250. The most obvious difference is size, with the TF-1000 being about 50 percent larger overall. The shape and styling of the speaker, however, are the same. A dark-brown cloth grille wraps entirely around the wide, shallow cabinet, which is capped top and bottom with wood endpieces finished in dark oak. Two short wooden feet swing out from beneath the cabinet to prevent it from tipping over. Amplifier connections are made to color-coded spring clips recessed into the back panel.

TF-1000s are sold in mirror-image pairs, with the drivers aligned almost vertically near the inner edge of the front baffle. On top is a 4-inch midrange cone, followed by a ¾-inch soft-dome tweeter and an 8-inch woofer. The tweeter is fitted with an acoustic lens to reduce diffraction, and the woofer is loaded by a tapered transmission line that terminates in a port on the front of the enclosure. All three drivers are on the upper half of the baffle; the port is a little more than halfway down, near the outside edge. As with other DCM loudspeakers, the TF-1000 is designed to minimize errors in phase as well as in amplitude response.

DCM makes no specific recommendation as to how far the TF-1000 should be placed from walls, so Diversified Science Laboratories measured the loudspeaker's response both against the back wall and several feet out into the room. The against-the-wall curves showed better bass response and about equal smoothness, so that position was used for all other measurements and for our published response graph. As you can see, the on-axis response is within about ±4 dB from 40 Hz to 16 kHz, and the off-axis spread is very similar—about +3, −5 dB over the same range. Particularly noteworthy is the excellent tracking of the two curves all the way up to the top octave, where most other speakers show significant divergence as the tweeter becomes more directive. The main feature of both curves is a trough centered at about 250 Hz. This undoubtedly is the result of interference from a reflection off the floor rather than a characteristic of the TF-1000's inherent response.

Sensitivity is fairly high, as is the impedance over much of the audio band. The latter ranges from a low of 3.3 ohms at 200 Hz to a high of 17.1 ohms at 1.5 kHz. Impedance from about 4 kHz up is in the vicinity of 5 ohms. At the bottom, below 70 Hz, the curve shows signs of the classic double hump that is characteristic of ported systems. The peaks are relatively subdued, however, probably because of the damping afforded by the transmission line.

In our 300-Hz pulse power-handling test, the TF-1000 accepted the equivalent of 26.8 dBW (481 watts) peak into 8 ohms, generating a calculated peak sound pressure level of approximately 118 dB. Distortion is impressively low, even in the deep bass and at high drive levels. At 85 and 90 dB SPL (our two lowest test levels), total harmonic distortion seldom topped 1 percent at any frequency and averaged well under that. Distortion naturally increases at higher levels, though surprisingly little in this case. Indeed, it never exceeded 2 percent



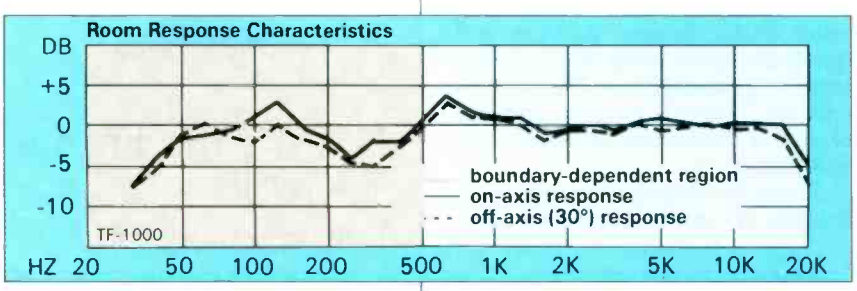
KENNETH SCHROERS

Dimensions: 19½ by 49¼ inches (front), 8 inches deep plus clearance for feet and connections.

Price: $999 per pair.

Warranty: "Limited," five years parts and labor.

Manufacturer: DCM Corp., 670 Airport Blvd., Ann Arbor, Mich. 48104.



Sensitivity (at 1 meter; 2.8-volt pink noise) 91 dB SPL

Average Impedance (250 Hz to 6 kHz) 10.2 ohms

at any frequency from 30 Hz to 10 kHz until the lab pushed the speaker to 100 dB SPL—our highest test level. This exceptional distortion performance confirms that the TF-1000 is capable of preserving the full dynamic range of today's finest digital recordings.

We confirmed this, as well as the smoothness suggested by the response curves, in our listening tests. When placed in just about any reasonable spot, the TF-1000 sounds good from just about any normal listening position. It provides truly full-range response, reaching from the bottom to the top of the musical spectrum. Tonal balance is even and uncolored, and the stereo image rendered from appropriately recorded works combines precision with a good sense of openness and depth.

DCM says it is particularly proud of the value delivered by its Time Frame line—justifiably so, we would say. The TF-1000 is not cheap, but for a speaker of its size and performance, it is something of a bargain. □

Harman Kardon TU-920 AM/FM Tuner

DAVID WAGNER

If you have a long memory, you may recall the Harman Kardon Citation 14 and 15 tuners, introduced in the early '70s. These were the first FM tuners to use phase-locked-loop (PLL) stereo demodulators. This innovation, combined with the growing use of integrated circuits (ICs), changed the face of tuner design to the extent that present-day tuners in just about any price category will outperform the very best you could buy 20 years ago.

Since then, there have been only two significant innovations. First came true digital tuning, which is mainly a convenience feature. Second were circuits designed to enhance effective stereo sensitivity by means of ingenious noise-reduction schemes. Now comes a third, from Harman Kardon, which the company calls Active Tracking tuning.

First introduced (appropriately) in the Citation 23 tuner, the Active Tracking system greatly enhances adjacent-channel selectivity without the traditional penalties of high distortion and poor channel separation. Its effectiveness is immediately apparent in our data column. The selectivity figures in the "wide" mode (Active Tracking off) are already quite respectable, but the effect of switching to "narrow" (Active Tracking on) is astounding. While alternate-channel selectivity improves by about 40 percent, adjacent-channel selectivity jumps by a factor of almost six to more than 40 dB—easily the highest reading we have ever seen for this measurement and as good as many tuners can do for plain old alternate-channel numbers. Channel separation does go down and distortion increases moderately, but neither change is dramatic enough to constitute audible degradation. The worst we can say about the Active Tracking circuit is that it almost doubles the capture ratio, which could make multipath more problematic in some situations. Otherwise, the system is almost purely beneficial.

At this point, you may be wondering why anyone would want 40-plus dB of adjacent-channel selectivity when most of us have been getting by on 4 or 5 dB—fairly typical figures for even very good tuners. The reason has to do with the way the Federal Communications Commission (FCC) allocates the FM spectrum. Each FM channel is 0.2 MHz wide, within which a station is allowed to modulate its carrier ±75 kHz around its assigned center frequency (the one you tune to—91.1 MHz, for example). That leaves a 50-kHz guard band between sta-

Dimensions: 17½ by 2¾ inches (front), 12¾ inches deep plus clearance for controls and connections.

AC Convenience Outlets: One unswitched (100 watts max.).

Price: $350.

Warranty: "Limited," two years parts and labor.

Manufacturer: Made in Japan for Harman Kardon, 240 Crossways Park West, Woodbury, N.Y. 11797.

YOU'LL NEVER HAVE TO SIT THROUGH ANOTHER AMATEUR NIGHT AGAIN.

How can you really enjoy professional entertainment when your equipment isn't professional?

You can't. And dbx can prove it to you. Here and now. And with a dbx dealer demo later.

For over 15 years, the greatest moments in entertainment have come through us. Today, you'll find dbx professional equipment at work at most every important recording studio, broadcast facility and live performance in the world.

With 75 patents and a recent Emmy for co-developing stereo TV, our list of firsts and onlies puts us in a class all our own.

The results are ready for you to take home now. Professional equipment with all the clarity, impact, nuance and range you couldn't get before. Even in the most expensive amateur systems.

The differences you'll see and hear are audible, visible and phenomenal.

For example, our Soundfield psychoacoustic-imaging speaker systems sound spectacular in any room. Anywhere you sit in that room.

Our audio/video preamplifier incorporates Dolby® Pro Logic surround sound using dbx proprietary technology. For the most thrilling home-theater performance you can get.

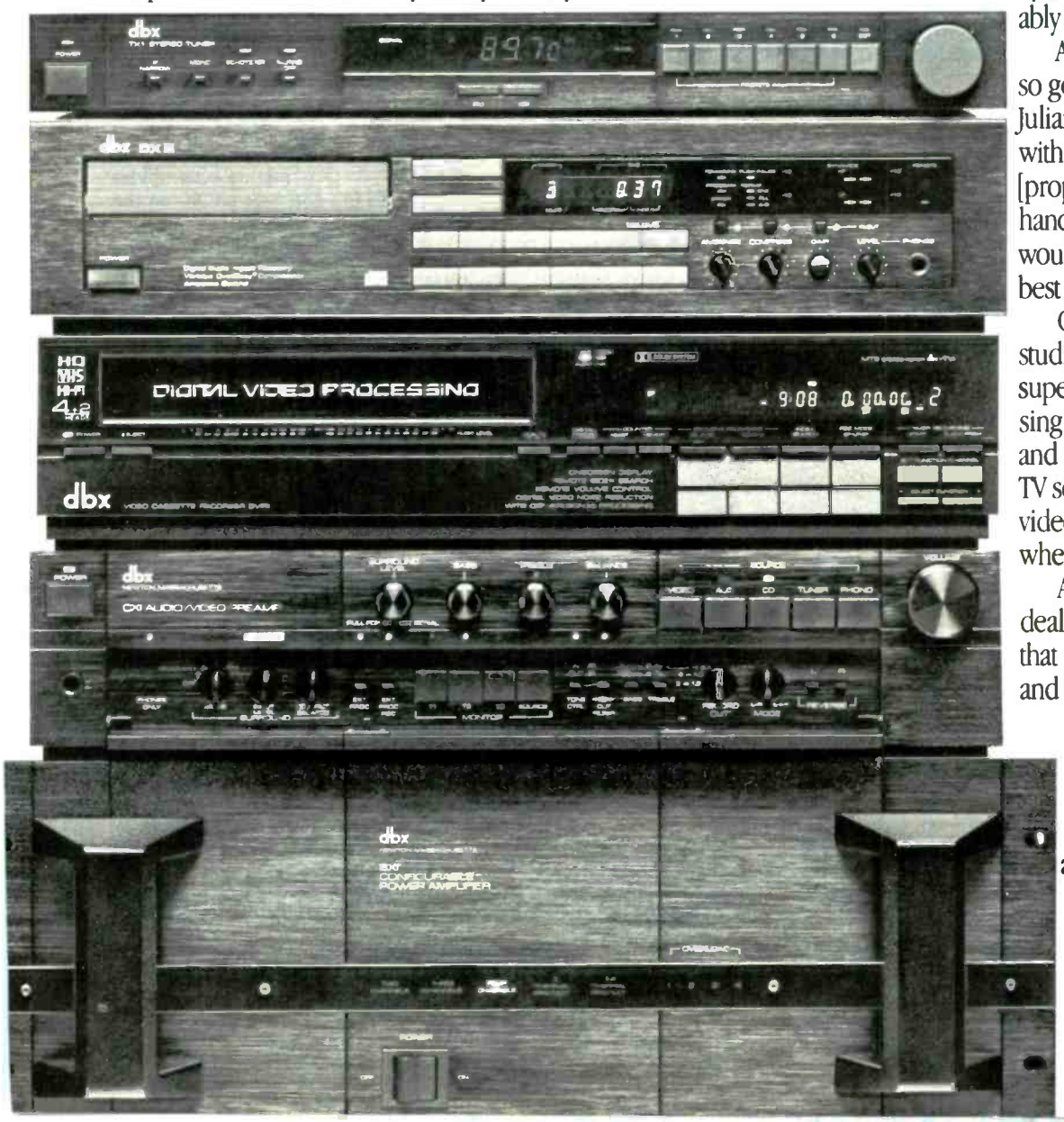
Our incomparable configurable 2/3/4-channel amplifier provides over 800 watts per channel in actual use. With a flatter response than amateur amps costing twice as much.

Add to these one-of-a-kind components our FM/AM tuner with Schotz® noise reduction, uncanny clarity and a noise floor way below what you're probably listening to now.

And a CD player that's so good, *Stereo Review*'s Julian Hirsch wrote: "Even without its special circuits [proprietary sonic enhancements], the dbx DX5 would rank as one of the best available."

Complete your home studio/theater with our superlative digital-processing VCR with VHS Hi-Fi and our own MTS stereo TV sound. And bring your video enjoyment up to where it should be.

A visit to your dbx dealer will convince you that your amateur days, and nights, are over.

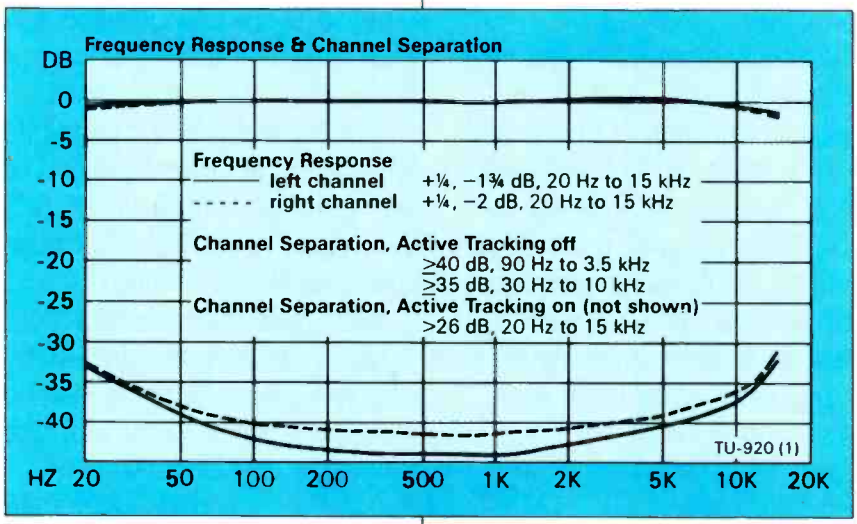


dbx®

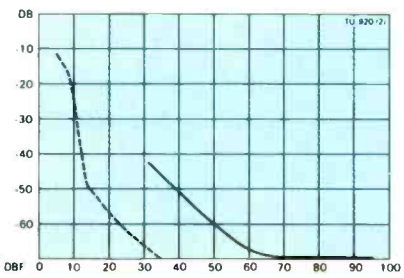
Audio and Video at its professional best.

Test Reports

Except where otherwise indicated, all data are for the Active Tracking (narrow IF) mode.



Sensitivity & Quieting



——— stereo quieting (noise)
- - - - - mono quieting (noise)

Stereo Sensitivity (for 50-dB noise suppression)		
38 1/2 dBf at 98 MHz, with 1.2% THD+N (38 1/4 dBf at 90 MHz; 39 3/4 dBf at 106 MHz)		
Mono Sensitivity (for 50-dB noise suppression)		
14 1/2 dBf at 98 MHz		
Scan Threshold (Mono)		32 dBf
Stereo Threshold		31 dBf
Stereo S/N Ratio (at 65 dBf)		69 dB
Mono S/N Ratio (at 65 dBf)		76 3/4 dB
Capture Ratio		
wide IF mode		1.6 dB
narrow IF mode		3.1 dB
Selectivity	**wide**	**narrow**
alternate channel	47 1/2 dB	67 1/2 dB
adjacent channel	7 1/4 dB	41 1/4 dB
Harmonic Distortion (THD+N)		
wide IF mode	**stereo**	**mono**
at 100 Hz	0.21%	0.15%
at 1 kHz	0.19%	0.08%
at 6 kHz	0.74%	0.15%
narrow IF mode		
at 100 Hz	0.32%	0.15%
at 1 kHz	0.22%	0.14%
at 6 kHz	0.84%	0.20%

tions that are adjacent on the dial—not enough space to prevent interference on a conventional tuner. Recognizing this technological limitation, the FCC assigns channels so that no two stations within a given reception area are less than two channels (0.4 MHz) apart. This is designed to ensure clean reception on any tuner with decent alternate-channel selectivity, which is easily achievable.

But times have changed. Tuners have become more sensitive than they were in the early days of FM broadcasting, enabling them to pull in signals from farther away. At the same time, the galloping success of FM radio has crowded the band to such a degree that, in major cities, it is absolutely jammed. There are virtually no open channels in New York City, for example: You'll find a station almost every 400 kHz along the dial. The big rub comes when you live a moderate distance outside such an area or, in the worst case, between two of them. Then you may find stations on adjacent channels fighting for your tuner's attention. Less obvious, though perhaps more intriguing, is the sin of omission. Your tuner might successfully suppress a distant, weak station occupying a channel adjacent to a nearby, strong station. This is better than interference, since you can pick up at least one station clearly, but if your tuner has superb adjacent-channel selectivity (as the TU-920 does), you might be able to get good reception of both with an antenna capable of coaxing adequate signal strength from the farther transmitter.

Previous approaches to obtaining high adjacent-channel selectivity have relied on extremely sharp bandpass filters in the IF (intermediate frequency) stage to strip away signals outside the desired channel. Unfortunately, the steeper the slope of a filter, the greater the phase shift it creates. And in FM, phase shift at this stage translates directly into distortion. The TU-920 uses less aggressive IF filters, which yield the perfectly reasonable selectivity figures shown in our data column for the wide IF mode. Switching the Active Tracking system on actually reduces the filter slopes and engages what Harman Kardon describes as a sophisticated PLL circuit that homes in on the desired channel's carrier frequency. The output from this circuit drives another that mimics the signal from the tuned station, except that it has a maximum deviation of ±85 kHz. It is the output from this second circuit that feeds the TU-920's FM detector. As a result, the tuner becomes essentially insensitive to out-of-channel signals, yielding high adjacent-channel selectivity without large amounts of distortion-inducing phase shift.

Apart from the selectivity, performance is about what you would expect from a tuner in this price range. Sensitivity is very good, and noise and distortion are adequately low despite the latter's deterioration at high frequencies. Response is perhaps a shade less even than we're used to seeing these days, with a tiny bump in the midtreble, a slight rolloff at the very top, and an even milder drop at the bottom. Separation, on the other hand, is quite good with the Active Tracking system on and outstanding with it off. We would prefer somewhat better pilot and subcarrier suppression, but in neither case is there cause for serious concern.

Features are also fairly typical, with one twist. Although the tuning is entirely electronic, you control it with a knob. A clockwise turn scans up the dial, a counterclockwise turn scans down. Going from one end of the dial to the other takes about 17 seconds. You can select automatic tuning (in which the TU-920 will seek the nearest station that it considers strong enough for decent stereo reception) or manual tuning, which steps in half-channel (0.1-MHz) increments. Switching to manual also turns the muting off, but it does not affect the reception mode. Instead, there is a separate mono/stereo switch.

The TU-920 provides 16 station presets on eight buttons plus a shift key. Each preset will hold one frequency on either the AM or FM band. A display window in the middle of the front panel indicates frequency, band, whether a station is tuned, whether it is in stereo, and the signal strength (on a five-LED readout with thresholds ranging from 18½ to 54½ dBf). The increments are more

tightly spaced in the middle of the range, between 27½ and 38½ dBf, where the information is most needed for antenna orientation. We were pleased to find that the back panel sports an F connector for 75-ohm FM antenna connections as well as the usual screw terminals for AM and 300-ohm FM antennas. There's even an unswitched AC outlet.

Operation of the tuner is absolutely straightforward, and performance is, as the numbers suggest, first-rate. The Active Tracking circuit did help us pick up some stations that otherwise would have been garbled beyond recognition or entirely missing; with a high-gain directional antenna, we no doubt could have found even more such stations. It's a terrific idea, and we hope to see much more of it in Harman Kardon products. Interestingly, we found that sensitivity seemed to increase a little with the Active Tracking turned off, so there is a good reason for the system's front-panel switch. In short, if you just need a basic tuner, the TU-920 will do the job; if you need something more sophisticated to handle difficult reception conditions, you're still covered. And either way, it won't cost you an arm and a leg. □

Test Reports

Stereo Pilot Intermodulation		
wide IF mode		0.01%
narrow IF mode		0.40%
Intermodulation Distortion (mono)		
wide IF mode		0.04%
narrow IF mode		0.06%
AM Suppression	**wide**	**narrow**
	64 ½ dB	64 ½ dB
Pilot (19 kHz) Suppression		40 dB
Subcarrier (38 kHz) Suppression		54 dB
Output Level (from 100% modulation)		0.79 volt
Output Impedance		2,450 ohms

Pioneer A-91D Integrated Amplifier

From where we stand, the flagship model in Pioneer's redesigned Elite Series is this integrated amp. The A-91D distinguishes itself on two counts: in the circuit-component and circuit-construction refinements employed in the interests of signal purity and in the comprehensiveness of its built-in digital switching and conversion circuitry.

Several of the measures taken are typical of those being employed these days to banish every conceivable source of signal contamination. For example, the A-91D's 65-pound weight is partly a result of its cast-iron transformer cases filled with damping fluid (to minimize vibration and maximize heat dissipation). Also typical of this trend are the concern for separation of functions in the internal layout and the use of intersection shielding, shortest-possible-path signal routing, and nonresonant mechanical construction. There is a honeycomb pattern stamped into the chassis panels to enhance mechanical rigidity, and the massive central finned heat sinks also adopt a honeycomb design to suppress fin vibration.

The internal layout assigns separate shielded bays to various functions, rather like industrial or military electronics. Most unusual is the digital bay, which contains separate digital-to-analog converters (DACs) for each channel with four-times oversampled digital filters. Its input is a digital "bit stream."

The switching for this section is exceptionally well thought out. There are direct-digital connections for as many as five digital-audio components, two of them digital recorders (either DAT units or digital-connection-equipped PCM adapters). DIGITAL 1 is a fiber-optic input connection; DIGITAL 2 and 3 are "coaxial" (pin-jack) electrical input connections. DAT 1 offers either optical or coaxial options for both input and output; if a plug is inserted into the electrical option, it overrides the optical feed. DAT 2 provides a coaxial input and output only. A major advantage of the optical connections is their freedom from possible spurious radio-frequency radiation, which could leak into nearby analog circuitry.

Both electrical and optical direct-digital input links deliver the digital bit stream to the built-in DACs, which convert only the signal that has been selected for monitoring or recording through the amplifier's analog section. All the digital outputs deliver the unaltered bit stream from a direct-digital input. For this reason, you can't record the digital output from a CD directly onto a DAT deck. The sampling rates aren't even the same,

DAVID WAGNER

Dimensions: 18 by 7 inches (front), 16½ inches deep plus clearance for controls and connections.

AC Convenience Outlets: Two switched (100 watts max. total), one unswitched (100 watts max.).

Price: $1,500.

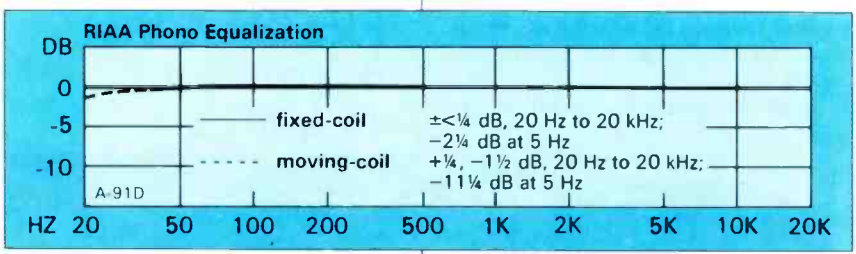
Warranty: "Limited," two years parts and labor.

Manufacturer: Pioneer Electronics Corp., Japan.

U.S. Distributor: Pioneer Electronics (U.S.A.), Inc., P.O. Box 1720, Long Beach, Calif. 90810.

Test Reports

Rated Power (8 ohms)	
	20.8 dBW (120 watts)/channel
Output at Clipping (at 1 kHz; both channels driven)	
8-ohm load	21.6 dBW (145 watts)/channel
4-ohm load	23.5 dBW (225 watts)/channel
Dynamic Power (at 1 kHz)	
8-ohm load	22.3 dBW
4-ohm load	24.6 dBW
2-ohm load	26.2 dBW
Dynamic Headroom (re rated power; 8-ohm load)	
	+1.5 dB
Harmonic Distortion (THD; 20 Hz to 20 kHz)	
at 20.8 dBW (120 watts)	< 0.01%
at 0 dBW (1 watt)	< 0.01%
Frequency Response	
	+0, −¼ dB, < 10 Hz to 28.0 kHz
	+0, −3 dB, < 10 Hz to 120 kHz



Sensitivity & Noise (re 0 dBW; A-weighting)		
	sensitivity	S/N ratio
aux input	13.3 mV	82 ½ dB
fixed-coil phono	0.21 mV	79 ½ dB
moving-coil phono	20 μV	80 ¼ dB
Phono Overload (1-kHz clipping)		
fixed-coil phono		205 mV
moving-coil phono		20 mV
Input Impedance		
aux input	44k ohms	
fixed-coil phono	49k ohms, 275 pF	
moving-coil phono	1,000 ohms	
Output Impedance (to tape)		765 ohms
Damping Factor (at 50 Hz; re 8 ohms)		300
Channel Separation (at 1 kHz)		72 ½ dB
Infrasonic Filter (phono only)		see text

and (unlike the built-in DACs) DAT electronics won't switch to the CD sampling rate. The myriad of switch settings necessary to accommodate all the permissible combinations of deck-to-deck dubbing (among two analog and two digital machines) is covered in a chart taking up half a page in the manual.

