

Stereo Review

OCTOBER 1990 ● \$2.50

INCORPORATING HIGH FIDELITY™

**CD PLAYER
LISTENING TESTS:
IS ONE BIT BETTER?**

AUDIO MYTHS

**LAB TESTS:
NAD PREAMP/TUNER,
ALTEC LANSING
SPEAKERS,
LINN INTEGRATED AMP,
AND MORE...**



MR DAVID S BUCHANAN
8900 YELLOW WOOD PL
LOUISVILLE KY 40242
10#4Y

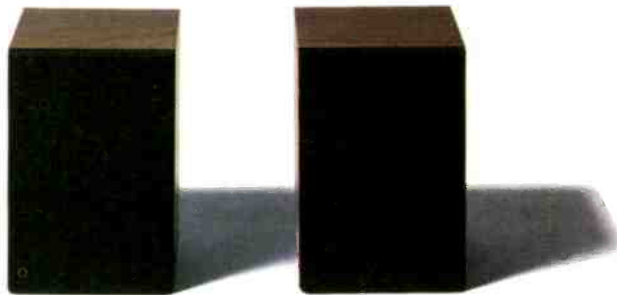
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This is what  sounds like.



This is what (●)™ looks like.



(●) is the symbol for the new *Sound Retrieval System* that lets you experience true 3-D sound from two ordinary loudspeakers. Read that last sentence again. You probably still won't believe it. But it is real.

In fact, (●) won the Grand Award for Audio Technology in the "Best of What's New", *Popular Science*, December, 1989.

Until now the quest for life-like 3-D sound has involved ever more sophisticated, complicated and expensive arrays of hardware.

Until now. Because the engineers at Hughes Aircraft Company began asking some new questions about sound itself. Instead of concentrating on hardware, they analyzed the way the ear processes sound. They discovered that the subtle restoration of certain frequencies in recorded audio can duplicate the way your ears locate sound. Ah ha!

Then they fiddled around with their new technology until they not only perfected it, they made it affordable for commercial applications.

To experience the uncanny realism of this new kind of sound is . . . well, uncanny. You can get up and walk around the room and the sound image doesn't change. You don't have to stay in the "sweet spot" created by delay arrays and surround-type matrices. And you won't find the "hot spots" you get with multi-

ple speaker arrays. Will (●) replace all those speakers? Len Feldman, in the September 1989 issue of *Radio Electronics* wrote, "The demonstration was so dramatic and effective that people couldn't help but look for additional hidden speakers."

So forget expensive surround-type speaker matrices. You don't need to buy a roomful of speakers and sacrifice a lot of square feet of living space to house them. All you need is (●).

We'll bet you're still skeptical, and will be until you actually hear (●) for yourself. Which you can, today, on Sony TV sets. Imagine that. You can buy a Sony TV with built-in sound that will make you want to throw rocks at your stereo system. Several other major electronics companies are poised to announce (●) on their products.

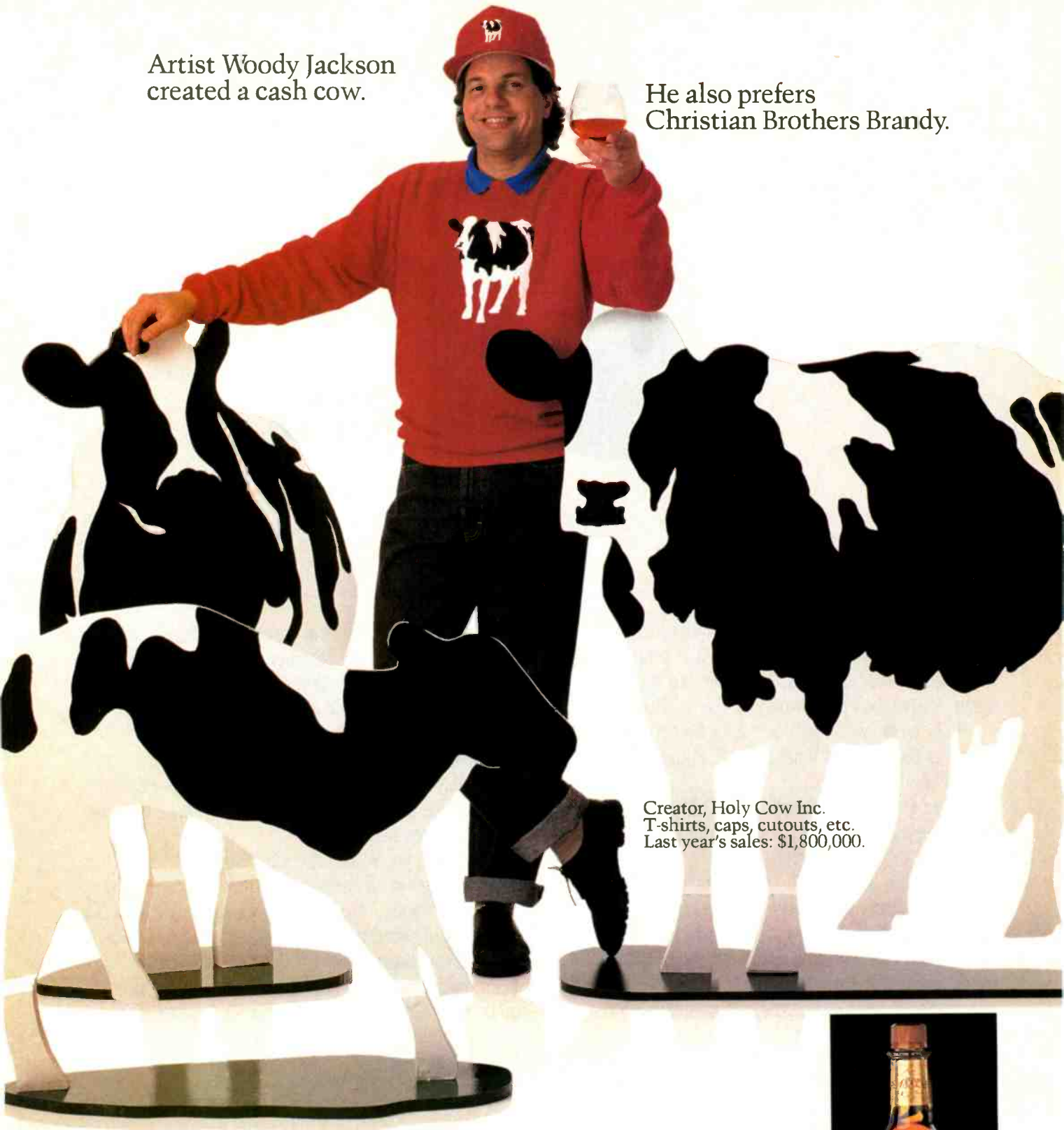
So, when you do look for your new audio system, look for (●).

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Christian Brothers Brandy.



Creator, Holy Cow Inc.
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Stereo Review

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Cover: See page 60 for listening comparisons of the Philips CD840, Technics SL-PS70, and Denon DCD-1560 CD players. Design by Sue Llewellyn, photo by Anthony Pettinato.

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The Nakamichi The End of the Single-vs.



Choosing a CD player isn't as easy as it used to be. The best single-disc players are often very expensive and unnecessarily complicated. Changers offer multi-disc convenience. But because they're generally not designed for the serious listener, they cut corners off performance. They make it difficult to play just one CD. And their mechanisms are slow and clunky.

You could partially solve this dilemma by buying both a single-disc player *and* a changer. But now, thanks to Nakamichi, there's a much better solution.

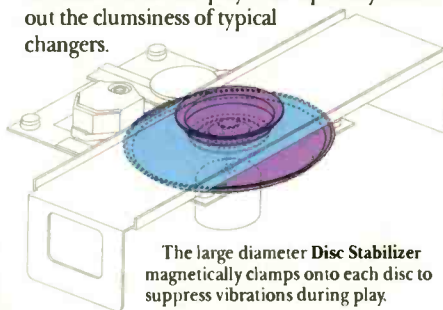


The **MusicBank System™** lets you load up to six discs for multi-play yet always accommodates a seventh single-play disc. You can easily load or eject discs via a familiar single-disc tray.

Take a close look at Nakamichi's new CDPlayer2, for example. On the surface, it looks like a conventional single-disc player (only less cluttered and generally more pleasing to the eye of most beholders). Look inside, however, and you'll find something totally

unique: the Nakamichi **MusicBank System™**.

The MusicBank System employs an ingenious "1 + 6" stoker mechanism that provides advanced multi-disc playback capability without the clumsiness of typical changers.

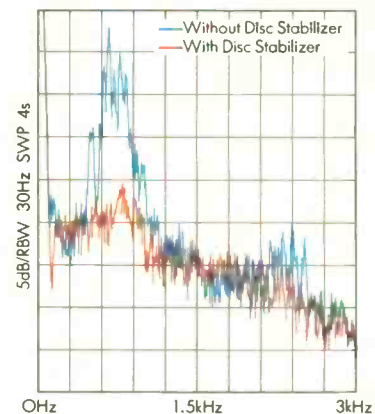


The large diameter **Disc Stabilizer** magnetically clamps onto each disc to suppress vibrations during play.

You can store up to six CDs in the MusicBank System, loading and unloading discs just as you would with a single-disc player. You can play a single CD at any time without juggling discs. And you don't even have to remove the single disc to play any of the stored discs.

You also get a full complement of easy-to-use single- and multi-disc programming capabilities, including delete play, 3-way random play, 3-way repeat play, and a 50-program memory. There's even Nakamichi's convenient **Synchro Recording** feature that automates CD dubbing with virtually any Nakamichi remote-controlled cassette or DAT deck. And whatever you ask of the MusicBank System, you'll find it responds quickly, smoothly, and quietly.

But forget about CDPlayer2's multi-disc capability for a moment. When it comes to sonic performance, CDPlayer2 must be com-



Measurements of focus servo error with and without the **Disc Stabilizer** reveal a dramatic improvement.

pared to the most ambitious, high-end single-disc players—the ones that typically cost hundreds, and even thousands, of dollars more.



CDPlayer2 uses Nakamichi's newly developed **Enhanced Linearity 20-bit D/A Converters**. Unlike other so-called high-resolution systems, it is an innovative and real solution to the problem of converter precision. With this new technology—plus an 8-times oversampling digital filter, improved linear-phase 3rd-order

CDPlayer2 comes with a full-function wireless remote control.

MusicBank System:TM Multi-Disc Player Dilemma.

Bessel-type active analog filtering, and numerous other Nakamichi refinements—CDPlayer2 sets a new standard for musical accuracy. You'll hear musical detail, soundstage precision, and ambience you never knew existed on your CDs.

To further assure even the finest musical subtleties are preserved, CDPlayer2 has a large-diameter, magnetically chucked Disc Stabilizer. It suppresses the effects of external vibrations and dampens disc resonances that can lead to excessive focus servo activity and sonic smearing.



The OMS-2000's optical transport mechanism provides absolute positioning with unrivaled precision.

As impressive as CDPlayer2's internal features may be, the full story goes considerably beyond what lies behind its front panel. After all, advanced CD player technology of this kind is not developed overnight. CDPlayer2 and, for that matter, all other Nakamichi CD players and digital audio products, benefit from years of fundamental research that has put Nakamichi at the forefront of optical disk and digital signal processing technologies.

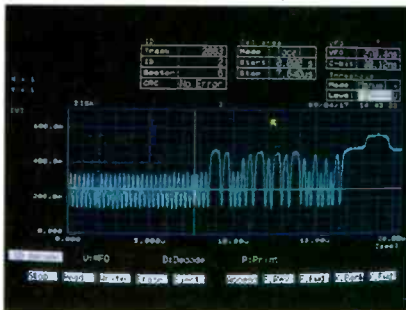
Just to put things into perspective, for a few hundred thousand dollars more than CDPlayer2 you can own a Nakamichi OMS-2000 optical disk analysis system. This remarkable read/write instrument can handle virtually every type of optical disk medium that has been or will be developed. The optical transport and disk drive mechanism are designed and manufactured by Nakamichi to unheard-of levels of precision—many orders of magnitude greater than that required for CD players. And through a sophisticated computer interface, the system permits a vast array of revealing measurements to be made. The list of companies using the OMS-2000 reads like a *Who's Who* of data industry giants.



The Nakamichi OMS-2000 optical disk analysis system has become the *de facto* standard in the data storage industry.

In fact, Nakamichi can rightfully claim a 95 per cent market share in optical disk analysis equipment of this type.

It was Nakamichi's experience in developing the OMS-2000 that revealed, for example, the importance of keeping the signal path between the laser and the signal processing circuitry as short as possible. Accordingly, the RF amplifier in CDPlayer2 is mounted right at the optical transport rather than remotely on the main circuit board as it is with conventional players. This, together with a new high-stability servo circuit developed with the aid of the OMS-2000, delivers much improved CD tracking and imaging accuracy.



The OMS-2000's computer interface enables measurements that have yielded invaluable data and insights on optical disk technology.

But Nakamichi also knows that fine audio components cannot be developed in the laboratory alone. That's why the Nakamichi headquarters research and development facility includes a lavish concert hall and special listening room. They provide a "live vs. reproduced" reference standard against which Nakamichi engineers can continually judge the success of their designs.

You can be the judge when you visit your Nakamichi dealer. Audition CDPlayer2 or CDPlayer3, both featuring the MusicBank System. If you don't need multi-disc capability, ask about CDPlayer4. Compare them to other players for musical accuracy, ease of use,

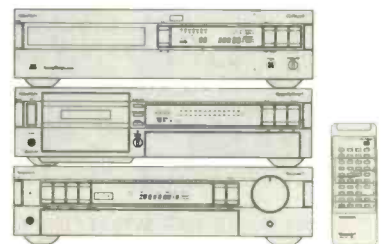
smoothness of operation, construction quality, versatility, and value. After that, the choice will be easy.



The ultimate reference standard: the Nakamichi Concert Hall and Listening Room are extravagant, yet essential, "test equipment" in the Nakamichi product development cycle.



Write or call for complete information on Nakamichi's new line of CD players, cassette decks, and receivers.



MusicBank SystemTM is a trademark of Nakamichi.

Nakamichi

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 **PIONEER**
The Art of Entertainment

by Rebecca Day and
William Livingstone

JAPANESE-AMERICAN PACT

McIntosh, long revered as a high-end, made-in-America brand name, has agreed to be acquired by the Japanese car audio manufacturer Clarion for an undisclosed amount of cash. McIntosh officials say the infusion of capital from Clarion will allow the company, based in Binghamton, New York, to expand its line to include products its customers have been asking for, such as home theater components, laserdisc players, and CD changers.

MAKE WAY FOR MOZART

Wolfgang Amadeus Mozart, who died in 1791, has become just about everybody's favorite classical composer, and the observances of the two-hundredth anniversary of his death are going to assume epic proportions next year. Record companies are getting a head start with their bicentennial issues this fall. Philips, which plans a complete Mozart edition, started with the September release of all of Mozart's forty-one symphonies performed by the Academy of St. Martin-in-the-Fields under Neville Marriner. LaserLight, an all-digital budget label, has released forty CD's, many of which were recorded in Mozart's home town, Salzburg, Austria.

The United States is not lagging behind. Newport Classic has released on four CD's (or cassettes) all of Mozart's sonatas for fortepiano played by Anthony Newman, probably the most influential American proponent of original-instrument performance. Another Newport Classic album includes the complete music for string orchestra with Newman conducting the Brandenburg Collegium.

There is lots more to come.

DAT TO COURT

Just when it seemed digital audio tape (DAT) and DAT equipment had settled safely on U.S. retail shelves, the National Music Publishers Association

(NMPA) slapped Sony with a class-action copyright-infringement suit aimed at barring the importation of DAT recorders and blank DAT cassettes into the U.S. In response, Sony officials termed the suit "totally without merit," claiming that the litigation challenges "the consumer's well-established right" to tape music at home for noncommercial purposes. In the meantime, NMPA is seeking an injunction that would prevent Sony from importing blank DAT's and DAT decks while litigation is pending.

TAPE NEWS

In September, Fuji will begin selling its FR-11X 100-minute audio tapes in "extra slim" cassette boxes. Said to be 20 percent thinner than conventional boxes, the new holders are in response to consumer wishes for compactness and portability. The company is also using a new double-coating videotape manufacturing process that is said to produce a superior image and improved audio output from its Super VHS Pro, A/V Master, A/V Pro Super HG, and HQ videocassettes. . . . Denon has introduced a budget-price S-Port Series of audio cassettes in high-bias and metal formulations. Available in 100-minute lengths only, the S-Port Metal and S-Port High cassettes are priced at \$6.99 a pair and \$4.99 a pair, respectively. . . . The latest Scotch brand audio cassette is Scream'r, a Type I formulation targeted at the teen and pre-teen market. . . . From September through December, Memtek is offering a five-for-the-price-of-four promotion to consumers who buy the five-tape package of HBS II 100-minute audiocassettes. . . . BASF's new T-130 videocassette has 30 minutes extra recording time in the extended-play mode and 10 minutes more in standard-play mode.

AIDING THE DISABLED

Electronic products designed to assist people with physical or sensory limitations are described in a pamphlet, "Extend Their

Reach," published by the Assistive Devices Division of the Electronic Industries Association's Consumer Electronics Group. The pamphlet is available to concerned individuals, physicians, and groups that deal with disability issues. For a free single copy send a self-addressed business envelope (#10) with a 25¢ stamp to Extend Their Reach, c/o Electronic Industries Association/CEG, P.O. Box 19100, Washington, DC 20036.



LABEL BILL VETOED

A bill that would have required the use of warning labels on recordings dealing with certain matters of sex, violence, or substance abuse has been vetoed by Gov. Buddy Roemer of Louisiana. While recognizing the need to inform parents of the contents of recordings, Gov. Roemer supports the voluntary labeling recently proposed by the Recording Industry Association of America (RIAA).

The Neville Brothers were among Louisiana musicians who praised the governor for his courage in vetoing the bill. Composer Randy Newman, who was born in New Orleans, said, "Had this bill been approved, its impact upon music and the arts in general would have been devastating."

Jason Berman, president of RIAA, said, "Governor Roemer deserves the respect of all Americans . . . he has sent a strong and clear message that the First Amendment's guarantee of freedom of speech must remain intact."

TERRY ALLEN

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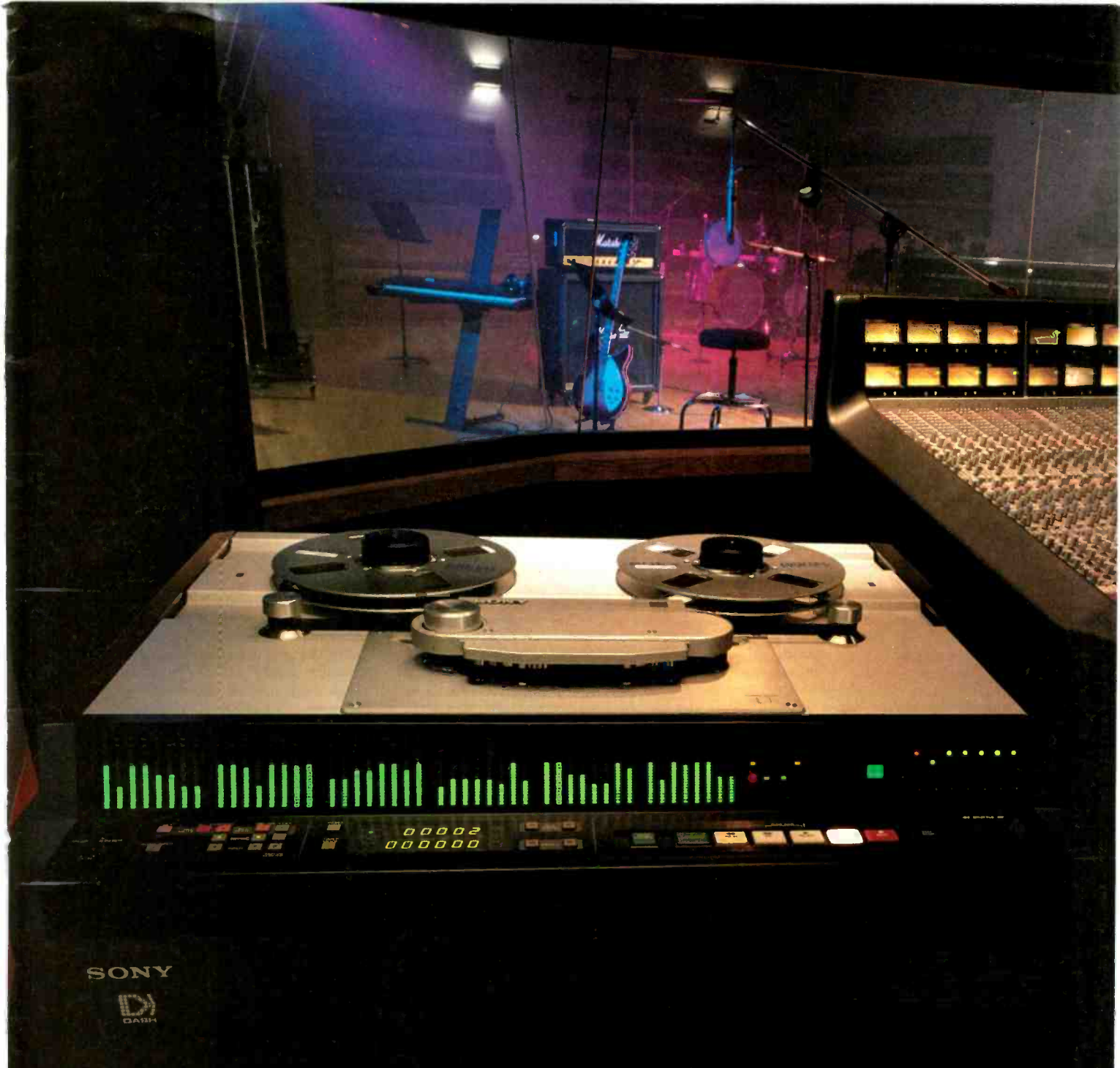
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CD Tweaking

Ken Pohlmann's "Signals" column in August is proof of something I have been saying to musicians for years: There are very few people who can actually "hear." Did Mr. Pohlmann "study" the Armor All phenomenon, or did he "hear" it?

Anyone who can hear will *immediately* hear an improvement of astounding proportions [in CD's treated with Armor All]. Strings *are* smoother, there is more of the original ambience, longer decay (less like the cutoff decay CD's are famous for—if you're listening), more accurate timbre, heightened dynamics, and altogether more "thereness." Must we be brainwashed by nonlisteners when, finally, something is hearable?

I read the original writeup of Armor All (in *Stereophile* magazine), tried it on some duplicate CD's, and did extensive A/B tests. The results were consistently astonishing. What does Mr. Pohlmann mean when he says, "The idea that strings will sound smoother or vocals crisper is clearly fallacious"? I'm not talking about ideas; I'm listening. Mr. Pohlmann scientifically disproves the *theory* of Armor All while I am listening to the reality. Music lovers are people who want to get closer to the music. We have been fooled over and over into thinking the sound would be better with the next technological breakthrough. But this time something works! And it's so cheap! For goodness sake, let's accept small miracles when they appear.