In addition to the five direct-digital sources, the A-91D has provisions for six analog sources: two tape decks, two aux, one tuner, and one CD player. The back-panel analog Tape 2 connections are intended primarily for insertion of a signal processor. The front-panel selector/monitor switch is set apart from the main switch array, together with a switch that selects the DAT 2 processor as the source for the built-in DAC. Individual stepper buttons serve as recording selectors for the analog and digital sections. The entire switching scheme is rather complicated, but evidently its ramifications have been carefully considered.

The remaining front-panel controls are quite straightforward. The main power switch is on the left; below it is a pilot light to show when the DAC is processing a bit stream (at any of the standard playback sampling rates: 32, 44.1, or 48 kHz). Below that is a headphone jack. To its right are the speaker selector (A, B, A+B, or off), the bass and treble controls, and the balance adjustment.

At the right end of the front panel are the volume control, a true muting switch (total output cutoff—not just 20-dB attenuation), the phono mode selector (MM/MC sensitivity, each with or without an infrasonic filter), and some mode selector buttons. The latter include one that steps from stereo through left-channel mono and right-channel mono (with the specified input fed to both outputs) and back. The others choose loudness compensation and "direct" operation.

The direct mode cuts out the tone controls, the loudness and mono/stereo controls, and the processor (Tape 2) loop. This is what we consider the standard mode for such an ultrapurist model, and Diversified Science Laboratories made most of the A-91D's very impressive measurements in the direct mode. We found only one performance anomaly with the A-91D: With the tone controls activated but at their detents, the amplifier has a noticeable rise in the bass response (particularly below 100 Hz), shelving at about +1 dB below 50 Hz.

The tone controls themselves are satisfactory in operation. Effective bandwidth handled by the bass control is altered somewhat by its degree of rotation. The maxima start digging in just below 1 kHz and have most effect (about 12 dB of boost, 9 dB of cut) below 50 Hz. Similarly, the TREBLE alters response slightly for at least an octave below 1 kHz. Moderate rotation of the treble control shelves response by 5 kHz or so, while maximum rotations deliver about 10 dB of boost or 9 dB of cut at 20 kHz. The loudness compensation has only a slight shelving effect on the treble (+3 dB, relative to 1 kHz, from about 6 kHz up in DSL's lowest-level test) but boosts the extreme bass by as much as 10 dB.

Phono response is extremely flat above 100 Hz despite very slight (roughly 0.1-dB) rises centered at about 500 and 10,000 Hz. At the bottom end, the fixed-coil (MM) trace shows a tiny rolloff without the infrasonic filter option engaged, while that for the moving coil is down a moderate amount (1½ dB at 20 Hz). Because the infrasonic filter is available only through the phono input and can't be measured in our usual way (through an aux input), the slope of the filtering is difficult to quantify. Suffice it to say that it is fairly steep, since it brings fixed-coil response down almost 3 dB at 20 Hz and 31 dB at 5 Hz (the middle of the warp frequencies). Moving-coil response with the filter on is down 3 dB at about 22 Hz, 4 dB at 20 Hz, and 39½ dB at 5 Hz.

In the distortion tests, no measurement exceeded our 0.01-percent reporting threshold. The amplifier section delivers 120 watts (20.8 dBW) into 8 ohms. Lowered speaker impedance increases the A-91D's current (and therefore power) moderately at each step with no sign of struggle. Pioneer appears to have opted for a well-regulated power supply, rather than spectacular dynamic-headroom figures.

All told, the A-91D is a worthy member of Pioneer's Elite family. Above all, we are impressed by the care that has gone into its design: the details of chassis layout and construction; the evidently high component quality; the comprehensive, thoughtful approach to analog and digital switching; the handsome, well-ordered appearance; and the solid, hefty operating feel. That it sounds great almost goes without saying. □

Phase Linear PLT-150 Car Power Amplifier

Though Phase Linear's history is somewhat checkered, it is nonetheless strewn with honors. The company was founded by the near-legendary Bob Carver, from whom control was wrested before he began his present company. Phase, as it is affectionately known, was sold to Pioneer, where it became an American subsidiary that continued to produce high-performance electronics (while also marketing certain high-end models built in Pioneer's Japanese factories). Today, Phase Linear is owned by Jensen, and, like its current parent, it designs equipment for manufacture under contract overseas.

The high-performance amplifiers that were the original company's entrée into a discerning market are the foundation on which the present model is built, at least in theory. But the PLT-150 is quite different in at least one important respect: As a car power amplifier, it must work from a 12-volt automotive battery, which cuts it off from the type of power-supply design that helped make the earlier home models such paragons of clean power. Instead, the PLT-150 is one of what Phase Linear calls its Turbo amplifiers: designs that can deliver plenty of dynamic power when working from a low-voltage supply, regardless of any limitations in terms of continuous (so-called RMS or sine-wave) power rating. The PLT-150, for instance, is rated at 30 watts per channel into 4 ohms but is intended to deliver the equivalent of as much as 150 watts short-term—for a period as long as half a second (500 milliseconds). This length of time is much more demanding than the 20-millisecond IHF pulse normally used in our tests (among others) to determine dynamic headroom.

On Diversified Science Laboratories' test bench, our sample's continuous output confirmed the basic rating but with little to spare. The clipping point turned out to be only 0.1 dBW (in this case, 1 watt) above rated power. As the data show, distortion is distinctly higher than we usually encounter at this level. However, the lab noted that these measurements were made only after the unusually long, high dynamic-power cycle had ended and that distortion drops considerably when measured at a level ½ dB or so lower.

In deference to the IHF amp-test standard and to the other amps that have been tested under it, we stayed with the mandated method. But the rated-power distortion figures we show should be taken as worst-case, not as characteristic of the model's actual in-use behavior. The lower test level (0 dBW, or 1 watt) revealed very little distortion. The measurements stayed below the reporting threshold almost to 1 kHz, where only the least objectionable spurious harmonic (the second) could be detected. Other harmonics did creep in at higher frequencies, but the measurement still remained below 0.02 percent up to the 10-kHz range—meaning that even in this range, our data show figures (0.087 percent at 20 kHz) that are not audible.

Remember, too, that the PLT-150 is unlikely ever to approach its steady-state clipping level with music or speech because of its high and long-lived peak-handling ability. Dynamic headroom measures a whopping 6.2 dB—a hair shy of the claimed 7 dB but huge by comparison to the 1 to 2 dB typical of home amplifiers. In effect, the amplifier's unusual design may work against it on the test bench, since it delivers numbers on some sine-wave tests that partially obscure its true capabilities with music: It can deliver more than four times its rated power on peaks. Suffice it to say that we had no listening-quality reservations of any sort at what we consider even semisane listening levels.

The PLT-150's design—satin-black with crisply painted legends—is unusually handsome. With superb (and very

DAVID WAGNER

Dimensions: 8½ by 2¼ inches (end), 10¼ inches long plus clearance for connections.

Connections: Pin jacks for low-level inputs and accessory line outputs; four-pin in-line male for high-level input harness and speaker-output harness, screwdriver terminal strip for battery, switching, head-end ground, and auto chassis ground. Supplied wiring and harnesses include extra-heavy battery lead with ring lug, two speaker harnesses with bare wires, switching lead with flat male connector, and head-end ground lead with spade lug.

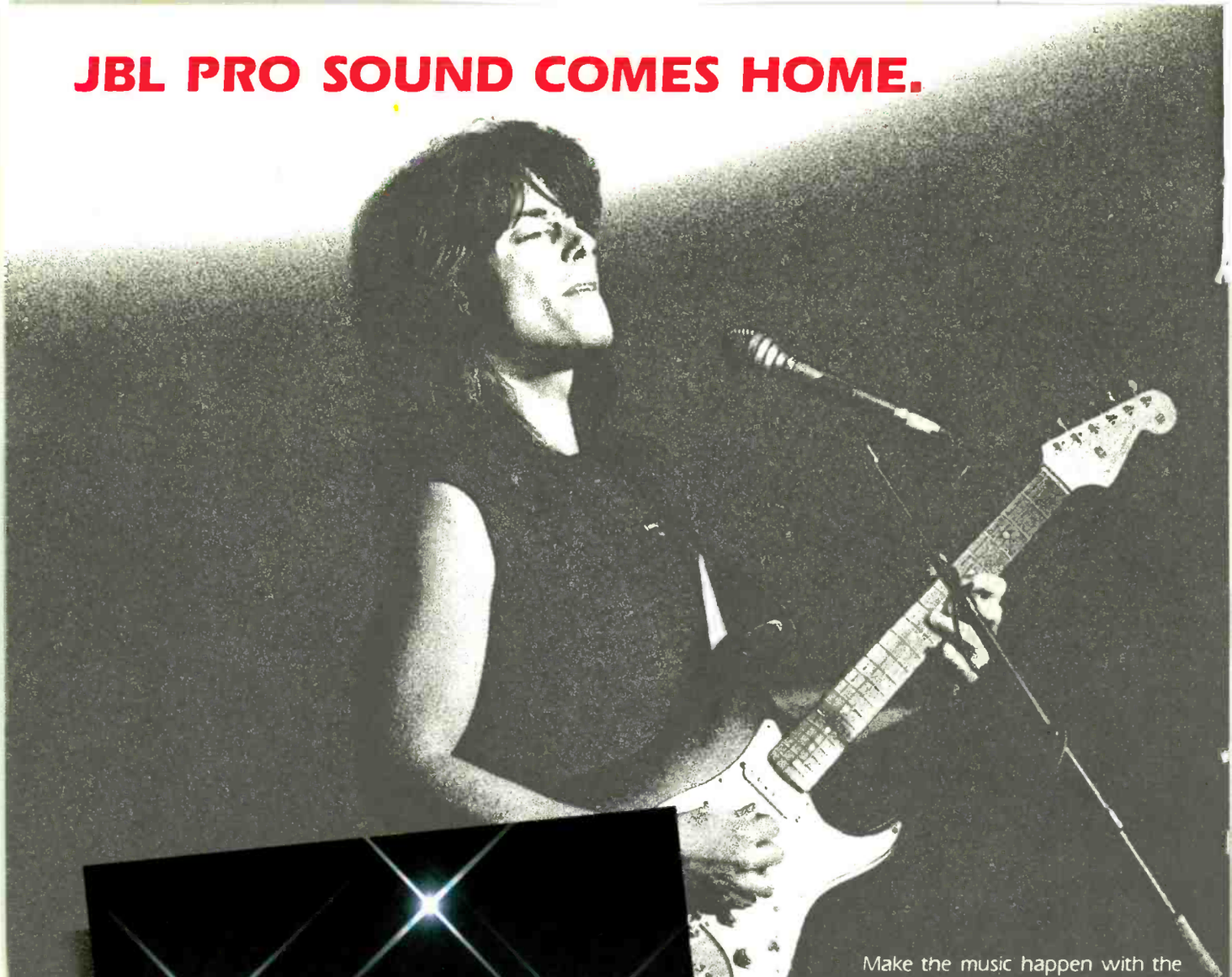
Fuse: 30-amp in battery cable.

Price: $275.

Warranty: "Limited, one year parts and labor.

Manufacturer: Made in Taiwan for Phase Linear, a Division of International Jensen, Inc., 4134 North United Parkway, Schiller Park, Ill. 60176

JBL PRO SOUND COMES HOME.



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rare) logic, one end is devoted to the inputs, the other to the outputs (and power connections). In case you opt for a visible mounting location, the top panel sports small pilot lights for both power and the protection circuitry. Mounting flanges on the bottom are fitted with heavy rubber grommets to electrically isolate the amp's chassis from that of the car. The ground connections (one to the head unit and one to the car chassis) are on the terminal strip, along with the battery connection. The mating wires are about 16 feet long. Stub harnesses are supplied for both the speaker outputs and the inputs from speaker connection on your existing radio, should the radio not have any line outputs. If it has line outputs, the PLT-150 has gold-plated line inputs to accept them.

Between the two sets of input connections are a screwdriver adustment for input sensitivity and a stereo/mono bridging switch. Beyond the low-level inputs are a second pair of pin jacks that serve as outputs should you want to cascade another device (for instance, a second, bridged PLT-150 to drive a subwoofer) from the amp. Such details of physical construction speak as eloquently on behalf of the PLT-150 as does its electronic behavior with music. It clearly has been designed and built with more than routine care and intelligence, and it encourages us to look forward to more exciting things from this new/old brand. □

Rated Power (4 ohms)	
	14.8 dBW (30 watts)/channel
Output at Clipping (at 1 kHz; both channels driven)	
4-ohm load	14.9 dBW (31 watts)/channel
Dynamic Power (4-ohm load)	21 dBW
Dynamic Headroom (re rated power; 4-ohm load)	
	+6.2 dB
Harmonic Distortion (THD; 20 Hz to 20 kHz; see text)	
at 14.8 dBW (30 watts)	≤ 2.6%
at 0 dBW (1 watt)	≤ 0.087%
Frequency Response	
	+0, – 1/4 dB, 15 Hz to 43.7 kHz;
	+0, –3 dB, < 10 Hz to 21.1 kHz
S/N Ratio (re 0 dBW; A-weighted)	
minimum gain	78 dB
maximum gain	65 dB
Sensitivity (re 0 dBW)	
minimum gain	230 mV
maximum gain	23 mV
Damping Factor (at 50 Hz; re 4 ohms)	20

Radio Shack Archer Surround-Sound Amplifier

Radio Shack has come up with a cost-effective introduction to surround sound, whether you want to recover encoded rear-channel tracks from prerecorded movies or enhance normal stereo listening. Compared with the more elaborate Dolby Surround systems we've reviewed, the Archer Surround Sound Amplifier from Radio Shack (catalog no. 15-1279) is plain vanilla. But it does give you what you need for an entry-level surround-sound system: licensed Dolby Surround decoding (which includes a 20-millisecond delay to the rear channels) and a rather modest four-channel power amplifier. If you already have a front-channel amplifier, you can switch the Radio Shack amplifier for bridged operation at higher power into a pair of rear speakers only. The frosting on the cake is an artificial-stereo synthesizer that can add life to a mono program source.

With the exception of the two-channel/four-channel bridging switch, all controls are on the front panel. Among them are a switch that turns on the unit's stereo-synthesis circuit and one that switches the surround circuitry between Dolby Surround (for decoding surround-sound movies) and STEREO ALL, the setting for delay-enhanced stereo reproduction. To the right of these are an input-balance knob (used to minimize leakage of dialogue into the rear channels) and a tone control (which progressively cuts the treble as it's turned counterclockwise). Two balance controls follow: The left knob sets the front/rear balance, the right adjusts the left/right balance. A three-position selector knob enables you to choose the source (the inputs—all line-level audio pin jacks—are labeled TUNER, TAPE, and VCR/TV). The volume knob on the far right controls all four outputs simultaneously.

On the back panel are stereo pairs of inputs for the three sources, tape-out jacks that permit you to record the source you've selected on a cassette deck or VCR, and line-level front-channel outputs. There is no center-channel output nor one for a subwoofer. Since there are also no rear-channel line outputs, you must use the built-in power amplifier to drive the surround speakers. Unfortunately, this cuts down on the unit's versatility.

There are four sets of push-to-insert speaker connectors, one each for front

DAVID WAGNER

Dimensions: 10¼ by 3¼ inches (front), 10 inches deep plus clearance for connections.

Price: $129.

Warranty: "Limited," 90 days parts and labor.

Manufacturer: Made in Korea for Radio Shack, Fort Worth, Texas 76102.

Processor Section

All data are for the front channels in Dolby Surround mode

Maximum Output Level (for 1% THD+N)	2.0 volts
Maximum Input Level (for 1% THD; surround mode)	2.0 volts
S/N Ratio (re 0.5 volt; A-weighted)	84 dB
Distortion (THD; 20 Hz to 20 kHz; 0.5-volt input)	≤ 0.24%
Frequency Response	± 1 dB, 20 Hz to 20 kHz
Channel Separation	see text
Input Impedance	49k ohms
Output Impedance	1,700 ohms

Power Amplifier Section

All data were taken with the amplifier in bridged mode

Output at Clipping (at 1 kHz; 8-ohm load)	8.7 dBW (7.4 watts)/channel
S/N Ratio (re 0 dBW; A-weighted)	62 dB
Distortion (THD at 1 kHz)	
at 9.9 dBW (9.8 watts)	3.0%
at 0 dBW (1 watt)	0.26%

and rear left and right speakers. If you are using the built-in power amplifier in the bridged mode, the right-rear speaker's terminals are connected to the right-front and right-rear "+" (red) terminals, and the left speaker to the left front-and-rear "+" terminals.

When testing the Archer unit, Diversified Science Laboratories used the VCR/TV input and adjusted the input-balance knob for minimum rear-channel output with a mono input. The single-knob tone control was turned fully clockwise to obtain the flattest response, and the volume was adjusted for unity gain to the front-channel line outputs. DSL chose to use the built-in power amplifier in its bridged mode and set the front/rear balance control for a 0-dBW output in the back channels with a 0.5-volt, 1-kHz out-of-phase input. At this level, rear-channel harmonic distortion is a modest 0.26 percent. The power amplifier shows signs of clipping at just shy of 8.7 dBW (7½ watts) but doesn't reach 3-percent distortion until delivering almost 9.9 dBW (10 watts). A-weighted noise is 62 dB below the 0-dBW (1 watt) reference—not bad when you consider this figure includes the noise from the rear-channel delay line.

Front-channel distortion is less than ¼ percent from 20 Hz to 20 kHz with a 0.5-volt input and is made up entirely of the relatively benign second harmonic. A-weighted noise is 84 dB below that reference level, and the input clipping level (as well as the maximum front-channel output level) is 2 volts, giving a potential dynamic range in the front channels of a very satisfactory 96 dB.

With the tone control fully clockwise, the front-channel frequency response is within 1 dB of flat from 20 Hz to 20 kHz. Reducing the control to its minimum results in a smooth rolloff of 6 dB per octave above 800 Hz. Input impedance is very satisfactory, front-line output impedance is adequately low, and there's the potential of almost 15 dB of gain to the front line outputs. All in all, there should be no problem interfacing this unit with normal audio equipment.

The Archer fulfills the specific Dolby Labs requirements of Dolby Surround processing. DSL measured the (fixed) delay time to the rear-channel outputs at 19 milliseconds (the standard calls for 20 milliseconds) with a high-frequency cutoff of 6.3 kHz (again, close to the 7-kHz Dolby standard). Bass response in the rear channels begins to roll off below 100 Hz and approaches a slope of 10 dB per octave at the lowest frequencies. Since there is also no subwoofer output, don't expect the gut-rending bass of more elaborate Dolby Surround systems.

As with early Dolby Surround processors (and many of the less exotic current models as well), the Radio Shack system uses "straight" Dolby decoding: The rear-channel outputs are derived from the out-of-phase front information without "logic" enhancement of separation. Thus, left-front or right-front information appears in the back channels only 6 dB below the rear-channel information. Nonetheless, left-front/right-front separation and center-front/rear-channel separation is at least 35 dB throughout the most important parts of the audio band—a respectable figure.

With the 20-millisecond fixed delay time used in the Radio Shack surround system, you should try to place the front and rear speakers equidistant from your viewing spot. The spare but readable manual provides useful speaker-arrangement suggestions. Careful speaker placement, along with careful adjustment of the front/rear balance, should ensure that the back speakers don't call undue attention to themselves.

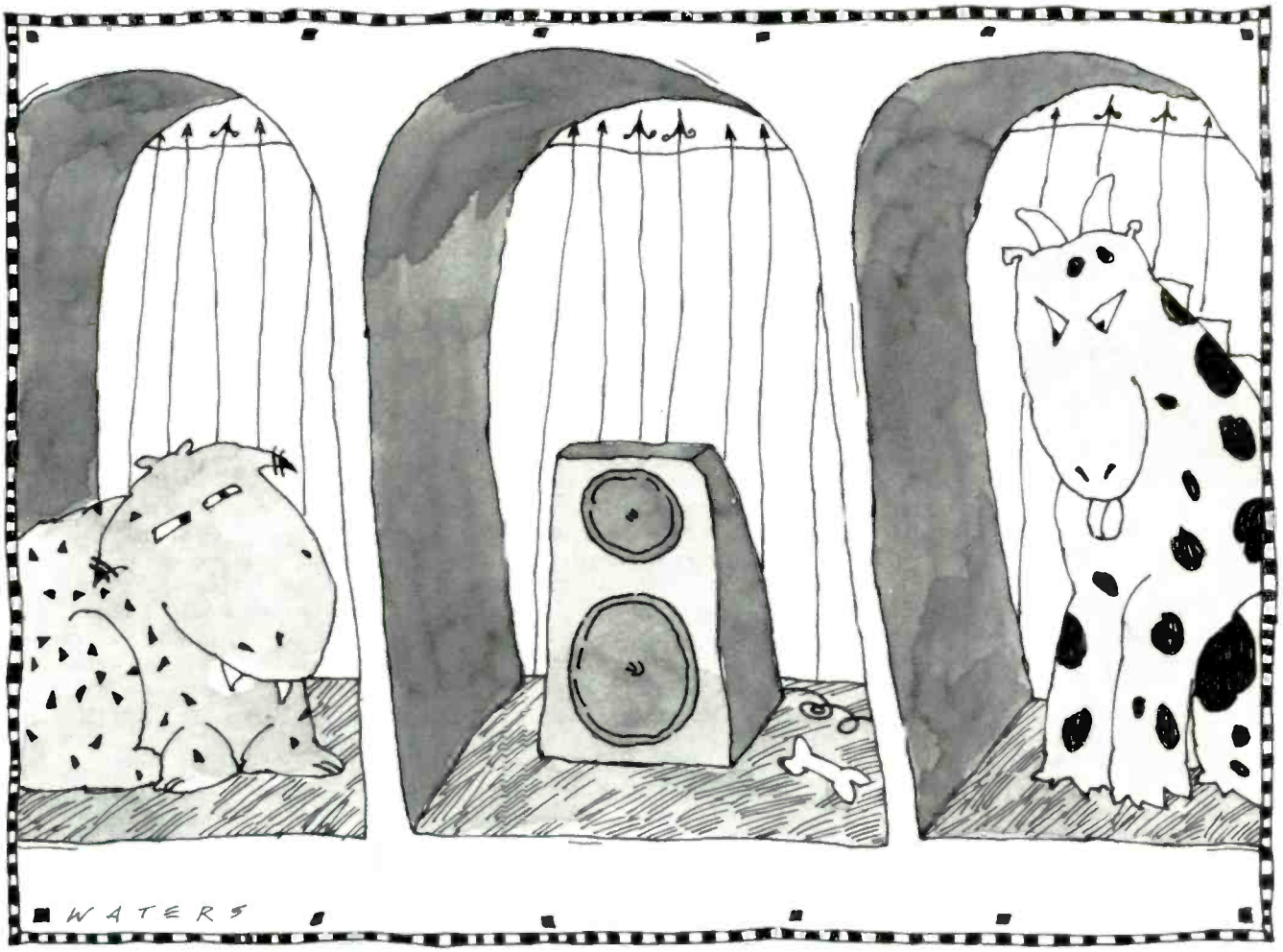
Once you've got the adjustments made, simply sit back and enjoy. This may not be the system for the spec-sensitive audio/videophile. But if you want to get a taste of what you've been missing—without spending a wad—the Archer Surround Sound Amplifier may be for you. Thrown in for good measure is a nice stereo synthesizer (using the complementary comb-filter technique that we prefer), and the price is certainly right. □

ABOUT THE dBW

We currently are expressing power in terms of dBW—meaning power in dB with a reference (0 dBW) of 1 watt. The conversion table will enable you to use the advantages of dBW in comparing these products to others for which you have no dBW figures.

WATTS	dBW	WATTS	dBW
1.0	0	32	15
1.25	1	40	16
1.6	2	50	17
2.0	3	63	18
2.5	4	80	19
3.2	5	100	20
4.0	6	125	21
5.0	7	160	22
6.3	8	200	23
8.0	9	250	24
10.0	10	320	25
12.5	11	400	26
16.0	12	500	27
20.0	13	630	28
25.0	14	800	29

CAGED SOUND



THOMAS WATERS

AN OVERVIEW OF THE INTIMATE—AND NOT ALWAYS BENEFICIAL—RELATIONSHIP BETWEEN SPEAKERS, ROOMS, AND LISTENERS

BY FLOYD E. TOOLE

An audio listening test can range from a controlled, double-blind lab experiment to the more common and much less scientific at-home evaluation of a record to the auditioning of a speaker at an audio store. In each situation, our perceptions and opinions can be influenced by many factors, not all of which are obvious. One of these "hidden factors," the listening room, is a major determinant of the sounds we hear.

Listening to the same recording or speakers in different rooms demonstrates that the effects of listening rooms are in no way subtle. Truly bad products will not be improved by even the most neutral rooms, but the perceived performance of good products can be degraded by quite ordinary rooms or by seemingly innocent decisions about interior decor. In short, the physical characteristics of listening rooms can alter most of the perceived qualities that are held as being fundamental to satisfactory stereo reproduction (see "Room for Errors," p. 44).

The variables that a room introduces into the listening equation conveniently fall into three categories: those related to a room's dimensions and proportions, those influenced by the positions of the loudspeaker and listener, and those related to sound reflection and absorption by the room and the materials in it. We'll discuss each of these in order.

Measuring Up

A room's proportions (length, width, and height) determine the frequency distribution of the room's resonances, while the room's precise dimensions determine the resonant frequencies. Another name for a room resonance is a "mode," which refers to a specific resonant frequency and its related distribution of sound-pressure maxima and minima within a room. In rectangular rooms, the mode frequencies and locations can be easily calculated.

For example, a large percentage of home listening rooms have ceiling heights of about eight feet. A seated listener's ear is thus close to the first null in the vertical resonance pattern (which occurs halfway between floor and ceiling). As heard by the listener, this will create a notch, or "suckout," in the steady-state frequency response at about 70 Hz (and alternate peaks and nulls at multiples of this frequency). This property of the room, which is independent of the speaker, shows how a com-

mon building practice has resulted in a common acoustical aberration. Fortunately, not all room resonances are equally important. Some are much more prominent than others because of the arrangement of speakers and listeners in the room or because some modes are inherently more "energetic" than others.

The issue is further complicated by the fact that not all resonances are equally audible. It has long been puzzling that music and speech can sound so natural in rooms that are horrendously flawed by a host of resonances. Resonances can sometimes be fairly obvious, but, by and large, they are not nearly so audibly bothersome as some measurements would appear to indicate. This seems to be the result of the resonances' usual medium-to-high "Q" characteristics: Each resonance covers a very narrow range of frequencies and requires substantial energy to be delivered at those frequencies in order for it to build up. When excited by the sounds of speech and music, which are mostly transient (or at least discontinuous) events, such resonances are not as apparent as they could be were they driven by sounds of longer duration. Thus, a kick drum can still sound "tight" in a room that might cause an orchestral bass drum or organ pedal to "boom" unnaturally and make male voices sound overly chesty.

Another aspect of room proportions is the basic one of size: The sound power required to fill a large room might unduly stress a loudspeaker that is perfectly satisfactory for smaller environments. This factor is sometimes forgotten when listening to speakers in dealer showrooms, some of which might be much *smaller* than the intended listening room at home. On the basis of an in-store audition, one could unknowingly select a model that has to be overdriven in order to generate adequate volume at home.

Taking a Position

Room dimensions usually must be accepted as is, but the listener can control one of the main variables in the speaker-room interaction: placement of the speaker and the listener both in relation to each other and in relation to the room. In general, speakers should be positioned according to manufacturers' instructions. That's easier said than done. You'll be lucky to get rough guidelines of things to avoid, let alone specific recommendations for placement of the speakers or the listener. A few manuals are very specific, the speakers they accompany having incorporated the positions of the adjacent room boundaries (walls, ceiling, floor) into their design.

Placement can, in some cases, have a greater effect on sound quality than can the choice of the speakers. For example, manuals rarely mention that the listener can choose to sit close to the speaker (to get the pinpoint imaging that can sometimes be revealed) or to lounge further back in the room (to pick up a more generous sense of acoustic space). And seldom do a speaker's instructions go into the effects of speaker and listener placement on bass response.

A major part of a room's effect occurs at low frequencies, below about 300 Hz. Let's take a detailed look at the two most important aspects of low frequencies in rooms: how the speaker interacts with room resonances and how a speaker's placement in relation to the room boundaries controls its bass output.

Acoustical coupling to the room resonances. The position of a speaker in a room determines the amount of energy supplied to each of the various room resonances. Likewise, the position of the listener determines the audibility of each resonance. For example, at the intersection of three boundaries (two walls and either the floor or ceiling), the sound source is at the most favorable point to efficiently activate all low-frequency room modes. An ear located in a corner is similarly an efficient receptor for all modes (though the body attached to that ear may be quite uncomfortable in such a position).

At locations away from the corners, the acoustical coupling is determined by the location of both the speakers and the ears with respect to the standing-wave pattern associated with each mode. For a perfectly rectangular, stiff-walled room, the maxima and minima for each mode can be predicted accurately. But in most rooms, the coupling of the sound from a speaker to a listener is akin to a lottery. Speakers with distinctive low-frequency-radiation characteristics, such as dipole-radiating speakers, add further confusion.

Figure 1 shows the type of variation typically encountered. It illustrates the change in bass response that occurs when listeners move into different regions of one particular room (with the speakers remaining fixed close to the end wall). Using the midroom position as a reference (solid curve) and moving backwards away from the speakers, listeners were aware of a slightly increased warmth in the upper bass and a loss of lower bass (dotted curve). Further back, the warmth remained and the low bass was greatly en-

Room for Errors

The size, shape, and acoustical characteristics of rooms—and the arrangement of speakers and listeners within those rooms—all have effects on the perceived sound quality of an audio system. The effects fall into two main categories.

First are variations in frequency response or perceived timbre caused by such factors as:

(a) the acoustical coupling of sound through the room's standing-wave system (the room resonances, or modes, that are related to its dimensions);

(b) listeners positioned on different direct-sound axes receiving different initial sounds from the loudspeakers;

(c) acoustical interference (comb filtering) that occurs when the direct sound and one or more strong early reflections combine at the listener's ears;

(d) variations in sound absorption in room boundaries and furnishings causing frequency-balance changes in reflected sounds, modifying the spectral balance of the integrated sound field at the listener's ears;

(e) strong reflections of inferior-quality off-axis sound from speakers affecting the spectral balance of the integrated sound field (a variant of the previous item);

(f) perceptual "amplification" of nondelayed resonances by reflections and reverberation (some sounds are *more* audible in a complex sound field);

(g) perceptual "attenuation" of delayed sounds by reflections and reverberation (some sounds are less audible in a complex sound field).

The second category includes such variations in the perceived spatial representation (imaging) as:

(h) those in the apparent "size" of auditory events (specific images) caused by reflected sounds, especially those in the horizontal plane;

(i) in the positions (lateral or in-depth) of auditory events by reflected sounds;

(j) in the sense of spaciousness or envelopment by reflected sounds, again mainly those occurring in the horizontal plane.

Although not every effect listed here is equal in audible importance, there is little left of the listening experience that is not in some way altered—either for better or worse—by room or speaker/listener-placement interactions. Ignore these effects at your own sonic risk. *F.E.T.*

hanced (the dashed curve shows a 10-dB increase at 30 Hz). These effects are not at all subtle: At low frequencies, a change of only 3 to 4 dB can result in a halving or doubling of perceived loudness. How a speaker sounds in any of these locations depends on its inherent bass response, but, in the room used for these graphs, the response of *any* speaker will be influenced in the manner shown. In your own room, the effects may differ from the example shown, especially if the room is not rectangular. Experimentation is essential.

In-room measurements can be a great help in sorting out some of these low-frequency problems. The popular full-octave or ⅓-octave spectrum-analyzer measurements are useful, but they lack the frequency resolution to identify the specific resonances responsible for a peak or notch in the response. Multiband spectrum analyzers reveal only broad trends in frequency response: In effect, they reduce the visible Q (narrowness or sharpness) of the room resonances and therefore are reasonably indicative of the audibility of the resonances during musical transients, although not during sustained tones. But measured indications will not always correspond with all of the audible effects, which is the main reason room equalization is a frustrating and frequently disappointing exercise. In fact, a spectrum analyzer may actually be more useful as a guide to speaker and listener placement than as a tool for equalizer adjustments.

The "solid angle" seen by the speaker. Speakers are often measured in a boundaryless "free field"—in an anechoic chamber or out of doors elevated above the ground—in which the sound can radiate in all directions. The speaker, it is said, radiates into 4π steradians (a full sphere). Placing the speaker on the floor reduces the solid angle by half, to 2π steradians (a hemisphere). Pushing it also against a wall reduces the solid angle to π steradians (a quarter sphere), and sliding it into a corner further constrains the sound output to a solid angle of $\pi/2$ steradians (one-eighth sphere). What happens to the sound from the loudspeaker under these vastly different circumstances is worth attention.

Consider a typical acoustic-suspension or vented "box" loudspeaker that is approximately omnidirectional in radiation pattern at low frequencies and that produces a relatively flat output in an anechoic chamber. If it is placed against a single, flat, very large surface, the speaker "sees" a solid angle of 2π steradians. If that surface is perfectly reflecting, the sound that would have radiated through the surface is reflected *forward*. The direct and reflected sounds combine and—if the distance from the loudspeaker to the surface is small compared to the wavelength—they will add up constructively, thus reinforcing each other. The sound pressure level at some distance in front of the loudspeaker will therefore rise by a factor of two (or 6 dB). For every additional halving of the solid angle seen by the loudspeaker, the sound level increases by a further 6 dB up to a whopping 18 dB for the loudspeaker at the intersection of three boundaries (such as a room corner). This is why bass response seems to rise as a speaker approaches a corner.

Boosts of this magnitude cannot be ignored. The heavy solid curve in Fig. 2 shows measurements taken eight feet from a speaker in the free field compared with measurements at the same distance when the speaker is on the floor in a corner of a room with (1) masonry walls (dotted line), (2) heavy plaster walls (dashed line), and (3) lightweight wood-frame walls (light solid curve). Three points should be noted. First, in all of these rooms there is a huge increase in low-frequency sound level over that which may have been intended for the speaker, especially if the speaker was designed to provide flat response in an anechoic chamber. Second, the increase is frequency-dependent, decreasing from the lowest frequency and eventually becoming irregular. Third, the amount of increase is room-dependent: A speaker that has abundant low bass in one room could sound a bit thin in another. In typical rooms, the low-frequency absorption can be substantial (because of vibrating walls, floors, windows, etc.), so that the acoustical gain is somewhat less than the theoretical 6 dB per halving of the solid angle. But the gain remains substantial.

The next exercise is changing the solid angle viewed by a speaker. Figure 3 shows measurements made in a room when the same speaker was placed on the floor at least three feet away from any wall (dotted line), moved against a wall, away from a corner (dashed line), and moved into a corner (light solid line). All should be compared with the speaker's free-field (anechoic) response (heavy solid curve). Note the persistent and difficult-to-eliminate dip at about 60 Hz (caused by the ear-height vertical resonance discussed above). These response alterations, together with additional nasties covered below, help explain why few manufacturers are very specific about advising listeners where to place their speakers. ▶

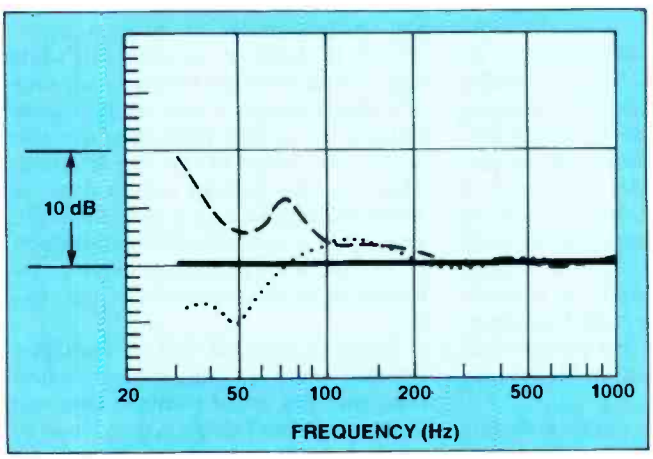


Figure 1: Using a midroom listening position as a reference (solid line), moving away from the speakers first produces the dotted curve, then the dashed response.

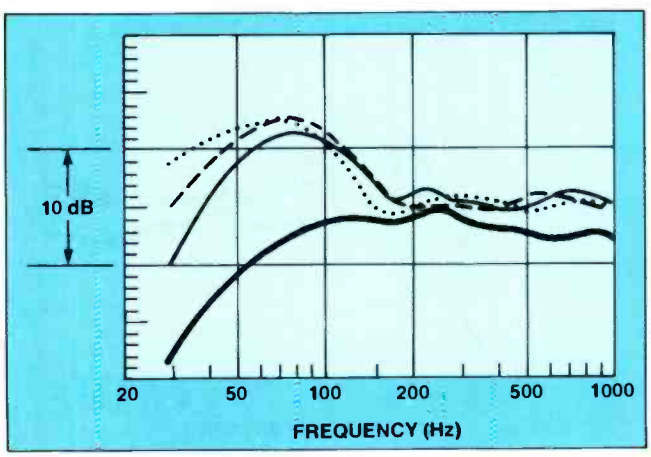


Figure 2: A speaker's anechoic response (heavy solid line) differs greatly from its responses on the floor in the corner of rooms of different construction (see text).

TECHNICAL ILLUSTRATIONS BY ALICE TOPP

Reflections on Reflections

Room-induced response alterations become less orderly—but smaller—above about 100 Hz. This is the frequency region where the direct and the reflected sounds go in and out of phase according to frequency and to the distance between the speaker and the adjacent reflecting room boundaries. If the speaker is moved away from the walls, for example, the irregularities can extend down to much lower frequencies, affecting not only the quantity of bass output but its quality as well.

As if that were not enough, the proximity of the room walls can also substantially affect stereo imaging. Sounds at mid and high frequencies that are reflected from side walls can expand the soundstage and enhance the sense of spatial envelopment. Whether this is desirable depends on three conditions. First, if the sounds bounced off the walls are of poor quality (having very colored frequency response, for instance), the deterioration of sound quality may offset any gains in spaciousness. Second, not all recordings are flattered by this kind of postprocessing, either because it is musically inappropriate or because the recording already has enough spaciousness. Third, you may not like the increased fuzziness of the resulting stereo image.

With multidirectional speakers designed to maximize room-reflection effects, the listening room has an especially strong influence. Movable drapes along the rear and side walls can be useful acoustical devices—a kind of nonelectronic spatial equalizer that enables the listener to tailor the reproduction to better match the recording. One side effect of augmenting spaciousness via reflections is that listener position matters less: Since the image is more vague, changes in it are less important. Another result is that poorly made recordings deficient in ambience can sound less glaring.

Recent research has drawn a distinction between two main categories of room reflections—early reflections that are relatively discrete (separated in time) and the directionally and temporally confused later sound commonly called reverberation. Both of these contribute separately to different aspects of the perception of sonic space and sound quality. In fact, when one examines the matter more closely, it becomes necessary to separate out the early lateral reflections (those arriving from the sides of the listener) as being more important than those arriving from other directions or later in time.

This interpretation of the term "reverberation" as a series of reflections—each with a given direction—is of greatest relevance to audio. It has an additional justification in normal listening rooms where, because of the small distances involved and of the reflectiveness of the room boundaries, it is possible for some of the early reflections to compete in level with the direct sound. In very well-damped rooms, an entire sound event may be more usefully viewed as a sequence of reflections, with little diffuse reverberation.

It is now generally acknowledged that early lateral reflections contribute to a sense of perceived spaciousness in the sound. Those reflections containing mid and low frequencies contribute to a perception of depth or envelopment, while higher frequencies can cause a broadening of auditory images. Under some circumstances, the earliest reflections can also modify the timbre of the overall sound. This is usually thought to be a result of acoustical interference (comb filtering), although it is normal to find that the perceived coloration is less than might be expected from measurements of interference.

The complicated tail of multiple-reflected sound following the early reflections stretches sound events in time and seems to give our hearing system longer to extract detailed information about some aspects of timbre. The addition of reflections and reverberation to sounds appears to increase the ear's sensitivity to certain resonances or timbral subtleties and to decrease the sensitivity to some delayed sounds. Thus, it can enhance the timbral richness of sounds while minimizing the detrimental influences of discrete delayed sounds. These effects seem to occur regardless of whether the reverberation is in the recording or is provided by the listening space. This can be a source of confusion in listening evaluations conducted with different recordings in different listening rooms.

The importance of the strength, spectrum, timing, and incident angles of early reflections places a special significance on the specific location of sound absorption, diffraction, and reflection surfaces with respect to the locations of the speakers. This is usually not acknowledged in the traditional literature on room acoustics. (The party line is that, acoustically, a rug is a rug, regardless of its placement.) Control of early reflections is, however, a matter of much current interest on the part of some innovative speaker manufacturers, who seek designs that will make the most of typical listening environments. Recording studios appear to be on an independent—and sometimes quasi-mystically misguided—quest for the optimum combination of speaker and control-room acoustics for monitoring purposes. At some point, the professional and consumer audio industries must come to grips with the fundamental differences between what goes on in recording-studio control rooms and what is heard in the home.

That won't happen unless there comes to be some understanding of how rooms, sounds, speakers, and listeners interact. This discussion has drawn attention to some of the problems existing in loudspeaker/room/listener interactions. Much more remains to be learned, but we know enough to understand the reasons for some of what we hear and to help us avoid some of the worst problems that are likely to be encountered. One thing is certain: There will be problems. It is important to be flexible and to *experiment* with different speaker and listening-spot arrangements and room treatments—until the most satisfactory combination is found. □

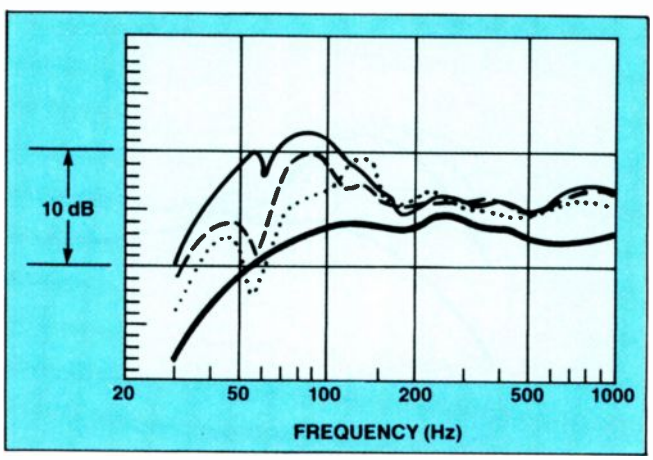


Figure 3: As the space into which a speaker is firing is progressively halved, its bass response becomes boosted compared to its anechoic response (heavy solid line).

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It's been a scant 10 or 12 years since car eight-tracks gave way to cassettes and the quest for mobile high fidelity began in earnest. Back then, if you wanted more than the standard 3 to 5 watts per channel, you bought a Craig Powerplay model and dazzled your friends with a thundering 12 watts a side. However, people of a less demanding audio nature were asking, "Why on earth do you need that much power in a car?" Several years later, a rumor that the high-end store across town had an ADS speaker system with a 50-watt amp set *me* to thinking, "Why on earth do you need that much power in a car?"

Then as now, the answer is that the extra power means greater sonic clarity and the potential for more volume. You don't have to be a decibel addict to appreciate the audible improvement a larger amplifier can make in virtually any system. Yet many people with four-figure investments in their home stereo systems still regard outboard car amplifiers with the kind of overkill sentiment usually reserved for nuclear arsenals. True, extra amplification complicates any installation, adding not only to the expense but also to the possibility of picking up noise from the engine or the car's electronic accessories. Realistically, though, it's the only way to achieve sonic excellence in a motor vehicle. Consider that, at 60 miles per hour with all windows closed, a car typically generates more than 65 dB of background noise—a level that even the so-called high-power radios have trouble overcoming.

The first step in adding an amplifier to your autosound system is to determine the kind of output connections provided on your radio, which may have a bearing on the type of amp you choose. Low-level, high-impedance preamp outputs are characterized by either RCA pin jacks (also called phono connectors) or a DIN plug, the latter a multipin connector about the size of your thumb. Typically, preamp outputs bypass a radio's internal amplifier and consequently supply a much cleaner signal to an outboard amp. Assuming the radio and amp are compatible, this is the connection of choice. However, most amplifiers offer a sensitivity adjustment to match a wide range of inputs, so signal-level compatibility should not be a problem (although it doesn't hurt to ask before you buy). If your radio has a DIN preamp output and the amplifier has a pin-jack input (or vice versa), a $10 adapter should mate the two. (Note that because DIN plugs are either male or female, a DIN-to-RCA adapter will not work for an RCA-to-DIN connection.) If both radio and amp have DIN plugs but are not the same brand, beware! A minimum of two adapters may be necessary, and you're asking for trouble in terms of noise, interference, and electronic compatibility. Fortunately, most amps with a DIN input have pin-jack inputs as well. Note: Never cut a DIN plug or pin-jack cable in an effort to splice the connection. This voids your warranty, even if a later problem is completely unrelated.

If your in-dash radio has neither DIN nor pin-jack outputs, a high-level, low-impedance connection to the amplifier will be required. Such connections, otherwise known as speaker-level or booster inputs, entail splicing the left- and right-channel positive and negative speaker wires from the in-dash unit to corresponding input wires on the amp. Caution: If the amplifier has only one negative input, but your radio has two out, do not splice all three together—you'll fry the output stage of your radio. What you should do is procure a floating-ground-to-common-ground adapter. Better still, get a speaker-to-RCA adapter/attenuator, which is your only choice if the amp doesn't have booster inputs (some don't).

Enough about wiring—let's talk watts. The number of brands

Power Choices

There's no reason to settle for wimpy sound in your car. For as little as $40 you can beef up your system with an outboard amp.

BY JAY C. TAYLOR

and models of car amplifiers is enormous and continues to grow. Even car-speaker manufacturers who previously had no intention of selling amplifiers have learned that big amps help sell their expensive speakers. A number of the best car amps are made in America, if you'll pardon the flag-waving. Prices for U.S.-made amps are competitive with those of products from the Orient, partly because of the fallen value of the dollar against foreign currencies.

Starting with the most basic mobile amplification, you'll find a number of models classified "BTL" (bridged transformerless). This simple design can produce 10 to 20 watts per channel with reasonably low distortion—typically one percent or less. Without a power "inverter" to step a vehicle's 12-volt power source to higher voltage, more power simply cannot be produced, regardless of any extravagant claims to the contrary. But don't underestimate what a modest BTL amp can do in comparison to your existing low-power radio: It will add immeasurably to your musical enjoyment and may set you back as little as $40. Alternatively, if you're starting from scratch, buy a radio with a built-in "high power" amp; the BTL circuitry adds only about $30 to the retail price of otherwise identical radios.

If you want to venture beyond the teenywatters, you're going to pay a premium. Anything with a legitimate 20-watts-plus (per channel) must include a power inverter to step the 12-volt source to a higher figure. This means you not only pay more bucks ($100 and up) but you get a bigger package—the inverter has to go somewhere. Beyond 20 watts, buying considerations become more interesting. Now you have to decide if you're after watts-per-dollar, sound quality, or a combination of both. Soundstream, for example, has a $350 25-watt-per-channel Class A car amp that's perfect for driving tweeters or small speakers in a multiamp system. But if you've got a $250 in-dash receiver feeding a $79 pair of 6-by-9 speakers, a Class A amp may not be the most appropriate investment. The same bucks might buy 100 watts per channel in a more conventional design—raw power that will serve you well the next time you're doing 60 with the windows down.

Other power-related considerations include the application you have in mind. If you need to power a subwoofer, find an amp that can be bridged to mono. Bridging often more than doubles a stereo amp's power output. In addition, the output power of some amps increases into lower-impedance loads. For example, two 4-ohm woofers wired in parallel will present a 2-ohm load to an amplifier. If the amp is designed to handle such a load, its power output may nearly double. Here's where it's very important to know the capabilities of an amp—that is, just how far it can be stretched. Amplifiers not designed to operate with a 2-ohm load will undoubtedly overheat in protest. Even worse, if the amp does not incorporate a thermal protection circuit that shuts it down to cool, it will cook itself and possibly the speakers attached to it.