Played on a good system, CD's still do not approach the sound of LP's, but Armor All gets them that much closer. The hell with the science. If I just did something and someone else proved scientifically that I couldn't have, would I erase it from my experience? I hope not.

Whether CD players will be destroyed by Armor All is entirely a separate problem, but when the music is this much improved, I'll take my chances.

KEITH JARRETT
Oxford, NJ

Ken Pohlmann stated that the only possible area of CD playback that could be affected by using green marking pens or Armor All is the error rates, activating the concealment and correction modes. He then dismantles this self-provided theory by means of his knowledge of digital audio. Is this adequate testing of a hypothesis?

The point I find fascinating is that he did not at any time listen to and document the effects (or the lack thereof) of the two CD treatments. It appears that he places intellectual knowledge before actual listening experience. This means that everything he observes is totally biased by the theory behind it—hardly

the scientific ideal of being an unbiased observer. If a difference can be found by listening, then a test needs to be found that explains why.

Time will show that new, quantifiable parameters of digital playback performance explain how "fallacious" treatments do indeed affect the sound. I agree that Armor All is not the correct substance to use on discs, but serious products now exist that won't destroy the player or discs. The existence of these products nullifies the high and mighty finishing paragraph of Mr. Pohlmann's column. Theorize away, Ken. I'll continue to subject these products to the most important test of all—listening.

BRENT K. COLE
Grandville, MI

Thanks to Ken Pohlmann for discrediting, once and for all, the ludicrous claims that green markers and Turtle Wax improve CD sound. It's a shame that such absurdities gain enough credibility to require addressing.

ALICIA SORENSEN
Columbia, MO

Ken Pohlmann replies: I've listened carefully to these surface treatments in double-blind tests and heard no effect. I've analyzed the arguments for them and found no reasonable basis. The burden of proof is on the folks making these claims, not the responsible audio community that discounts them. Until I see a properly conducted listening test or an engineering report that proves otherwise, I'll chalk up Mr. Jarrett's and others' experiences with Armor All, Turtle Wax, green stripes, etc. to the placebo effect. While there are things that do make CD's and CD players sound different, in my opinion these treatments aren't among them.

Neeme Järvi in Detroit

We read with delight the article by Lawrence B. Johnson in September about the Detroit Symphony Orchestra's new music director, Neeme Järvi. Since the article was written, the orchestra has received more than \$11.6 million in extraordinary funds from the state of Michigan, the Big Three automakers, and other major corporations, and we are well on the road to financial stability.

TOM GULICK
Vice President for Marketing
Detroit Symphony
Detroit, MI

Audio Time Machine

My thanks to Julian Hirsch for a reminiscence and retesting of his 1955 Acoustic Research AR-1 speaker (June "Technical Talk"). I was especially interested

because I still use a pair of AR-4 bookshelf speakers I bought in high school (\$110 a pair in February 1964). These two speakers are all I've ever needed, and so far there's been no reason to replace them. I've never driven them with more than 35 watts, and they give exceptional sound at the moderate listening levels I like.

BRUCE L. FELLOWS
Anaheim, CA

Pure Sound

While I agree with Mike Porta (August "Letters") concerning spurious noise in utility-company electricity and have taken his suggestion to begin generating my own electricity for my stereo system, I did run into one pitfall. When I purchased the finest 10-kilowatt power plant available, it didn't occur to me that our local fuel supplies were man-made propane and not the natural gas he recommended. Consequently, the output from my system sounded stilted. Fortunately, the cure was simple and reasonably straightforward. Disassembling one end of the precision-balanced alternator allowed access to the commutator, which I painted in alternate segments with green and yellow fluorescent markers. The output was stabilized, and my high-end equipment is now performing perfectly on our supply of propane.

BOB RICKETTS
Terrebonne, OR

Corrections

The list of recommended recordings accompanying Gerald Seligman's article "Music of Brazil" in August incorrectly credited the album "Aguas de Marco" to singer/songwriter Gilberto Gil; the artist is João Gilberto. Also, the article itself stated, because of an editorial error, that Caetano Veloso at one point spent "two months in prison in Rio followed by four years under house arrest in Bahia." In fact, Veloso spent four months under house arrest.

"Audio for Video" in August incorrectly stated that the Acoustic Research Powered Partners have to be plugged into the wall individually. Although they may be plugged into separate outlets if they're at a distance from each other, you can also plug one Partner into another and then into one wall outlet.

In September's "New Products," a description of Sansui's R-950AV receiver was mistakenly accompanied by a photo of the company's RZ-9500AV receiver. The main differences are that the RX-9500AV, which lists for \$769.95, has five amplifiers (front left, right, and center and two rear channels), Dolby Pro Logic decoding, and a programmable remote control. □

NOW IT'S YOUR TURN.



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To capture all the power, the passion and the pulse of the world's most-admired musicians, the world's most-respected studios turn to Sony Digital Recorders. But up till now, digital recording has remained where it was born—in the studio. Now those days are gone. Welcome to the age of Sony Digital Audio Tape, DAT.

Based on Sony technology, DAT brings to the world of tape recording all the brilliance and accuracy of the digital Compact Disc. Capturing up to two full hours of digital sound on a durable, reusable tape that's 47% smaller than the standard audio cassette.

With the new Sony DTC-700 DAT deck, you can experience this wonderment for yourself. Because you can record live music digitally with a precision and clarity you've never heard before. Or record directly from a digital or analog

source, without the hiss, wow and flutter, or distortion of conventional cassettes.

The DTC-700 also demonstrates the tangible benefits of Sony's studio expertise. You can hear it in High Density Linear Converter™ circuitry that faithfully renders even the most delicate sonic shadings. You can experience it in our high-speed loading system and ultra-stable 4-motor

transport. And you can enjoy it in scan, search and programming features conventional decks can only dream of. Which means the DTC-700 not only defines DAT, it also refines it.



Sony DAT cassettes. Sub-microscopic metal particles, proprietary coating and binder make it a technological triumph in its own right.

For more information, call 1-201-SONY-DAT. Better still, visit your authorized Sony DAT dealer. Where you'll discover you don't have to be a recording professional to make professional-grade recordings.

SONY

THE LEADER IN DIGITAL AUDIO™

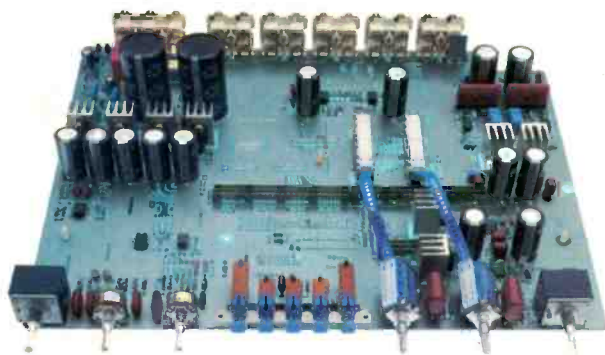
Adcom's GFP-565 Preamp: Pure and Simple.



In Search of Sonic Perfection, Adcom Took the Path of Least Resistance

The fewer circuits a musical signal encounters on its way to your loudspeaker system, the greater its musical purity will be. Now, through obsessive attention to detail and design ingenuity, Adcom has created the GFP-565 — the world's first affordable preamplifier with direct, linear gain path circuitry. By combining the GFP-565 with any of Adcom's power amplifiers, you can experience the exceptionally lifelike sound which has astonished even the most demanding critics.

From Input to Output,
the Signal Path is
as Direct, Pure and
Simple as Possible



By gold plating all input and output jacks, and then directly mounting all jacks, switches, potentiometers and other laboratory grade components on a double copper-plated, glass epoxy printed circuit board, signal losses and noise are dramatically reduced.

Three Sets of Outputs for the Perfect Balance of Performance and Flexibility

You can use one or more sets of outputs: 1) **BYPASS** - direct-coupled before tone controls, filters, etc. for the most direct path to your power amplifier while retaining control of volume and balance. 2) **LAB** - direct-coupled with no output-coupling capacitors yet with tone, filter and loudness controls. 3) **NORMAL** - same as LAB but with highest quality output capacitors for use with amplifiers needing the extra protection of ultra-low-frequency roll-off.

Bi-amped and tri-amped systems are easily accommodated by this flexible arrangement.

Pure Convenience

The minimalist aesthetics of the GFP-565 are deceptive in their simplicity. Without being overly complicated to use, this preamplifier is able to integrate and control all of the components in the most sophisticated of music systems. There are five high-level inputs as well as a phono input. A separate front-panel switch allows the use of an external processor, only when needed, leaving both tape circuits free. And, of course, you may listen to one input while recording from another.

More Sound, Less Money

Adcom stereo components have a reputation for sounding superior to others costing two and three times more. Keeping faith with this tradition, Adcom took the path of least resistance. Why not do the same? Ask your authorized Adcom dealer for a demonstration of this remarkable stereo preamplifier. Please write or call for a fully detailed brochure. You'll discover the best value in high performance preamplifiers.

Pure and simple.

ADCOM[®]

details you can hear

©1990 ADCOM

NEW PRODUCTS



MITSUBISHI

The Mitsubishi M-R8010 is a four-channel audio/video receiver with Dolby Pro Logic surround-sound decoding as well as preset Hall, Club, and Arena ambience programs. When the receiver is connected to a monitor, on-screen menus guide the user through remote-controlled calibration of levels for front and rear speakers and setting of rear delay times. The M-R8010 has six audio/video inputs, two switchable for S-video connections. It is rated to deliver at least 125 watts rms per main channel from 20

to 20,000 Hz with no more than 0.05 percent total harmonic distortion (THD) and 25 watts per rear channel from 50 to 10,000 Hz with 0.5 percent THD, both into 8 ohms. The tuner has sixteen AM/FM presets, and there are connections for two audio tape decks, a VCR, and a video monitor. A line-level center-channel output and separate subwoofer and preamp outputs are provided. Price: \$1,399. Mitsubishi Electronics, Dept. SR, 5757 Plaza Dr., Cypress, CA 90630. *Circle 120 on reader service card*

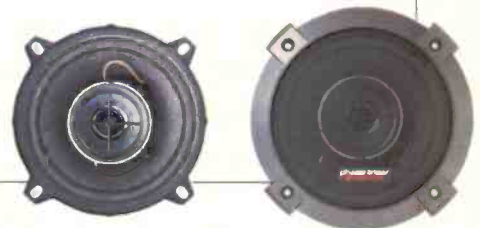


MONITOR AUDIO

The Studio 10 is a bass-reflex speaker that uses a 1-inch gold-dome tweeter and a 6½-inch magnesium/aluminum cone woofer with a ceramic coating. Frequency response is rated as 40 to 30,000 Hz ± 3 dB and sensitivity as 88.5 dB at 1 meter with a 1-watt input. Nominal impedance is 8 ohms. Recommended amplifier power is 20 to 200 watts. Measurements are 15¼ x 8 x 10 inches, and the speakers weigh about 20 pounds each. Cabinets are made of medium-density fiberboard finished in black, walnut, oak, or rosewood veneer. Weighted, spiked, 24-inch-high stands are optional. Price: \$2,800 a pair; stands \$750 a pair. Distributed by Kevro International, Dept. SR, P.O. Box 1355, Buffalo, NY 14205. *Circle 122 on reader service card*

PHASE LINEAR

Phase Linear's Graphite PL2520 loudspeaker is designed to be used in cars that afford only a shallow mounting depth, approximately 1¾ inches or less. The two-way speaker has a 5¼-inch graphite woofer and a ½-inch ferrofluid-filled polycarbonate-dome tweeter. Power handling is rated as 90 watts peak, 35 watts continuous. Frequency response is rated as 64 to 20,000 Hz with less than 1 percent distortion, sensitivity as 88 dB. Price: \$130 a pair. Phase Linear, International Jensen, Dept. SR, 25 Tri-State International Office Center, Suite 400, Lincolnshire, IL 60069. *Circle 123 on reader service card*



MARANTZ

The Marantz Collectors' Edition audio system includes a CD changer, a digital tuner, a dual-well cassette deck, a semi-automatic turntable, a high-current amplifier, a seven-band graphic equalizer, and a pair of three-way speakers. The cabinet is available finished in either oak or black lacquer, and the front panels of all the electronic components are finished in brushed-gold aluminum. The speakers have black grilles. The system

comes with two remote controls, one that operates only Marantz equipment and another that can be programmed to control other products. A LightWave accessory lamp that attaches under a pull-out turntable shelf is also included. All Collectors' Edition purchasers will receive personalized registrations. System price: \$2,000. Marantz, Dept. SR, P.O. Box 2066, Aurora, IL 60507. *Circle 121 on reader service card*

A cow with black and white patches is in the foreground, looking towards the camera. In the background, there is a green field and a house with a chimney. The scene is brightly lit, suggesting a sunny day.

IOWA FARMER EXPOSED TO LARGE SHINY DISC EXPERIENCES PHENOMENAL IMPROVEMENT IN SIGHT AND HEARING.

The instant you see it, you're helpless to turn away. The Pioneer combination Compact Disc/LaserDisc Player. With a 60% sharper picture than videotape, it'll take you far beyond anything you've ever witnessed on the face of your television.

You'll hear things you never knew existed as you experience movies and concerts with incredible

digital sound clarity and Dolby® Surround-Sound™. You'll also hear your music as never before as you play it on CD.

But, whatever you do, don't attempt to describe your first encounter with a Pioneer combination Compact Disc/LaserDisc Player to anyone. Even your loved ones won't believe you.



 **PIONEER®**
Call 1-800-421-1404 for the dealer nearest you.



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



Eliminate independent power supplies

Remove fiber optic modules from signal path

Disconnect Accubit calibration circuit

Replace die cast metal tray with cheap plastic

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

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

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

So Carnegie Hall sounds like Carnegie's closet.

Taking out Onkyo's Opto-Coupling fiber optic

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

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

Now, we could do all these things to an Onkyo CD player. But then we wouldn't have a component as masterful as our new DX-5700 with Dual Linear

18 Bit D/A Converters and Accubit² Calibration.

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



ONKYO®

200 Williams Drive, Ramsey, N.J. 07446 201-825-7950

CIRCLE NO. 47 ON READER SERVICE CARD

NEW PRODUCTS

EPI

EPI has introduced a new version of its Model 100 bookshelf speaker system. The two-way Series 2 uses a 1-inch wide-dispersion dome tweeter and an 8-inch woofer. Frequency response is rated as 60 to 20,000 Hz \pm 3 dB and sensitivity as 90 dB at 1 meter with a 1-watt input. Nominal impedance is 8 ohms. The speaker is covered by a five-year extendable warranty. The cabinet has rounded front edges and is finished in a textured-slate veneer with a charcoal knit grille. Dimensions are 20 x 11 $\frac{1}{8}$ x 9 $\frac{1}{2}$ inches. Price: \$249 a pair. EPI, Dept. SR, 8400 Balboa Blvd., Northridge, CA 91325.

Circle 128 on reader service card



SONANCE

The Sonamp Model 260 x 3 power amplifier from Sonance was designed to feed as many as three pairs of speakers in a custom multiroom installation. It is said to remain stable with low-impedance loads and is rated to deliver 60 watts per channel with high-current capability. Its automatic on/off function is program-source activated. The amplifier is normally in standby mode; when it senses an input signal it goes to a full-on condition. Front-panel switches enable one pair or any combination of speaker

pairs to be activated. RCA-type connectors enable the linking of multiple units so that one input source can feed several amplifiers. Individual left/right inset screw adjustments allow output levels to be preset in order to achieve proper balance and volume. Price: \$375. The Model 260 Sonamp (\$325, not shown) is the same except that it is designed for only a single pair of speakers. Sonance, Dept. SR, 961 Calle Negocio, San Clemente, CA 92672.

Circle 129 on reader service card



PROTON

Proton's 400 Series includes (from top) the AM-455 50-watt-per-channel high-current integrated amplifier, the AT-470 AM/FM tuner, the AC-420 compact disc player, and the AD-430 cassette deck. The tuner, which has sixteen presets, features circuitry by Larry Schotz that is said to increase sensitivity and enhance selectivity. The compact disc player offers dual 16-bit digital-to-analog converters, double-oversampling digital filters, fifteen-track programming, and repeat functions. Cassette-deck features include Dolby B and Dolby C noise reduction and Dolby HX Pro headroom extension.

For those who prefer fewer components, the 400 Series also includes the AV-445 receiver (not shown). The 50-watt-per-channel AV-445 combines the functions of the AT-470 tuner and AM-455 integrated amplifier in one chassis and features high-current capability, twenty-four tuner presets, and a unified remote control. Prices: AM-455 amplifier, \$250; AT-470 tuner, \$220; AC-420 CD player, \$280; AD-430 cassette deck, \$280; AV-445 receiver, \$400. Proton, Dept. SR, 5360 Cerritos Ave., Cypress, CA 90630.

Circle 130 on reader service card



by Ian G. Masters



Dolby on Open-Reel

Q I have a number of open-reel tapes that I want to copy to cassette, but they were recorded with Dolby B using an outboard encoder. The Dolby unit is now gone, but I would still like to get the benefit of the noise reduction if possible. Should I make "straight" copies and play them back using the cassette deck's Dolby decoder?

DON SMITH
Fort Worth, TX

A That would be the ideal way to make the copies, but only if you can devise some way to match levels exactly to prevent the Dolby circuits from mistracking. The only really sure method is to use a Dolby calibration tone to match the open-reel recorder to your cassette deck. Outboard encoders contained oscillators for accurate level setting, and you may find a bit of the appropriate tone recorded on one of your old tapes. Or you can purchase an open-reel test tape containing the tone. These don't seem to be a stock item any more, but Magnetic Reference Lab can make one up for \$46 (plus postage and handling). Write to Jay McKnight at MRL, 229 Polaris Ave., Suite 4, Mountainview, CA 94043; or call 1-415-965-8187. Refer to part No. 233-204-450-102.

Either way, copy the tone onto a cassette without using noise reduction, and then play it back with the Dolby B switched in, noting where the tone reads on the level meters. Repeat the process until the Dolby tone reads +3 dB on playback. You will have to follow this

trial-and-error method even if you have a three-head cassette deck, because no deck will let you record "straight" and monitor with Dolby at the same time. Once you have got the right level, your machines will be matched, and then you can dub your tape without touching the level controls and with the noise reduction switched out. They should play back properly with Dolby on.

If all that seems like too much trouble, you may be able to get a reasonable match by ear, simply through making a few test dubs. With Dolby B, if you're within 2 dB of the proper level, the system should decode correctly. Or you could simply roll off the highs of the open-reel tapes a tad and dub them as if they were not encoded.

Playing Metal Tapes

Q It was my understanding that metal tapes should be played back only on cassette decks with the appropriate metal switch position on the panel, but I have also read recently that metal tape can be played back on any deck. Wouldn't the result be head damage without the metal switch?

E. T. SHIELDS
Barboursville, WV

A If your deck can play a chrome-equivalent (Type II) tape, it can play a metal one with no problem. A cassette deck really only cares what kind of tape you use when you are recording; once you have successfully put the music on tape, you can play it back on virtually any deck. For the best sound, you should make sure the playback deck is switched to the right equalization (metal and chrome tapes use the same one), and whatever noise-reduction system was used in recording should also be used in playback. But there is no need to worry about head damage.

Car Amplifier at Home

Q I am planning a surround-sound system that will require four extra channels of amplification. There are not many low-power four-channel amplifiers designed for this purpose, and those that do exist are expensive. But low-power multichannel car stereo amplifiers are everywhere. Could I buy or build a power supply that would let me use a car amplifier in my home system?

BRIAN HUGHES
Perrysville, IN

A Yes, but there's really not much point. To run 12-volt car audio equipment from an AC source, you need a regulated power supply that filters out every vestige of the 60-Hz line frequency, which would cause hum. Such de-

vices are readily available for low-current devices drawing a couple of amperes or less, and these can be used for operating automotive cassette or CD players. But amplifiers need lots more juice; by the time you have obtained a big enough power supply, with adequate regulation, I suspect you will have spent at least as much as you would on a four-channel amplifier designed for surround systems.

Gold vs. Aluminum CD's

Q I have heard that gold CD's sound superior to aluminum ones because the information can be read more accurately from a gold information layer. Is gold really an improvement?

KEN MOTAMED
Columbia, MO

A Bits is bits. Whether they are recovered from gold or aluminum is unimportant, especially after they have passed through a CD player's error-correction circuits. But gold does have the advantage that it will never oxidize, no matter how much air leaks in through the disc's protective layers. With gold, "CD rot" can never be a problem (if, indeed, it ever is).

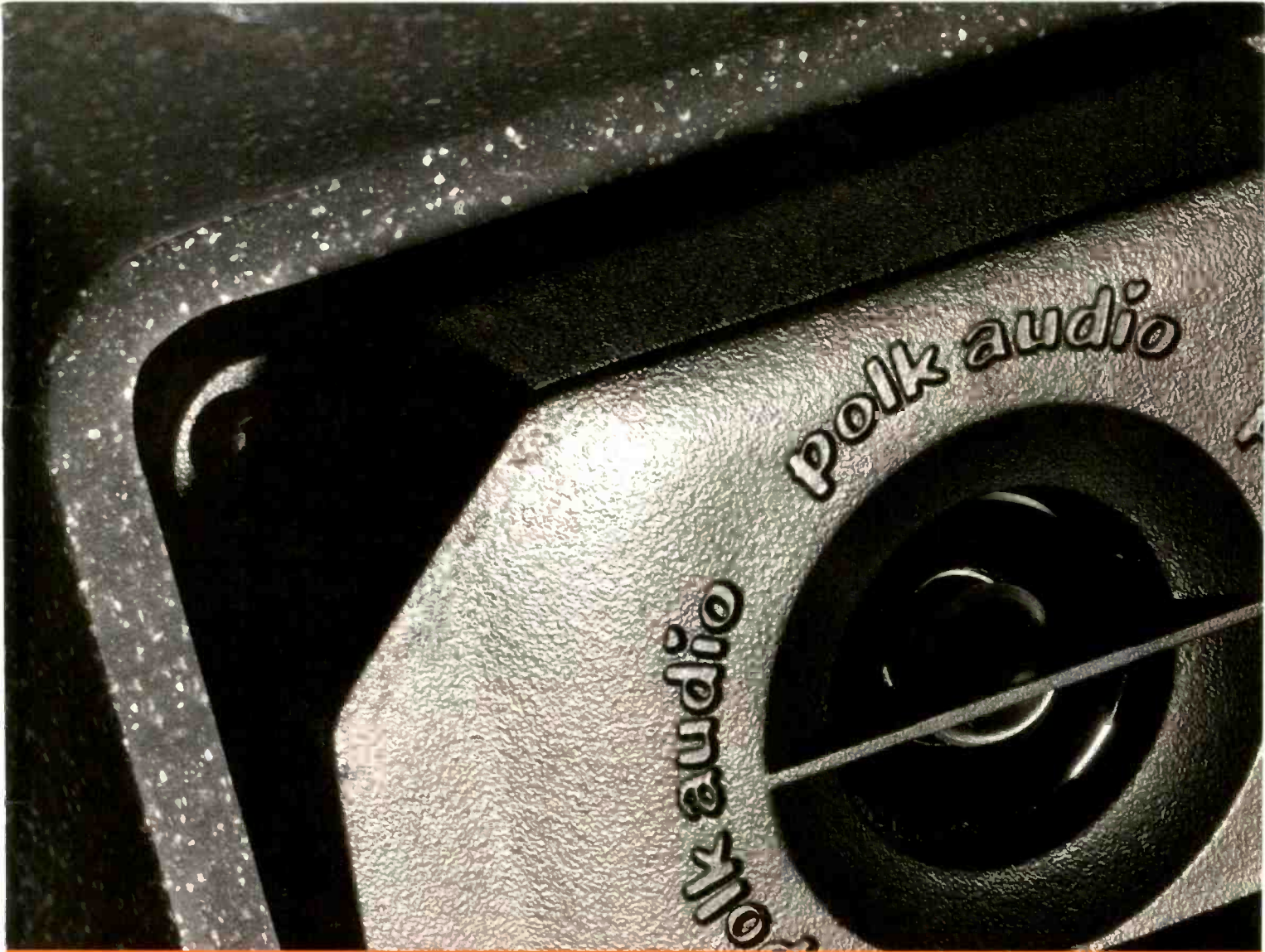
Volume Controls

Q My power amplifier has its own level control. Is the amplifier delivering half its rated power when the control is set at 12 o'clock and full rated power when the control is turned all the way up? What would be the level control's ideal position?

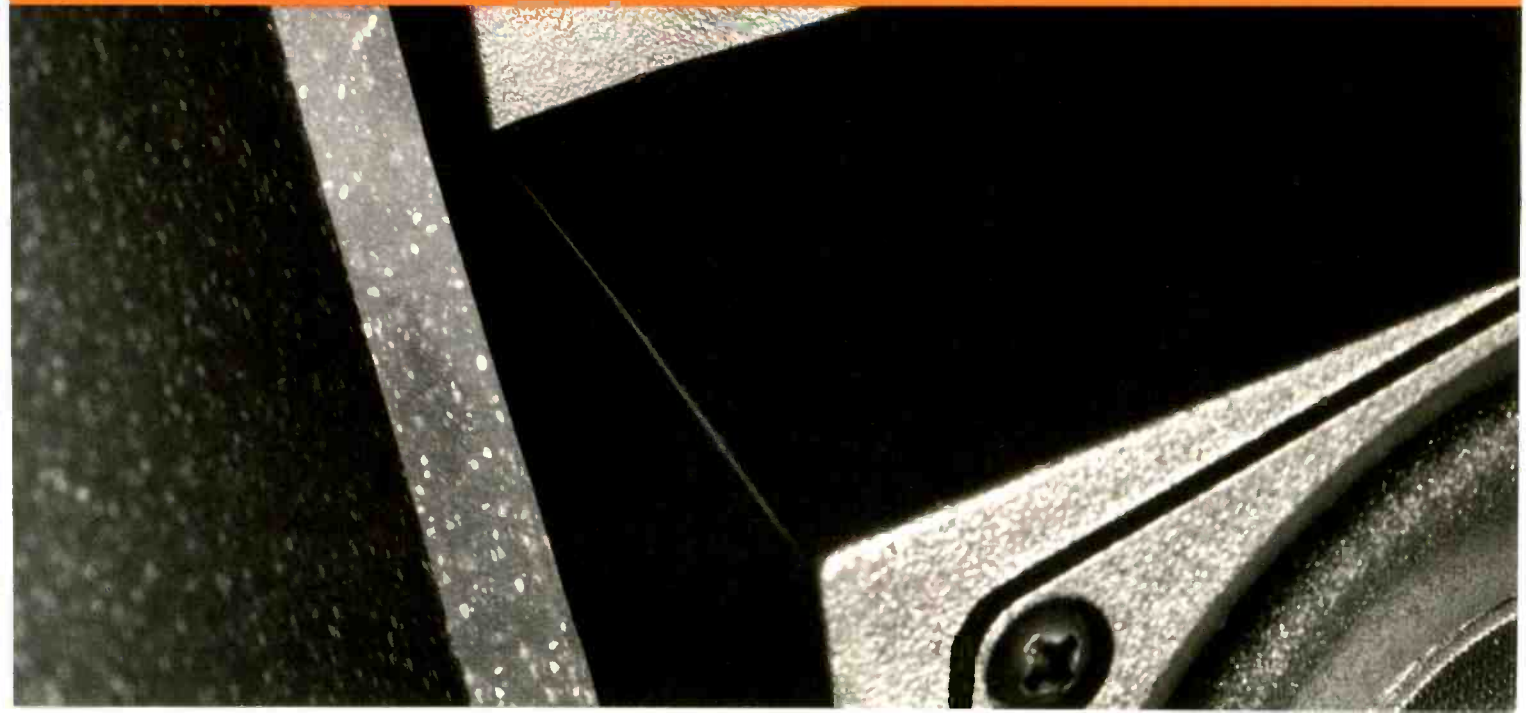
RON BESSELL
Cleveland, OH

A It's a common misconception to think that an amplifier has a constant output and that this somehow relates to the position of its level control. What comes out of the speaker terminals at any moment depends on what is being fed to the inputs: If that's silence, the output will be virtually nothing; if it's a very high level of signal, the amplifier might reach its maximum output and go into clipping. (Rated power is the maximum number of watts the manufacturer guarantees an amplifier can produce continuously under stated conditions.)

The level control simply tailors the incoming signal so that the amplifier operates in its most comfortable range. The output-level control of the preamplifier does much the same thing, but a separate control on the power amplifier enables you to keep the preamp's control in mid-rotation for normal listening levels. So the ideal setting for a power amplifier's level control is whatever makes operation of the rest of the equipment most convenient. □



Sound as big as life...



Listening in the 90's

Today people have become more and more space conscious. Many apartment dwellers don't want to give up valuable floor space for large speaker systems. Others who are planning a surround sound or home theatre system simply don't have the room for more speakers in their listening rooms or hesitate to commit the floor or wall space to a good sounding pair of speakers.

Until now, serious music lovers have had little, if anything, to choose from that would produce a large, bigger-than-life sound in a small, compact size. Systems that fit one's space requirements have been woefully disappointing in sound quality.

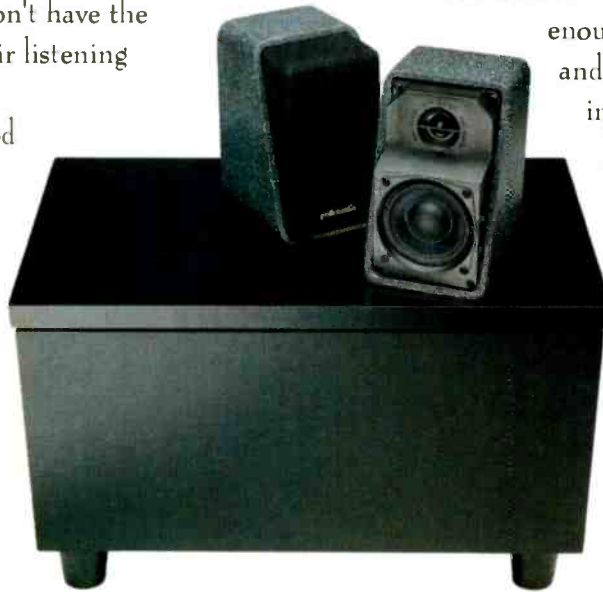
The RM 3000 Three Piece System

Polk's engineers had determined long ago that there were indeed certain technical advantages in

sonic performance.

The small satellites can be located on shelves, mounted on a wall or placed on their own floor stands. They are very attractive and yet small enough to be hidden from view if desired.

The RM 3000 subwoofer is also small enough to sit behind your furniture and can be used on its side to fit into tight spaces. And since it is beautifully finished, it can be used as a piece of furniture.



The RM 3000's satellites measure 7" H x 4 1/4" W x 5 3/8" D and are available in black matrix, gloss black piano or paintable white. The subwoofer is 12 1/2" H x 20" W x 12 1/2" D and is available with black wood grain sides and a black, mar-resistant top.

The Legendary Sound of Polk

In the tradition of Polk Audio, Matthew Polk and his team of engineers were determined to make the RM 3000 sound better than any other speaker of its type.

Initial reactions have been filled with superlatives including Julian Hirsch of

Stereo Review magazine who says, "...they sound excellent...spectral balance was excellent—smooth and seamless."

...from speakers small enough

small speaker systems. Both high and mid frequencies could be faithfully reproduced with superior transient response and dispersion characteristics, and the convenient, more flexible placement of small enclosures within the listening area could create an ideal sound stage. Unfortunately, reproducing the life-like, full body of the lower frequencies could not be achieved in a truly compact enclosure.

Polk's RM 3000 replaces the traditional pair of speakers with three elements, two compact midrange/tweeter satellites and one low frequency subwoofer system. This configuration makes it easy to properly and inconspicuously place the system within your listening room while offering superior

Behind all these accolades is an impressive technical story.

The Technical Side

The big sound of the RM 3000 is due, in part, to the unique arrangement of the tweeter and midrange elements. This "time aligned system" delivers the high and mid frequencies at precisely the same instant. The result is a clear, lifelike and expansive presentation.

The cabinet materials selected for the satellites are over four times as dense as typical enclosures. The black matrix finish is a non-resonant polymer aggregate (FOUNTAINHEAD®). The gloss black piano and paintable white finishes are rigid ABS

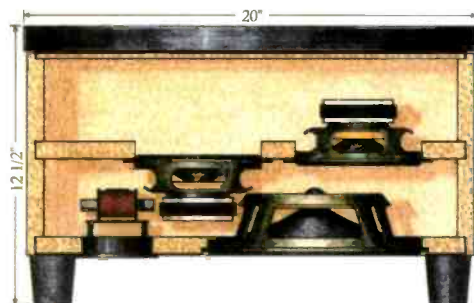


Polk's RM 3000 Three Piece Speaker System easily fits into today's home decor.

to live with.

surrounding a mineral filled polypropylene inner cabinet. Polk engineers have all but eliminated any "singing" or resonating of the satellite enclosure. You hear the effortless, free sound of a much larger system.

Most subwoofer systems look alike on the outside, but the Polk is worlds apart on the inside. Utilizing twin 6 1/2" drivers coupled to a 10 inch sub-bass



For deep, well defined bass, Polk uses twin drivers coupled to a sub-bass radiator. Normally, one subwoofer system is used for both channels. For those desiring even greater low frequency performance, a second subwoofer can be added, one fed by the left channel, the other by the right channel.

radiator, the bass is tight and well defined. There is no tuned port to create "whistling" or "boominess" of the bass frequencies.

You Have To Hear It To Believe It

You really won't believe how good the RM 3000 sounds until you hear it. We invite you to your nearest authorized Polk dealer for a demonstration. You'll hear sound as big as life...from a speaker you can live with.

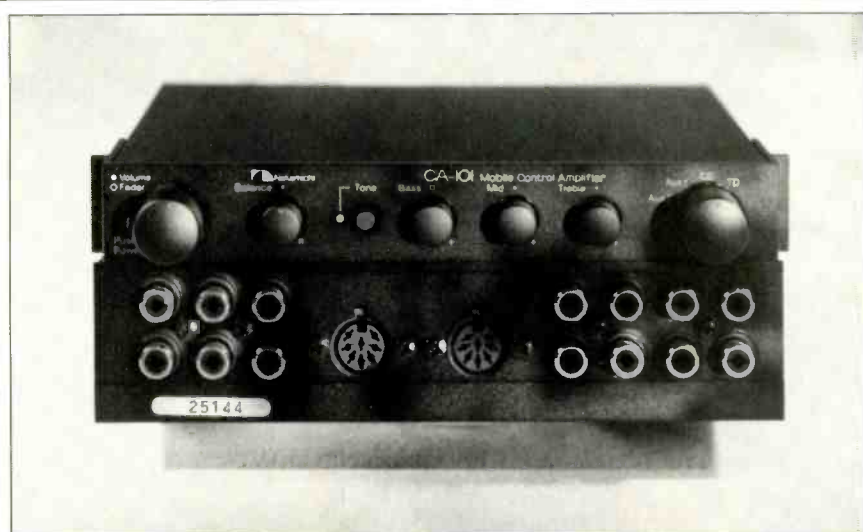
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polk audio
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Where to buy Polk Speakers? For your nearest dealer, see page 122.

CIRCLE NO. 90 ON READER SERVICE CARD



NAKAMICHI CA-101 PREAMPLIFIER

Ken C. Pohlmann, Hammer Laboratories

AT the heart of any high-quality home stereo system is a preamplifier, which provides a central connecting point as well as volume and tone controls, source selection, and other crucial functions. Now consider a high-quality car system, with tuner, cassette deck, CD player, equalizer, amplifiers, and other components. Why isn't there a preamplifier to coordinate everything? Why put up with the multiplicity and redundancy of controls and run the risk of degraded sound because of all the shaky interconnections?

Nakamichi's engineers asked those same questions and responded with the CA-101, a mobile preamplifier designed to integrate multiple sources through a single controller that feeds the desired signals to the system's power amplifiers. In other words, the CA-101 performs the same function as a preamplifier in a home audio system.

Although the CA-101's panel is quite simple, it provides a full complement of preamplifier functions. The volume-control knob doubles as a pushbutton power switch. This arrangement is preferable to ones in which the power is turned off by twisting the volume control to its extreme counterclockwise position, since it enables you to maintain a

volume setting. A concentric front/rear fader ring around the volume knob has a firm center detent.

Left/right channel balance is handled by a separate knob, also with a detent at the midpoint of its travel. A separate balance control is certainly more useful than one that is integrated with the volume/fader control. Three more knobs operate bass, midrange, and treble tone controls. Three-band equalizers such as this one are a real treat to use, giving more precise control over frequency contour than traditional two-band systems, particularly in the important midrange. In this case the bass and treble controls allow a ± 12 -dB variation at 20 and 20,000 Hz, respectively, while the midrange control allows a ± 10 -dB variation at 200 Hz. The entire equalization section can be defeated by a nearby button, bypassing its circuitry and restoring flat response. An LED lights when the EQ section is engaged.

A rotary switch selects any of four inputs, labeled TD (tape deck), CD, AUX 1, and AUX 2. When the tape input is selected, the CA-101's volume, tone, balance, and fader adjustments are bypassed (as is the rest of the CA-101's circuitry), and the signal is routed directly to the output jacks. The bypass is intended for head units that lack an auxiliary

input: For example, a CD changer can be routed through the CA-101, so that the CA-101 controls CD volume and other parameters while the head unit retains control for tape and radio playback. This eliminates duplication of controls and unnecessary circuitry that could degrade the signal.

All four line-level inputs would be equally at home dealing with outboard CD players, DAT decks, or other audio components. Each of the four settings has a firm click stop, which, in conjunction with white lettering on a black background, makes control settings clear and unambiguous. Yes, it is possible to design an audio product that doesn't have a multicolored LCD with flashing lights and Times Square message matrices.

On the other hand, nighttime illumination is marginal. Each of the controls is backlit, so that a halo of light helps you to locate it in the dark. The illumination is very dim, however, and none of the control labels is lighted. Unless you know the functions of the controls (admittedly, an easy feat of memory), you'll have to rely on trial and error.

The CA-101 actually comes in two pieces. Its DIN-width control module is designed to be mounted in the dashboard, and its half-DIN height should help installers squeeze it into a stack of DIN-size components. But most of the CA-101's circuitry is in a separate input/output (I/O) subchassis, which is connected to the control unit by way of two umbilical cables with DIN connectors on the subchassis end.

Although the I/O module lacks any user controls, it handles all of the audio and power interconnections. Aside from the DIN connectors used to attach the subchassis to the control unit, all audio connections are via fourteen gold-plated phono jacks. Specifically, there are two inputs each (left and right) for CD, AUX 1, and AUX 2 and four inputs (left and right, front and rear) for tape. There are four line-level outputs (left and right, front and rear). Power is delivered through a box connector; it attaches to leads providing battery and ignition power, as well as a 500-milliamp on/off control, to turn remote power amplifiers or other com-



*W*ITH SANSUI'S NEW MINI MODULAR,
IT'S MUSIC THAT FILLS THE ROOM, NOT THE STEREO.

Sansui's engineers will surprise you with their Mini Modular series. In an engineering feat akin to painting the Sistine Chapel on the head of a pin, they've packed a complete audio system, including a CD player and dual tape decks, into just 11 square inches. And the Mini can be arranged to fit any space. Which means you still get the same larger-than-life Sansui sound, but the Mini series leaves room to dance. The Sansui MC-1000. Sight and sound made better.



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THE SANSUI MC-1000 MINI COMPONENT SYSTEM. AM/FM STEREO RECEIVER. DUAL CASSETTE. PROGRAMMABLE CD PLAYER. REMOTE CONTROL.

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CIRCLE NO. 99 ON READER SERVICE CARD

ponents on and off. Both battery and ignition leads are fused with 2-ampere fuses. With the connector attached, the wiring harness is more than 4 feet long. A separate ground lead is about 2 feet long.

The CA-101's simple front panel and interconnection method belie the complexity and sophistication of its design. The control unit contains preamplifier circuitry, while the I/O subchassis contains switching relays and a power supply. Just as in home components, this separation of noise-generating circuitry from the audio signal path helps minimize interference from "dirty" circuits contained in the DC-to-DC converter power supply. To make sure the noise does not affect the relays, the DC-to-DC converter is enclosed in its own Faraday shield; the relays are sealed, providing additional shielding. The converter is a pulse-width-modulation (PWM) design of considerable capacity; it is rated to supply three times the power required to run the CA-101.

Nakamichi employs opto-isolators to decouple the car's electrical ground from the CA-101's reference ground. This prevents leakage of noise into the audio circuits. In addition, local regulators and filters in the control module guard against interference; they use Nakamichi's proprietary Isolated Ground topology to further isolate the ground from noise. The audio outputs have FET (field-effect transistor) push-pull buffer amplifiers to maintain a clean signal even if the power amplifiers are placed at a distance from the preamplifier. Nakamichi says that cable runs of 15 feet would pose no problems.

The control module measures 7¹/₁₆ inches wide, 1 inch high, and 4¹/₁₆ inches deep. It weighs 1 pound, 2

ounces. The I/O module is 6⁷/₁₆ inches wide, 1¹/₁₆ inches high, and 6⁵/₁₆ inches deep; weight is 1³/₄ pounds. Price: \$595. Nakamichi America Corp., Dept. SR, 19701 South Vermont Ave., Torrance, CA 90502.

Installation

Installation of the CA-101 posed no problems. We placed the control unit under the dashboard using a pair of supplied mounting brackets and tucked the I/O module inside the dashboard using supplied Velcro strips. As noted, the I/O module contains a DC-to-DC converter; because this type of circuit radiates stray magnetic flux in the form of switching noise, it could interfere with radio reception. We were careful, therefore, to locate it away from the tuner as well as the antenna and antenna lead. We did not encounter any radio interference.

Following mechanical installation, it was a simple task to insert the CA-101 into the audio chain. We were lucky enough to have other Nakamichi components on hand to complement the CA-101: a TD-560 tuner/cassette deck, a CDC-101 CD changer, a DAC-101 digital-to-analog (D/A) converter, and SP-65C and SP-80 loudspeakers. A Blaupunkt BMA-5350B amplifier powered the system. The CA-101 was installed between the head unit and the power amplifier. Following the advice in the owner's manual, we used the remote turn-on lead from the CA-101 to trigger the amplifier (as opposed to using the lead from the head unit).

Road Tests

Roadwork with the CA-101 was satisfactory in virtually all respects. Although the TD-560 has auxiliary inputs, we connected it and the

CDC-101 changer (via the DAC-101 outboard D/A converter) to the CA-101. All controls on the CA-101 worked perfectly, without noise, pops, or clicks. The tone controls in particular were excellent in their ability to provide just the right contour. Unlike the selector switches in some home preamplifiers, the CA-101's source selector was not plagued by crosstalk between inputs. The available headroom is considerable; in fact, there is probably no reasonable way you could overload this preamplifier. Without a doubt, the CA-101's sound quality was topnotch. It caused no audible degradation whatsoever to the signals passing through it. In other words, it was neutral, without any "sound" of its own. That, of course, is the mark of a high-quality preamplifier.

The control knobs had a solid, stiff feel, which is often an earmark of high quality (as in this case), but this friction coupled with the small diameter and smooth surfaces of the knobs made them somewhat hard to grasp and turn. Ridged edges would provide a better grip. And in some installations it might be advantageous to have the option of controlling the tape deck's front-channel outputs through the preamplifier; in other words, a switchable bypass would be nice, instead of the current hard-wired bypass. Those quibbles aside, there was no mistaking the convenience of central control of the car's audio sources, which makes mobile listening more enjoyable and probably safer as well.

If your car is suffering from the overcrowding of too many audio components, you may be leery of the suggestion that you add yet one more. In this case, more really is less. The Nakamichi CA-101 does an admirable job of consolidating the components of an audio system (as well as making room for expansion), providing a single set of controls to adjust their sound. Moreover, its quality is comparable or superior to that of the sources, insuring that the signals passing through its circuitry will not be impaired. In short, this half-DIN box could be one of the biggest assets in a mid- to high-end car installation.