The lesson here is to plan your amplification for both current use and any future upgrading. Keep in mind that if you start with a modest amp to power full-range speakers and you later want to add a subwoofer or two, a larger amp will be in order for the low frequencies. Most likely, the existing amp will then become the smallest in your future system and will never see duty in a bridged-mono configuration. In my experience, a high-quality, no-frills model therefore makes the best cornerstone for a future multiamp system.

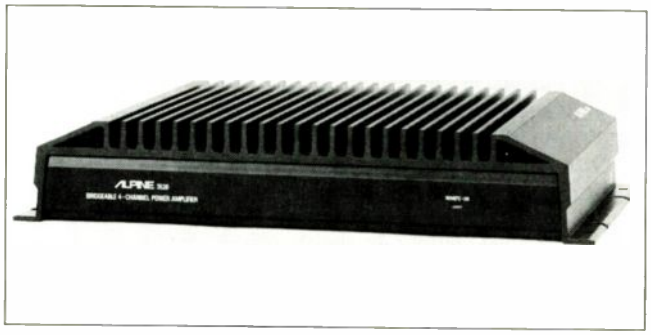
If you don't have room for a biamp or triamp system, then three-, four-, five-, and even six-channel amplifiers are available. In a multichannel design, two or more amps share the same chas-

Power Choices

sis and frequently the same power supply, providing a savings of space and dollars. Multichannel models are a logical choice for all but megawatt installations and usually save time (and therefore money) on installation as well. Many feature built-in crossover networks, which further reduce cost and installation space (assuming the choice of crossover points and slope fulfill your system requirements). Flexibility is further enhanced if the multichannel amp offers bridging options. For example, a four-channel model could be bridged to three (stereo plus a high-power mono channel for a subwoofer) or even two (for maximum power to a single pair of speakers).

Another advantage of a single chassis is a significantly reduced chance of noise, since the combined amp sections share a common electrical ground to the vehicle. This eliminates the potential for ground loops (one of the most common and serious afflictions in mobile audio), which can occur in multiamp installations. However, this does not diminish the importance of a clean, paint- and rust-free ground connection. Should a difference in ground potential exist between the amp and any other component, a slight amount of current will flow along the patch cords. This translates to noise that suppressors can't cure.

Altec Lansing's ALA-270, with its Dynamic Stored Energy circuitry, delivers ample short-term power beyond its 70-watt-per-channel rating.



In its four-channel mode, Alpine's 3528 is rated at 30 watts a side; flicking a switch bridges the two stereo amps into one rated at 80 watts per channel.

Not interested in multichannel? Then how about something in a mono design? Alphasonik has made mono (left-plus-right) subwoofer amplifiers for years. Currently available in both 60- and 100-watt versions, they add punch to frequencies below 150 Hz. Alpine recently introduced a mono design of its own, which lets you choose either left- or right-channel output or the sum of the two. Lacking any internal crossover, it could be used as one side of a mammoth stereo pair but will most likely see duty driving big woofers using an external crossover.

Recently, much has been written about amplifiers with integral equalization circuitry designed to counteract broad frequency-response irregularities within specific cars (namely, certain models from the Big Three automakers that feature custom systems). Blaupunkt has temporarily cornered this area of the aftermarket with its PSA-108 Parametric Sound Amplifier (see last month's "Autophile" test drive). Expect to see other companies follow suit if initial interest translates into sales. Bosch (Blaupunkt's parent company) has an inside advantage because of its influential position in the automotive field. But many retail car-audio specialists are also capable of generating a frequency-response analysis for a given car, thanks to the Audio Control Real Time Analyzer. These dealers could sell you a parametric equalizer supplied with a directory of settings for your vehicle. Individual adjustments for variations in both speakers and personal taste can be made later. Perhaps the biggest advantage of the current Blaupunkt system is its extraordinarily reasonable price ($210).

Other trends of interest include the use of peak power designs, such as in Proton's Dynamic Power on Demand (DPD) or Phase Linear's Turbo amplifiers (one of the latter is tested in this issue). Both provide substantially more output in short bursts than their continuous-power rating to cover high-level, transient music signals. This is particularly useful for classical music, especially on CD, where the difference between the softest and loudest passages can push an ordinary amp over its limit.

Canton's Mainframe amplifier system is now finding its way into car-audio dealerships. A system with built-in crossovers and as many as five channels, it is unique in its modular concept and elegant in its execution. Canton's 50-watt mono amps attach to a common mounting base as needed, while low- and high-pass filters (at 150 Hz and 2.5 kHz) are activated to suit the configuration of your system. As larger and smaller Canton amp modules become available, the Mainframe could offer the kind of flexibility you've been looking for (at a fairly high-end price).

Before you buy, make sure the amp will fit where you want it to be installed. Consider whether your installation will be well-ventilated to prevent overheating. Is your +12-volt power lead heavy enough (12-gauge or better) to avoid starving the amp (since more current from the battery is needed as power goes up)? After spending big bucks for big watts, skimping on the wire is unnecessary thriftiness and lost power. On the output side of the amp, cheap speaker wire means a low damping factor at the speakers and the possibility of muddy bass. If you have any intention of entering local "Crank It Up" contests, you might want to check on the power classes rather than get stuck competing with the big boys simply because your system is ten watts over the limit. (The National Autosound Challenge Association, which seems to have broad support from both manufacturers and retailers, has established the following classes for total watts, based on manufacturer's ratings: 0–50, 51–100, 101–250, 251–500, 501–1,000, and more than 1,000.)

Once properly installed, your new amp should provide trouble-free listening pleasure for years to come. Enjoy! □

Jay C. Taylor is car-stereo products manager for Crutchfield.

Edited by Ted Libbey and Ken Richardson

Soviet Spectacular

The Russians are coming! But what's remarkable is that they're coming *only* to Boston. For three weeks in March, Soviet artists will be an occupying force in most of Boston's major halls—the result of a daring and unique exchange agreement worked out between Sarah Caldwell, director of the Opera Company of Boston, and Rodion Shchedrin, the influential Soviet composer. More than 200 Soviet musicians and dancers—including members of the Bolshoi Ballet—will appear in concerts, operas, and ballet productions designed specifically for Boston. In many instances, they will perform alongside American artists, and by the time they leave, they will have given the Beantown audience an unprecedented serving of Soviet culture. In the fall of 1989, the tables will be turned and an equally large contingent from Massachusetts will invade Moscow, bringing American art and artists to the Russians.

The festival, which has been given the rather flat-sounding title "Making Music Together," is in reality much more than a celebration of Soviet music and dance; there will be an art exhibit and poetry readings as well. More important, attention will focus emphatically on the contemporary. A dozen living Soviet composers are to be showcased in "profile concerts," lecture-performances at which the composers will be on hand to discuss their work with the audience. At the moment, little of their music is known in the United States. Even their names—Andrei Petrov, Gia Kancheli, Boris Tchaikovsky (no relation to Pyotr Il'yich), to cite just three—are unfamiliar to most American concertgoers, including those with an interest in contemporary music. But that is all about to change.

Shchedrin's name, of course, *is* known here, and it is going to be a lot better known as the festival runs its course. His opera *Dead Souls*, based on the Gogol novel, will be performed by the Opera Company of Boston under Caldwell's direction. Maya Plisetskaya, *prima ballerina assoluta* of the Bolshoi Theater, will dance several of the ballets composed for her by Shchedrin, including *Anna Karenina*, *The Seagull*, and the popular *Carmen Suite*. In private life, Shchedrin and Plisetskaya are husband and wife, and this will be very much their festival.

"Making Music Together" will also be an opportunity for Boston to show that it remains a cosmopolitan cultural center, a place where things happen. The city and the commonwealth of Massachusetts are pooling their resources to make the Soviet visit possible, and the corporate community in Boston is expected to produce almost $1 million in additional support. Paul Revere would have appreciated this spirited a response to the challenge at hand.

Ted Libbey

Fans, Critics, and Elliott

Bernard gave me a call the other day. "Elliott's playing at Tramps this week. Wanna go?" Bernard is a friend of mine. Been so since 1970. Elliott is Elliott Murphy, an intelligent songwriter and guitarist I've been following since his first album, *Aquashow*, came out in 1973. And me . . . I consider myself both a fan *and* a critic. Been so since I was eight years old getting up at six in the morning to listen to rock radio and keep lists of my favorite songs. Little kids who get up early to listen to the radio grow up to be fans; little kids who get up early to make lists of their favorite songs grow up to be critics.

But list-keeping isn't the only distinction. As a fan, I know what I like. But as a critic, I should be able to explain to *others* what an artist or group has going for him/her/them. In other words, I should be able to not only determine if an artist is breaking new ground but also answer the "big question" that follows: So what?

Elliott has been up with the biggies, releasing four major-label albums between 1973 and 1977. Commercial success eluded him, however, and he got dumped. Over the past eight years, Elliott has made three small-label albums (very-small-label albums) and assembled a cassette of material that never made any of his first four records. Finally, in late 1986, he released *Milwaukee*, available on the EMIS (Elliott Murphy Information Society) label and distributed nationally by Rounder. Along the way, he has developed a small but loyal following.

So what? Working within the basic rock song structure, Elliott excels at constructing images of romantic power by blending lyrical and musical elements of desire, danger, fatalism, heroism, and ironic detachment. Rock music provides an arsenal of images, ranging from the brute force of Me-Tarzan-You-Jane to God knows what and beyond. Elliott's images, however, are focused, subtle, and resonant, imbued with a down-to-earth realism.

Still, few people seem to be getting off on his music. Lots of critics think, "If only there were some justice in this world, then (artist, group, album, style) would be (appreciated, rich, No. 1, whatever)!" As a fan, however, I can reap the benefits of all this injustice. In New York, Elliott can be seen in small clubs and bars like Tramps, which holds maybe 80 to 90 patrons. With a tight, understated band behind him, he puts his guts on the line in an atmosphere where the trappings of "the performance" don't get in the way. And he certainly recognizes his fans. Fortunately, through EMIS (and Charlie Hunter, who runs it at Box 253, Northampton, Mass. 01061), there's a means by which friends, fans, and critics can all come together.

Mark Rosenblatt

Mr. Rosenblatt, one of our readers, lives in Brooklyn.

The Fall and Rise

CLASSICAL

SUZIE E. MAEDER

Talk about foresight. Flutist James Galway's recording contract with RCA Red Seal, signed in 1984, stipulates that if RCA ever appoints a strong worldwide chief executive for classical music—emphasis on "worldworldwide"—Galway must deal directly with that man or woman, not an underling with control over only the U.S. market.

The person who negotiated this odd provision was Michael Emmerson, Galway's longtime manager. Emmerson reasoned that RCA executives would eventually admit that they could not compete

SUZIE E. MAEDER

BRIAN DAVIS

# of RCA Red Seal

PART II

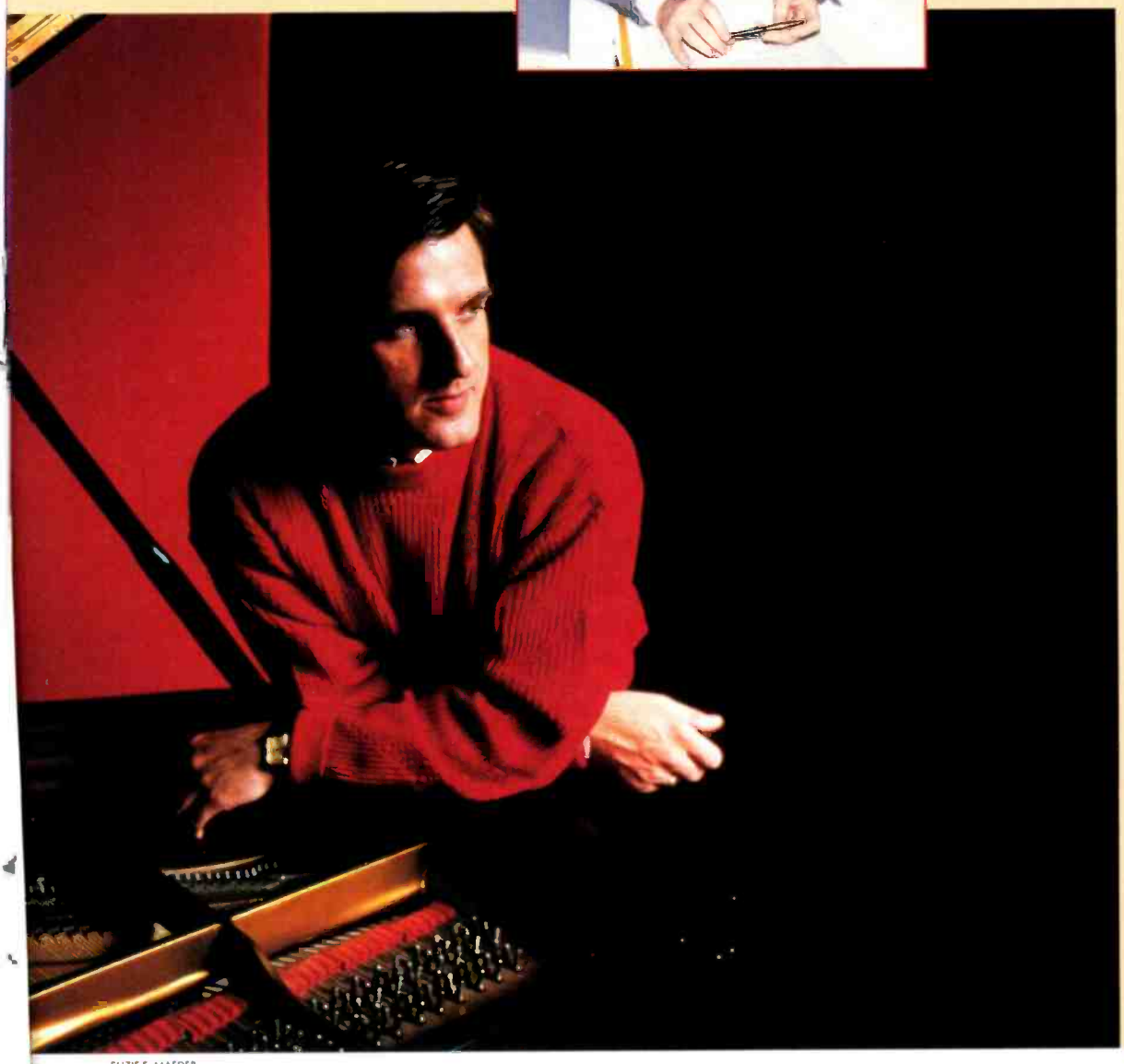
Label president Michael Emmerson reveals his strategy for restoring RCA to a dominant position in the classical record business by the end of the 1990s.

By David Rubin

with the increasingly dominant European labels—Deutsche Grammophon and its partners in the Polygram group, Philips and Decca/London—without a more international outlook.

Emmerson, who is English, recognized that RCA would have to improve worldwide advertising, marketing, and distribution, and select artists and repertory with an eye toward consumers in Europe and Japan. This would require a new chief executive with the power to integrate and command all the foreign fiefdoms in RCA's classical empire. When and if that

NICK SANGIAMO



SUZIE E. MAEDER

A new team at Red Seal: Clockwise from top right, Michael Emmerson; pianist Barry Douglas; flutist James Galway; conductor André Previn; and recorder virtuoso Michala Petri.

day ever came, Emmerson wanted that person's undivided attention on behalf of Galway.

Emmerson was right. In August 1986, RCA finally appointed a president of its Red Seal division with responsibility for worldwide operations. His name: Michael Emmerson.

Given his clear insight into RCA's mounting problems, it is not surprising that Emmerson had first been approached three years earlier about taking over the classical label. On that occasion, he had refused. He was rightly wary of the anti-classical, bottom-line psychology at RCA that had made it nearly impossible for a succession of Red Seal executives—particularly Roger Hall, Peter Munves, and Thomas Z. Shepard—to keep the label competitive. In the period following the death of the legendary David Sarnoff (founder of RCA, who died in 1971), the once-proud label of Toscanini, Rubinstein, and Heifetz had become the home of Galway, Isao Tomita, and Jean-François Paillard (see HIGH FIDELITY, February).

Two developments changed Emmerson's mind about the job. First, Red Seal was soon to escape from RCA and its tightfisted corporate parent, General Electric. It would fall into the warm German embrace of Bertelsmann AG, the third-largest music company in the world. Emmerson would report to a European board knowledgeable about, and committed to, classical music. Second, the growing Compact Disc mania would give him time to rebuild the sadly depleted roster of current RCA artists. He could boost revenues in his first few years by recycling on CD the spectacular RCA catalog from the 1950s and '60s. By the time such revenues leveled off, he would have had enough time to field a new team of artists and replenish the catalog.

Now, 16 months into the very job he foresaw, Emmerson is optimistic enough to declare that his goal is to bring Red Seal "back to life" by next September and to make it one of the top two classical labels by the late 1990s. He has a new title—president of BMG Classics—and four labels to play with: RCA Victor Red Seal, RCA Victor Gold Seal (for budget items, reissues, and historical items), and two new labels for Broadway shows, movie music, and crossover efforts. (Against fierce bidding, he won the right to produce the original-cast recording of Stephen Sondheim's new musical *Into the Woods*, maintaining the RCA/Sondheim connection faithfully nurtured by Shepard.)

In addition, Emmerson has the rights to distribute outside France all Erato recordings, which gives him a major say in that label's enterprising projects. And through the Eurodisc line, with which RCA is also affiliated, he can pick from the best of the Melodiya and Supraphon catalogs, in certain territories.

Emmerson has already attacked the fragmented marketing structure that undermined his predecessors in the pre-Bertelsmann days. He alone signs artists to the label and decides what they will record. He now can guarantee that a new release or reissue will be marketed in as many of RCA's 20 worldwide territories as he sees fit. He does not have to plead for access to foreign subsidiaries, such as RCA Italiana. He has also swept out half of the classical marketing managers in the RCA territories, replacing them with his own people. He has moved quickly to capitalize on the once-only explosion of demand for CDs by accelerating the pace of CD reissues.

PETER SCHAAF

Joseph Swenson: ready for Beethoven

For openers, Emmerson pushed forward the mammoth Rubinstein series launched by Shepard and under the technical direction of the pianist's longtime producer, Max Wilcox. Assisted by producer Jack Pfeiffer, a 40-year RCA veteran, Emmerson followed this with a flood of reissues from the Toscanini, Reiner, Heifetz, and Munch catalogs, plus performances by lesser artists on midprice CDs. The RCA opera vault is now yielding reissues of performances from a "golden age" when the label had under contract the likes of Zinka Milanov, Jussi Björling, Leonard Warren, Carlo Bergonzi, Robert Merrill, and Leontyne Price.

Any smart executive, of course, would be marketing the daylights out of such a stunning catalog in just this manner. The more important question is what Emmerson will do *after* the reissues have run their course. He acknowledges that the true measure of his tenure at RCA will be how he rebuilds the artist roster and compiles a catalog with a chance to compete in the year 2000.

Emmerson's sense of what will work with the record-buying public has been shaped by his enormously successful partnership with Galway. Not surprisingly, he is looking for artists with Galway's two most significant assets: exceptional musicality and great personality. "We are living in an era," Emmerson says, "when it is not possible to be successful without charisma and deep musicality." While he believes many artists have the requisite musicality, "without a distinctive personality they're boring, and they won't get far." Thus the success of Galway.

For this reason, one of Emmerson's first decisions was to let pianist Emanuel Ax jump to CBS Masterworks last year, replacing him with the photogenic 1986 Tchaikovsky Competition winner, Barry Douglas. Ax's RCA recordings had never sold well, and Emmerson doubted his appeal. Similarly, he released the Guarneri String Quartet, because, he says, they were not particularly interested in promotion. Their place has been taken by the Tokyo String Quartet, which has recorded the Brahms Piano Quintet with Douglas and will soon embark on a complete Schubert cycle.

As a former manager, Emmerson also wants artists whose careers are under strong management and whose engagement schedules are either full or promising. He does not believe that a successful career can be built on recordings alone, Glenn Gould notwithstanding. When Emmerson signed recorder player Michala Petri last year, he helped engineer her switch to the IMG agency and the savvy management team of Edna Landau and Charles Hamlen.

Last fall, Emmerson called off, at the final moment, a recording session in Europe with a young pianist when he learned that she had recently fired her manager. He believes this was her way to avoid paying him the standard percentage of her record royalties. Emmerson told the startled pianist that if her manager did not have a financial stake in her recording career, Emmerson would not be able to count on him to cooperate with RCA in scheduling recording sessions and in promoting her records—and Emmerson wanted no part of that. He said he would not record her at all until she was again under management.

While Emmerson found and nurtured one James Galway, how many others are out there for the plucking? Emmerson thinks he has already signed up several potential superstars, in addition to Barry Douglas. Below are his views of the first clutch of artists on whom he is betting the future success of RCA.

• *Michala Petri:* "She has such depth, such musicality." To soften Petri's image as a recorder virtuoso who plays only Baroque music, Emmerson says, "We'll feature her in contemporary music, and her true personality will be revealed. Clothes, image—everything is going to change, I promise you. The public will see a complete transformation of this artist."

• *André Previn:* "Everyone knows that Previn is a great technician who can get whatever he wants from an orchestra. I believe Previn is also a great conductor, and he will steadily be perceived as such. He has more depth than he has been credited with." Emmerson plans to record Beethoven and Mozart symphony cycles with him, even though Previn has recorded little if any Mozart in the past.

• *Joseph Swenson:* "He's the violin equivalent of Barry Douglas. I first heard him in Monterey, California, playing the Brahms concerto. He has good management [ICM] and a good diary of playing dates. His first recording for us will be the Beethoven concerto with Previn and the Royal Philharmonic. He's ready for it."

• *Sergei Edelmann:* "My first inclination was to get rid of him, but he had some champions at the label [including Jack Pfeiffer] and they forced me to reassess. He doesn't have many playing dates, but when he does play, he is reengaged. I switched his management in the U.S. [to ICM] and I'm working on getting him good European management. We'll record some concertos with him."

In addition, Emmerson plans to pump new life into the recording careers of such RCA holdovers as Galway, Julian Bream, and Richard Stoltzman, all of whom were feeling neglected by the old management. He expects that Stoltzman's career, in particular, will blossom like Petri's. "He is maturing, getting more confident in his own style of playing, and finding out who he is."

Missing from this list are singers. Given the importance Emmerson places on charisma and projecting a distinctive personality, and given that singers are better able to project their personality than instrumentalists, this would seem to be an odd omission. One need only think of the value to a record label of a Callas, Pavarotti, Corelli, Sutherland, Price, or Nilsson to realize that Emmerson is overlooking the most likely group of candidates for superstardom.

While Emmerson admits this, he says that RCA will avoid new opera ventures for the next five years. "There is a small group of mega-star singers with long-standing relationships to other labels," he points out. "Those labels have what we had at RCA in the 1950s and '60s. Why try to compete with that, with a certainty of failure at the end? I don't want to expose our new team yet to the nightmare of opera recording. There is too much rebuilding for us to do before we can afford the luxury of opera."

Emmerson also says that his own musical tastes run to instrumental and orchestral music, not opera. "I recognize this as a

Richard Stoltzman: maturing, more confident

weakness in my profile," Emmerson admits. "Once the division is back on its feet, it will be essential to have an opera division in it." But for the present, any new operatic recordings will come from the Erato label, which RCA distributes. *La Bohème* and *Boris Godunov* are already on the way.

If he does manage to corral some superstar singers, Emmerson swears there will be no crossover projects such as Deutsche Grammophon's *West Side Story*, which he calls a "travesty."

"That is not a road this division will *ever* go down," he says with evident contempt. "There are a number of opera singers today who have totally betrayed themselves." Emmerson reserves especially harsh words for Kiri Te Kanawa, the Maria in the *West Side Story* set. "I will not let an artist use his or her art in a facile way. I feel this strongly. It is very important for an artist to be true to himself."

RCA can succeed in its bid to become a top label again in two ways: by wooing buyers away from DG and the Polygram group or by expanding the audience for classical music. To accomplish the latter, Emmerson points to the demographics of the post-World War II baby-boom generation. "The classical business is on the verge of a major explosion," he predicts. "The baby-boomers and their musical tastes have been moving through the record industry like a big bubble. They went from crooners to rock 'n' roll to the Beatles to New Age. They have time and money on their hands. What will they move to next? I think their salvation, as they get older and grayer, will be classical music. And I intend that my group of labels will be there to satisfy all their musical tastes."