Circle 139 on reader service card

LABORATORY MEASUREMENTS

Output at clipping: 8.6 volts
Maximum input level: 4.8 volts
Sensitivity (for 0.5-volt output):
 271 mV
Signal-to-noise ratio (A-weighted,
 referred to a 0.5-volt output):
 86.8 dB
Frequency response: +0, -0.25
 dB from 20 to 20,000 Hz
Channel separation: 82.8 dB at
 1,000 Hz

**Maximum crosstalk between
 inputs:** -87.2 dB
Harmonic distortion (THD +
 noise) at 1,000 Hz and 1-volt
 output: 0.041%
Tone-control range: 20 Hz, +11.7,
 -11.8 dB; 200 Hz, ±9.8 dB;
 20,000 Hz, +11.7, -11.5 dB
Maximum current consumption:
 0.5 ampere

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Romance
(Arista) 24824

Wilson Phillips:
(SBK) 00726

Guns N' Roses:
Appetite For Destruction
(Geffen) 70348

The Black Crowes:
Shake Your Money
maker (Geffen) 52142

Janet Jackson's
Rhythm Nation
(A&M) 72386

The Who: Who's Better,
Who's Best (MCA)
00790

Don Henley: The End Of
The Innocence
(Geffen) 01064

Eagles: Greatest Hits,
Vol. 1 (1971-75)
(Asylum) 23481

Quincy Jones: Back
On The Block
(Warner Bros.) 64116

Horowitz At Home
(DGC) 25211

The Moody Blues:
Greatest Hits
(Threshold) 34284

Whitesnake: Slip Of
The Tongue
(Geffen) 01147

The Dizzy Gillespie
Symphony Sessions
(Pro Jazz) 44022

Duran Duran: Decade
(Capitol) 73573

The Best Of Steely Dan:
Decade (MCA) 54135

Bon Jovi: New Jersey
(Mercury) 00516

Faith No More: The Real
Thing (Reprise) 63719

Cher: Heart Of Stone
(Geffen) 42874

Tom Petty: Full Moon
Fever (MCA) 33911

The Traveling Wilburys:
Volume One
(Warner Bros.) 00711

Roy Orbison: Black
And White Night
(Virgin) 64495

Jeff Lynne: Armchair
Theatre
(Reprise) 00803

Lisa Stansfield: Affec-
tion (Arista) 34198

Bell Biv DeVoe: Poison
(MCA) 01029

Jazz CD Sampler
(PolyGram) 73406

The B-52's: Cosmic
Thing (Reprise) 14742

J.R. Baker: Every-
body's Favorite Synthe-
sizer Pieces
(Newport Classic) 44611

Linda Ronstadt: Cry
Like A Rainstorm, Howl
Like The Wind
(Elektra) 52221



Heart: Brigade
(Capitol) 64305

**The Jeff
Healey Band:**
Hell To Pay
00544

Shred O'Connor:
I Do Not Want What
I Haven't Got 33512

Michael McDonald:
Take It To Heart
(Reprise) 00573

Pat Metheny: Question
& Answer (Geffen) 73522
(A&M) 04891

Fine Young Cannibals:
The Raw And The
Cooked (I.R.S.) 01068

Pavarotti: Volare
(London) 25102

Randy Travis: No
Holdin' Back
(Warner Bros.) 34766

Def Leppard: Pyroma-
nia (Mercury) 70402

The Smithereens 11
(Capitol) 10619

Pretty Woman Sound-
track (EMI) 34631

Restless Heart: Fast
Movin' Train
(RCA) 10802

Bonnie Raitt: Nick Of
Time (Capitol) 54410

Chicago: Greatest Hits
1982-89 (Reprise) 63363

George Gershwin Plays
Rhapsody In Blue
(Pro Arte) 44635

Michael Penn: March
(RCA) 83798

Best Of Dire Straits:
Money For Nothing
(Warner Bros.) 00713

The Church: Gold After-
noon Fix (Arista) 71667

Depeche Mode: Violator
(Sire) 73408

The Judds: Love Can
Build A Bridge
(RCA) 30298

Robert Plant:
Manic Nirvana
(Es Paranza) 54122

Slaughter: Stick It
To Ya (Chrysalis) 42308

Lynyrd Skynyrd:
Skynyrd's Innyrds
(Hits) (MCA) 01150

The Cure: Disintegra-
tion (Elektra) 01109

Peter Gabriel: Passion
(Geffen) 63668

Frank Sinatra: Capitol
Collector's Series
(Capitol) 64362

Rod Stewart:
Greatest Hits
(Warner Bros.) 33779



M.C. Hammer: Please
Hammer Don't Hurt 'Em
(Capitol) 34791

Simon & Garfunkel:
Concert In Central Park
(Warner Bros.) 44006

Aerosmith: Pump
(Geffen) 63678

Led Zeppelin IV (Runes)
(Atlantic) 12014

Hank Williams, Jr.:
Lone Wolf
(Warner Bros.) 64311

John Hiatt:
Stolen Moments
(A&M) 44540

Keith Sweat: I'll Give All
My Love To You
(Elektra) 51603

Diana Ross & The
Supremes: 20 Greatest
Hits (Motown) 63867

Styx: Classics (14
Greatest Hits)
(A&M) 14822

13 Jazz Classics
(Compose) 10460

Dionne Warwick:
Greatest Hits
(Arista) 00667

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Behind The Mask
(Warner Bros.) 43766

Jimi Hendrix:
Electric Ladyland
(Reprise) 23362

The Beach Boys: Made
In U.S.A. (25 hits!)
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Movin' (Virgin) 14823

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by Julian Hirsch



WHY MEASURE, ANYWAY?

THERE are some audiophiles who question the value or validity of performance measurements of audio components. They claim that since they can hear differences between components that measure virtually alike, these measurements are invalid as a means of establishing the components' worth.

Others just as forcefully hold the opposite view. Human hearing, despite its incredible resolving power and dynamic range, has repeatedly been shown to be highly fallible, and (to my knowledge) the ability of people to hear these unmeasurable differences has never been verified in a true "double-blind" test in which neither the person giving the test nor the person taking it knows which component is being played at any given time.

Putting aside for the moment the frequently heated and not always logical counterclaims made by adherents of both points of view, it seems to me that there is something to be said for each of them. Let's examine what we measure in a performance test—and also what we do not and (so far) *cannot* measure.

In this context, the purpose of a

measurement, essentially, is to establish *what a product actually does*. To some extent, we may attempt to verify claims made for the product by the manufacturer or others, but beyond that a measurement can often tell us more about the overall performance than is available in published specifications.

Electrical performance measurements on audio components can be very involved. Without accepted standards, measurements are generally meaningless. A minimum criterion for acceptability of a measurement is *repeatability*. If the measurement is valid, another person in a different laboratory, possibly using different test equipment, could obtain the same results from the same test sample. Ideally (but rarely, in this imperfect world), identical results should be obtainable from other samples of the same product.

Assuming that the measurement is repeatable, just what have we really learned about the product under test? Certainly *not* how it sounds—the standardized tests of electronic components do not involve listening to them. How about its reliability? Unless the product fails during the test, virtually nothing can be learned about this very important property. What of its ergonomic design—how easy it is to use? Is frequent reference to an instruction manual necessary in order to use the product effectively? Well, the tester is likely to learn quite a bit about the product's human engineering, but, unfortunately, what appeals to one person may put off another. I may dislike aspects of a product's design that you find innocuous, and vice versa. Evaluating ergonomics is

as subjective as evaluating sound quality, though probably not quite so controversial.

Let's look at a totally subjective appraisal of the same component. It is unpacked and installed in a system; perhaps the instructions will be studied, although this important step is often omitted or done halfheartedly by reviewers of all stripes. Assuming we are dealing with a basic piece of audio electronics, not a speaker or, as a rule, a tuner, the usual process of evaluation involves listening to a variety of favorite recorded se-

The purpose of a measurement essentially, is to establish what a product actually does. A minimum criterion for acceptability of a measurement is repeatability.

lections on LP, tape, or CD (the last medium has achieved only partial acceptance in certain "high-end" circles).

Often, especially if the component is an amplifier, it is used with several different speakers, with the goal of revealing different aspects of the resulting sound that are peculiar to the product being evaluated. The fact that the sound differences between speakers are immensely greater than those between electronic components would seem to diminish the value of such a test, but it is common nevertheless. The evaluation process usually is, and should be, very lengthy, given the many variables (program material, associated equipment, speakers, rooms and so forth).

It seems to me that, at least in practice, this kind of process frequently results in several dissimilar judgments. True, skilled listeners can sometimes develop a common vocabulary that enables them to describe a tonal quality to their mutual satisfaction. Unfortunately, this mutual understanding seldom carries beyond a small group of people who are familiar with (or share) each other's tastes in sound.

A purely (or largely) subjective product evaluation, then, tells us little more than the reviewer's reaction

Tested This Month

NAD MONITOR 1600
PREAMPLIFIER/TUNER

ALTEC LANSING SYSTEM 3
SPEAKER SYSTEM

LINN INTEK
INTEGRATED AMPLIFIER

HAFLER SE130
AM/FM TUNER

OHM ACOUSTICS FRS 9
SPEAKER SYSTEM



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to what he heard (or thought he heard) under the highly specific test conditions that prevailed at the time. The evaluation is almost completely nontransportable to another person reading the review, unless that person is totally familiar with the reviewer and the conditions of the evaluation. This is in sharp contrast to the situation with standardized measurements, which are to a large extent transportable to a different test environment with relatively minor differences in the end result.

Which approach is "right"? In my view, neither can stand by itself. Performing the most elaborate bench measurements without using and listening to the product in its intended application and environment may tell us very little about its sound—if it *has* a "sound." (Not everything has, or should have, sound qualities of its own, but that is another matter.) On the other hand,

even the most expert listener who claims to detect qualities in the sound of a product that are too subtle to measure is at the mercy of his own prejudices and misconceptions (we all have them). Even if he were totally neutral, he could not fully and accurately convey his subjective

A rational use of both subjective and objective test methods will come closest to meeting the needs of a person looking for guidance.

reactions to a reader of the printed review. I have rarely been able to interpret subjective reviews of electronic components (and not always even of speakers) in a way that makes any sense to me. Others may be more astute in translating

concepts from another person's mind to their own through the spoken or written word.

My conclusion is that neither approach has a monopoly on the truth (whatever that might be) and that a *rational* use of both subjective and objective test methods will come closest to meeting the needs of a person looking for guidance in the written word. There are many gradations between a purely subjective approach and a purely objective one, and any appraisal depending solely on either one is not likely to be worth much.

My advice, as I have said many times in the past, is to believe *no one* who tells you that this or that product is "the only one" you should consider, or that it is "totally without merit." I don't believe I have ever encountered a component, in many thousands of tests, that fit either description. Just use your common sense. □

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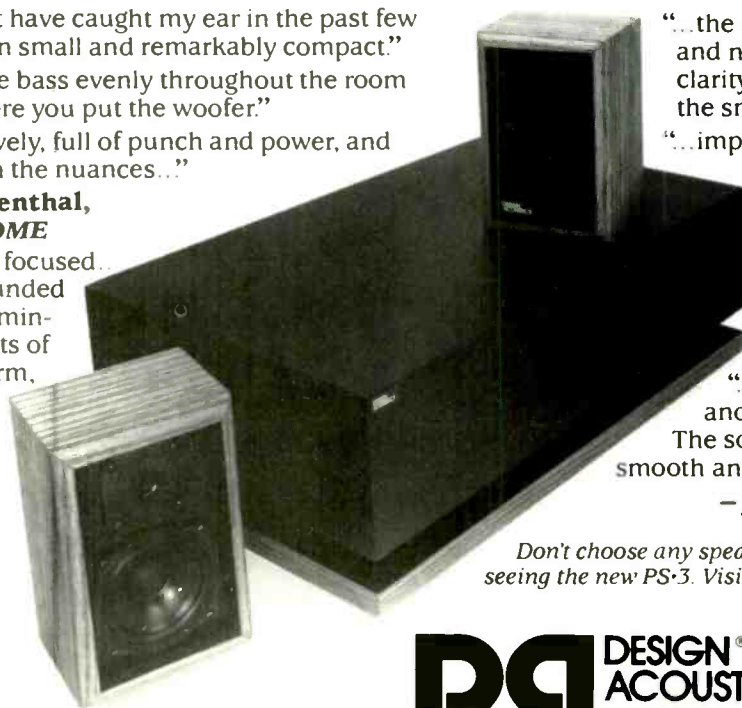
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HI-TECH HOME

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— Rich Warren,
Chicago Tribune

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— Julian Hirsch, **Stereo Review**

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- *Sound & Vision Magazine*

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JOOK P. LEUNG

NAD MONITOR 1600 PREAMPLIFIER/TUNER

Julian Hirsch, Hirsch-Houck Laboratories

A PREAMPLIFIER/TUNER is essentially a stereo receiver without a power-amplifier section. While such a component is smaller and lighter than a receiver, its principal advantage is the ability to drive any outboard power amplifier. High-power receivers, rated for 125 watts per channel or more, are very heavy and bulky, and they tend to run hot. With a preamp/tuner, you can use the most powerful amplifier you can afford, or even separate amplifiers for each channel—located out of sight if you prefer—while retaining the full control flexibility of a receiver in an attractive and compact unit. Also, upgrading the system at any time to a more powerful or better-quality amplifier is easy.

The NAD Monitor 1600 combines a high-quality AM/FM tuner and a pre-amplifier at a very moderate price. Although its specifications are excellent, our measurements showed that most of them are highly conservative.

The NAD 1600 has the styling and appearance of the company's other Monitor Series components, with a gray panel and cabinet, black knobs and pushbuttons, and clearly legible white markings. A long, narrow black window across most of the front panel contains a number of pushbutton controls along with the display.

Most of the buttons in the window are tuner-preset selectors. The tuner has memories for fourteen stations, in two banks of seven. Each memory can be assigned to either an AM or an FM channel; a button toggles between the two banks, and a light indicates the selection. Other buttons select AM or FM, mono operation (effective with any program source), and FM BLEND, which reduces noise in stereo FM reception by partially mixing the two channels. Unlike most other such circuits, the NAD blend circuit affects the entire audio frequency range instead of just the high frequencies.

The luminous display contains large station-frequency numerals, center-tuning indicators, a bar-segment signal-strength indicator, and a signal light that shows when a command is received from the infrared remote control. Unlike many receivers, the Monitor 1600 illuminates its tuner-frequency display only when the tuner is selected as the program source.

The tuning controls are two buttons to the right of the window. The SEARCH button below them selects either manual tuning (in steps of 50 kHz for FM and 10 kHz for AM) or a continuous scan until a station is received.

The other controls form a row across the bottom of the panel. The volume knob, at the lower right, is operated by a small motor when the remote control is used. The balance control and the bass and treble tone controls are center-detented. A TONE DEFEAT button between the tone controls bypasses their circuits.

The program selectors are momentary-contact buttons. The available inputs are CD, video, phono, tape 1, and tape 2. A LOW LEVEL button next to the input selectors reduces the volume by 20 dB.

Two tape decks connected to the

NAD 1600 can be cross-connected by a front-panel lever switch for dubbing from either deck to the other, and the tape-input selectors permit monitoring from either deck during dubbing. The EPL (external-processor loop) button at the lower left of the panel inserts a signal processor (or a third tape deck) into the signal path. Two nearby buttons activate the BASS EQ circuit (a low-frequency boost affecting signals below 60 Hz) and a loudness-compensation circuit. Lights above the display window show when the EPL circuit has

been selected and when a stereo FM broadcast is being received. The front panel also contains a power button and a headphone jack.

The supplied remote control is designed as a system control for other NAD components, including a cassette deck and a CD player. Many of the keys on the remote unit serve different (but analogous) functions depending on which source is selected. For example, the numbered buttons can select either preset stations, tracks on a CD, or recorded segments on a tape.

The rear apron of the NAD 1600 contains input and output jacks for all of the signal sources as well as the pre-out jacks that connect to a power amplifier. The phono-input jacks are gold-plated, and a small switch below them sets the preamplifier gain for a moving-magnet (MM) or moving-coil (MC) cartridge. Another switch activates an infrasonic filter that operates with all inputs, although it is likely to be required only when playing records.

There are two AC outlets on the rear apron, one of them switched, as well as a coaxial connector for a 75-ohm FM antenna feeder and spring connectors for a long-wire AM antenna and ground. Unlike most tuners, the NAD 1600 does not come with a loop antenna for AM reception.

The NAD 1600 measures about 17 inches wide, 15¼ inches deep, and 4¾ inches high, and it weighs 14 pounds. Price: \$399. NAD, Dept. SR, 575 University Ave., Norwood, MA 02062.

Lab Tests

The NAD 1600's usable FM sensitivity, rated at 11 dBf, or 1 microvolt (μV) into its 75-ohm antenna terminals, measured about 12 dBf (1.1 μV). Radio-frequency measurements at these levels are difficult to make repeatably and accurately without a fully screened test room, and this problem was only too evident in our tests.

Data from NAD on our test sample showed an extraordinary usable FM sensitivity of 9 dBf. When we tried to verify this figure, we initially succeeded—to our surprise. But in later tests we were unable to repeat this result, possibly because of an increase in local atmospheric radio noise. Nonetheless, the 12-dBf sensitivity we measured consistently is still an excellent figure.

Much more important to the listener is a tuner's 50-dB quieting sensitivity, and here the NAD 1600's excellence was unambiguous. An input of only 15.5 dBf (1.65 μV) produced a solid 50-dB quieting level and truly usable listening in mono. The stereo threshold was 26 dBf (5.5 μV), and the stereo 50-dB quieting input was 38.6 dBf (23.4 μV). The tuner's mono noise level was a very low -86 dB at inputs of 65 dBf or

FEATURES

- Digital frequency-synthesis AM/FM tuner with fourteen station memories
- Coaxial 75-ohm FM antenna input, terminal for long-wire AM antenna
- FM blend circuit to reduce noise on weak stereo signals
- Low-noise discrete-transistor phono stage with selectable gain for MM or MC cartridge
- Feedback volume control to reduce noise as gain is lowered
- EPL (external-processor loop) circuit for equalizer or other signal processor
- Tone-defeat switch
- Bass EQ circuit to improve deep bass without altering midrange timbre
- Switchable infrasonic filter
- Circuits for two tape decks with two-way dubbing and independent monitoring
- Low output impedance to enable use of long cables without high-frequency losses
- Supplied remote control can also operate most NAD tape decks and CD players; volume knob motor-driven for low noise and distortion

LABORATORY MEASUREMENTS

- Tuner Section** (all figures for FM only except frequency response; measurements in microvolts, or μV , referred to 75-ohm input)
 - Usable sensitivity: mono, 12 dBf (1.1 μV)
 - 50-dB quieting sensitivity: mono, 15.5 dBf (1.65 μV); stereo, 38.6 dBf (23.4 μV)
 - Signal-to-noise ratio at 65 dBf: mono, 85.7 dB; stereo, 75.5 dB (80.2 dB at 85 dBf)
 - Distortion (THD + N) at 65 dBf: mono, 0.049%; stereo, 0.045%
 - Capture ratio at 65 dBf: 1.3 dB
 - AM rejection: 88 dB
 - Selectivity: alternate-channel, 62 dB; adjacent-channel, 5 dB
 - Stereo threshold: 26 dBf (5.5 μV)
 - Pilot and subcarrier leakage: 19 kHz, -72 dB; 38 kHz, < -90 dB
 - Hum: -79 dB
 - Stereo channel separation at 100, 1,000, and 10,000 Hz: normal, 45.5, 51.5, and 35.5 dB; FM blend, 7, 7, and 8 dB
 - Frequency response: FM, +1.3, -0.2 dB from 30 to 15,000 Hz; AM, +2, -6 dB from 22 to 2,800 Hz
- Preamplifier Section**
 - Output at clipping: 10 volts into 600 ohms
 - Distortion (THD) at 1,000 Hz: 0.0047% at 1 volt, 0.0068% at 5 volts
 - Frequency response (CD): +0.05, -0.18 dB from 20 to 20,000 Hz
 - Sensitivity (for a 0.5-volt output at 1,000 Hz): CD, 80 mV; MM phono, 1.17 mV; MC phono, 0.092 mV
 - A-weighted noise (relative to a 0.5-volt output): CD, -101.5 dB; MM phono, -86 dB; MC phono, -81 dB
 - Phono-input overload (MM): 180 to 194 mV from 20 to 20,000 Hz
 - Phono-input impedance: 48,000 ohms in parallel with 102 pF
 - Tone-control range: ± 8 dB at 100 Hz, ± 9 dB at 10,000 Hz
 - Maximum loudness compensation: +9 dB at 100 Hz, +4 dB at 10,000 Hz (for volume-control settings under -40 dB)
 - Bass EQ response referred to 1,000 Hz: +1 dB at 90 Hz, +6.4 dB at 35 Hz, 0 dB at 25 Hz, -20 dB at 10 Hz
 - RIAA equalization response error: +0.1, -1.5 dB from 20 to 20,000 Hz

WIMPY CAR STEREO NEED CAR STEREO REVIEW.

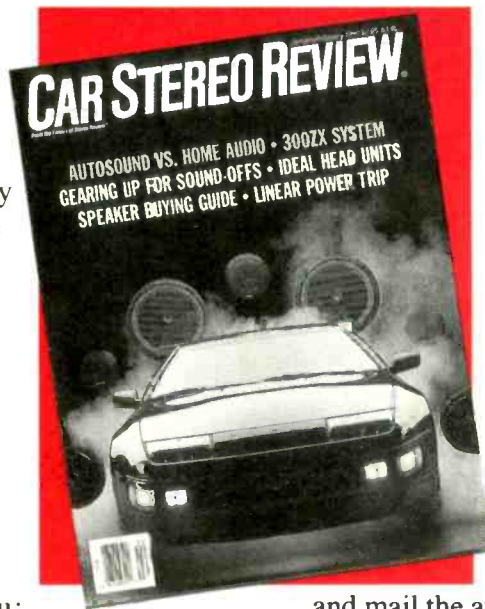
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"Model Eleven...Exquisite Sound...Dwarfs Any Portable Stereo...A High Tech Wonder...Thumbs Up"

Doug Simmons—*The Village Voice*

MODEL ELEVEN

BY HENRY KLOSS

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



Made In U.S.A.

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sound virtually identical to our acclaimed Ensemble® speaker system.

Model Eleven can be used virtually anywhere in the world—115- or 230-volt, 50 or 60 Hz AC or 12-volts DC. Because the entire system fits under an airline seat—or can be checked as baggage—you can take it just about anywhere. But Model Eleven's sound is so good, so "big," you may want to keep it home. It's an ideal second (or first) music system for a study, bedroom or kitchen. At \$749† we don't know of any combination of components near its price (transportable or not) that approaches its sound quality.



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

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



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

Performance that rivals the best home component systems.

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

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

Ambiance

BY HENRY KLOSS

Ambiance is an ultra-compact speaker that proves high performance, small size and low cost need not be mutually exclusive. Ambiance is ideal for bedrooms, dens, dorm rooms...or for use as an extension speaker or in surround sound systems. While no speaker of its size can provide the same low bass as our Ensemble and Model Eleven systems, Ambiance has more output in the

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



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David Clark—*Audio Magazine*

Ensemble

BY HENRY KLOSS

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

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



New Ensemble System With Utility Woofer Cabinets.
\$499†

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

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

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

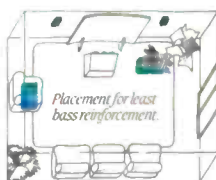
30-day money-back satisfaction guarantee.

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

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

No matter how well a speaker performs, at home the listening room takes over. If you put a conventional speaker where the room can help the low bass, it may hinder the upper ranges, or vice-versa. Ensemble, on the other hand, *takes advantage* of your room's acoustics. The ear can't tell where bass comes from, which is why Ensemble's bass units can be tucked out of the way—on the floor, atop bookshelves, or under furni-

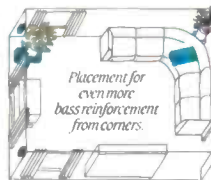
ture. The satellites can be hung directly on the wall, or placed on windowsills or shelves. No bulky speaker boxes dominate your living space, yet Ensemble reproduces the deep bass that *no* mini speakers can.