It is much too early to assess the Emmerson era, although Emmerson claims that CD reissues permitted him to show a profit in his first six-month reporting period (January through June 1987). The changes at RCA, however, are already evident to specialists in the classical record business.

"Four years ago, RCA was probably the worst classical line among the majors," says Paul Tai, assistant manager of the classical department at Tower Records's Greenwich Village store. "But I have definitely perceived a change since the Bertelsmann deal. There is a seriousness of purpose now at RCA that's visible on all fronts. They are issuing higher-quality pressings. The recording quality is much better. There are fewer returns [of defective product] from customers. The packaging is much better. Their Victrola cassette line now looks so good they could be sold at full price. The "60+ "CD series [which promises at least 60 minutes of music per CD] gives them an identity in the marketplace."

Adds Tai, "They're doing what CBS Masterworks did about four years ago—improving the pressings, the cover art, and the packaging—and, as a result, they're closing the gap with CBS. Their image is definitely changing."

Emmerson says his eventual target is Deutsche Grammophon, noting that Herbert von Karajan, the German label's bankable workhorse, will be eighty this year. When Karajan finally stops recording and his faithful audience is split up among the other labels, Emmerson promises that RCA will be at the table as a major player. □

David Rubin is on the journalism faculty at New York University and is a noted writer on the business of the performing arts.

From Haydn To Crumb, Via Joplin

Nonesuch retraces its steps with nine CD reissues of adventurous repertory.

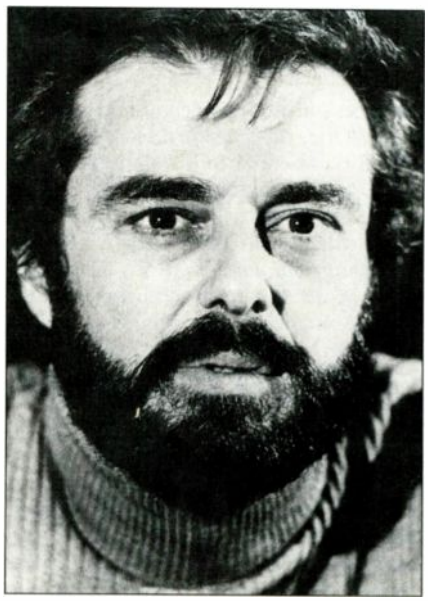
BY K. ROBERT SCHWARZ

In its two decades of existence, Nonesuch Records has staked out territory that few other American labels have cared to explore. By focusing on four areas that are consistently ignored by the big labels—Americana, new music, neglected corners of the Classical repertory, and non-Western music—Nonesuch has both assembled a consistently stimulating catalog and filled an all-too-apparent void in the recording world.

Last summer, Nonesuch raided its vaults, selecting the cream of its LP crop for rerelease on CD. The nine CDs that have been reissued—all originally recorded between 1970 and 1980, during Teresa Sterne's tenure as Nonesuch's vice president and general manager—provide a balanced picture of the label's interests (only non-Western music is absent). All of the recordings have been lovingly remastered: Tape hiss is barely noticeable, spatial separation is enhanced, and the dynamic range is in most cases comparable to today's standards. The nine CDs range in playing time from 65 to 71 minutes, putting to shame those labels that insist on marketing 35-minute CDs simply because the original LP was so conceived. By combining parts of several LP releases onto one CD, Nonesuch has been able to capitalize on the extended length of the medium.

Americana, having received so much of Nonesuch's attention, accounts for five of the CD reissues. Stephen Foster's lilting, nostalgic parlor songs come to life in performances by mezzo-soprano Jan DeGaetani, baritone Leslie Guinn, and pianist Gilbert Kalish, who plays melodeon on several songs. The accompaniments—occasionally expanded to include piccolo, flute, violin, and keyed bugle—are played on period instruments from the Smithsonian Institution and are radiant in their simplicity. DeGaetani's clear diction, light tone, and impeccable intonation lend Foster's songs a refreshing clarity, and the performers neither exaggerate nor deny the strain of sentimentality that permeates this repertory (Nonesuch 79158; playing time: 70:51; from 71268 and 71333).

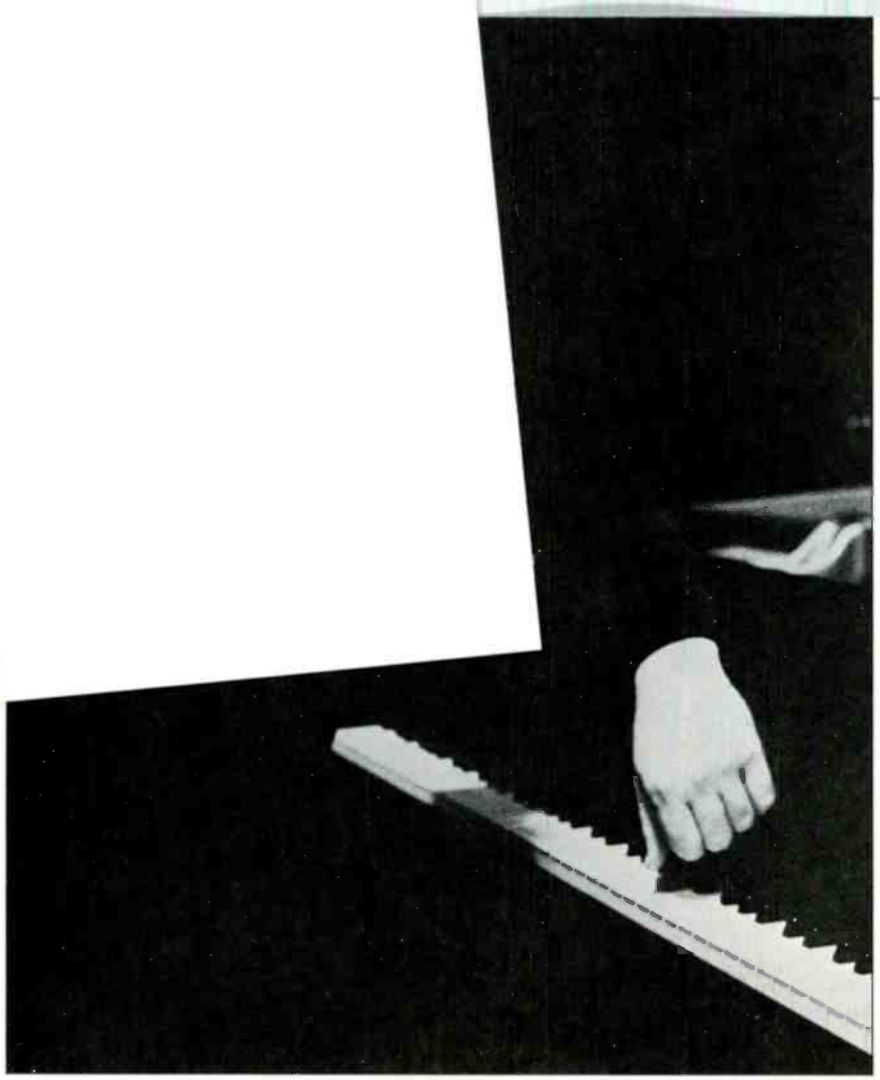
Popular music from the turn of the century is represented on *After the Ball*, Joan Morris and William Bolcom's delightful compilation of vaudeville and parlor songs (79148; playing time: 70:09; from 71304 and 71330). Bolcom, now receiving belated recognition as an important composer, is an ideal accompanist, exuberant yet sensitive to Morris's every nuance. Morris herself, as much an actress as a singer, displays a remarkable dramatic gift, shifting smoothly from sentimental delicacy to boisterous belting. Best of all, neither Bolcom nor Morris sneers superciliously at these pieces; together, they revel in their naiveté and rousing good humor.



Paul Jacobs: Brilliant Debussy Études

The Bolcom/Morris team returns on *Piano Music and Songs by George Gershwin*, but here it is Bolcom who steals the spotlight with his rousing rendition of *George Gershwin's Song-book* (1931). These rhapsodic piano arrangements of Gershwin's Broadway hits were written by the composer himself, and Bolcom performs them with irrepressible energy. To hear his sweeping left hand and sharply etched syncopations—leavened with a nostalgic tenderness—is to experience Gershwin's own playing brought back to life (79151; playing time: 70:30; from 71284 and 71358).

Bolcom also lends his services to Gerard Schwarz on *Cornet Favorites* (79157; playing time: 68:07; from 71298 and 71341). Schwarz, a trumpet virtuoso long before he made a career as a conductor, explores the cornet repertory of the late 19th and early 20th centuries, the heyday of band music in America. The pieces included here lay no claim to profundity; they were designed chiefly to display the tech-



Parlor songs, anyone? William Bolcom tickles the ivories in turn-of-the-century tunes.

nical skills of the soloist. But Schwarz's dazzling agility and contagious enthusiasm ennoble even the most trivial selections, and both performers delight in uncovering unexpected links to ragtime, New Orleans jazz, and popular song. Polka fans will welcome the highlights from *Cousins* (an album of "polkas and other entertainments for cornet and trombone") that fill out the disc, in which Schwarz is joined by pianist Kenneth Cooper and trombonist Ronald Barron.

Joshua Rifkin's three recordings of Scott Joplin rags almost single-handedly sparked the Joplin revival of the 1970s (79159; playing time: 71:15; from 71248, 71264, and 71305). The loving respect with which Rifkin approached these gemlike miniatures is precisely the treatment Joplin so fervently desired. Rifkin's conception is refined and lyrical, emphasizing musical sophistication rather than motoric power. Though occasionally one may yearn for more muscularity and less sobriety, Rifkin's interpretations remain the standard by which others are judged.

American percussion music from the 1930s to the 1970s is represented on 79150 (playing time: 67:51; from 71291 and 71353). Varèse's *Ionisation* (1931), one of the principal repertory items of the percussion ensemble, shares the disc with Henry Cowell's gamelan-influenced *Ostinato pianissimo* (1934), Michael Colgrass's *Fantasy Variations* (1960), and David Saperstein's *Antiphonies* (1972). Charles Wuorinen's 40-minute *Percussion Symphony* (1976), which occupies the bulk of the CD, alternates violent massed sonorities with delicate interludes based on a 15th-century Dufay chanson. The performances by the New Jersey Percussion Ensemble deftly balance spontaneity and precision, and the CD remastering heightens both the shattering climaxes and the spatial effects.

George Crumb's *Ancient Voices of Children* (1970), a song cycle set to texts by Federico García Lorca, is one of the few genuine masterpieces of the American avant-garde (79149; playing time: 65:10; from 71255 and 71311). In its fascination with instrumental color, extended performance techniques, use of quotation, and non-Western influence, *Ancient Voices* is a virtual catalog of the compositional preoccupations of the 1960s. Yet its eerie, ritualistic quality and haunting timbres remain as astonishing as they did on first hearing, as does Jan DeGaetani's battery of vocal effects. If *Music for a Summer Evening* (1974)—performed by pianists Gilbert Kalish and James Freeman and percussionists Raymond DesRoches and Richard Fitz—seems more self-indulgent in its exploration of sound color, it may be that it merely suffers from comparison with *Ancient Voices*.

Kalish, who is versatile enough to have performed on both the Stephen Foster and George Crumb CDs, has also recorded five LPs of Haydn sonatas for Nonesuch. The five sonatas selected for CD release—H. XVI:36, 40, 41, 49, 50—display Haydn's progression from the so-called *Sturm und Drang* of the 1770s to the mature, almost Schubertian lyricism of the 1790s (79162; playing time: 69:31; from 71344, 71362, and 71379). Kalish's approach is introspective and poetic, and he avoids both heavy textures and rough articulations. Searching instead for the sonatas' expressive potential, his caressing touch creates a subtle palette of tone colors and dynamic shadings. I can only look forward to a companion CD of Haydn variations and sonatas from Kalish, who—like Rifkin with Joplin—played no small role in the recent Haydn piano-sonata revival.

I have left Paul Jacobs's CD of Debussy piano music for last, partly because it is the only release to contain new material and partly because of the emotions it evokes. I defy anyone to listen to these brilliant performances without experiencing an almost palpable sense of loss. Jacobs, who died of AIDS in 1983, recorded 15 albums for Nonesuch, ranging from Bach to Busoni to Carter, and his rare combination of intuitive musicality, probing intellectualism, and technical skill is irreplaceable. Nonesuch has turned the CD booklet into a touching memorial containing tributes from Kalish, Ned Rorem, and Teresa Sterne that not only rage at the cause of Jacobs's death but attempt to convey the uniqueness of his talent.

The crystalline textures, crisp articulations, and delicate filigree that Jacobs achieves in Debussy's *Études*, Books I and II, are perfectly matched to the linear quality of the composer's late utterances. *En blanc et noir*, recorded live at the Ojai Festival in 1982 and never before released, finds Kalish and Jacobs joined in a performance of visionary rapture and boundless energy (79161; playing time: 66:50; *Études* from 71322). Jacobs's career, that of a man who brought to the Classical repertory the same searching musicianship he displayed in new music, would never have been documented were it not for Nonesuch. That in itself is a fitting tribute to the label as it enters the CD era. □

BARTÓK: Sonata for Two Pianos and Percussion; Concerto for Two Pianos, Percussion, and Orchestra.

◑ *K. Labèque, M. Labèque, Gualda, Drouet; City of Birmingham Symphony Orchestra, Rattle. David R. Murray, prod. Angel EMI CDC 47446 (D).* ⊡

On this disc, sisters Katia and Marielle Labèque turn in thoroughly mediocre performances of two variants of the same piece and are further undone by the extraordinarily thin, ugly, wiry piano tone captured by EMI. The Labèques tend to pound when they get excited (which is most of the time); consequently, their playing here leaves the impression of a pitched battle between pianos and percussion. But since the recording robs their instruments of their sonic punch, while giving far too much prominence to the timpani and xylophone, the Labèques don't stand a chance. Bartók could not have had this unequal contest in mind.

The sonata was recorded in EMI's London studios, while the concerto sessions took place in Birmingham. But the recorded balance in the latter makes it sound as if the pianos and the microphones had remained in London the whole time, with just the faintest trace of orchestral sonority wafting over on a breeze from the Midlands. Under the circumstances, the nature of Simon Rattle's contribution is impossible to determine, though the concerto seems better integrated musically, if not sonically.

Neither performance commands that much interest. The sonata's opening movement begins too slowly, accumulating little of the tension necessary to justify the eruption of the Allegro. The percussionists fail to distinguish adequately between side drums with and without snares, while the Labèques exaggerate Bartók's carefully contrived dynamic shadings. The slow movement goes fairly well, but the finale is especially brutal and humorless, with virtually none of the playfulness and charm that make it distinctive in Bartók's output. The concerto comes off somewhat more successfully within the same basic framework, but the recording is so poor that it hardly matters.

For a coupling like this to succeed, the emphasis must be on the differences between the two versions of the score, and an attempt must be made to make each one sound as if it was what Bartók had intended the piece to be from the beginning. Only such an approach will stimulate the listener's interest and justify the purchase of a disc containing the same music in two different arrangements. But on that count, too, this potentially interesting experiment fails. Playing time: 52:09.

David Hurwitz

SIEGFRIED LAUTERWASSER

Barenboim conveys a keen understanding of the "economy of means" that governs Dutilleux's music.

DUTILLEUX: Symphonies: No. 1; No. 2 ("Le double").

◑ *Orchestre de Paris, Barenboim. Henri Dutilleux and Michel Garcin, prods. RCA Erato ECD 75362 (D).* ⊙

The small but significant output of French composer Henri Dutilleux has been sadly underrepresented on record. The Winter 1988 SCHWANN carries only a half-dozen listings: the Jeffrey Siegel performance of the 1947 Piano Sonata (on Orion), an almost 20-year-old Charles Munch pairing of the 1959 Symphony No. 2 and the 1964 *Métaboles* (on Erato), the 1942 *Sarabande et cortège* for bassoon and piano (on Cybelia), and no fewer than three versions of the 1942 *Sonatine* for flute and piano that Dutilleux considers—along with the Oboe Sonata—to be among his lesser efforts. Angel EMI's excellent recording of the 1970 Cello Concerto (*Tout un monde lointain . . .*) is inexplicably out of print, and before this new release of the two symphonies, the only Dutilleux entries in the CD catalog were the 1950 Symphony No. 1 and the 1980 *Timbres, espace, mouvement* rendered by Serge Baudo and the Orchestre national de Lyon (on Harmonia Mundi).

That Symphonies Nos. 1 and 2 are among the relatively few works by Dutilleux already available on record makes these 1987 accounts by Daniel Barenboim and the Orchestre de Paris no less noteworthy. To the same degree as Munch and perhaps more so than Baudo, Barenboim seems to understand the strange polarity that typifies Dutilleux's handling of musical form. Both works are in essence monothematic, not so much developments of a basic idea as extended variations on a single germinal motif. At the same time, both gain enormously in complexity and momentum during the course of a performance, as their thematic material ricochets with ever-increasing dynamic force between one instrumental group and another. Barenboim's readings offer the listener the perfect balance of consistency and diversity. The "economy of means" that Dutilleux said in 1966 was at the very heart of his music is also the guiding principle behind these interpretations. Playing time: 58:08.

James Wierzbicki

ELGAR: Variations on an Original Theme ("Enigma"), Op. 36; Pomp and Circumstance Marches, Op. 39.

◑ *Royal Philharmonic Orchestra, Previn. Philips 416 813-2 (D).* ⊙ ⊡

The initial release in André Previn's Elgar cycle for Philips with the Royal Philharmonic was an interesting if lightweight performance of the First Symphony. With this second installment, Previn has reverted to his manner of several years ago and produced one of the most stolid of recent accounts of the *Enigma* Variations. Virtually everything about the performance radiates blandness: The statement of the theme is colorless; Variation I (depicting Elgar's wife, Alice) lacks tenderness and passion; "Nimrod" fails to achieve the inner stillness that makes its climax so powerful; and the optional but necessary organ additions to "E.D.U." are dispensed with and are sorely missed. Philips has captured this dull affair in dry, constricted sound; there is little sheen to the orchestra's admittedly average strings and only modest bass—a far cry from what Elgar's scoring so obviously demands.

The accompanying *Pomp and Circumstance Marches* lack precisely the qualities their title suggests they should have. Moreover, Previn unwisely adopts Adrian Boult's cuts of the repeats in the second march, a pity because it is probably the best of the five. And since the CD is by no means filled to capacity, a little more music would have been welcome. Playing time: 56:29. *David Hurwitz*

ENESCU: Suites for Orchestra: No. 1, in C, Op. 9; No. 2, in C, Op. 20.

◑ *Philharmonic Orchestra of Monte Carlo, Foster. Jerôme Paillard, prod. RCA Erato ECD 75118 (D).* ⊙ ⊡

ENESCU: Romanian Rhapsodies: No. 1, in A, and No. 2, in D, Op. 11; Poème roumain, Op. 1*.

◑ *Men's Choruses of l'Orchestre Colonne and Vocal Audite Nova de Paris*, Philharmonic Orchestra of Monte Carlo, Foster. Jerôme Paillard, prod. RCA Erato ECD 75179 (D).*

ENESCU: Symphonie concertante for Cello and Orchestra, in B minor, Op. 8*; Suite for Orchestra No. 3, in D, Op. 27 ("Villageoise").

◑ *Maggio-Ormezowski*; Philharmonic Orchestra of Monte Carlo, Foster. Michel Garcin and Jerôme Paillard, prods. RCA Erato ECD 75329 (D).*

There can be no doubt that George Enescu (1881–1955) was an important composer, not only for his native Romania but for all the world. Although many of his works were of a high quality, his output as a whole was both limited and inconsistent. A lifelong habit of painstaking self-criticism and an active career as a violinist kept him from being in any way prolific, while a desire to cultivate the folk-music resources of the Balkan peninsula conflicted with a desire to write in an "international" style. As late as 1916, Enescu was only "on the brink of full maturity," according to the entry on him in *The New Grove Dictionary of Music and Musicians*, and he would hover on that brink for a decade and a half more.

HIGH FIDELITY ARCHIVES

Enescu: conflicting compositional objectives

Enescu's mature style, which features a synthesis of modern chromaticism and traditional ethnic elements, was achieved only in the late 1920s and is evidenced in only a relatively small number of his works. Most of the music on these discs precedes this mature period: The *Poème roumain* dates from 1897, when Enescu was still a student at the Paris Conservatoire; the Opus 8 *Symphonie concertante* and the Opus 11 *Romanian Rhapsodies* are from 1901; the first suite is from 1903, the second from 1915. Indeed, along with the 1926 Violin Sonata No. 3 and the 1944 Piano Quartet No. 2, the 1938 *Suite villageoise* is among the very few of Enescu's compositions in any medium in which apparently homely melodic and rhythmic motifs seem perfectly balanced with the most sophisticated compositional techniques. As in the best work of Bartók, the rustic material is merely the starting point for an extended tour de force of counterpoint, development, and variation.

Lawrence Foster began his survey of Enescu's orchestral works in 1983 with the recording—released on LP and cassette in 1984—of the first two suites. The other works were recorded later that year. Last fall, the present trio of Compact Discs appeared: the two suites on one CD, the Opus 11 rhapsodies and the *Poème roumain* on a second, and the pairing of the *Suite villageoise* and *Symphonie concertante* (with the brilliant Franco Maggio-Ormezowski as the cello soloist) on a third. The sound is not great: The dynamic range seems compressed, most of the pieces feature podium thumps or other external noises, the woodwind sound is mostly thin, and the string sound is generally diffused. But under Foster's direction, the ensemble certainly plays together, and there are many moments when—at least in terms of the shapeliness of the gestures—the Monte Carlo players almost sound like a world-class orchestra. Sonic flaws notwithstanding, these are dynamic, forceful, and richly colored performances that neatly outline the architecture of Enescu's music at the same time that they convincingly project its ethnic flavor. Playing times: 55:39 (ECD 75118); 51:38 (75179); 50:22 (75329).

James Wierzbicki

FALLA: The Three-Cornered Hat*; Nights in the Gardens of Spain†.

◑ *Jones*, Rosenberger†; London Symphony Orchestra, Schwarz. Jody Schwarz, prod. Delos DCD 3060 (D).*

Carol Rosenberger brings to *Nights in the Gardens of Spain* all the improvisatory, introspective subjectivity the score demands, and she employs true rubato that makes the freer sections sound, as they should, almost as if she is making the music up as she goes along. She also, as few pianists do, has the intelligence to let the sustained orchestral sound take over the customary function of her piano's sustaining pedal, resulting in some transparent sonic filigree evocative of the Moorish sil-

JACK MITCHELL

Schwarz gets good results in two Falla works.

verwork still sold in the places Manuel de Falla had in mind when he wrote this lovely music.

Gerard Schwarz conducts the orchestra deftly in these three nocturnal movements (less for piano and orchestra, in the conventional sense, than for orchestra with important piano obbligato), although at moments of climax he tends to abandon the impressionistic sensual for something closer to the Brucknerian apocalyptic. He fares much better in *The Three-Cornered Hat*, which we get here uncut. A sort of plot "timetable" informs the listener, to the second, of what happens on stage during the music. However, it starts (after the *Nights*) at 25:20, whereas the time counter on your player will show 00:00—an unfortunate, inconvenient slip-up.

The orchestra sounds splendid; I only wish we got a lot more of Della Jones. Her two vocal bits, totalling a mere 4:13, confirm my impression of her in the Los Angeles production of Handel's *Alcina* as one of the most truly exciting mezzos now performing. Playing time: 64:15. *Paul Moor*

GERSHWIN: Overtures to "Girl Crazy," "Of Thee I Sing," "Tip-toes," "Primrose," "Oh, Kay!"; Excerpts from "A Damsel in Distress."

◑ *The New Princess Theater Orchestra, McGlinn. John Fraser, prod. Angel EMI CDC 47977 (D).* ⊙ ⊡

What better way to commemorate the 50th anniversary of George Gershwin's death than with a collection of his overtures and film music, all lovingly restored to their original splendor? Until recently, such a reconstruction would have been impossible: The orchestrations for most of Gershwin's Broadway and Hollywood scores were believed to have been lost, but they turned up unexpectedly in a Warner Bros. warehouse in New Jersey and were available for use in this recording. From the raciness of the jazz-age musicals of the '20s through the Hollywood romance of *A Damsel in Distress* (1937), Gershwin's writing sparkles as never before.

Much of the credit for this project's success must go to conductor John McGlinn. What he has accomplished, with the aid of the original orchestrations, is akin to what the early music movement has achieved with performances of Mozart on historical instruments: The scores have been scraped clean, and they glisten in their newly taut, lean-textured guises. In the present performances, unexpected links with New Orleans jazz and big-band swing leap forth, and the sentiment, rather than descending into bathos, remains romantic.

The unflagging energy of these performances by the New Princess Theater Orchestra complements the music's perpetual optimism and tireless vitality; this is Gershwin played with panache, flair, and, above all, precision. The film score and the overtures are—with the exception of *Of Thee I Sing* (1931)—merely potpourris of hit tunes, but who can complain? A better assemblage of tunes and more exuberant performances would be hard to find. Playing time: 42:06. *K. Robert Schwarz*

JANÁČEK: The Cunning Little Vixen; The Cunning Little Vixen (orchestral suite, arr. Talich).

◑ *Popp, Randová, Jedlička; Vienna State Opera Chorus, Bratislava Children's Choir, Vienna Philharmonic Orchestra, Mackerras. James Mallinson, prod. London 417 129-2 (2, D).*

JANÁČEK: The Cunning Little Vixen.

◑ *Hojóssyová, Beňačková-Čápová, Novák; Czech Philharmonic Chorus, Kühn Children's Chorus, Czech Philharmonic Orchestra, Neumann. Supraphon CO 1261/62 (2, A). (Distributed by Denon.)*

The Cunning Little Vixen is a late work of Leos Janáček, written between 1922 and

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1924 when Janáček was nearly seventy years old. It is unusual among Janáček's operas not simply for the oddness of its story about talking animals—*The Excursion of Mr. Brouček to the Moon* is as fantastic in that respect, and even Janáček's earlier *Jenufá*, in its frankness, seemed eccentric at the time—but for the fact that Janáček adapted this story of a fox and her human captors himself and for once wrote the entire libretto. Thus, for the first time, he was able to put the impress of his idiosyncratically original mind on the actual choice and arrangement of the words, not just on their musical treatment.

The story, taken from a modern fable then being serialized in the newspapers, tells of a young female fox cub who is captured by a gamekeeper, escapes by outwitting his subservient barnyard animals, grows to adulthood, falls in love, raises a family, and ultimately perishes. At the same time, certain parallels are drawn between human and animal behavior, and observations are made on the universality of the cycle of birth, struggle, and death, and on the continual renewal of the cycle by succeeding generations. Janáček made it plain, however, that he intended audiences to see more in the work than a diverting allegory of frisky, humanlike animals.

Some of what sounds distinctively individual in Janáček's music is the result of his frequent use of the traditional scales of Moravian folksong, with all their intrinsic foreignness to Western ears. The scales are made to sound even less familiar by the unconventional way they are harmonized and by the absence of any direct quotation of folk tunes themselves. Consequently, Janáček's writing—in which archaic conventions are taken out of normal context to support unconventional new ideas—is at once reminiscent of something older yet strange and hard to classify. The individuality of Janáček's musical invention was reinforced by several strongly held and particular philosophical convictions. For example, he believed that words properly set to music should conform to what he called natural "speech rhythms." Furthermore, as a musical reformer and as a nationalist, Janáček was convinced that Czech composers should rid their music of Austrian and German influences. This belief, together with his individual musical instincts, led him to harmonize what he wrote in a manner that was unique, even peculiar.

However, what distinguishes Janáček's work from that of other nationalistic iconoclasts or ideologues—and what makes it attractive and consequential—is the fact that it represents more than an impulse for reform. He had real and original musical ideas that emanated from a genuinely observant and creative mind. Moreover, he had in addition a controlling competence, as a practical composer of music to be listened to, that enabled him to express his ideas in a manner that was appropriate and effective and not merely unexpected.

For example, some of the words in *The Cunning Little Vixen* are set to the note patterns of bird calls and the like, yet there is no mimicry. Instead, the buzzings and rustlings of the forest in summer are suggested in the prelude by spiccato and tremolo playing and by falling motifs and lush harmonies. Nor does the composer resort to clucking or crowing to characterize the Chickens or the Rooster in Act I. The Chickens are made to seem like chickens merely by having them utter banalities like "We work hard, we lay eggs" in a monotonous and reiterative manner. And the Rooster establishes himself as an overbearing fool by fatuously offering the Vixen help she doesn't need if she'll agree to work for him. For this, he nearly gets his neck wrung.

Mackerras's is the distinctive Vixen.

Where Wagner is prolix, Janáček is concise. In *The Cunning Little Vixen*, there is the striking compression of events into a shorter-than-usual span, even for stage time. Almost immediately after the adolescent Vixen consents to let the Fox sleep with her, she reemerges from her burrow whimpering that she's pregnant. Far more unconventional for opera is the fact that the characters say what they have to say only once, and almost always rather briefly at that. Even the Gamekeeper's comparatively expansive apostrophe at the end of the third act reflects philosophically on two lifetimes—his and the Vixen's—in a stretch of music lasting only a few minutes.

Such compression of dialogue is of particular advantage in this opera. By making the libretto serve as no more than a bare outline of the story, the composer has left the characterizations to be filled in by the listener's imagination—which, given the right material to set it going, can be both vivid and various. In the notes to the Charles Mackerras recording, the fable as it first appeared in Czech newspapers is likened to Walt Disney's animated feature cartoons. But that is precisely what *The Cunning Little Vixen* does *not* resemble: The temptation Disney yielded to—the urge to round out and humanize his animals in the manner of *Lady and the Tramp*—is the same one Janáček resisted. As a result, the listener's mind, unrestricted by overexplicit and ultimately cloying characterizations, remains receptive to the implications of the innumerable undefined parallels, both comic and serious, between the lives of animals and people. These were, after all, what drew Janáček to this tale in the first place. The popularity of the opera among children can therefore be attributed not only to the high jinks in the first act, but to the suggestions of mild eroticism in the second act, which appeals to their nascent adulthood, and to the implicit and overt reflections on death and renewal in the third act, which interests children even more so than it does adults.

With so little time taken up by words, *The Cunning Little Vixen* is extended to full length by long orchestral preludes, interludes, and bridge passages. It is in his orchestral writing that Janáček's originality is most impressive. His harmonies (with their unexpected modulations around whatever note happens to be common to two otherwise tenuously related chords) and his instrumentation (which produces its striking effects with a sureness and economy comparable to Berlioz's) fall wonderfully on the ear. Morever, they combine to produce an impact on the mind that is out of all proportion to what seems to be happening on stage.

Because the orchestral writing is so important, the Mackerras recording, with its clearer sonics, better playing, and more animated conducting, is the one to acquire. Václav Neumann's sluggish tempos and nerveless shaping of the music with the merely adequate Czech Philharmonic act as a damper on the singers much of the time. The one moment of superiority in his account is the love scene in Act II, one of the greatest moments in the opera. Gabriela Beňačková-Čápová's singing as the Fox here is boyish and pure, whereas Eva Randová's in the Mackerras recording is shrill, tremulous, and not easily distinguishable from the singing of Lucia Popp

as the Vixen. Furthermore, for the gradual awakening of these two creatures to their own and each other's desirability, Janáček wrote the one long-spanned vocal melody of the opera, sung by the Vixen. Here, it is important that the singer sustain her notes, which Magdaléna Hojóssyová does admirably in the Neumann recording. In the Mackerras set, however, Popp destroys much of the intended effect by turning the passage into a succession of unconnected bursts of tone and volume. Elsewhere, her singing is agreeable and the two casts largely equal, although Mackerras has the more flexible voice of Dalibor Jedlička for the Gamekeeper's soliloquy at the end, where Neumann has only the straining of Richard Novák.

John Tyrrell's biographical and analytical notes for the Mackerras album are first-rate. The libretto has been translated into a contemporary British slang that is an equivalent of the local dialects used in the original to amuse Czech audiences. The only English expression that may be incomprehensible to most North Americans is "I took a bunk" ("I scrammed out of there"). In contrast, the translation that accompanies the Neumann recording takes all the fun out of the libretto and makes the boring and uninformative notes almost impenetrable in places, as in: "This symbolics of the Vixen figures frequently and prominently in the music with every erotic feature of the story."

The Mackerras album (playing time: 108:45) includes Václav Talich's engaging suite drawn from the orchestral pages of the opera. Neumann's (playing time: 95:43) contains only the opera itself.

Thomas Hathaway

JOSQUIN DES PRES: Plainchant ("Pange lingua"); Missa Pange lingua; Missa La sol fa re mi.

◑ *The Tallis Scholars, Phillips. Steve Smith and Peter Phillips, prods. Gimell CDGIM 009 (D). ⊙ 1585-09. ⊙ 1585T-09. (Distributed by Harmonia Mundi, U.S.A.)*

This remarkable release proves once again that a small record company endowed with taste, intelligence, and imagination can stand up to the big boys and beat them at their own game.

The ensemble calling itself the Tallis Scholars consists of two sopranos (female), two countertenors, two tenors, and two basses, all of them expert in this sort of early music (Josquin died in 1521). Aside from an indomitably English accent in the Latin sung here, they perform these works to perfection. The free-lance recording engineer known as Mr. Bear has recorded the group with extraordinary skill and fidelity, aided by the richly reverberant acoustics of Oxford University's Merton College Chapel. That, plus Josquin's grandeur as a composer, makes this disc worthy of special attention.

HIGH FIDELITY ARCHIVES

But for their accent, the Tallis Scholars perform a pair of Josquin masses to perfection.

The opening plainchant *Pange lingua* provides the foundation for the five-part Mass that follows here. The other, earlier Mass takes its name from the five steps of the scale covered by the principal theme, but, as the author of the liner notes speculates, quite possibly also from "an

unknown potentate who used to send away importunate suitors with the words '*Lascia fare mi*' (Leave me alone)."

Gimell, which happens to be located in Oxford as well, has achieved something remarkable here in every way. Playing time: 61:29. *Paul Moor*

With his full, white beard, Koechlin did not exactly look like a man who could fall head over heels in love with something as modern as *le cinéma*, but he did. He wrote the *Seven Songs for Gladys* (to wisps of text of his own contrivance) for the character portrayed in a film by Lilian Harvey, and he dedicated his five *Dances for Ginger*, Opus 163, to Ginger Rogers. He composed many songs to poems in the 13-verse rondel form (including the last seven listed above), and in other respects as well he went his own independent way undeterred. Oblivion has descended over almost all Koechlin's work today; the songs deserve a better fate.

Pianist Boaz Sharon handles Koechlin's difficult accompaniments with easy expertise.

KOECHLIN: Songs.

◑ *Leblanc, Sharon. Ted Perry, prod. Hyperion CDA 66243 (D). ⊙ ⊡ (Distributed by Harmonia Mundi, U.S.A.)*

Si tu le veux, Op. 5, No. 5; Sept chansons pour Gladys, Op. 151; Le cortège d'Amphitrite, Op. 31, No. 2; Amphise et Melitta, Op. 31, No. 6; Déclin d'amour, Op. 13, No. 1; Aux temps des fées, Op. 7, No. 4; Le repas préparé, Op. 31, No. 5; La chanson des ingénues, Op. 22, No. 1; Améthyste, Op. 35, No. 2; Hymne à Vénus, Op. 68, No. 1; L'hiver, Op. 8, No. 2; La nuit, Op. 1, No. 1; L'été, Op. 1, No. 4; L'air, Op. 8, No. 5; La lune, Op. 8, No. 4; Le printemps, Op. 1, No. 3; Le thé, Op. 1, No. 2.

A song or two by the French Alsatian composer Charles Koechlin used to crop up on an occasional recital program in New York, but nowadays those songs seem to have disappeared. Koechlin never enjoyed true fame and conceivably never sought it, but his music has its own particular charm, and that makes this selection (spanning 151 opus numbers) especially welcome. The influences of Fauré and Debussy dominate (Koechlin studied with Fauré and orchestrated his music for *Pelléas et Mélisande* as well as Debussy's *Khamma*). But by the time he died in 1950, Koechlin—who experimented with polytonality even before Milhaud—had also dabbled in atonality and serialism.

Claudette Leblanc hails from Canada, and you hear it in her French; that almost anti-Parisian accent, plus unincisive diction, does not exactly suit this quintessentially French music. But Leblanc does have a warm, smooth voice, particularly in *mezza voce*, and she controls it well and expressively. Boaz Sharon, a Koechlin specialist at the University of Florida, handles the piano parts, some of them exceptionally difficult, with easy expertise. Playing time: 56:58. *Paul Moor*

POULENC: Works for Piano.

◑ *Rogé. Michael Haas, prod. London 417 438-2 (D). ⊙ ⊡*

Les soirées de Nazelles; Three Novelettes; Pastourelle; Trois mouvements perpétuels; Valse; Improvisations (Nos. 1, 2, 3, 6, 7, 8, 12, 13, and 15); Trois pièces.

In his numerous recordings for London, the young French pianist Pascal Rogé has proved a safe, sound, stable performer thoroughly grounded in the French style, especially in his worthy cycle of the Saint-Saëns concertos, wonderfully accompanied by Charles Dutoit and the Royal Philharmonic. But of electricity or "champagne" he conveys little.

I therefore approached this disc with a sense of reserve that, it turns out, was only partly justified. While I still await the CD release of Gabriel Tacchino's wonderful complete recording of Poulenc's solo piano works and the equally fine, if slightly more brilliant, cycle on Adès by that unsung master, Bernard Ringeissen, in their absence I cheerfully greet this excursion from Rogé. As has already been observed in the foreign press, it ranks as one of the best solo-piano recordings of the year.

Although Poulenc's piano works were not his favorites, he was wrong to think so little of them. Very few 20th-century composers wrote as lovingly and lyrically for the instrument as he did; none outdid him. While I wait for Tacchino and Ringeissen, I can at least allow myself to enjoy this cherishable recital from Rogé. Playing time: 66:32. *Thomas L. Dixon*

RAVEL: Miroirs.
PROKOFIEV: Sonata for Piano No. 7, in B flat.
STRAVINSKY: Three Movements from "Petrushka."

◑ *Toradze. Patti Laursen, prod. Angel EMI CDC 47607 (D). ⊙ DS 37360.*

Alexander Toradze, born in Soviet Georgia, first attracted the attention of American listeners when he won the silver medal in the 1977 Van Cliburn International Competition in Fort Worth. From that fact, you would expect him to play a great many notes very loud. Well, he does—but the surprise comes here in Ravel's *Miroirs*, which he plays superbly and in quite a different manner from the Russian works.

In Prokofiev's Sonata for Piano No. 7, Toradze's electrifying technique turns the technical horrors into a mere piece of cake, but that, in turn, tempts him to extremes that endanger the overall musical tension. In the first movement, for instance, he starts out like a house on fire, *inquieto* indeed, but the appearance of the second theme, marked merely *andantino*, turns turmoil to sudden *Träumerei*—and the forward propulsion comes close to dying on the spot.

With Ravel, another pianist seems to take over. Steel turns into filigree and lace, particularly in the opening "*Noctuelles.*" His machine-gun-like repeated notes in the "*Alborada del gracioso*" remind one of Lipatti's legendary recording, but Toradze's interpretation suffers slightly from his starting at a clip he simply can't maintain in those passages. Toradze plays the preposterously difficult Stravinsky uncut, and he plays it brilliantly.

Since 1983, Toradze has made his home in this country. To judge by this record, we should hear a good deal more from him. Playing time: 61:03. *Paul Moor*

SAINT-SAËNS: Concertos for Piano and Orchestra: No. 2, in G minor, Op. 22; No. 4, in C minor, Op. 44.

◑ *Collard; Royal Philharmonic Orchestra, Previn. John Fraser, prod. Angel EMI CDC 47816 (D).*

Saint-Saëns at his most serious is not Saint-Saëns at his best. He took music to be a matter of "elegant lines, harmonious colors, and a pleasing succession of harmonies," which he demonstrated in his delightful chamber compositions and, to an extent, in his piano concertos. When he assumed the Germanic weightiness and Romantic seriousness that went with making a Major Statement, as he did in his Third Symphony, he could not carry it off. Though he came close by dint of his expert craft, there is little sense in pretending that he was another Beethoven or even a Tchaikovsky.

Suppose, however, that we do pretend. What would the result be? It depends on the artists: It could be quite deadening, or—as is the case with these performances of Piano Concertos Nos. 2 and 4 by Jean-Philippe Collard, with the Royal Philharmonic Orchestra conducted by André Previn—it can be a lot of fun. Saint-Saëns's elegance and humor are not slighted here, nor is his lighthearted romanticism, but the emphasis is definitely on squeezing as much high drama out of these works as possible. The outcome veers between grand orchestral gesture, Lisztian mania, Mendelssohnian charm, and salon music.

In defense of his view of the music, Collard has said that "Saint-Saëns is always played very lightly, like an appetizer, but inside the music we can find other lines, stronger sounds. . . ." While I would prefer that lighter approach, it is hard to imagine anyone outdoing Collard in drama and excitement without becoming overbearing. He conveys the various moods of the music with the utmost dexterity, conviction, and virtuousity, as do Previn and the Royal Philharmonic. The playing is gorgeous, the sound stunning. Playing time: 49:56. *Robert R. Reilly*

RECITALS AND MISCELLANY

LONDON SYMPHONY ORCHESTRA: "Skyscrapers" and Other Music of the American East Coast School.

◑ *London Symphony Orchestra, Klein. Brian Culverhouse, prod. Angel EMI CDC 49263 (D).* ⊙ ⊡

CARPENTER: Skyscrapers. PAINE: Prelude to "Oedipus tyrannus." MacDOWELL: Lamia. FOOTE: Suite for Strings, in E. BUCK: Festival Overture on "The Star-Spangled Banner."

In most of the works on this recording, one finds 19th-century American composers imitating European cultural models to such an extent that any suggestion of a native voice is stifled. When that voice does emerge, in John Alden Carpenter's *Skyscrapers* (1924), it gains even more potency from its juxtaposition with works composed in such a derivative context.

John Knowles Paine, the teacher of Carpenter, Arthur Foote, and an entire generation of American composers, clearly displays his roots in the Prelude to *Oedipus tyrannus* (1881). Paine's model is the conservative German tradition of Mendelssohn and Schumann, and while he shows considerable melodic skill, he never rises to the level of his European idols. Dudley Buck's *Festival Overture* (1887) is enlivened by the appearance of "The Star-Spangled Banner," but otherwise the work is an embarrassment. Foote's Suite for Strings, in E (1908), though it has sometimes been characterized as Brahmsian, seems closer to the sturdy craftmanship and slightly cloying sentimentality of Elgar. At least Edward MacDowell chose to model his music on the European avant-garde of his day: *Lamia* (1889) has all the trappings of a Lisztian symphonic poem, from sinuous chromaticism and picturesque orchestration to stream-of-consciousness form.

All the more surprising, then, to stumble upon Carpenter's *Skyscrapers*, a work displaying the sort of brash, Roaring Twenties modernism we associate only with Copland. Motoric, Stravinskian ostinatos depict the bustle of urban life, while blue notes, syncopations, saxophones, and banjo all reflect the jazz and dance music of the era. *Skyscrapers* suffers from a certain patchwork quality, as do so many ballet scores deprived of a visual context. But it deserves rediscovery, and its machine-age verve is conveyed brilliantly by conductor Kenneth Klein and the London Symphony Orchestra.

Rehearsal time must have been limited to the Carpenter, because the strings sound ragged indeed in the other works. By itself, however, *Skyscrapers* is worth the price of purchase. How about doing Carpenter's *Krazy Kat* next? Playing time: 67:41. *K. Robert Schwarz*

THEATER AND FILM

WALTON: Suite from "Henry V"*; Suite from "The Battle of Britain"; Interlude from Act II of "Troilus and Cressida"; Suite from "As You Like It"*; March for "A History of the English-Speaking Peoples."

◑ *London Philharmonic Choir*, London Philharmonic Orchestra, Carl Davis. David Groves, prod. Angel EMI CDC 47944 (D).*

William Walton wrote music for films over a period of almost 30 years; unfortunately, much of what he composed is relatively unknown. This splendid CD should help rectify that situation.

The music for *As You Like It*, dating from 1936, was dashed off at the last minute but is among Walton's finest efforts in the genre. For the 1969 film *The Battle of Britain*, Walton composed about 25 minutes of music, but only part of the score was used in the film. That part—an exuberant segment entitled "Battle in the Air"—is included in a two-movement suite arranged by Colin Matthews and recorded here for the first time, along with the recently rediscovered *March and Siegfried Music*, which quotes the horn-call motif used in Wagner's *Ring*. The interlude from the opera *Troilus and Cressida* depicts a torrid love scene that Walton himself called "pornographic." It is the one excerpt on this disc that does not come from a film or television score, yet it is nonetheless unabashedly cinematic. The March for *A History of the English-Speaking Peoples*, written for a 1959 ABC television series based on Churchill's book, is a grand, powerful piece that is strikingly reminiscent of Walton's coronation march, *Orb and Sceptre*. The familiar music from *Henry V*, heard here in an adaptation by Malcolm Sargent, fills out the disc.

Carl Davis leads the London Philharmonic in magnificent performances, handsomely augmented by the London Philharmonic Choir in the Hymn from *As You Like It* and in two of the excerpts from *Henry V*. Angel EMI's reproduction is stunning, with warmth, depth, clarity, and impact. Playing time: 50:14.

Robert E. Benson

FORMAT KEY

⊙ **LP** ⊡ **Videocassette**
⊡ **Cassette** Ⓥ **Videodisc**
◑ **Compact Disc**

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(A) Analog original (D) Digital original

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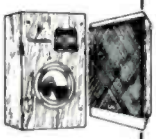

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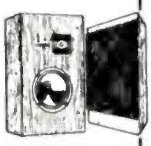

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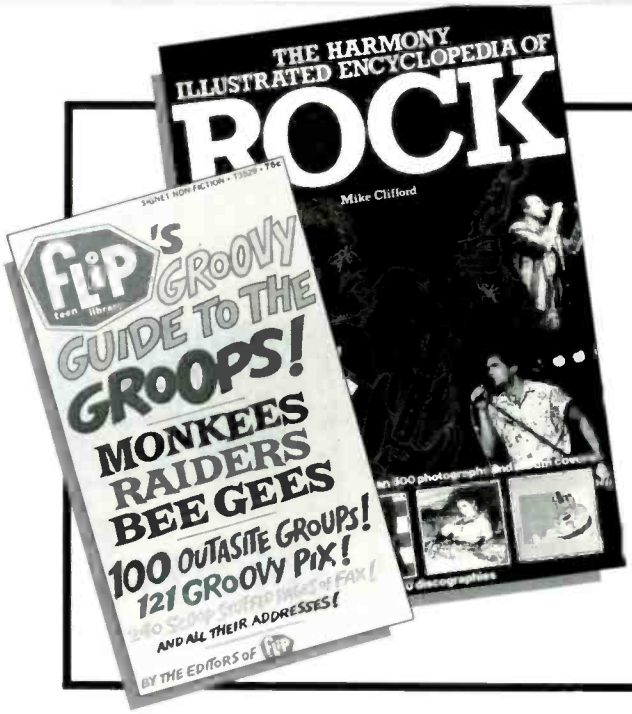
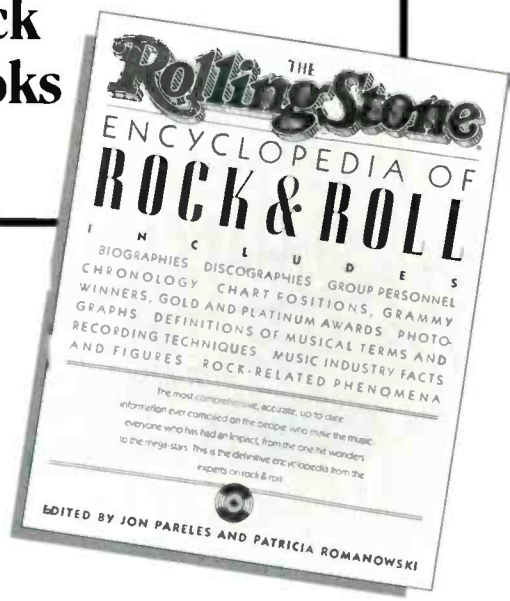


You Can Look It Up!