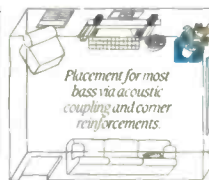
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TEST REPORTS

greater. The stereo noise was -75.5 dB at 65 dBf and -80.2 dB at inputs of 85 dBf and higher.

The tuner's capture ratio of 1.3 dB and AM rejection of 88 dB were excellent, and its 79-dB image rejection was well above average. Selectivity was 62 dB for alternate-channel spacing and 5 dB for adjacent-channel spacing, both good though not exceptional figures. The hum level was -79 dB, equally divided between 120- and 180-Hz components. The 19-kHz stereo pilot-carrier leakage into the audio was at a -72 -dB level, and the 38-kHz stereo subcarrier was undetectable.

Frequency response in FM was $+1.3$, -0.2 dB from 30 to 15,000 Hz, and stereo channel separation was about 50 dB through the midrange, 39 dB at 30 Hz, and 29 dB at 15,000 Hz. The FM blend circuit reduced the channel separation to a constant 7 dB from 30 Hz to several kilohertz; the separation was slightly greater at 10,000 and 15,000 Hz (8 and 10 dB, respectively). Activating the blend circuit also reduced the overall program level by 3.2 dB. The AM section's frequency response was $+2$, -6 dB from 23 to 2,800 Hz.

The NAD 1600's preamplifier section had a frequency response of $+0.05$, -0.18 dB from 20 to 20,000 Hz. Its tone controls had conventional characteristics, with a maximum range of slightly more than ± 10 dB at the frequency extremes. The Bass EQ circuit took effect gradually below 100 Hz, raising the response to $+6.4$ dB at 35 Hz and cutting it to -20 dB at 20 Hz. The loudness contours were conventional, boosting both low and high frequencies as the volume-control setting was reduced.

Total harmonic distortion plus noise (THD + N) at 1,000 Hz was just over 0.01 percent for outputs of several volts, and the output clipped at about 10 volts. At 1 volt, the distortion consisted of odd harmonics at very low levels, -90 to -100 dB. The rms sum of the first twenty harmonics was -86.5 dB, or 0.0047 percent. At 5 volts, the rms sum was -83.3 dB, or 0.0068 percent. The preamplifier's A-weighted noise level was exceptionally low, -86 dB for MM phono, -81 dB for MC phono, and a remarkable -101.5 dB for the CD input.

Comments

The NAD Monitor 1600 is an unusual and noteworthy component, not because of its features, few of which are unique, but rather because of its excellent overall performance, which in several respects challenges the most advanced of today's hi-fi products. Its FM performance was particularly admirable, at a level seldom attained by the most expensive receivers—or even by separate tuners in its price range.

The preamplifier section also performed superbly, at a level of distinction that would do credit to any separate preamplifier in this price class. The Bass EQ circuit can provide a useful deep-bass foundation—assuming your speakers are capable of it—without a trace of boominess. The phono stage was first-rate overall and absolutely outstanding in signal-to-noise ratio (S/N). In addition, the high-level section's A-weighted noise level of -101.5 dB (referred to 0.5 volt) was possibly the lowest we have measured in a preamplifier and actually lower than the noise output from many CD players.

In everyday operation, the NAD 1600 was as simple and straightforward as one could wish, in sharp contrast to the control complexity of so many receivers. Even its remote

control was surprisingly simple to use, especially considering that it is a system control designed to operate a cassette deck and CD player as well as the preamplifier and tuner functions. Its twenty-three buttons are grouped logically and distinguished by different colors. Nevertheless, it's a good idea to read the complete, well-written instruction booklet carefully. For example, although switching from the tuner to a CD player or tape deck is a single-button operation, it is necessary to press *two* buttons to return to the tuner.

The NAD 1600 is not only an excellent preamplifier/tuner but one of the outstanding values in today's hi-fi market. Its price would be quite reasonable for either a tuner *or* a preamplifier, and few products in either category at that price would be likely to match its performance. To get it all in one attractive package for \$400 is remarkable. Combine the Monitor 1600 with a good separate power amplifier, from NAD or another manufacturer, and you could have a light, compact, cool-running "receiver" able to deliver upwards of 100 watts per channel for less than \$1,000, with overall performance superior to that of any single-chassis unit in the same price range. By my standards, the NAD 1600 is a true bargain.

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The D-35, like all Sony Discman portables, offers the expertise expected from the inventors of the compact disc. And like the Maestro himself, it demonstrates that size has nothing whatsoever to do with ability.

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Of Music Do We Find Something
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At Altec Lansing, we think it's time you had a hand in what you hear. That's the idea behind the new Altec 511 Tower, the first loudspeaker that gives you total control of amplification, tonal balance and imaging for each midrange, tweeter, upper bass and woofer. The result is a sound system that lets you mold the music precisely to your taste, so everything from Mozart to Motown will sound exactly the way you want it.

Five years in the making, this towering achievement lets the discriminating audiophile choose between single, bi, tri or quad amplification and an impressive range of tonal balance levels, all through a simple control panel. So now, you can tell the philharmonic how to conduct itself.

The remarkable 511 Tower is one of twelve new Altec Lansing speakers, all designed to reproduce sound with unheard-of accuracy.

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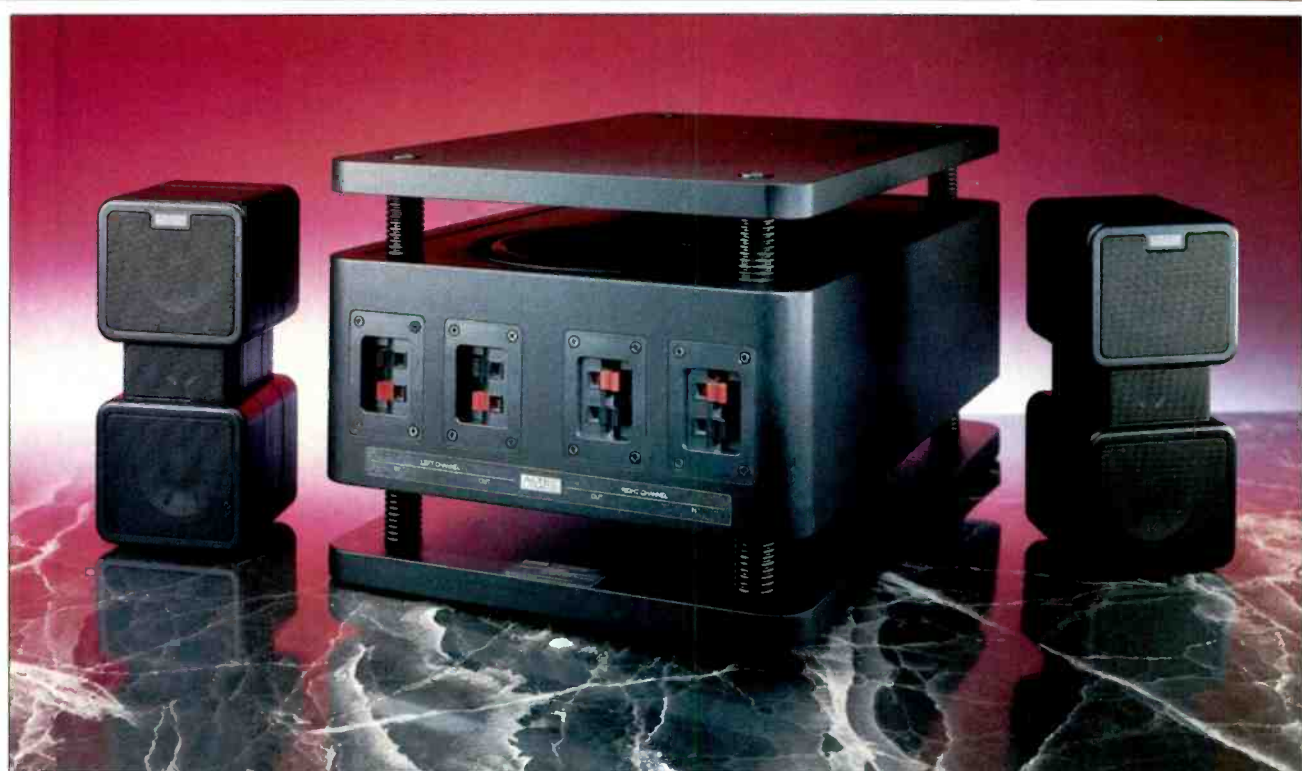
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ALTEC LANSING SYSTEM 3 SPEAKER

Julian Hirsch, Hirsch-Houck Laboratories

THE Altec Lansing System 3, a three-piece speaker system, was designed for ease of placement. Its two small satellite speakers can sit on shelves, tables, or stands and can even be hung on walls or poles using the keyhole slots in the rear, while the separate bass module can be located anywhere in the room.

Each satellite contains two 3-inch polypropylene-cone drivers in nearly cubical housings (4 x 3½ x 3¼ inches) joined by a midsection that contains a half-inch dome tweeter whose voice coil is cooled by ferrofluid. The enclosure, which measures 8½ inches high overall, is made of a strong, black molded plastic material, with perforated metal grilles protecting the drivers. The frequency response of the satellites is specified as 180 to 20,000 Hz. The 12-dB-per-octave crossover is at 4,500 Hz.

The System 3 Multipath Subwoofer contains two 8-inch polypropylene-cone drivers on opposite sides of a sealed enclosure. Attached to each of these sides is a flat panel held 1½ inches out from the speaker board, creating a 1½-inch slot around the periphery through which each driver's output radiates. The subwoofer's overall dimensions, including the outer panels, are 9¾ x 12 x 20 inches. Spring-loaded input and output connectors are recessed on one of the smaller sides of the black-finished unit, which can operate on any of its six sides. The subwoofer's rated frequency response is 32 to 190 Hz, with a 12-dB-per-octave crossover slope.

The system's specifications include a 4-ohm nominal impedance, a sensitivity of 90-dB sound-pressure level (SPL) at 1 meter with 1 watt input, and a frequency response of 30 to 20,000 Hz. The system is rec-

ommended for use with amplifiers rated between 10 and 100 watts per channel. Price: \$600. Altec Lansing, Dept. SR, Milford, PA 18337.

Lab Tests

The averaged room response from the complete Altec Lansing System 3 was very flat over most of the audio range, varying ± 2.5 dB from below 100 Hz up to about 10,000 Hz and rising slightly from 10,000 to 20,000 Hz. Quasi-anechoic FFT response measurements revealed a sharp, narrow dip at about 3,000 Hz, which appeared in off-axis as well as axial measurements (in the averaged room response it appeared as a broader and less extreme dip). The subwoofer's response reached its maximum at 100 Hz in an FFT measurement, dropping off rapidly above that frequency and rather gradually at lower frequencies. At 30 Hz, its output was down 6 dB relative to the 100-Hz level. The overall response was ± 6 dB from 30 to 20,000 Hz.

Minimum system impedance was 4.3 ohms at 40 Hz, and the impedance varied between 7 and 15 ohms over most of the range above 130 Hz (the maximum was 19 ohms at 3,500

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Hz). The system's sensitivity was 90 dB, as rated, and the subwoofer's distortion at a 2.83-volt input level was 8 to 10 percent at 40 Hz, decreasing to less than 0.5 percent at 100 Hz and above.

The horizontal dispersion of the satellites was good, if somewhat unusual. Above the 4,500-Hz crossover between the cone "woofer" and dome tweeter, the response curves on-axis and 45 degrees off-axis were nearly identical almost to 20,000 Hz except for an approximately 6-dB level difference. Apart from a sharp 0.7-millisecond dip at 3,000 Hz, corresponding to the response dip we measured, the group-delay variation was typically less than 0.4 millisecond from 1,000 to more than 20,000 Hz.

The system's power-handling ability was excellent. At all three test frequencies—single-cycle pulses at 100, 1,000, and 10,000 Hz—the amplifier clipped before the speaker produced significant audible or visible (on an oscilloscope) waveform distortion. The clipping levels were in the range of 810 to 950 watts.

Comments

Like most good three-piece speaker systems, the Altec Lansing System 3 produced a smoothly integrated sound, with no audible suggestion that its lower octaves originated several feet away from the rest of the program. The smoothness and octave-to-octave balance of the sys-

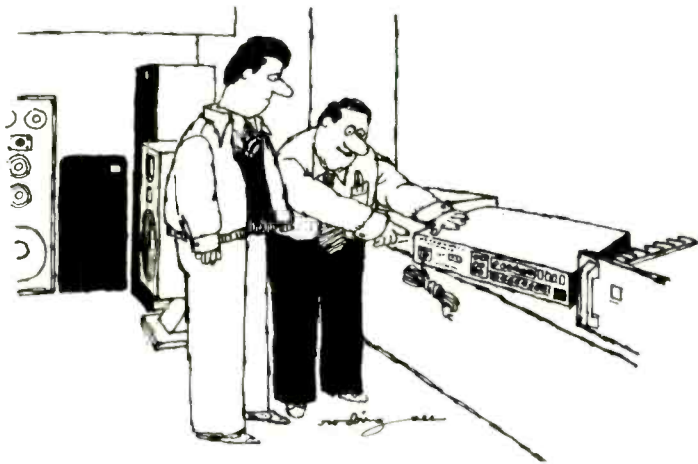
tem's output were evident from the absence of unnatural coloration in any part of the spectrum.

Unlike speakers whose response is emphasized at the bottom, imparting audible heaviness to certain sounds (and giving a false impression of more bass than is really there), the System 3's bass output appeared to extend seamlessly through the low-frequency limit of the satellites, never exceeding the sound level in the vicinity of the crossover to the subwoofer. As a result, the subwoofer's output was usually undetectable as such.

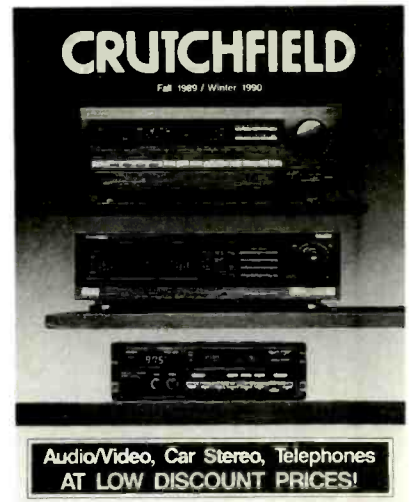
The best proof that the bass does come from the subwoofer is to play a test record that sweeps (or steps) upward from a very low audio frequency, such as 20 Hz. When we tried this experiment, at relatively low volume settings, the first audible sound was a subtle (but clean) tone at 32 Hz or thereabouts, which was felt on the skin as well as heard through the ears.

The bass output of the Altec Lansing System 3 may not be able to rival that of a large add-on subwoofer costing twice its price, but it is quite sufficient to make this a true full-range speaker system, with the added convenience of highly compact satellite speakers and a bass reproducer that can be hidden almost anywhere. It is a worthy addition to the growing ranks of high-value three-piece speaker systems.

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LINN INTEK INTEGRATED AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

ORIGINALLY known as a manufacturer of fine record-playing components, Linn Products, based in Scotland, has expanded its line to include speakers, preamplifiers, and power amplifiers. The Intek is its first integrated amplifier.

The Intek is rated to deliver 50 watts per channel into 8-ohm loads or 80 watts into 4 ohms. Although the instruction booklet's specifications page lists input sensitivities, impedance levels, and power-output capabilities, it does not mention distortion ratings as required by the Federal Trade Commission for home audio products advertised for sale in this country.

The Linn Intek's front panel presents a clean, uncluttered appearance, with full-size knobs, large rectangular control buttons, and clear, legible white markings. The case is finished in black.

The amplifier's circuitry, including the front-panel controls and back-panel connectors, is all on one large circuit board. Unusual for an integrated amplifier, the Intek has separate power supplies for its pow-

er and preamplifier sections. In fact, the only parts of the unit common to both sections are the primary winding of the power transformer and, of course, the AC line cord.

According to Linn, the output transistors used in the Intek are identical to those in its more expensive LK280 power amplifier. The output devices are protected by a sensing circuit that shuts down the power supply instantly if the transistors draw excessive current. Unlike the current-limiting protection circuits used in some other amplifiers, which can degrade the sound quality under certain conditions, the Linn system simply turns off the amplifier before the output transistors can be damaged. To restore operation, it is necessary to switch off the power for a few seconds. There is also a thermal-protection system that shuts down the amplifier if its internal temperature reaches 70° C (158° F).

The front panel, machined from an aluminum extrusion, contains separate program-selector knobs for the listening and tape-recording outputs. The available sources are identified as phono, tuner, CD, video,

tape 1, and tape 2. Volume is controlled by a concentric pair of knobs for the two channels. Normally operated as a unit, the knobs can be adjusted relative to each other for channel balancing. A slip clutch maintains their relative setting during normal operation.

The other front-panel controls are five bar-shaped pushbuttons. Two of them connect the front-panel headphone jack and the rear-apron switched speaker jacks to the amplifier outputs. A second set of speaker jacks, permanently connected to the amplifier, is normally used for the primary speakers. Another button mutes the audio outputs, and the fourth parallels the two channels for mono operation. The last button is the power switch, with a green LED pilot light above it.

The rear apron of the Intek contains standard RCA-type phono jacks for the signal inputs and tape-recording outputs. There are separate gold-plated jacks for moving-magnet (MM) and moving-coil (MC) phono cartridges. A small switch beneath these routes the preamplifier to the appropriate input and changes its input termination and gain to match the cartridge type (the switch merely changes a control voltage in the phono stage and does not actually handle the signal). A grounding post is located near the phono inputs.

A pair of pre-out/power-in jacks can be used to drive an external

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power amplifier. In order to drive the Intek's power amplifier from, say, an equalizer or surround-sound decoder fed from its preamp stages, however, internal jumpers on the main circuit board must be cut. Although instructions are given for doing this, it is recommended that the modification be done by a qualified dealer.

The speaker-output jacks on the rear apron are compatible with standard single or dual banana plugs, but Linn furnishes connecting plugs of a slightly different design that make a very positive contact with the jacks. The socket for the detachable line cord contains a replaceable fuse.

The Linn Intek measures 17 x 3½ x 13¼ inches, and it weighs about 16½ pounds. Price: \$995. Distributed by Audiophile Systems, Dept. SR, 8709 Castle Park Dr., Indianapolis, IN 46256.

Lab Tests

The Linn Intek's top cover, over the heat sink and the power transformer, became moderately warm in normal operation and not much hot-

ter during our high-power measurements, but the bottom plate, immediately below the power transformer, became uncomfortably hot to the touch.

With both channels driving 8-ohm loads at 1,000 Hz, the outputs clipped at about 55 watts per channel. Into 4-ohm loads, the clipping-level output was 100 watts. The respective clipping-headroom figures were 0.25 and 1 dB. Clipping-level power could not be measured into 2 ohms (for which the amplifier is not rated) because the protection circuit operated before the clipping point was reached. The dynamic power outputs were 90 and 100 watts into 8 and 4 ohms, respectively, corresponding to dynamic-headroom figures of 2.55 and 1 dB. The 2-ohm dynamic power was an impressive 264 watts, and the protection circuit did not trip during the 20-millisecond tone bursts (although it frequently shut down the amplifier during steady-state tests into 2 ohms).

The amplifier's frequency response, through the CD input, was

flat within +0, -0.5 dB from 20 to 10,000 Hz and down 2 dB at 20,000 Hz. When the gains in the two channels were matched at a typical volume-control setting, the channel balance varied less than ±0.3 dB over a 40-dB adjustment range.

The maximum power delivered into 8 ohms with no more than 1 percent distortion was 55 to 57 watts between 20 and 2,500 Hz, decreasing to 50 watts at 5,000 Hz and dropping to 18 watts at 20,000 Hz. These figures do not mean the amplifier cannot deliver its full power over the audio range—merely that its distortion exceeds 1 percent at high frequencies.

The total harmonic distortion (THD), including noise, was fairly constant with frequency from 20 to 1,000 Hz but rose at higher frequencies regardless of the power level. At 5 watts output, it was typically 0.06 percent below 1,000 Hz, reaching a maximum of about 0.5 percent between 10,000 and 20,000 Hz. At 50 watts, however, the distortion measured about 0.2 percent up to 1,000 Hz, 1.25 percent at 10,000 Hz, and 3.5 percent at 20,000 Hz. Spectrum analysis showed that these readings reflected a large number of distortion components (up to at least the twentieth harmonic) whose individual levels were typically between -45 and -60 dB.

The RIAA phono-equalization error was -1 dB at 40 and 10,000 Hz and -3 dB at 22 and 20,000 Hz. Input sensitivity, for a reference 1-watt output, was 22 millivolts (mV) through a high-level input, 0.265 mV through the MM phono input, and 0.0245 mV for MC phono. The respective A-weighted noise levels were -80.2, -78, and -78 dB. The MM phono input impedance was 47,000 ohms in parallel with 80 picofarads, as rated. The phono input overloaded at 104 mV at 20 Hz, 75 mV at 1,000 Hz, and only 17 mV at 20,000 Hz (where the overload was gradual and evidenced largely by the appearance of third-harmonic distortion rather than clipping).

We made limited frequency-response and distortion measurements at the pre-out jacks, where the frequency response was perfectly flat from 20 to 2,000 Hz and down 0.9 dB at 20,000 Hz. Distortion was

FEATURES

- Inputs for three high-level sources, two tape decks, MM or MC phono cartridge
- Independent selection of sources for tape recording and listening
- Separate, concentric left- and right-channel volume controls to enable balance setting
- Two sets of speaker outputs, one switchable
- Front-panel headphone jack with switch
- Mute switch to silence outputs
- Mono switch to parallel channels
- Gold-plated phono-cartridge inputs with rear-apron switch to select MM or MC cartridge
- Over-current protection circuit shuts down amplifier to protect output transistors
- Thermal-overload protection
- Preamplifier output can be modified for power-amplifier input from external processor

LABORATORY MEASUREMENTS

Output power at clipping (1,000 Hz): 55 watts into 8 ohms, 90 watts into 4 ohms; 2 ohms, see text

Clipping headroom (relative to rated output): 0.25 dB into 8 ohms, 1 dB into 4 ohms

Dynamic power output: 90 watts into 8 ohms, 100 watts into 4 ohms, 264 watts into 2 ohms

Dynamic headroom: 2.55 dB into 8 ohms, 1 dB into 4 ohms; 2 ohms, see text

Harmonic distortion (THD+N at 1,000 Hz into 8 ohms): 1 watt, 0.07%; 10 watts, 0.08%; 50 watts, 0.2%

Maximum full-power distortion (20 to 20,000 Hz into 8 ohms): 3.5% at 50 watts (20,000 Hz)

Sensitivity (for a 1-watt output into 8 ohms): CD, 22 mV; MM phono, 0.265 mV; MC phono, 0.0245 mV

Phono-input overload (MM): 104 mV at 20 Hz, 75 mV at 1,000 Hz, 17 mV at 20,000 Hz

A-weighted noise (referred to a 1-watt output): CD, -80.2 dB; MM phono, -78 dB; MC phono, -78 dB

Phono-input impedance (MM): 47,000 ohms in parallel with 80 pF

RIAA equalization error: -3 dB at 22 and 20,000 Hz

Frequency response: +0, -0.5 dB from 20 to 10,000 Hz; -2 dB at 20,000 Hz

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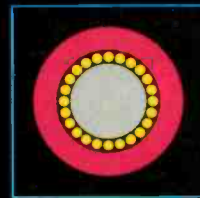
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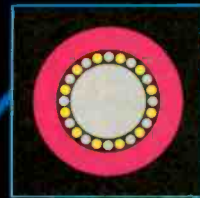
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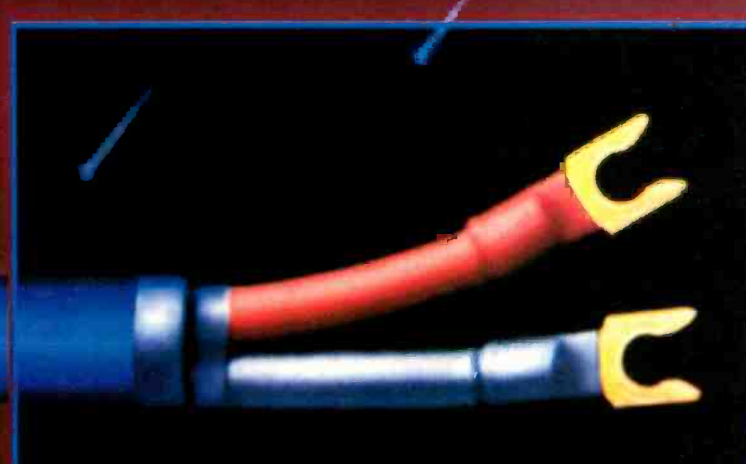
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0.01 to 0.02 percent at output levels less than 7 volts, and the output clipped at about 7.5 volts.

Comments

The Linn Intek is an excellent illustration of the fact that the worth

and sound of an amplifier cannot be judged solely by its measured performance. Some of the measurements of this amplifier were, frankly, well below what we would expect from Linn. Although the preamplifier section was very good, the

power-amplifier section's frequency-response and distortion characteristics were unexpected.

Nevertheless, nothing we heard from the Intek suggested that it was anything but excellent. Although the measured distortion rose at high audio frequencies to levels that would probably have been audible a few octaves lower, it had no discernible effect on the sound quality. The amplifier's noise levels were very low, but the phono preamplifier overloaded (at high frequencies) at a surprisingly low input level.

Although the Intek met its power specifications easily at low and middle audio frequencies, the increased distortion at the top end of the audio

When we played various CD's through the Linn Intek amplifier into good speakers, the sound was flawless. And the simplicity and clarity of its front panel made the Intek a pleasure to use.

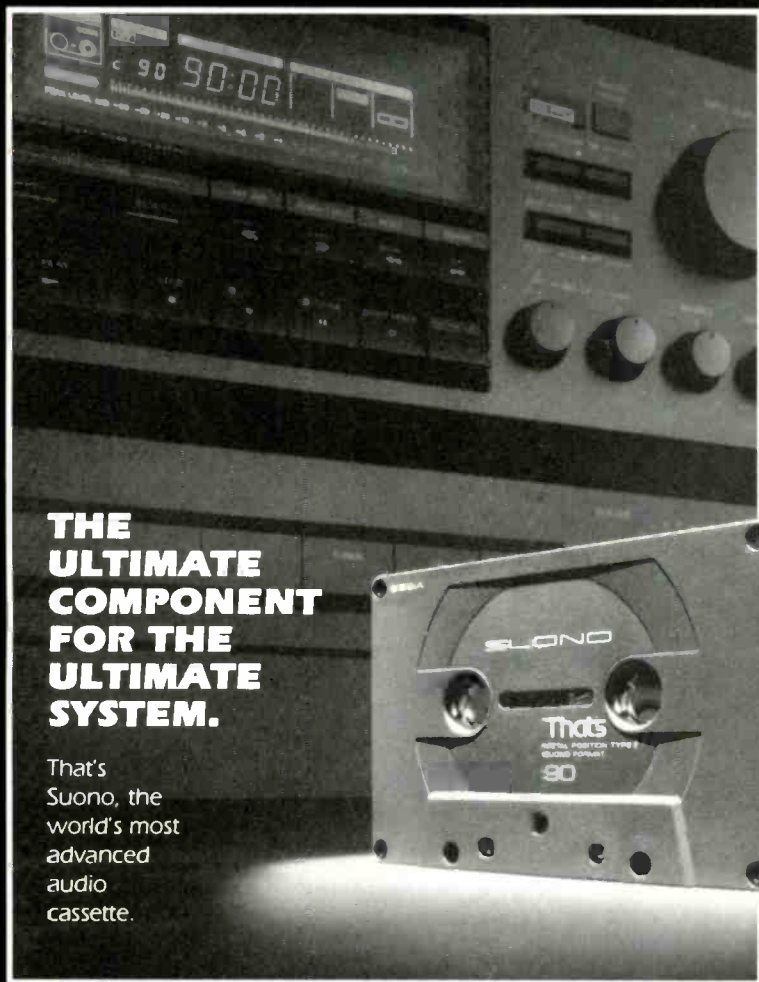
range suggests either that a power rating following the FTC standard would be unrealistically low or that its distortion rating should be correspondingly high. Since both channels gave essentially identical test results, we can only assume that our measurements were valid.

As always with high-fidelity components, however, the ultimate proof of quality is in the listening. When we played various CD's through the Linn Intek into a pair of good speakers, the sound was flawless, even at levels that would certainly have revealed any meaningful deficiency in power or excess of distortion. Furthermore, the simplicity and clarity of its front panel made the Intek amplifier a pleasure to use.

The Linn Intek is not inexpensive, but, like other Linn products, it is a handsome, carefully built, and fine-sounding component. I did not hear anything from it that was not commensurate with its appearance, price, and heritage.

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Julian Hirsch, Hirsch-Houck Laboratories

THE digital phase-locked-loop (PLL) Hafler SE130 stereo tuner has eighteen preset station memories divided into three banks of six, two for FM and one for AM. The all-black chassis presents an attractive, functional appearance. All the front-panel controls are black buttons about 3/8 inch in diameter. There is a single row of control buttons and a small window in which the tuned frequency appears, along with a stereo indication and the preset channel number, if applicable. The control and panel markings, white against the black background, are exceptionally clear and legible.

The six preset buttons are located below the display. Slightly to their right is a button that steps between bands and preset banks (FM 1, FM 2, and AM). Green lights above the buttons identify the selected band and bank. To the right of these are two pairs of tuning buttons. The TUNE buttons step up or down one broadcast channel at a time (200 kHz per step for FM and 10 kHz for AM). Touching the up or down SEEK button initiates an automatic scan across the band, stopping on the first receivable station. The two SCAN buttons, one for the full band, the other for the selected bank of presets only, initiate an automatic scan to

the next station, where the tuner pauses for several seconds (with the frequency display blinking) before continuing to the next signal. A second press on the button halts the process.

The mute and mono buttons have green status lights above them. Regardless of the setting of the mute button, the tuner is always silenced while scanning between stations. When mute is engaged, the audio program will be heard only if the signal strength is great enough for listenable quality. If the signal strength is below the muting threshold, a red DISTANT STATION light comes on to confirm the presence of a weak signal, giving the user the option of switching off the mute circuit (and possibly pressing the mono button to reduce the noise).

The SE130 has a somewhat unusual signal-strength indicator. A single light, normally colored green, appears on the panel when a strong signal is picked up. At lower signal levels, the light gradually changes to yellow and then orange. In the absence of a signal, the light is red. The color changes are sensitive enough to serve as a guide for orienting a directional antenna.

The SE130 also has a feature that is almost universal in automobile tuners though rare in home compo-

nents. As the signal strength drops, the stereo channels are progressively blended to reduce noise. If the signal level is fluctuating significantly, the mono button can be used to force the tuner into that mode.

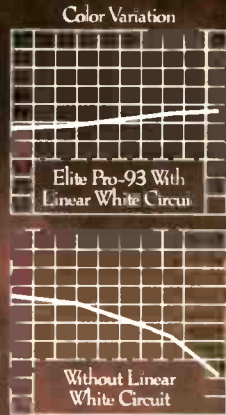
The Hafler SE130 measures 17 inches wide, 8 3/8 inches deep, and 3 inches high and weighs 7 1/2 pounds. Optional rack-mounting brackets are available from the factory. The rear apron has an F connector for a 75-ohm coaxial antenna lead-in as well as binding-post terminals for a 300-ohm FM antenna and a pivoted wire-loop AM antenna (furnished) or long-wire AM antenna. A single pair of audio output jacks carries the program at a fixed level. Price: \$300. Hafler, Dept. SR, 613 S. Rockford Dr., Tempe, AZ 85281.

Lab Tests

The SE130's usable sensitivity in mono was 14.4 dbf (2.9 microvolts, or μV). Its 50-dB quieting sensitivity was 16.5 dbf (3.7 μV) in mono and 37 dbf (39 μV) in stereo. At a 65-dbf (1,000- μV) input total harmonic distortion plus noise (THD + N) was 0.21 percent in mono, and the signal-to-noise ratio (S/N) was 68.5 dB. In stereo, the distortion was 0.32 percent, and the S/N was 62.5 dB.

Output from a 100-percent-modulated FM signal was 0.65 volt. The FM frequency response was +1.2, -0 dB from 30 to 15,000 Hz, and the 1,000-Hz channel separation at 65 dbf was 42.5 dB. Separation ranged from 37 to 46 dB between 30 and 2,000 Hz, diminishing to 22 dB at

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15,000 Hz. The auto-blend circuit came into operation below 40 dBf (55 μ V), reducing the 1,000-Hz separation from about 40 dB at higher inputs to 12 dB at 35 dBf (30 μ V) and 4 dB at 20 dBf (5 μ V).

Capture ratio was 1.7 dB, and AM rejection was a very good 75 dB. Image rejection, at 50 dB, was only fair, as was the alternate-channel selectivity of 57 dB. The muting and stereo/mono threshold was 43 dBf (78 μ V). The 19-kHz pilot-carrier leakage was -66 dB, and power-line hum was -69 dB. The AM tuner section's frequency response was +2, -6 dB from 20 to 3,300 Hz.

Comments

Operation of the Hafler SE130, despite being a bit different from that of other tuners or receivers, is mostly intuitive. For example, to store a station frequency in memory, you tune in the signal and hold the desired preset button down for about 3 seconds, during which time the audio output is muted. When the sound returns, the frequency storage is complete, and the next time that button is pressed the same station will be recalled.

Although we had some initial reservations about the auto-blend system, its operating range is well chosen. The blending action occurred only at marginally low signal levels, which are unlikely to provide quiet stereo reception with full separation anyway. Any separation that remains in the blended signal can be considered a bonus, and we found in some cases that the system provided audible separation with acceptably low noise from weak signals. In sharp contrast to the many car radios that deliver true stereo reception only in extremely high-signal areas, even though their lit stereo indicators may convince some users that they are actually hearing a stereo program, when the SE130's front-panel signal-strength light is green, you can be sure that it is providing full separation.

Although the Hafler SE130's measured performance did not challenge the state of the art, the tuner was so easy and natural to use, and it sounded so good, that we find it difficult to criticize in any major respect. At its price, the SE130 represents a good value.

Circle 143 on reader service card

FEATURES

- Digital phase-locked-loop (PLL) tuning
- Presets for twelve FM and six AM stations
- Tunes in single-step or auto-scan mode
- Preset scan
- Automatically mutes during tuning
- Variable-color light to indicate signal strength
- Red DISTANT STATION light to indicate reception of signal below muting threshold
- Automatic signal-controlled channel blending for reducing noise on weak stereo signals
- Inputs for 300- or 75-ohm FM antenna and wire-loop or long-wire AM antenna
- Settings stored in memory after shut-off; lithium back-up battery with ten-year life

LABORATORY MEASUREMENTS

All figures for FM only except frequency response; measurements in microvolts, or μ V, referred to 300-ohm input.

Usable sensitivity: mono, 14.4 dBf (2.9 μ V)

50-dB quieting sensitivity: mono, 16.5 dBf (3.7 μ V); stereo, 37 dBf (39 μ V)

Signal-to-noise ratio at 65 dBf: mono, 68.5 dB; stereo, 62.5 dB

Harmonic distortion (THD + noise) at 65 dBf: mono, 0.21%; stereo, 0.32%

Capture ratio at 65 dBf: 1.7 dB
AM rejection: 75 dB

Selectivity: alternate-channel, 57 dB; adjacent-channel, 5.5 dB

Stereo threshold: 43 dBf (78 μ V)

Pilot and subcarrier leakage: 19 kHz, -66 dB; 38 kHz, -80 dB

Hum: -69 dB

Stereo channel separation at 100, 1,000, and 10,000 Hz: 43, 42.5, and 25 dB

Frequency response: FM, +1.2, -0 dB from 30 to 15,000 Hz; AM, +2, -6 dB from 20 to 3,200 Hz

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Many audiophiles know that an ideal speaker would be a point source; unfortunately, multiple-driver systems often fall far short of this ideal. With Neodymium-Iron-Boron, the most powerful of all magnetic materials, KEF has created a tweeter so small that it can be placed inside the woofer's voice coil. In effect, every Uni-Q driver is a point source.

Moreover, the woofer cone acts as a wave guide for the tweeter and controls its dispersion. The entire frequency range arrives at the listener's ears at exactly the same time, producing seamless sound no matter where the listener sits. Unwanted reflections within the room are actually reduced, and the music you hear is less colored.

If you appreciate music, audition the Reference 105/3's. For any audiophile system, they are "standard" equipment.



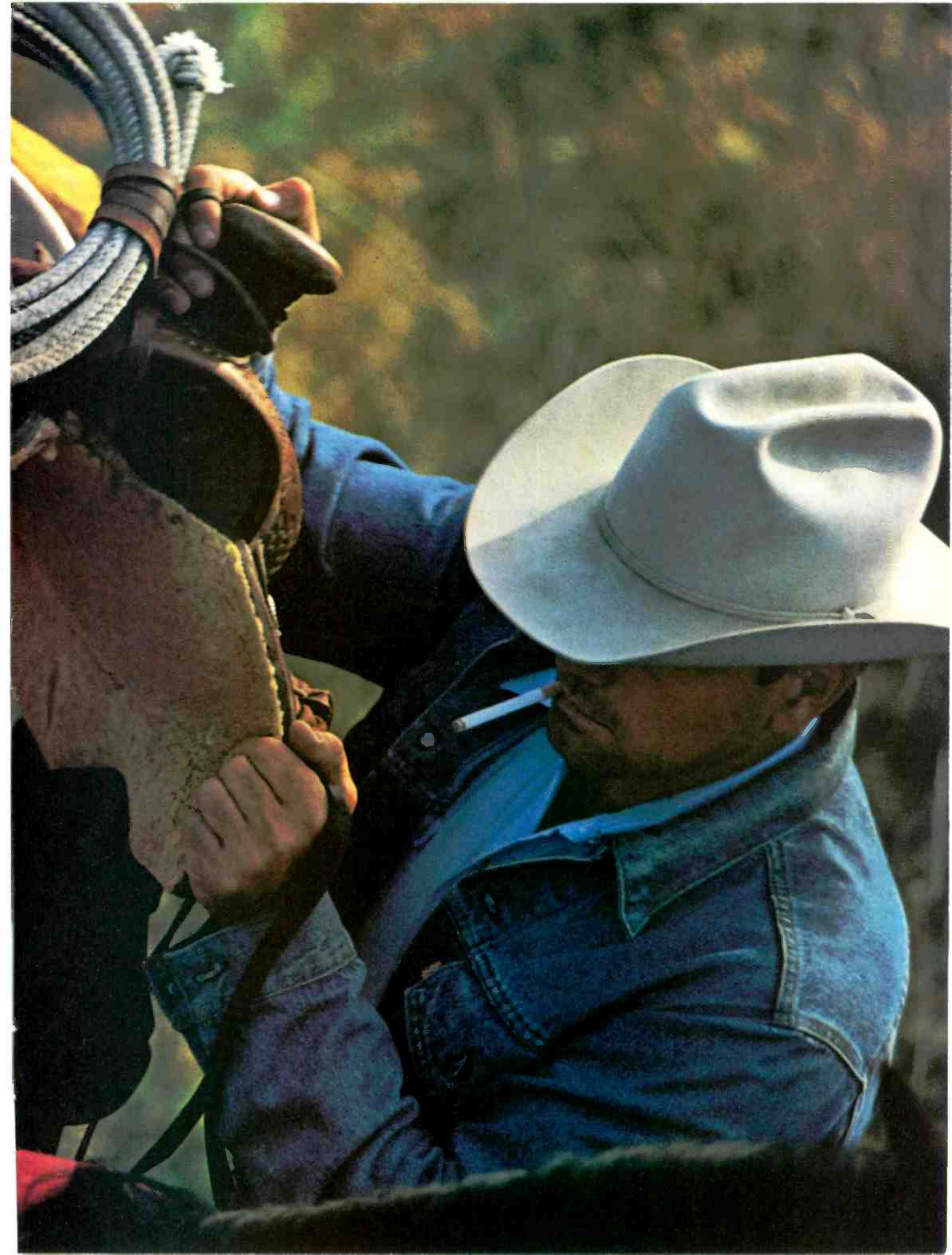
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OHM ACOUSTICS FRS 9 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

THE line of "Full Room Stereo" speakers from Ohm Acoustics is designed to provide a wide, deep, and tall sonic image at almost any point in the listening room rather than only at a specific "sweet spot" directly in front of the speakers. To accomplish this, each speaker's single tweeter is aimed inward and upward at a 45-degree angle (the speakers are sold in mirror-image pairs). According to Ohm, the crossfire from the left and right tweeters produces a recognizable stereo stage even when the listener is located in front of (and close to) one speaker, and the general distribution of the sound remains essen-

tially unchanged as a listener moves about the room.

Although the on-axis response of each tweeter would be too bright-sounding for most listening tastes, the angled placement directs the excess high-frequency energy toward the ceiling. The forward-radiated component of the tweeter's output, heard by most listeners as direct sound or as early reflections, has the frequency response needed for a balanced sound quality overall, while the output reflected from the ceiling adds spaciousness.

The Ohm FRS 9, which is in the middle of the FRS line, is a columnar floor-standing speaker measuring

35¼ inches high and 11¼ inches square. Each speaker weighs about 43 pounds. The front, sides, and top of the cabinet are finished in oak-grain vinyl. The single 8-inch woofer is at the top of the front panel, and the ¾-inch dome tweeter is close to it in the upper inside corner. The system's bass output is augmented by a 10-inch passive radiator at the bottom of the rear panel.

The speaker also incorporates Ohm's proprietary Sub-Bass Activator (SBA) circuit to extend the system's low-bass response. The SBA circuit is an underdamped high-pass filter that rolls off at 12 dB per octave but boosts the output slightly just above its cutoff point. It provides a slight response extension at the bottom of the FRS 9's useful range while reducing the possibility of overdriving the system at very low frequencies (a limitation of many vented and passive-radiator bass systems).

The Ohm FRS 9 has a rated frequency response of 36 to 20,000 Hz \pm 4 dB and a sensitivity rating of 90 dB sound-pressure level (SPL) with a 1-watt input. Its nominal impedance is 8 ohms, and it is rated for use with amplifiers delivering 15 to 225 watts per channel. Price: \$800 a pair. Ohm Acoustics, Dept. SR, 241 Taaffe Place, Brooklyn, NY 11205.

Lab Tests

The installation instructions for the FRS 9 suggest placing the speakers fairly close to the wall behind them for strongest bass output. We located them about 1 foot from the wall and about 7 feet apart. They faced directly forward, according to the instructions, which left the tweeters angled inward.

The room-response curve for the FRS 9 speakers showed a distinct shelf at about 1,500 to 2,000 Hz. The level at higher frequencies averaged about 5 dB below that of the lower and middle frequencies. Each band contained the normal irregularities (about \pm 3 dB) caused by room reflections and standing waves. The bass was strong down to 50 Hz or slightly lower.

The close-miked woofer response was flat within \pm 3 dB from 52 to 1,000 Hz. It sloped off at higher frequencies, to about -12 dB at 3,500 Hz, and cut off sharply above

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3,500 Hz. The acoustic crossover from the passive radiator to the driven cone was at about 45 Hz, and the passive unit contributed much of the output below 50 Hz.

The splice between the close-miked and room-response curves was somewhat ambiguous. Although the two curves overlapped for several octaves, the resulting composite response curve did not particularly resemble the way the system sounded in our room. The composite curve varied about 6 dB overall from 55 to 1,300 Hz and sloped down a few decibels from 1,300 to about 2,000 Hz. There were the usual high-frequency variations, representing both the speaker's natural response and the various room reflections. The upward angle of the tweeter made these effects more prominent than with most conventional speakers, but the overall response was still a very creditable ± 3 dB from 55 to 1,300 Hz and from 1,000 to 20,000 Hz, with the treble portion averaging about 5 dB below the lower-frequency portion.

Quasi-anechoic FFT response tests confirmed the irregularities that appeared in the swept-frequency measurements. The tweeter response on several horizontal axes showed large off-axis dips at about 2,500 Hz (apparently the crossover frequency) at angles of ± 45 degrees

off the speaker's forward axis, which was not surprising in view of the system's asymmetrical design and the relatively high crossover frequency of its 8-inch woofer. Because of the proximity between the tweeter and woofer, however, the group delay was quite uniform, varying only about ± 0.2 millisecond over the full audio range.

The system's sensitivity measured 89 dB SPL at 1 meter with an input of 2.83 volts of pink noise. The woofer distortion at 3.1 volts (corresponding to a 90-dB SPL at 1 meter) was between 1 and 3 percent from 55 to about 350 Hz, and it fell slightly, to about 0.5 percent, from 700 to 2,000 Hz. From 55 Hz downward, where the passive radiator's output was predominant, the distortion was 4 to 5 percent.

Impedance was at its minimum of 4 ohms at about 200 Hz; it varied between 4 and 12 ohms from 200 down to 20 Hz and rose to 11 ohms at 1,500 Hz. The impedance phase angle varied in an abrupt fashion between 20 and 60 Hz, suggesting the existence of some undamped resonances in the passive radiator.

In the pulse power-handling tests, the passive radiator rattled loudly with a 100-Hz input of 55 watts into its 5.5-ohm impedance. At 1,000 and 10,000 Hz, the amplifier clipped (at 765 and 1,470 watts, respectively)

before the two active drivers showed signs of overload.

Comments

The Ohm FRS 9 sounded much smoother and better balanced than its composite frequency-response curve would suggest. It had virtually none of the upper-bass emphasis that mars the sound of so many speakers, but it also did not convey the sense of deep bass that its 36-Hz low-end rating would imply. Perhaps in a larger room, or even in a corner (neither of which was available to us), its deep-bass performance would be improved. We noted that when we listened to music, rather than high-level test signals, there was no sign of the bass overload we encountered in one of our tests. Fortunately, most of us do not listen to music at the volume of a live performance, and short of that we would not expect the FRS 9 to reach its woofer's excursion limits.