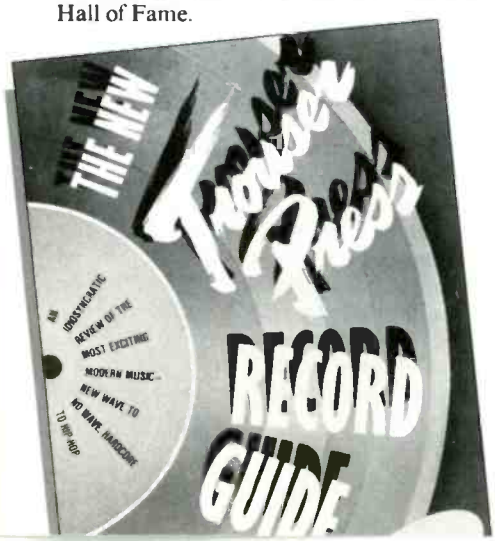
A guide to rock reference books

BY DAVID BROWNE



Isaac Hayes's onetime manager was a cofounder of the Holiday Inn chain. Gladys Knight, not Diana Ross, discovered the Jackson 5. Playwright/actor Sam Shepard played drums for the Holy Modal Rounders. Lynyrd Skynyrd was named for the band's sadistic phys-ed teacher. The Captain and Tennille have sold 23 million records. Johnny Rivers wrote and sang George McGovern's Presidential campaign theme. In 1964, Steve Lawrence and Eydie Gorme opened for the Beatles. The shortest song in pop history is the title track of Sly and the Family Stone's *There's a Riot Goin' On*, listed at 0:00.

Trivia to some, manna to others, this is just a taste of the most sprawling, sweeping cultural saga of our time: the history of rock 'n' roll. Over the course of a scant 35 years, careers and genres have risen, fallen, degenerated, and been redeemed. One-shot wonders, inspired idiocy, and incredible arrogance—sometimes all within the course of one career—have combined to create moments of transcendent brilliance. A panorama of greed, luck, and talent, rock history is so vast and so slippery that it simply cannot be contained on reissued Compact Discs or in a Rock 'n' Roll Hall of Fame.



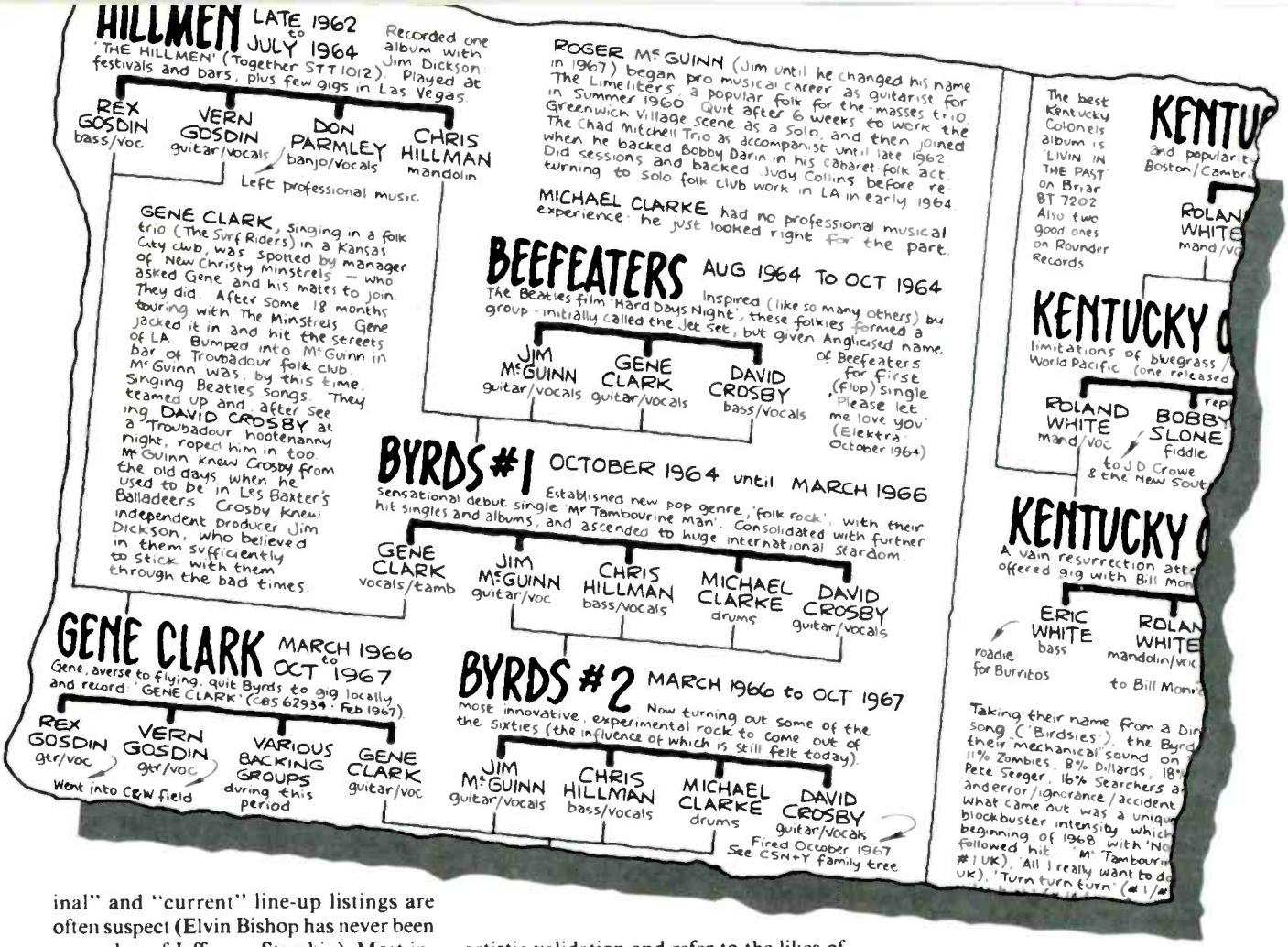
Or for that matter, within the pages of one reference book. Hence this selective guide to building a home library of rock encyclopedias and record guides. For purposes of space, we've had to omit artist biographies, historical overviews like the preeminent *Rolling Stone Illustrated History of Rock & Roll* and the even more ambitious though textbookish *Rock of Ages: The Rolling Stone History of Rock & Roll*, and focused critical works like Greil Marcus's *Mystery Train* (the rock equivalent to D. H. Lawrence's *Studies in Classic American Literature*). Nor do we include such upscale tomes as the four-volume, nearly $600 *New Grove Dictionary of American Music*. For now, here are the basic reference works most likely to be found in your local bookstore. Cumulatively, they may not amount to the history of the world, but for some of us, they come pretty close.

Rock reference books received their official send-off in 1969, when Australian reporter and New York *Daily News* columnist Lillian Roxon published the first edition of her *Rock Encyclopedia* (Grosset & Dunlap). Until then, rock documentation was virtually nonexistent: *Rolling Stone* and *Crawdaddy* were just starting up, and pop "scholarship" was reserved for the gee-whiz, favorite-food coverage in the likes of *Groovy Guide to the Groops!* (Signet, out of print), written by the editors of the now defunct teen mag *Flip*.

Roxon's book, updated several times since, changed all that, selling well and garnering a rave review from *The New York Times*. That seems surprising today, since the book has dated worse than Tiny Tim. Its A-to-Z of rock performers and genres is mired in uninspired writing ("Every man dug her spirit," Roxon writes of Nancy Sinatra); firm details are reserved for the discographies, which list album titles, song titles, and year and *month* of release. Roxon was prescient enough to include an entry for Jackson Browne three years before the release of his first LP, but she also fumbled through entries for "head music" and "feedback."

The most commercially successful offshoot of Roxon's concept is a spin-off of the British weekly *New Musical Express*. Now called *The Harmony Illustrated Encyclopedia of Rock* (Harmony, edited by Mike Clifford), the book was first published in 1977 and has been updated four times since, most recently in 1986. It remains the flashiest and most accessible of all reference works, its alphabetized listing of artists interspersed with photos, sharp album-cover reproductions, and easy-to-read discographies (with chart placements for both U.S. and U.K. singles). There are also appendices on musical-instrument manufacturers and industry hotshots. For a breeze-through introduction for beginners, the book has yet to be topped.

Cramming about 600 acts into a mere 272 pages has its limitations, though. The write-ups are mostly accurate yet superficial (on Neil Sedaka: "His music is enjoyed by the widest possible audience"), and the "selected discography" and "orig-



Excerpts from two of Pete Frame's rock family trees: "Byrds of a Feather" (above) and "Eric Clapton: Guitar and Vocals"

inal" and "current" line-up listings are often suspect (Elvin Bishop has never been a member of Jefferson Starship). Most infuriating, the book still suffers from its English bias: Why are the Rascals, the Spinners, and Warren Zevon relegated to the appendix of miscellany while the Bay City Rollers and Gary Glitter are accorded full-length listings in the main section?

The Rolling Stone Encyclopedia of Rock & Roll (Summit/Rolling Stone Press), co-edited by *New York Times* writer Jon Pareles and Patricia Romanowski, takes a more sober tact. On the basis of names, dates, birthplaces, and discographies, it's more dependable and better written than the Harmony series, but it's also duller. The *Rolling Stone* logo notwithstanding, the book's just-the-facts approach makes for parched reading: Exciting careers are reduced to curiously nonpartisan chronologies and album titles. Only the charts interspersed throughout the book (on Grammy winners, "One-Hit Wonders," etc.) provide some respite from the monotony. Worth owning, but don't expect to bring it along to the beach.

Worth skipping is Irwin Stambler's *Encyclopedia of Pop, Rock & Soul* (St. Martin's Press), which hasn't been updated in 11 years and is afflicted with simplistic writing in which every record seems to have been "a chart hit." Also avoid Norm N. Nite's series of *Rock On* collections (Crowell), which dote on chart entries as artistic validation and refer to the likes of Dan Fogelberg as "a major talent."

Because the encyclopedias are fact-filled but usually fail to include critical perspective, the next step in building your library is to select at least one review guide. The current standard-bearer is *The New Rolling Stone Record Guide* (Random House), edited by Dave Marsh and John Swenson. First published in 1979 and updated four years later, the book has one basic goal: to rate every record currently in print (about 160,000, they say), somewhat like a SCHWANN guide with one-to-five-star ratings and annotations. Not surprisingly, there are omissions and gaffes (Mink DeVille is reviewed twice, under *D* and *M*, by two different writers). And the second edition tacks on too many post-1979 albums without discussing many of them in depth.

The most annoying aspect is that the book clearly suffers from the particular moralistic bias of its first-named editor. In other words, nearly every Bruce Springsteen album rates four or five stars, while bands that don't fit into Marsh's rigid working-class-rock ethic (X, for example) are dismissed with nasty one-star reviews. Yet the *Record Guide* at best is feisty and opinionated, offering incisive, revisionist critiques of the recorded works of the Grateful Dead, Linda Ronstadt, the Doors, and many others. Keep in mind, though, that the book makes for a dubious reference source: These are highly subjective (read: politically correct) ratings, and they're as likely to infuriate as to inform.

As the most recent edition of the *Record Guide* is now five years old, it doesn't cover the indie-label scene that has since exploded in both America and England. For that information, you'll need *The New Trouser Press Record Guide* (Scribners), the best guide to underground and nonmainstream LPs, EPs, cassettes, and singles. Named after the defunct "new wave" magazine and edited by founder Ira A. Robbins, the book is a valuable source if only to sort out the winding recorded works of the likes of Alex Chilton and Cabaret Voltaire. The writing can be predictably biased toward anything remotely "alternative," indie record-company addresses aren't given, and a star-rating system would have helped. But if you need background on everyone from A Certain Ratio to the Zantees (or if you need to know what Plastic Bertrand recorded

You Can Look It Up!

after "Ca Plane Pour Moi"), this is the place to turn. (Note: A third edition, available only in England through Omnibus Press as *The New Music Record Guide*, offers updates on British bands and records.)

Even more limited in scope is *Christgau's Record Guide* (Ticknor & Fields), a compendium of *Village Voice* senior editor Robert Christgau's graded "Consumer Guide" record reviews of the '70s. Novices to rock criticism will need a road map to decipher some of Christgau's convoluted thoughts, but he remains one of pop's most astute critics. The collection works best when it digs through the maze of '70s pop to uncover hidden gems like Bill Withers's *Still Bill* or when Christgau sums up a record (or a career) in a sentence or two (on the Partridge Family: "At least the Osmonds were a cultural presence"). John Schaefer's *New Sounds: A Listener's Guide to New Music* (Perennial/Harper & Row), a recent addition, takes in electronic, New Age, "unusual" folk, ethnic, and other nonmainstream recordings and provides a workable introduction to them all.

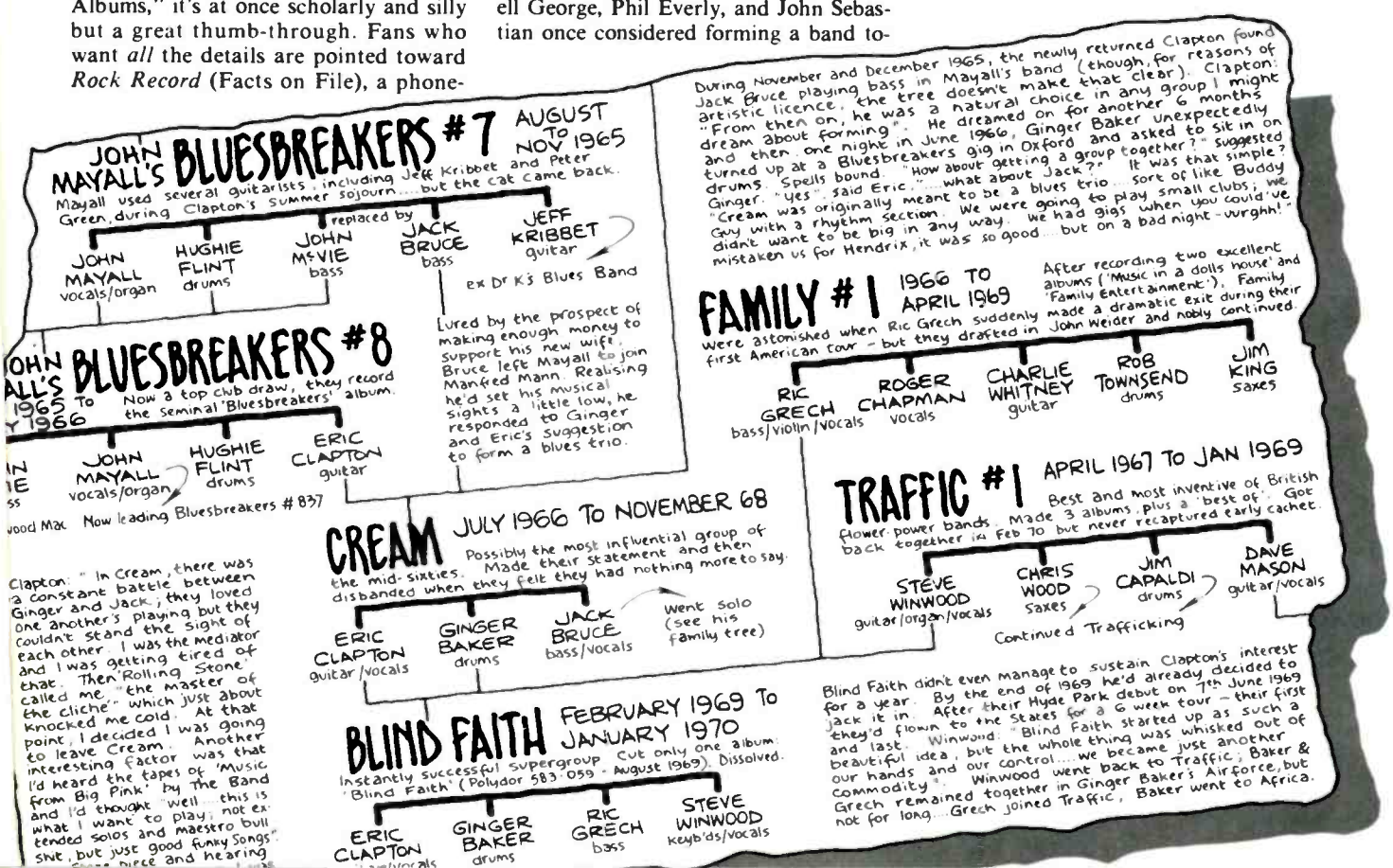
No reference library would be complete without its share of miscellany, of which Dave Marsh and Kevin Stein's *The Book of Rock Lists* (Dell/Rolling Stone Press) has the most. In listing everything from best and worst album covers to "Rock Stars Who Have Complained of Hearing Loss" and "The 15 Most Boring Classic Albums," it's at once scholarly and silly but a great thumb-through. Fans who want *all* the details are pointed toward *Rock Record* (Facts on File), a phone-book-size volume purportedly listing every album ever released and which musicians played on each of them. It's incomplete and filled with typos, but pop obsessives will love it.

Joel Whitburn's frequently updated *Billboard Book of Top 40 Hits* (Billboard), which lists hit singles by title and artist, is a must-own reference source. (Who sang "It Never Rains in Southern California," anyway? Albert Hammond, of course.) *The Billboard Book of Top 40 Albums* does the same with LPs. Michael Shore's *Music Video: A Consumer's Guide* (Ballantine) rates every long-form video compilation and rock movie available on tape but is marred by Shore's rambling way with a sentence.

Last, no library should be without Pete Frame's *Complete Rock Family Trees* (Omnibus Press, combining the formerly separate Vols. 1 and 2; available from Music Sales Corp. Distribution Center, 5 Bellvale Road, Box 572, Chester, N.Y. 10918). A labor of love, the book can be described as a collection of hand-drawn flow-charts that trace the history of band personnels. But that basic description shortchanges the vast information crammed into each nook and cranny of these painstakingly drawn schematics, such as interview snippets, discographies with chart placings, and the sort of facts and gossip on which rock legends are made (David Crosby originally played *bass* for the Byrds; Lowell George, Phil Everly, and John Sebastian once considered forming a band together). The amount of work involved in chronicling the ever shifting histories of, say, King Crimson/Yes/Asia or Steely Dan/Doobie Brothers/Little Feat or Buffalo Springfield/Byrds/CSNY/Poco—or Fairport Convention all by itself—is astounding. And a new volume of *Rock Family Trees* is in the works.

With an assortment of these books in hand, you should be able to sort through the maze of pop history—at least until it takes a left turn and reinvents itself yet again. In that regard, the last word should be reserved for Lillian Roxon herself, who died in the early '70s and never got to see what she had wrought. "Trying to get the rock world to keep still long enough for me to take its picture was one of the most difficult tasks in putting this book together," she wrote in the author's note for her book's first edition. "Fine performers degenerated swiftly and inexplicably while supposed second-raters found their promise all too late to make our deadlines." In the end, she concluded, "The music itself has to tell the story." Undoubtedly, it always will. □

In addition to serving as copy editor (and frequent reviewer) for this magazine, David Browne writes for Rolling Stone, *the New York* Daily News, *and other publications. Thanks to this article, he knows more about Grand Funk Railroad than anyone should.*



IN SHORT ORDER

POP AND JAZZ MINI-REVIEWS

TÊTES NOIRES: Clay Foot Gods.
⊙ *Rounder 9008.*
Têtes Noires, now six women strong, started in Minneapolis in 1983 as a charmingly amateurish performance-art project with venomously sarcastic lyrics and a near-throwaway attitude toward the music. They have since grown much more self-assured musically without sacrificing either of the first two elements. The addition of a drummer helps, because on songs like "Bless Me," "The Plain," and "World Turning," it makes more explicit the element of '70s arena rock that has always co-existed in their music along with sturdy melodies, girl-group brightness, and baroque vocal arrangements. They've also learned to let that music do more of the talking: It's the tacky nightclub sound as much as the lyrics of "Pour More Water on Her, George" that reveals the song's Wet T-shirt Contest for the sordid event it is. And their vocal attack, which plays distinctive lead voices against six-part harmonies, remains convincing. Whether taking on Catholic confession ("Bless Me"), the squeeze on the small farmer ("Why Are the Farmers Dying?"), or sexual exploitation and inequality (nearly every other song), they can say the sweetest things so harshly, and the harshest things so sweetly. *John Morthland*

DAVE LIEBMAN:
Homage to John Coltrane.
⊙ *Owl 046. (Polygram.)*
It has been 20 years since John Coltrane died, and no one since has had his almost incantatory influence over other jazz musicians. Soprano saxophonist Dave Liebman was one of those inspired by what he calls "the intensity and conviction of Trane's music," and *Homage to John Coltrane* is a lyrical tribute to the older saxophonist's style. But while Liebman uses some of Coltrane's devices—the overblown notes and the seesawing phrases—he doesn't seek to recapture that intensity. Whereas Coltrane on "Crescent" was powerfully sombre, Liebman is spare, as he comments over the occasional interjections of drummer Adam Nussbaum and bassist Eddie Gomez. He's more dramatic on "Untitled Original" and offers free improvisations on "Selflessness." With the exception of "Mr. Day," which founders on a two-chord vamp, this *Homage* is successful. It ends, on "Dear Lord," with a kind of prayer. Coltrane was known for his passion; this solo reminds us that he should also be remembered for his radiant serenity. *Michael Ullman*

EARTH, WIND & FIRE: Touch the World.
⊙ *Columbia FC 40596.*
Separately, Maurice White and Philip Bailey have two of the most alive voices in the business. Together, they're a ten-man chorus. So it's a shame that Earth, Wind & Fire's first release in four years is steeped in mile-high programming that sometimes obscures their natural high. But *Touch the World* is nothing if not contemporary: lots of Prince-funk grooves, references to Reagan and the Contras, kalimba-like samplers that yell "Third World." Charged by the famed Hawkins Family, the title cut is a churchified version of "We Are the World," a good dance rave-up and not a bad campaign song for Jesse Jackson. In "Victim of the Modern Heart," White falls strangely prey to sagging intonation, but Bailey excels throughout: In the majestic ballad "You and I" and the potential hit "Here Today and Gone Tomorrow," his boy soprano is pure, lithe, and melismatically ecstatic. The message, as always, is stop, step back, and turn up your light.
Pamela Bloom

STEVE GOODMAN: Unfinished Business.
⊙ *Red Pajamas RPJ 005. (P.O. Box 36E77, Los Angeles, Calif. 90036.)*
This miscellany of previously unreleased radio recordings, demo tapes, and publisher's reference tracks will please avid fans of the late singer/writer Steve Goodman but persuade no newcomers. Of the ten cuts, only the WFMT recording of "(Now and Then There's) A Fool Such as I," in duet with legendary mandolinist Jethro Burns, and the solo acoustic version of "My Funny Valentine" truly stand out. A club performance of Michael Smith's "The Dutchman," a Goodman classic, has been included owing to overwhelming mail requests, but the definitive recording remains the studio arrangement released on *Steve Goodman*, his sturdy 1971 debut, still my favorite. The Grammy Award-winning *Tribute to Steve Goodman*, too, is a better introduction, available from Red Pajamas as a two-record set.
Leslie Berman

BARRY WHITE:
The Right Night & Barry White.
⊙ *A&M SP 5154.*
Before Teddy Pendergrass's snarl, Luther Vandross's arpeggios, and Michael Jackson's hiccups, there was Barry White's deep, smooth moan, which compelled a female friend of mine to sigh, "He could make you climax reading the telephone book!" With hits like "Can't Get Enough of Your Love, Babe," "Never, Never Gonna Give Ya Up," "You're the First, the Last, My Everything," and "It's Ecstasy When You Lay Down Next to Me," White became The Maestro, king of sensual soul during the early '70s. Now he's back, and little has changed. Sure, this album contains lots of '80s instrumentation, but besides the synth whoosh, there's the same sort of sexual poetry, the same lush string arrangements that made White famous. His trademark lyrical simplicity is also here. Except for the elastic "Sho' You Right," which gets the job done on the dancefloor, this comeback shows that during any quiet storm, underneath White satin is still a pretty good place to be.
Havelock Nelson

ANDREW HILL TRIO AND QUARTET: Shades.
⊙ *Soul Note SN 1113. (Polygram.)*
For almost 25 years, pianist Andrew Hill has been releasing records of his highly personal music: Alternately dark and brooding, shimmeringly romantic, and obsessively explosive, his playing has been consistently off-center both rhythmically and harmonically, reflecting the temperament of someone seemingly repulsed by the very thought of cliché. Fortunately, it's an iconoclasm with its own logic, one that sidesteps the expected phrase and still makes a coherent statement. For *Shades*, Hill has assembled a listener-friendly combo that swings with loose-limbed articulation; tenor saxophonist Clifford Jordan is a special treat. But rather than court convention, the pianist then proceeds to dig in and subtly subvert the concepts of the basic modern-mainstream session. Fans will seek this out; others who are open to an original voice, specifically one reflecting a mature radicalism, would do well to follow suit. *Richard C. Walls*

K. T. OSLIN: 80's Ladies.
⊙ *RCA 5924-1.*
Singer/writer K. T. Oslin worked her way through folk music, commercials, and Broadway show tunes before breaking into country, and her voice readily demonstrates her savvy, showing some of the power of a Janis Joplin, some of the control of a Phoebe Snow—but unfortunately very little of country music tradition. With a couple of exceptions (notably the title cut's fem-lib commentary), these songs stick like glue, both stylistically and thematically, to all the standard and redundant 20th-century pop-love-song formulas. I want more. *Joe Blum*

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WOODY HERMAN AND HIS BIG BAND: Woody's Gold Star.