The highs, on the other hand, were audibly smooth and obviously well dispersed. The stereo-imaging qualities implied by the "Full Room Stereo" design were quite apparent as we moved about the room. The FRS 9's stereo stage was not the kind of sharply delineated array of individual sound sources that can sometimes be realized from precise placement of speakers and listener, but it did provide a stable placement of major elements of the orchestra. In other words, the location of the apparent sound sources was limited to a left-center-right resolution, much as it is at a live concert. But within that constraint, moving about the room, even outside the boundaries set by the speakers themselves, had little or no effect on the apparent locations of the sources. That was presumably the goal of the FRS series design, and it certainly is achieved in this speaker.

In judging the measured (though not necessarily audible) limitations of the FRS 9, you should bear in mind that it is not an exotic "high-end" product but a speaker system that is no more than midprice in today's market. It is also a very listenable and attractive speaker, and it has some special qualities not found in most others of its class.

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NEW YORK, SUNDAY, MARCH 25, 1990

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The New CD Players: Can You Hear the Difference?

To find out if one bit is better than twenty, we conducted controlled listening tests of top CD players that use different ways of converting digital data to music.

ONE of the surprises of the digital era has been the amount of effort lavished on improving CD playback. The performance of even very early compact disc players was, after all, excellent compared with what we were used to getting from phonograph equipment. It was not perfect, however. As a result, numerous generations of product refinement have brought not only more features and lower prices but also greater accuracy of sound reproduction.

The main engineering focus has been on the digital-to-analog (D/A) converters at the heart of every CD player. These converters handle the critical task of translating the binary codes recorded on disc back into music. Conventional multibit converters, used until recently in all CD players, are very finicky devices. Extraordinarily tight manufacturing tolerances are required to minimize conversion errors and resulting distortion of the audio signal, especially at low levels. Elimination of low-level nonlinearity has become what one might call the "final frontier" of audio D/A converter design.

For the last several years, this

quest has led mostly in the direction of more is better: more adjustments, more bit levels in the converters (18- and even 20-bit chips used to decode standard 16-bit digital-audio signals). Now the wind is starting to blow the other way. The new chips on the block are various types of "1-bit" converters that are said to perform as well as or even better than the best multibit circuits, and at a lower cost.

To find out whether these radical new D/A converters really deliver the goods, we turned to a blind listening comparison. The test was designed to answer, insofar as possible, two questions: Is there an audible difference between the performance of 1-bit converters and that of conventional multibit systems? If so, which sounds better?

Our approach was to compare the new technology with one of the best representatives of the old. For the 1-bit team, we selected two players of very different design: a Philips CD-840 using that company's Bitstream conversion system and a Technics SL-PS70 built around parent company Matsushita's MASH technology. The multibit player was a Denon

PHOTOS BY ROBERT BUJLEK

BY KEN C. POHLMANN



DCD-1560 employing a system that Denon calls Lambda 20-bit D/A conversion.

In addition to the listening evaluations, we ran a complete set of measurements on each player. These measurements were not revealed to the listening panel, however, and in fact were done after all the listening was completed. With both rigorous listening comparisons and full bench tests, we felt confident that we would be able to judge audible differences (or the lack thereof) among these three players.

Setting Up

Because we expected all three machines to exhibit very high sound quality, it was important to assemble a playback system of suitable fidelity. After much debate, we settled on equipment that proved to be both accurate and a joy to listen to. The preamplifier was a Conrad-Johnson Motif MC9, a field-effect-transistor (FET) design. The power amplifier was a Conrad-Johnson MS-100, a solid-state unit rated at 100 watts per channel into 8 ohms. The loudspeakers were KEF Model 107's. All interconnects—between CD players and the preamplifier and between the preamp and the power amplifier—were Monster Cable M1000, which we kept as short as possible. Two 20-foot lengths of Monster Cable M1 linked the power amplifier to the loudspeakers. Gold-plated Monster Cable plugs were used throughout. We also made sure that the polarity of the signal path through the system was noninverting at the speaker terminals.

The ABX System

To provide a quick, convenient way of switching between the CD players, we used an ABX system designed by David Clark. This system consists of a switching box, a logic and display box, and a handheld controller. Outputs from the two CD players to be compared are arbitrarily labeled A and B and routed through the switching box on their way to the preamplifier, power amplifier, and loudspeakers. The ABX system randomly assigns one of the inputs, A or B, to the X posi-

tion on the controller. The listener can switch at will between A, B, and X, and he must eventually decide which source, A or B, has been assigned to X. If the listener can hear a difference between A and B, he can accurately identify which has been assigned to X. After each choice, the listener proceeds to another trial with a new random assignment to the X setting.

FOLLOWING a set of trials, the actual X assignment for each trial and the listener's choices can be read from the ABX system memory. Listeners were not told the actual assignments until the end of the entire test. In addition, during the test the listeners did not know which two players were being compared. At the end of each player-pair evaluation, we asked each listener whether he preferred one player, A or B, over the other. The point of this elaborate rigmarole was to prevent the listeners from being influenced by anything other than the sound of the players being compared. This is extremely important, since the perceptions of even very sophisticated listeners can be unconsciously colored by extraneous factors such as a component's appearance or brand name or knowledge of its circuit design.

In a properly conducted ABX test, listeners will not be able to do significantly better than chance at choosing which player is X unless there is some audible difference between A and B. That is, if a listener cannot tell the two players apart, he will decide correctly about 50 percent of the time. As his success in hearing differences increases, so will his score. With a large number of trials, a score of 75 percent or more would suggest that there is a significant audible difference. Statistically, a score of 75 percent or more over a large number of trials would almost certainly not be the result of mere luck. (The number of trials is important, since a good score can easily occur by chance alone if the number of trials is small; the more trials, the higher the probability that

the resulting score is a true reading rather than a fluke.) Scores between 50 and 75 percent are precisely the kind of stuff that makes audio so much fun—in other words, those scores are debatable.

Keeping in Sync

Although it is very easy to use this method of testing to compare amplifiers, loudspeakers, and most other types of components, CD players, tape decks, and the like present a challenge. For example, in comparing two CD players playing copies of the same disc, any timing difference between the two would give the listener an undesired clue to the identity of X, whether or not there were a real audible difference. In other words, an artifact of the test itself would rob it of validity.

Ideally, one would get around this potential problem by insuring that the players were precisely synchronized. That would require hardware modifications to one or both players, however, and the modifications could alter, for example, the players' jitter characteristics, which some might argue have an effect on the sound. Alternatively, the players could be synchronized by hand and allowed to run freely, with the test being stopped when they drift apart so they could be resynchronized—clearly a laborious process.

TO avoid both hardware modification and extra work we used another method. Both players were loaded with identical discs. The ABX system was used to select X assignments randomly. The listener could ask to hear player A or B or X, and the tester switched the ABX system accordingly. During each switch the audio signal was muted, and the player to be heard next was started at the beginning of the track being auditioned. In this way the listener heard the same track played over and over by player A, B, or X. Precisely because no attempt was made to run the players simultaneously, there was no possibility of using imperfect synchronization to



Denon's Lambda SLC D/A conversion method adds digital bias to all but high-level data before conversion. Because this increases the amplitude of most signals, distortion of low-level information during conversion is

reduced. After conversion, the bias is removed. The D/A converters themselves in the DCD-1560 are of conventional 20-bit linear design. An eight-times-over-sampling digital filter precedes the bias circuit.

LAB MEASUREMENTS

- Frequency response:** +0.05, -0.29 dB from 20 to 20,000 Hz
- De-emphasis error at 16,000 Hz:** +0.09 dB
- Channel separation:** 102.9 dB at 1,000 Hz, 90.1 dB at 20,000 Hz
- Dynamic range (A-weighted):** 98.9 dB
- Signal-to-noise ratio (A-weighted):** 112.6 dB
- Harmonic distortion (THD + noise) at 1,000 Hz:** 0.0024% at 0 dB, 0.015% at -20 dB
- Linearity at -90 dB:** left, -2.04 dB; right, -1.44 dB
- Interchannel phase shift at 20,000 Hz:** 0.1 degree



The Philips Bitstream conversion method, as implemented in the CD840, employs 256-times-over-sampling and sophisticated data manipulation to obtain a single-bit data

stream at a rate of 11.289 MHz. Pulse-density modulation (PDM) is used to reconstruct the audio waveform. A second-order noise shaper reduces in-band requantization noise.

LAB MEASUREMENTS

- Frequency response:** +0.10, -0.0 dB from 20 to 20,000 Hz
- De-emphasis error at 16,000 Hz:** +0.45 dB
- Channel separation:** 65.1 dB at 1,000 Hz, 65.1 dB at 20,000 Hz
- Dynamic range (A-weighted):** 100.6 dB
- Signal-to-noise ratio (A-weighted):** 102.8 dB
- Harmonic distortion (THD + noise) at 1,000 Hz:** 0.0032% at 0 dB, 0.018% at -20 dB
- Linearity at -90 dB:** left, -2.32 dB; right, -0.47 dB
- Interchannel phase shift at 20,000 Hz:** 0.6 degree



The Technics SL-PS70's MASH D/A converter uses thirty-two-times-oversampling and third-order noise shaping to reduce the 16-bit data from a

CD to an eleven-value signal. This signal drives a pulse-width-modulation (PWM) output circuit operating at 768 times the original sampling rate.

LAB MEASUREMENTS

- Frequency response:** +0.23, -0.08 dB from 20 to 20,000 Hz
- De-emphasis error at 16,000 Hz:** -0.47 dB
- Channel separation:** 83.0 dB at 1,000 Hz, 79.9 dB at 20,000 Hz
- Dynamic range (A-weighted):** 97.8 dB
- Signal-to-noise ratio (A-weighted):** 112.2 dB
- Harmonic distortion (THD + noise) at 1,000 Hz:** 0.0026% at 0 dB, 0.021% at -20 dB
- Linearity at -90 dB:** left, -0.29 dB; right, -0.30 dB
- Interchannel phase shift at 20,000 Hz:** 0.2 degree

cheat the test. The time required to mute playback, switch the ABX box, and start the next player—after some practice—was about 3 seconds. Because the equipment and the listeners were placed in different rooms, at no time could a listener see the players or their switching. In addition, because the tester followed the random ABX assignments and performed a simple series of steps in switching players, the potential for the tester to influence this single-blind test, either consciously or unconsciously, was minimized. Although this technique is theoretically less secure than a double-blind test, in which neither listener nor tester knows the identity of the player assigned to X, we believe that our controls were good enough to prevent bias.

A FEW other details needed tending to. Any level difference between players would invalidate the test. In general, listeners tend to prefer the signal that is louder. (When you compare stereo components, make sure their levels are the same; otherwise you are wasting your time.) In this case, because a level difference of even 0.1 or 0.2 dB at 1,000 Hz is discernible, differences of that magnitude would clearly invalidate the test. To overcome this potential difficulty, we routed the four cables from the two players to four precision locking potentiometers with calibrated scales. Each CD player's output was normalized using a test disc and an Audio Precision test set. In this way, we kept level differences at the loudspeaker terminals to 0.01 dB or less.

The Room and the Music

Still another consideration was the listening room itself. Although it was the same for both CD players, we were anxious to provide an environment that was comfortable, free of distractions, and sonically neutral. We chose a room of irregular shape with largely anechoic construction near the loudspeakers and reflective diffusors at the rear. It

was almost perfectly isolated from outside noise and enabled the tester and all equipment except the loudspeakers to be placed in another room. In addition, the listening room could be made absolutely pitch black. Although the blackout was optional for the listeners, it is my belief that hearing becomes more acute in darkness, and I prefer to do critical listening that way.

YET another factor was the audio program to be used. We divided the test into two parts, the first using a test tone, the second music. The test tone was the one on Track 20 of the CBS CD-1 test disc, which is a 500-Hz dithered sine wave that fades from -60 to approximately -120 dB. It is extremely useful for evaluation of low-level conversion linearity in CD players. For the musical part of the test, we used three selections: Philip Glass, "Solo Piano Works" (CBS MK 45576), Track 7; Pink Floyd, "A Momentary Lapse of Reason" (CBS CK 40599), Track 5; and Richard Wagner, *Das Rheingold* (Angel CDCB-49853), Disc 2, Track 21. This menu of test tone, solo piano, pop, and orchestral music seemed to cover the listening bases and presented analytical, soft, loud, ambient, sustained, transient, and other types of sonic signposts. The same battery of listening tests was used for the three different player comparisons.

The Listeners

The last consideration was the listening panel itself. After screening a number of people, we picked five individuals whose hearing we trusted and who were willing to endure the rigors of the test. Critical listening such as this, although interesting and enjoyable, is also time-consuming and difficult. As part of the screening process, we performed a listening test using two older-generation CD players with known (and different) sonic defects to test the hearing acuity of the listeners. We chose individuals with high scores in this shakedown test.

Three men and two women made up the panel; their average age was twenty-six. They were instructed in the methodology of the test, then placed one at a time alone in the listening chamber with a pad and pencil to record their choices and comments. They did not know which pair of players they were hearing in any series of trials. They could listen to A, B, or X any number of times in each trial and could return to a previous trial if they wished. Each listener performed twenty trials in each of the twelve tests (one using test tones and three using music for each of three different player pairings). They were free to take a short break between tests. In some cases, different player combinations were auditioned on different days. As noted, the listeners were not informed of their scores until after all of the tests were completed.

Scoring and Interpretation

The numerical results of the player comparisons are shown on the facing page. The first comparison was between Denon and Philips, the second between Denon and Technics, and the third between Philips and Technics. The results are broken down by test material: the pure tone, Philip Glass, Pink Floyd, and Richard Wagner. Four numbers are given for each test segment: (1) correct answers vs. number of trials, (2) the percentage of correct answers, (3) the probability that the correct identifications were the result of chance, and (4) the level of confidence that the identification did *not* result from chance.

THE third and fourth items are just different ways of expressing the same thing—the statistical uncertainty of the raw score. Although easy to overlook, this is a very important piece of information. A probability figure lower than 0.01, corresponding to a confidence level of more than 99 percent, indicates that the associated score is almost certainly valid. When the probability figure edges past 0.05, the confi-

STATISTICAL RESULTS

		Denon vs. Philips	Denon vs. Technics	Philips vs. Technics
Fade-to-zero test tone	(1)	68/100	54/100	70/100
	(2)	68%	54%	70%
	(3)	0.0002	0.2421	0.00004
	(4)	99.9%	75.8%	99.9%
Philip Glass (solo piano)	(1)	58/100	53/100	62/100
	(2)	58%	53%	62%
	(3)	0.0666	0.3086	0.0105
	(4)	93.3%	69.1%	98.9%
Pink Floyd (rock group with vocals)	(1)	54/100	55/100	61/100
	(2)	54%	55%	61%
	(3)	0.2421	0.1841	0.0176
	(4)	75.8%	81.6%	98.2%
Wagner (orchestra)	(1)	57/100	51/100	56/100
	(2)	57%	51%	56%
	(3)	0.0967	0.4602	0.1356
	(4)	90.3%	53.9%	86.4%

EACH of the three players was compared with each of the others in a total of four hundred trials: five listeners performing twenty trials each with four different types of material, three musical and one a very demanding test signal. In each trial, the listener attempted to determine which of the two players under comparison was identical to the randomly assigned mystery source, X. A high proportion of correct identifications—75 percent or more—over a large number of trials indicates that there are significant audible differences between a given pair of players. Pure guesswork should yield a score of approximately 50 percent. The significance of scores between 50 and 75 percent is uncertain, perhaps indicating a weakly audible difference between players, but perhaps not.

The aggregate results of our listening comparisons are presented

in four different ways: (1) the ratio of correct identifications to the number of trials, (2) the percentage of correct identifications, (3) the probability—expressed as a decimal between zero (an impossibility) and one (a certainty)—that the score is the result of chance, and (4) the level of confidence, expressed as a percentage, that the score did not result from chance. The last two figures are thus a measure of the identification score's statistical uncertainty. A confidence level lower than 95 percent (equivalent to a probability figure greater than 0.05) suggests that the score is questionable.

The scores shown in the table are relatively poor. None of the comparisons reached a level of 75 percent correct identifications, and only four of the twelve yielded better than a 60-percent ratio (two of them with the test tone). These four scores, all for comparisons involving the Philips player, are also the only

ones with high confidence levels. Among the scores for individual listeners (not shown), the highest was 90 percent, for the Philips vs. the Technics with the test tone (the next highest with the test tone was just 75 percent, by the same listener and one other comparing the Denon and the Philips). With musical material, the highest score—and the only one with a confidence level greater than 95 percent—was 75 percent by the same listener for the Denon vs. the Philips with the Philip Glass solo-piano recording; he also got the next best score of 70 percent for the Philips vs. the Technics, again with the Glass recording. (These were the only individual scores obtained with musical material to have confidence levels greater than 86.8 percent.) Overall, however, this listener's score was just 64.2 percent, and if the test-tone results are excluded, it drops to 60.6 percent.

Both the aggregate and the individual data strongly suggest that the Denon and Technics players are audibly indistinguishable. The highest score achieved by any of the listeners for this pairing was 65 percent, by one individual with both the test tone and the Pink Floyd recording, but with a confidence level of only 86.8 percent. With this combination our overall top-scoring panelist, the one mentioned previously, chalked up scores ranging from 50 percent with Pink Floyd to 60 percent with the test tone and the Glass recording, with poor confidence levels across the board. It does appear that there may be some barely perceptible differences between the Philips player and the other two, at least when listening to the test tone. With music, however, the evidence is weaker, and the reasons for any possible differences between the players are not obvious.

dence level is down to 95 percent, one chance in twenty that the associated score is just a product of lucky guesses. Statisticians usually start getting nervous at this point, since the reliability of the score, no matter how good, is questionable.

"There are lies, damned lies, and statistics," Mark Twain's Disraeli said. Data of the type obtained from our listening comparisons must be

analyzed carefully to guard against misinterpretation, especially when, as in this case, the numbers do not show dramatic trends. A few tendencies are noteworthy, however. For example, the listeners were correct more often with the fade-to-zero test tone than with music. With the test tone, their aggregate scores were 68 percent correct matches when comparing the Denon and

Philips, 54 percent when comparing the Denon and Technics, and 70 percent when comparing the Philips and Technics. In other words, their scores tended to be better when the Philips player was one of those under test.

Although all the aggregate scores fell short of the 75-percent criterion normally used to demarcate the threshold of audibility, several of

the individual scores reached 75 percent, and one hit 90 percent. All of these relatively high-score comparisons involved the Philips player and had high confidence levels. This suggests that on pure tones its sound at extremely low levels may be slightly different, for better or worse, from that of the other players in the comparison. Overall, with the test tone, listeners answered correctly 192 times out of 300 trials, which is 64 percent of the time. This score has a high confidence level, so it is unlikely to have occurred by chance alone. On the other hand, it is so low that the differences being detected must be barely perceptible—below what technically would be considered the threshold of audibility—and are thus of questionable significance.

When listening to music signals, which tend to be highly complex, our panelists fared more poorly. The aggregate scores were 56.3 percent when comparing the Denon and Philips, 53.0 percent when comparing the Denon and Technics, and 59.7 percent when comparing the Philips and Technics. Again, this suggests that the Philips sounds somewhat more different from the other players than they do from each other, but by a very slender and elusive margin at best. Overall, when listening to music, the panel was correct 507 times out of 900 trials, for a score of just 56.3 percent. Interestingly, the Glass solo-piano piece provided the best score, 57.6 percent, Pink Floyd's rock-and-roll was next at 56.6 percent, and Wagner came in last at 54.6 percent.

BREAKING down the results by panelist demonstrates that listening skill and acuity vary somewhat even among individuals selected for their abilities in this regard. Listener No. 3, for example, answered correctly 96 times out of 180 trials when listening to music, for a score of 53.3 percent—the lowest of the group. Listener No. 4, on the other hand, beat out her competition with 109

correct answers for a score of 60.6 percent.

At the end of each player comparison, the listener was asked if he had a preference between players A and B. Taking the thirty-one player comparisons in which the listener scored better than 50 percent, the player selected least often got the nod seven times, as opposed to ten and eleven times each for the other two; in three cases, the listener expressed no preference. Statistically, however, the listeners were too unsure about audible differences between the players for the rank ordering to have any validity.

Laboratory Measurements

Finally, following all listening tests, each CD player was subjected to a battery of standard audio tests. It is clear from the measurements we made that all three players performed very well in virtually all respects. In fact, the numbers in the individual tests are remarkably similar, which indicates that the basic performance of these three players is quite similar despite the very different technologies employed to recover disc data. For example, total harmonic distortion plus noise (THD + N) measured at 0 dB and 1,000 Hz was 0.0024 percent for the Denon, 0.0032 percent for the Philips, and 0.0026 percent for the Technics—all figures well below the threshold of audibility.

Among the bench measurements that might conceivably have some bearing on the results of the listening tests, the differences were still quite small. The Technics beat out the other two players by a very small margin in linearity at extremely low levels—so small a margin that we very much doubt its significance. The Philips measured 9 or 10 dB worse than the other players in signal-to-noise ratio (S/N) but 2 to 3 dB better in dynamic range, which might account for the slight differences apparently observed in the listening test using the fade-to-zero tone; it is hard to believe this would be a factor with music signals, however. Though all three players had very flat frequency responses, the differences were

great enough that they might be barely audible under some circumstances with musical material, but again, it is unclear whether this was a factor in the listening tests.

What Did We Prove?

It is difficult to draw hard and fast conclusions from all our experimental data. It does appear, with an aggregate score of 64 percent, that the listeners were sometimes able to hear small differences between the players when a low-level fade-to-zero tone was played. What is remarkable, however, is that whereas it was very easy to hear differences between earlier players in this test (the listening panel scored 99 percent in it during the screening with previous-generation players), it is apparently quite difficult with today's most advanced machines. That suggests that the new D/A converters used in these CD players have largely solved the problem of low-level nonlinearity.

THE score of 56.3 percent shows that audible differences between these players on music, if and when they exist at all, are extremely small. In a strict interpretation of the data, we would have to say that the differences were not significant. In most listening environments, this would surely be the case. Still, the score could suggest that under very precise listening conditions very small audible differences *are* detectable. If these differences do indeed exist, exactly how important they are to the enjoyment of music reproduction is a question best left to each individual.

In the final analysis, three CD players were auditioned by five listeners—grand generalizations are simply not possible. We certainly have no basis for concluding that any of these players is sonically superior to either of the other two. In addition, it must be remembered that these three players are particular pieces of gear and that manufacturing differences from unit to unit within each model line could easily

DAVID VS. GOLIATH

In the past, digital audio devices used D/A (digital-to-analog) converters with fundamentally similar designs. The binary input signal was used to sum the outputs from resistor ladders or current sources selectively to create a total instantaneous output voltage equivalent to the value coded by the data for a particular sample, thus converting the digital data stream into an analog waveform. This kind of multibit converter works well but can be vulnerable to problems such as nonlinearity, in which the output voltage imprecisely represents the digital data. The result is increased distortion, particularly at low signal levels.