⊙ *Carl E. Jefferson, prod. Concord Jazz CJ 330.* ⊡◑ *(P.O. Box 845, Concord, Calif. 94522.)*

Woody Herman was a mediocre singer, a pallid alto saxophonist, and a clarinetist who was second to almost any other professional you can name. He was also a marvelous bandleader whose exuberance, taste, and boundless energy carried him through a 50-year career. Audiences loved him; so did, and this is rarer, his bandmembers. Herman first recorded in 1936, but his important work came soon after World War II, with his first, second, and third Herds—groups that helped adapt bop phrasing and rhythms to big band swing. His best pieces, such as "The Good Earth," "Wildroot," "Early Autumn," and "Four Brothers," are endlessly satisfying; others, like "Caldonia," are remembered for their leader's lively and unassuming vocals.

Herman's last years were sad. There are only two sure things, the old joke goes: death and taxes. Herman faced them both at the same time. While in the hospital suffering from heart disease, he was in the process of being evicted from his home and being sued for back taxes (owing to a former manager's mishandling of funds). A nationwide movement, headed by musicians and fans, saved him from eviction and prompted Congress to introduce legislation to relieve his tax burden, but Herman died last October 29 at the age of seventy-four.

And so *Woody's Gold Star*, taped live in March 1987, the last month he performed, becomes Herman's final recording. It features the brash, brass-dominated arrangements of John Fedchock, whose trombone solo on "In a Mellow Tone" is a highlight of the second side. Elsewhere we find an uptempo version of Duke Ellington's zinger "Battle Royal" and long covers of Herbie Hancock's "Watermelon Man" and Chick Corea's "Samba Song." There's nothing here that is particularly new or startling: just good, bright big-band jazz. Herman contributes a soft-toned clarinet solo on "Rose Room." He sounds a little breathless, but he may have been bowing out modestly.

I remember him in earlier days, starting a performance with four barks and a wave of his right arm. Eyebrows arched, face lit up in delight, he was his band's best cheerleader. And the music was warm, spirited, and dignified. Herman thought of jazz as "The Great Escape," as a title on this record suggests. Now he has escaped

us, leaving behind the vigor of his music, and a question: Who will find and nurture the Ralph Burnses, the Neal Heftis, the Alan Broadbents, and the John Fedchocks of the future? *Michael Ullman*

Editor's note: The National Academy of Jazz has established the Woody Herman Foundation Fund to help jazz artists in financial distress. Readers may send their contributions to the fund at 12501 Chandler Blvd., Suite 107, North Hollywood, Calif. 91607.

AMERICAN JAZZ ORCHESTRA/ BENNY CARTER: Central City Sketches.

◑ *Leroy Parkins, prod.; Gary Giddins, exec. prod. Musicmasters CIJD 60126X.* ⊙ *(2).* ⊡ *(2). (1710 Route 35, Ocean, N.J. 07712.)*

"Symphony in Riffs" is the apt title of a 1933 Benny Carter composition reprised on this 1987 studio session with the American Jazz Orchestra. But all of the charts that Carter brings to his first date with a big band in three decades are symphonies in riffs: The achievement of grandeur through economy is what gives his orchestrations their timeless appeal.

Recorded last March, a week after an SRO New York concert in early celebration of Carter's eightieth birthday, *Central City Sketches* suggests that not the least of the great alto saxophonist's plenary abilities is hoodwinking Father Time. His wraparound blues choruses on "Easy Money," to cite one example among many, confirm that he remains one of jazz's most dazzling improvisers—still in full possession of the roseate, almost "legitimate" tone that has been his signature for more than half a century now, but thoroughly modern in his note values and harmonic reach. *Central City Sketches* is an invaluable Carter retrospective, with material ranging from the Thirties' "Lonesome Nights," "When Lights Are Low," and "Blues in My Heart" (unaccountably saddled with a boogie-woogie beat—Carter's only injudicious revision) to the ingratiatingly varied six-part title suite, presented as a work-in-progress at the New York concert and finished just in time for this recording session.

The set also marks an auspicious recording debut for the American Jazz Orchestra, with musical director John Lewis spelling Dick Katz at the piano for sharp-witted choruses on four numbers, including Carter's no-doze arrangement of the Fred Waring warhorse "Sleep." The brainchild of jazz critic Gary Giddins, the AJO is a repertory band dedicated to the proposition that what's needed to keep the mold off classic jazz is exposure to the fresh air of performance. This terrific album proves the point and then some.

Francis Davis

HENRY BUTLER: The Village.

⊙ *Ricky Schultz, prod. MCA/Impulse! MCA 2-8023 (2).* ⊡◗

Pianist Henry Butler ended his first album for MCA/Impulse!, *Fivin' Around*, with a short piece called "The Pastoral Connection." It might have been the subtitle for his new two-record set, *The Village*, given the easygoing lyricism of its compositions and its affable solos.

Butler favors fleet right-handed runs—his phrases often end in a flurry—over carefully articulated chords. He avoids the thunderous statements of other pianists and, perhaps in deference to the fine bass-playing here of Ron Carter, concentrates on the midrange and treble. On ballads such as his "Beautiful, She Is," Butler's light, swirling patterns seem to glimmer and shake. Similarly, one doesn't expect hard-driving lines from a piece with a title like "Soft Platonicism," with its references to Duke Ellington; it's lovely, though, and the waltz "Joanna" sparkles innocently, too. John Purcell solos effectively on a variety of horns in this set. The strongest soloist, however, is clarinetist Alvin Batiste, who is probing on "The Village" and who offers an eloquent commentary on Butler's vocal during "Music Came."

Clearly, Butler does not want to dominate this band, which includes the wonderful Jack DeJohnette on drums and, on one number, Bob Stewart on tuba. The pianist rarely solos at length; when he does, as on "The Village," we regret his reticence elsewhere. He's an original-sounding instrumentalist who uses the devices of a McCoy Tyner to serve more lyrical ends. Perhaps he simply wants to make a statement through his compositions. At any rate, Butler is most vigorous, and most playful, in the final number of the set, where he is joined by Batiste and Stewart for a short rendition of Scott Joplin's "The Entertainer." On that rag, and in that company, Butler swings us into good health. *Michael Ullman*

FORMAT KEY

⊙ **LP/EP** ⓥ **Videocassette**
⊡ **Cassette** Ⓥ **Videodisc**
◑ **Compact Disc**

Large symbol at left margin indicates reviewed format. Small symbols following catalog number of reviewed format indicate other available formats (if any). Catalog numbers of formats other than the reviewed format are printed only if their basic numbers differ substantially from that of the reviewed format.

"In Short Order": Note that these mini-reviews provide only the reviewed format and its catalog number.

Arabic numeral in parentheses indicates number of items in multi-item set.

POP

STEVIE WONDER: Characters.

⊙ *Stevie Wonder, prod. Motown 6248-ML.* ⊡◗

Stevie Wonder's personal life and his way of making music have always seemed a paradox: One imagines him surrounded by loving people, yet he sits alone in his high-tech studio accompanied only by synthesizer, synclavier, and drum machine. Still, his brand of pop, funk, and blues, though often predictable, has never sounded remote or mechanized. In *Characters*, he sings directly to individuals he personally knows, as well as to those considered family in the political/spiritual sense. The greatest character in his life, however, is God, and he's getting very definite about that.

Characters is thick on words, but Wonder is pushing himself to new rhyme schemes, along with inventive phrases like "Miss Lady Girl," "galaxy paradise," and "crevices in your pantry." The opening "You Will Know," his typical lush ballad, addresses the loneliness of drug abusers *and* single parents (!) and promises ultimate comfort from the Inner Man. The eminently danceable "Dark 'n' Lovely," a searing song of apartheid, also beams with Wonder's special kind of optimism: "Hey there Botha/Yes, we are watchin' you . . ./Watch our world turn/To help those in pain." But Wonder drops the goody-goody persona in the funky "In Your Corner," where he accompanies a low-life friend to the pleasure corner of Main and Dog-Meat-Bite. Even "Get It," the jittery duet with Michael Jackson, is not about love that's nice and easy.

Still, Wonder is most sensuous when he's being musically inventive. Destined for long life, the beautiful ballad "With

Each Beat of My Heart" turns artifice into art when Wonder sets his actual heartbeat against a breathy syncopated pant. With lyrics that trip on the tongue, Cole Porter-style, Wonder sounds as if he's singing this one in your ear. Meanwhile, the deceptively upbeat "Cryin' Through the Night" is the closest the singer comes to cynicism, in a song that reports losing his best lover to his best friend.

The final "Free," Latin-tinged with a gospel grandeur, is Wonder's conclusive anthem of transpersonal liberation. "Free like the river . . ./To be nowhere/But in every place I need to be," he sings, and you believe him. *Pamela Bloom*

GEORGE HARRISON: Cloud Nine.

⊙ *Jeff Lynne and George Harrison, prods. Dark Horse 25643-1.* ⊡◗

This is an album that benefits greatly from lowered expectations. With his last few outings being basically fizzles—and then no release for five years—the fact that George Harrison, aided by Jeff Lynne, has put together an album of punchy pop packs the element of surprise; besides, when a past hero shows signs of life, it can only mean that there's hope for all of us on the far side of youthful inspiration. But prolonged exposure to *Cloud Nine*, not to mention obedience to the critical code of honesty (bet you didn't know about *that*), forces one to admit that this is an extremely lightweight LP—maybe not by current pop standards, but certainly by any other.

Musically, this could be Harrison's belated new-wave album: Sturdy pop/rock clichés are stitched together in a gleeful manner that suggests healthy renewal rather than parody. The clean, sharp sound grabs you, Harrison's trademark "weeping" guitar triggers pleasurable sense memories, and the familiar non-singer voice is out in the open in surprisingly good form. Lynne's contribution is obvious in both the sometimes sugary adornments and the carefully-attended-to beat. However, having drawn a career's worth of inspiration out of some of the Beatles' most questionable moves, Lynne's a mixed blessing, as is best exemplified by the nostalgic but upbeat "When We Was Fab": Though it draws specifically from "A Day in the Life" and "I Am the Walrus," it manages to sound as much an homage to Lynne's old band, the Electric Light Orchestra, as to George's.

Lyrically—with the exception of "When We Was Fab," "Wreck of the Hesperus" (an anthem for aging rockers), and "Devil's Radio" ("gossip is . . .")—this is standard pop boilerplate. The punchline to all this carping is that the record is immensely enjoyable, like a bowlful of whipped topping. Wolf it down and try not to feel too guilty. *Richard C. Walls*

THE PROCLAIMERS: This Is the Story.

⊙ *John Williams, prod. Chrysalis BFV 41602.* ⊡

Scottish twins Craig and Charlie Reid are the Proclaimers, an acoustic duo whose recently released debut, *This Is the Story*, is lean and lively. One sings, the other chords a jangly guitar, and together they write sensitive and stirring songs—half wistful love ballads, half fierce statements of national pride.

The Reids stake their political turf with the LP's opener, "Throw the 'R' Away," a disdainful jab at sensitive Saxon ears that interpret the boys' bone-jarring accent as an indicator of social inferiority. "Perhaps for some money/I could talk like a bee dripping honey," they proclaim, then dismiss the sad joke, defying their conquerors with angry love songs for hearth and homeland. In "Misty Blue," the singer views his country with the mournfulness of a deceived lover; in "The Joyful Kilmarnock Blues," he caresses it as he exultantly paces its hills. Rounding out the political quartet with "Letter from America," the Proclaimers decry the destruction of their land and culture, urging friends who have emigrated to greener pastures to return and invigorate themselves and the land with their dreams.

But there is an ambiguity here: In their matching plastic-frame glasses and polo shirts, the Reids could be a pair of polite adolescents-next-door, whistling into and out of a twilight zone of Fifties America's suburban kitchens, and their bright roots rock could have issued from Hank Williams or Ricky Nelson. Their comforting linguistic frugality and the rolling burrs of their edgy/soothing speech are equally intrinsic to the duo's vitality. These lads do, as they say, come from Scotland, U.S.A.

Leslie Berman

ROBBIE ROBERTSON: Robbie Robertson.

⊙ *Daniel Lanois and Robbie Robertson, prods. Geffen GHS 24160.* ⊡◗

From its clatter of superstar pals to its heightened air of self-mythology, Robbie Robertson's first-ever solo album picks up where he left off in 1976, with the Band's farewell concert (and movie), *The Last Waltz*. When it came to the Band, a little went a long way: Recordings were few and far between, and the group seemed more than willing to skirt by on legend alone. The same can be said of the group's principal songwriter and leader, who, after a decade of coking it up with the Malibu crowd, has deigned to bring us a new LP.

More *Back in the High Life* than *Centerfield* in the Sixties-warhorse-returns genre, *Robbie Robertson* is sleek and ultra-

(Continued on page 79)

The Proclaimers (that's Charlie on the left and Craig on the right): romantic/political Scots

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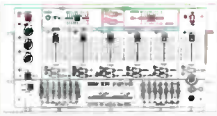

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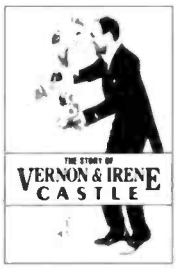

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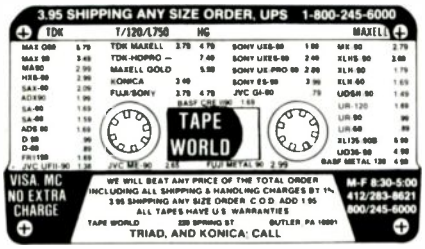

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(Continued from page 73)

modern. It wallows in trendiness, be it U2 collaborator Daniel Lanois's spacious production, the guest spots (U2, Peter Gabriel, the BoDeans, Lone Justice's Maria McKee), or the songwriting collaborations with the likes of "We Built This City" co-author Martin Page. If only for this reason, the record rings cynical. Yet it also takes a certain kind of arrogance for Robertson to present himself as a singer: His reedy, cigarette-charred voice is simply expressionless; when he reaches for high notes, his falsetto is like fingernails on a blackboard. And given his longstanding annoyance that Band records never went platinum, there's an opportunistic edge to his duets with U2 (the pompous "Testimony") and Gabriel ("Fallen Angel"), which sound like outtakes from *The Joshua Tree* and *So*, respectively.

There are moments when even Robertson's limitations and his sanctimony cannot stand in the way: the warm, electronic-Band feel of "Sonny Got Caught in the Moonlight"; "Broken Arrow," a lovely song of need helped greatly by Gabriel's harmonies; Bono's cries of "Didn't we?" in the verses of "Sweet Fire of Love." Likewise, the sweeping anthemic guitars and BoDean harmonies of "Showdown at Big Sky" manage to overcome the conceit of an L.A. fat cat playing American Indian storyteller. But then you encounter Robertson's moralistic "American Roulette," in which he croaks, "Lord please save his soul/He was the king of Rock and Roll." Robertson has written many rugged songs and has been a part of several momentous recordings, but he was never a king of anything, much less rock 'n' roll. Therein lies the problem. *David Browne*

FRENCH, FRITH, KAISER, THOMPSON: Live, Love, Larf & Loaf.
◑ *Henry Kaiser, prod. Rhino RNCD 70831.* ⊙ ⊡

SINÉAD O'CONNOR: The Lion and the Cobra.
⊙ *Sinéad O'Connor, prod. Chrysalis BFV 41612.* ⊡ ◑

THELONIOUS MONSTER: Next Saturday Afternoon.
⊙ *JB, Thelonious Monster, and Flea, prods. Relativity 88561-8174-1.* ⊡ ◑

THE CUCUMBERS: The Cucumbers.
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PAUL KELLY AND THE MESSENGERS: Gossip.
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French, Frith, Kaiser, Thompson are Captain Beefheart drummer John French, avant-guitarist Fred Frith (playing bass), session guitarist Henry Kaiser, and still-cult-hero guitarist Richard Thompson. *Live, Love, Larf & Loaf*, filled with eccentric songs and great fretting, is on my ten-best list and should be in your CD player (54:59, with two extra cuts). Also on the list is Sinéad (sha-NAID) O'Connor's *The Lion and the Cobra*, the best debut by a female vocalist in some time. This very Irish singer howls, chimes, pouts—and, in the end, bewitches. Writes/co-writes eight of nine mature songs, too, and produces all of them. Kate Bush finally has company.

On to the beery bashing of L.A.-based Thelonious Monster, the kind of band that plays anything because . . . why not? *Next Saturday Afternoon* has guitar sludge here, acoustic ballad there, sort of latter-day Traffic not far from here, and tuba instrumental way over there. All this and Bob Forrest's frat-brother vocals, too. As opposed to Deena Shoshkes's wondrously girlish (not girlie) vocals for the Cucumbers. Not everything on the Hoboken band's eponymous album is as addictive as "One Step Further," but overall this is sparkling guitar pop. I just wish the fine-sounding CD lasted longer than 31:58.

The 15 bits of *Gossip* told by Paul Kelly are honest; so, too, the rock/pop/blues of the Messengers. In Kelly's native Australia, this is a *double* LP with *nine* more bits. Send 'em Up Over. *Ken Richardson*

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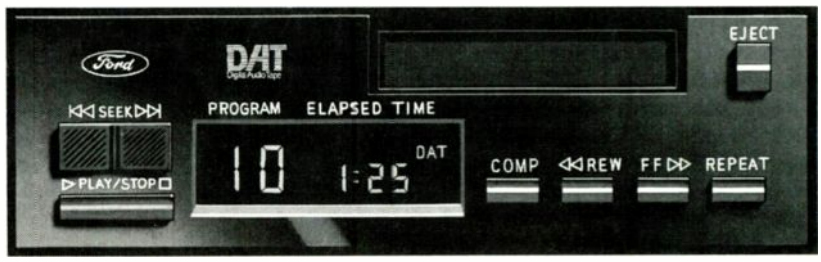

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(Continued from page 16)

Ford/JBL custom sound system, which is anchored by a radio/cassette head unit. However, if a sufficient selection of prerecorded DATs—or the home recorders with which to make them—is not available by that time, Ford will delay the offering. As an alternative to the DAT deck, the Continental is also available with a factory-installed, in-dash CD player. *Contact your local Lincoln/Mercury dealer for more information.*

Read All About It

The Video Camcorder Handbook, by video-industry veterans Marjorie Costello and Michael Heiss, takes a thorough look at how to select and use a camcorder. All of the features, controls, accessories, connections, and technical terms are discussed in a manner that should appeal to both neophytes and technophiles. The 160-page book is available in bookstores, photography stores, and video stores, or can be ordered for $14.95 plus $1.95 shipping from HP Books, P.O. Box 5367, Tuscon, Ariz. 85703.

Big Screens

RCA has introduced its first 31-inch direct-view TV monitors, the G-31100 and G-31150, both priced at $2,499. Differing only in cabinet design, both units feature MTS (stereo TV) tuning, extensive audio and video connections (including the new S-connector for S-VHS decks), and remote operation of on-screen picture and sound controls. Four built-in speakers are provided to augment the synthesized surround-sound mode. The comprehensive remote also operates certain RCA VCRs and audio components.

RCA G-31150 31-inch direct-view set

On an even larger scale, RCA's new P-50595 50-inch rear-projection set ($2,999) offers two separate MTS tuners for picture-in-picture displays. The small inset picture is actually the same size as a 14-inch-diagonal screen. *RCA Consumer Electronics, 600 North Sherman Dr., Indianapolis, Ind. 46201.*

Super VHS Camcorders

Hitachi has two S-VHS camcorders, the full-size VM-6000A and the compact (S-VHS-C) VMC-60A, both priced at $1,700. The full-size model weighs 5½ pounds without its battery, the compact model just over 2½ pounds. Both feature a ten-second-delay self-timer with a 30-second automatic shutoff. The VMC-60A also includes high-speed shutter options. As with other S-VHS camcorders and decks, the Hitachis can make and play back regular VHS recordings. *Hitachi Sales Corporation of America, 401 W. Artesia Blvd., Compton, Calif. 90220.* □

Hitachi VM-6000A full-size S-VHS camcorder

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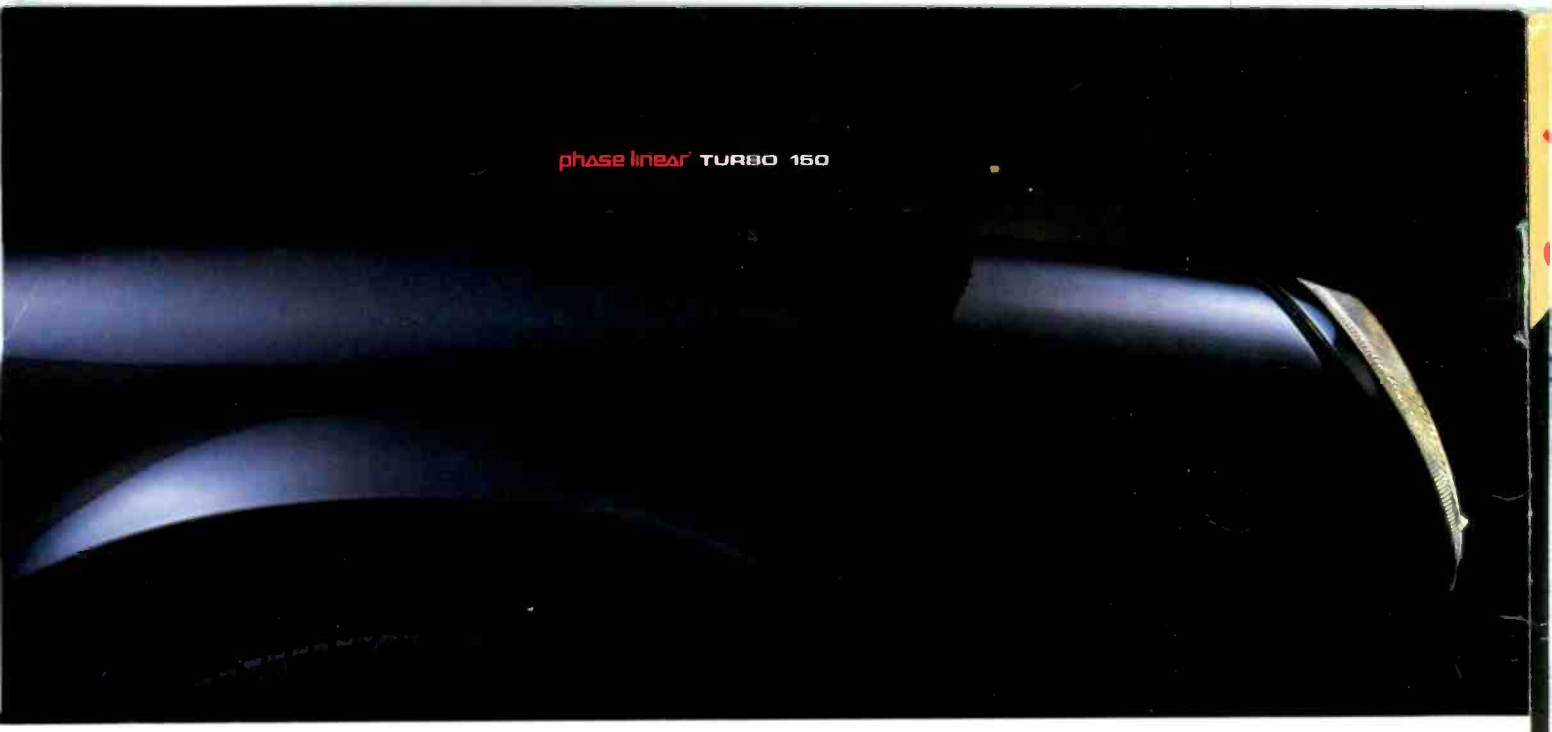

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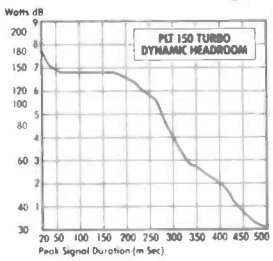

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