To minimize this problem, 18- and even 20-bit D/A converters were developed. Although CD's themselves contain only 16-bit audio data, the added bit levels in the converter can help make the conversion more accurate, thereby reducing nonlinearity. Unfortunately, such converters are difficult to engineer, require careful adjustment, and can be prone to instability and drift over time. To overcome these drawbacks, manufacturers sought an entirely new approach.

The result was the development of 1-bit D/A converters. Instead of using many bits to create the output waveform through a series of amplitude slices, 1-bit converters mathematically transform the 16-bit signal from a CD into a very high-speed single-bit pulse stream running many times faster than the 44.1-kHz CD sampling rate. This pulse stream is the converter's final output. Moment-to-moment changes in the density or width of the pulses vary the energy output in such a way that a simple ultrasonic filter smooths the signal into an exact replica of the original audio waveform encoded on the disc. The conversion is thus direct, its accuracy limited only by the precision of the mathematical transformation and the quartz-controlled oscillator used to generate the pulses.

Because the requantization of the

signal from 16-bit to 1-bit introduces a large amount of noise, all 1-bit converters use a process called noise shaping to redistribute most of the noise created within the audio band up into the ultrasonic range, where it is inaudible and easily filtered out. With noise shaping and 1-bit waveform reconstruction, D/A conversion can be performed with both excellent linearity and low noise.

Within the family of 1-bit conversion, however, many variations are possible. The Philips 1-bit converters use what the company calls Bitstream technology, which employs 256-times oversampling to raise the data rate to 11.289 MHz. A second-order noise-shaping circuit uses sigma-delta processing to reduce requantization noise in the audio band. The circuit's output is a stream of pulses, all having the same width and amplitude, generated by a process known as pulse-density modulation (PDM). A pulse can go either up (positive) or down (negative). Changes in the ratio of positive to negative pulses emerge from the system's third-order Bessel output-smoothing filter as variations in the amplitude of an audio waveform. To improve performance further, the CD840 player used in our test runs two converters per channel in a differential mode, which reduces noise.

The converter used in the Technics SL-PS70 is more like the various 1-bit systems that have been introduced by other Japanese manufacturers, all of which use pulse-width modulation (PWM) to generate their outputs. The Technics converter requantizes the 16-bit data read from a CD to a signal with eleven possible values at a thirty-two-times-oversampling rate. This signal feeds a pair of pulse-width modulators, operated differentially to improve performance, that generate constant-amplitude, single-bit pulses having eleven possible widths. The oscillator that makes these pulses runs at 768 times the CD sampling rate, with twenty-four clock cycles for each increment of pulse width. Because the

timing of pulse transitions is precise, a high-quality audio waveform can be reconstructed by passing the pulse signal through a simple low-pass ultrasonic filter. The Matsushita converter used in the Technics is named after its multistage noise-shaping (MASH) system, which performs third-order noise shaping to reduce in-band requantization noise.

The converter in the Denon DCD-1560 player we pitted against these two 1-bit upstarts is a multibit device with a couple of interesting design wrinkles. It is a sophisticated 20-bit circuit (called Lambda SLC by Denon) in which a digital signal-processing circuit splits the signal from the disc into two streams, adding a positive digital bias, or level shift, to one and a negative bias to the other. Each stream then goes to a separate 20-bit D/A converter.

Because of the amplitude shifts introduced by the bias, very low-level signals never cross the converter's zero line, where nonlinearity is greatest. Higher-level signals cross zero at only two points per cycle instead of the usual four. After conversion, the bias is removed from each leg of the signal, and the two streams are recombined. Since they were biased in opposite directions, the two data streams crossed the zero lines of their converters at different points. Consequently, the points of maximum distortion in each output signal are averaged with relatively undistorted segments of the other when the two are merged, reducing the peak distortion level by about half. This technique, combined with careful adjustment and the high linearity of the converters themselves, is responsible for the DCD-1560's excellent performance at low signal levels.

When high-level audio signals are present, the biasing is discontinued to prevent overload, and the converters operate in a conventional linear fashion. In practice, the biasing is almost always in operation, being disabled only when the signal passes within 0.1 dB of maximum. —K.C.P.

swamp any small audible differences detected in our tests.

On the other hand, the tests do support one very important conclusion. By showing that audible differences between these 1-bit and 20-bit CD players are, at most, exceedingly small, our results suggest that the

new 1-bit converter technology, in its earliest incarnation, has already rivaled or equaled the sound quality of highly evolved conventional designs. Whether 1-bit conversion will go on to still higher levels of sonic performance—or even whether there is a higher level to be attained

within the CD standard—remains to be seen. For now, it appears that CD players equipped with Lambda, Bitstream, and MASH converters are running neck and neck in the race toward better digital audio reproduction. In other words, it was a three-way dead heat. □

AUDIO MYTHS

Do bogus "facts" confuse your buying decisions?

by Ian G. Masters

W

HILE there is an undeniable fascination

with audio equipment for its own sake, an interest in high fidelity is most often based primarily on the desire to enjoy recorded music. Aside from a minority whose main interest is the hardware itself, most of us learn just enough about the technical side of the subject to make an informed buying decision. And yet audio is

one of the most technically complex subjects most people will ever encounter, so it's not really surprising that much of the detail about how the various components work is understood only dimly by the majority of buyers.

Because of this imperfect knowledge, the audio field has built up a rich mythology over the years. The myths include bogus "facts" as well as principles that many audio enthusiasts (and not a few people who sell the equipment) believe with a fervor bordering on religious faith, even though none of these "truths" can be supported by science or engi-

neering. Some of them seem intuitively reasonable, some are based on outdated technology, some are promoted by manufacturers to gain a competitive advantage, some are half-truths, and some are simply wishful thinking. All are false.

Take a look at the following statements, for example.

MYTH

Popular music and classical music require different kinds of loudspeakers.

The idea of "the rock speaker" and "the classical speaker" arose at a



time when designers were unable, or unwilling, to produce truly natural, flat-response speakers. Those with high sensitivity, a prominent midrange, and a punchy low end were aimed at popular-music listeners, while the more "polite" speakers—primarily, those with a weak bass and "soft" highs—were offered to devotees of the classics. But music is music, and nowadays the view that a speaker should simply reproduce what is in a

recording, rather than selectively emphasizing or removing those parts the speaker designer feels should be changed, has largely been accepted. Neutral speakers that are suitable for *all* music are now the rule rather than the exception, and it is left up to the record producer to add any emphasis he feels the program material requires. It is true that at one time rock music, because of its limited dynamic range and high overall level, required a speaker to handle higher continuous power levels than other types of material, but in the digital age even this distinction has largely disappeared.

MYTH

The lower the stylus tracking force, the better the performance.

Certainly, tracking a stylus at too much force runs the risk of damaging an LP by wearing it out. But even worse consequences can occur if too little force is applied: The stylus can mistrack if it is not held firmly in the groove. Mistracking means that the stylus loses contact with the groove walls momentarily, and then comes crashing back down. Not only does this sound excruciating at the time, but the damage is likely to be permanent, for the stylus has a tendency to break off bits of vinyl as it regains contact. In general, a stylus should be set to track at the upper end of the manufacturer's suggested range.

MYTH

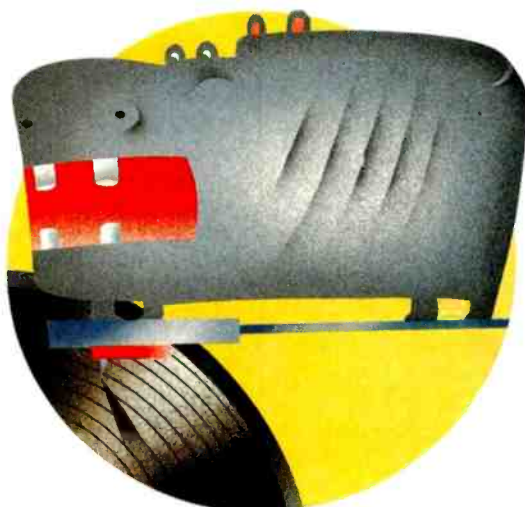
Tone controls should be left "flat" at all times.

If that were true, there wouldn't be tone controls. A properly matched system and room combination should yield a balanced sound, but the match is never perfect, and small sonic problems can often be corrected with tone controls. They can also be very handy for taming a strident recording or giving a lift to the low end of one that is bass-shy.

MYTH

A frequency response of 20 to 20,000 Hz is the minimum performance level for true high fidelity.

These numbers have long been a touchstone in audio, partly because they look "right," partly because they represent a comfortable ten musical octaves (approximately), and partly because they exceed the range most people can hear by a rea-



sonable margin. Most of us are capable of hearing sounds somewhat lower than 20 Hz, but relatively few of us have an upper range that goes much beyond 16,000 Hz. To reject a piece of equipment that falls short of this "ideal" would be unnecessarily fussy—FM radio, for instance, doesn't extend beyond 15,000 Hz, but, whatever its other faults, few would deny that FM is at least capable of high-fidelity sound. On the other hand, if a component is reasonably flat between 20 and 20,000 Hz, it will usually be flawless in the range we can actually hear.

MYTH

Speakers (and other components) should be "musical."

Well, of course, if what is meant by the term is that the equipment should be able to handle musical material without adding anything of its own, but that would be better expressed by such words as "flat" or "neutral" or "undistorted." If the term signifies that a piece of equipment adds a warmth and character of its own, as would a violin, then it would be synonymous with "not high fidelity" or "distorted." In fact, although the term "musical" is often used by a certain segment of audiophilia, it's meaningless in this context.

MYTH

A well-known brand name is the only assurance of audio quality.

It may be a real assurance of fine workmanship, though not always, and it may mean that the company will be around to fix a component if it breaks. But the well-known companies have no monopoly on good design or manufacturing, nor do their products always live up to

their reputations. A purchaser of audio equipment should judge each component on its own merits, without undue reference as to where it came from.



MYTH

The larger the speaker, the better the bass.

When speaker design was more primitive than it is today, and amplifier watts were much more expensive, there was something to this. But now it is possible to achieve truly astounding low-frequency output from very small enclosures. The trade-off is almost always a requirement for considerably more power from the amplifier, but watts are plentiful and reasonably economical, so that's less of a restriction than it once was.

MYTH

Equipment choice is a matter of personal preference because everybody hears differently.

Physically, what reaches the eardrum is influenced heavily by the shape of the outer ear, and every ear is different, so it is undoubtedly accurate to say that the waveform for any particular sound is unique by the time it gets to each individual eardrum. But each of us hears *all* sounds through our own acoustic filters, and that forms our only reference. The aim of an audio system is to duplicate natural sounds that, although we all react to them differ-

ently, we all recognize as natural sounding. Personal preference comes into play when the equipment available is sufficiently imperfect that we are forced to decide which flaws are least intolerable.

MYTH
Digital audio has a distinctive "sound."

Audio's belated Luddites would have us believe that, by its nature, digital sound is "hard," "glassy," strident, fatiguing, and thoroughly unpleasant. Certainly there have been compact discs that were all of those, but in virtually all cases the problems could be attributed to recording practices—such as excessive equalization, dubious microphone placement, and so forth—that were developed to compensate for what some saw as flaws in the vinyl LP. But even the most committed antidigital partisans will admit that there are *some* good digital recordings, and it's the good ones that prove a system's worth. If the system can perform flawlessly even once, there's nothing wrong with digital recording itself, only with the way it's sometimes used. It is a truly neutral recording medium, but it can unfortunately show up the faults in other parts of the chain.

MYTH
The best sound is obtained by using headphones.

Headphones frequently offer a very dramatic and pleasant audio experience, but by their very nature they

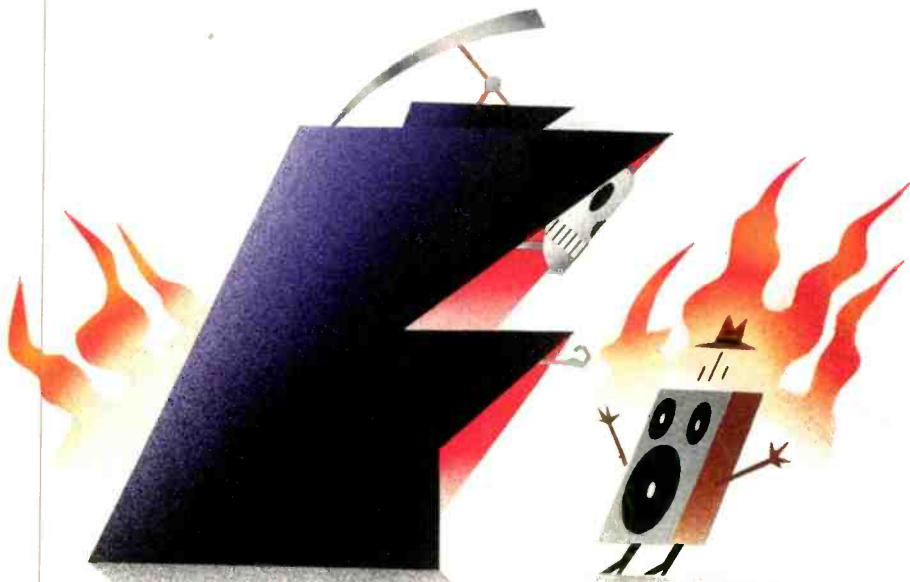
are unrealistic. For one thing, the vast majority of recordings are designed to be heard through speakers, and the stereo sound stage is optimized for that. Headphones exaggerate the stereo image, with extreme left/right separation and a characteristic "soloist-in-the-middle-of-the-head" effect. In addition, high-frequency sounds decay naturally in real acoustic environments, but not with headphones, which are coupled directly to the ear. Thus, unless corrective steps are taken, the sound is usually overbright.

MYTH
Moving-coil cartridges are inherently superior to moving-magnet models.

This may have been true at one time, since moving-coil designs reached what is now considered to be the pinnacle of their potential before moving-magnet cartridges did. But now, the top MM designs equal the performance of even the best MC cartridges. In some senses, most MC cartridges might even be considered inferior. They're invariably more expensive, their low output requires boosting to work with most amplifiers, they are more susceptible to noise, they usually don't track as well, and they often have poorer frequency response.

MYTH
The greatest threat to a speaker is too much power.

While it is possible to fry a speaker by hitting it with a great jolt of power, speakers can also be ruined by too *little* power. If an amplifier has insufficient power, playing music at high volume can cause excessive clipping, producing a large amount of spurious high-frequency energy that the tweeter just can't handle. The distorted audio signal overheats the tweeter's voice coil, and its fine wires burn up. R.I.P.



MYTH

The more the channel separation, the better the imaging.

Good separation may be an indicator of competent design, but psychoacoustic tests indicate that imaging ability does not increase once separation exceeds about 20 dB.

MYTH

Transistor and vacuum-tube components sound different from each other.

The earliest examples of solid-state equipment sometimes did have a distinctive sound, but that was because the bugs hadn't yet been worked out of a new design technique. Now that both types of equipment boast distortion and noise levels well below audibility, any sonic differences have disappeared, although not all audiophiles are willing to admit this.

MYTH

Tight bass and good bass transients are the measure of a good speaker.

Tight bass usually means lots of energy in the mid-bass region and next to none at the lowest frequencies. It's dramatic sometimes, but imperfect. As for what are called bass transients, there ain't no such thing—the "transient" portion of, say, a kick-drum beat is all high-frequency sound and is reproduced by the higher-frequency drivers. It has nothing to do with the woofer.

MYTH

High-end audio equipment always outperforms lower-priced components.

This *should* be true, but it is far from being so. "High-end" usually means high-priced, and audio has always been notorious for its lack of any real price/performance correspondence. Prices can be determined by a number of things: scarcity, status, features, size, brand, exotic materials, and so forth. Rarely do these factors have much to do with how a component actually *sounds*. Quality is available at all levels of the market, and a smart shopper can end up with a truly first-class system for relatively little money as long as he takes the time to find the lower-priced models that offer the best performance.

MYTH

The less turntable surface that comes into contact with an LP, the less chance that spurious vibrations will reach the stylus.

Surface-borne vibrations may be reduced by reducing contact area, but they are usually less of a problem than airborne vibration, which can turn a vinyl record into a very effective microphone. To prevent airborne vibration, an LP should be completely supported in the playing area, but not at the raised edge or label area.

MYTH

Most of the problems with an audio system can be corrected by equalization.

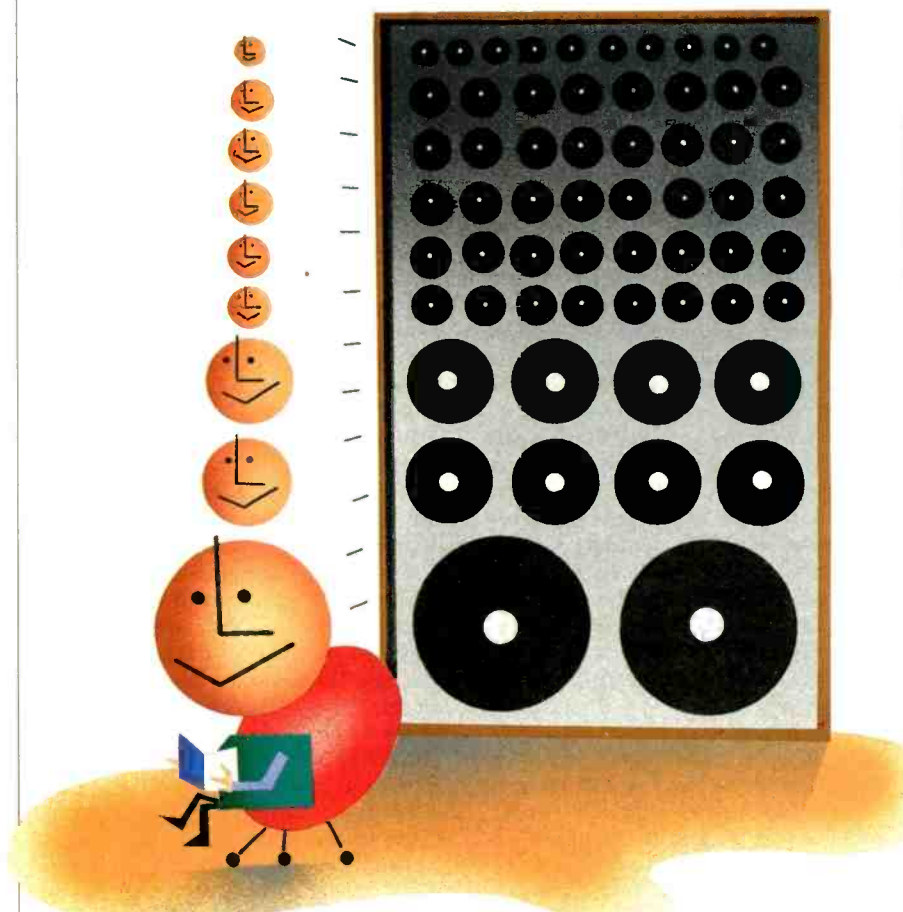
Like tone controls, an equalizer can deal with small aberrations, although many users tend to over-modify their sound this way. But sound from a particular source, such as a pair of speakers, is different in different parts of the listening room, so the most an equalizer can do is correct for a single listening position. One popular use of an

equalizer is to boost bass; while it can do this, it does so at the risk of overdriving the power amplifier. The result is usually worse sound than without equalization.

MYTH

The more drivers a speaker contains, the better the sound.

On the surface, a three-way system would seem to be superior to a two-way, and speakers are usually priced with that in mind (of course, a three-way system is more expensive to build). But the more different types of driver a system contains, the more complex a crossover network it requires, and crossovers have always been troublesome in terms of coloration and phase linearity. By the same token, multiple drivers of the same sort—tweeters, say—leave themselves open to various sorts of acoustic interference. While there are superb speakers on the market that use extremely complex arrays of drivers, some of the smoothest sounding speakers are simple two-way systems. □



"On stage you can be great one night, and it's lost. With recording it's there forever."



Maybe it's all the talk of Tears for Fears growing up that makes him wary. The band's third album, "The Seeds of Love," released in the U.S. in October 1989, sprang from five years of uncertain silence to surprise critics and fans with a new direction. Back on the U.S. concert circuit this past summer, Orzabal was eager to avoid the disruptions that had left him and partner Curt Smith rattled and flustered at the beginning of the Eighties.

"Going on tour for nine months with two albums' worth of material, as we did then, is something I don't recommend to anybody." More important, he said, the stage isn't his preferred medium. "You can be so great one night, and it's lost forever. Touring is easier this time, but what I like about recording is that it's there forever."

Tears for Fears has always tried to mix oil and water. The band's impeccable pop sense comes to bear on weighty topics, and occasionally the result is brilliant—*Pale Shelter* from their 1982 debut, "The Hurting," for instance. At other

when the strands Orzabal and Smith had been struggling with coalesced. Singer and keyboardist Oleta Adams, recruited by the duo after they saw her in a Kansas City night club, found her place at the center of a soulful, organic, remade-for-the-Nineties Tears for Fears. Orzabal found new songwriting inspiration. The band turned away from its banks of technology.

"When we first started, technology was very anti-rock-establishment. Now it's the dominant force in pop music," he said. "Meanwhile, the unreal element of recording and video is increasing. To maintain our stance—outside the mainstream—we've had to move away from our roots, go back to a more organic sound."

In spite of the intention to move against the grain, the band seems to have settled comfortably into the mainstream with the new album. It's oil and water again, and Orzabal doesn't understand the mix. "We have a difficult time comprehending our appeal and success," he said. "On one hand, that's bad because it



Roland Orzabal (right) and Curt Smith



TEARS FOR FEARS

BY RICK G. KARR

ROLAND ORZABAL is inscrutable. Could be he's relaxed, in control, and satisfied with Tears for Fears' erratic but impressive progress. Perhaps he's a misunderstood *artiste*. Or maybe he's just dead tired, wishing he was anywhere else.

He's wary, more than anything. Orzabal approaches interviews with a self-imposed moratorium on shooting his mouth off. He's been burned by one too many clever-than-thou reporters who have lulled him into a false sense of security. "I've done interviews where I've sat down and chatted for hours and hours about psychology, politics, astrology—all this interesting stuff," he told me recently in a southern English accent. "It comes off really badly in print. See, I don't consider myself an intellectual. Communication that comes from the heart is far more potent than that which comes from the head."

times they sound like overzealous college freshmen who have read too much and understood too little.

"The Hurting" took its theme from some esoteric theories of child and adolescent psychology. Crystalline synth-pop fused with adolescent self-absorption to create a small-scale version of Pink Floyd's "The Wall" for the teen-angst crowd on both sides of the Atlantic. TFF deftly moved on to haunt the summer of 1984 with the multi-Platinum, hook-laden "Songs from the Big Chair" (*Everybody Wants to Rule the World, Shout*).

Then they disappeared.

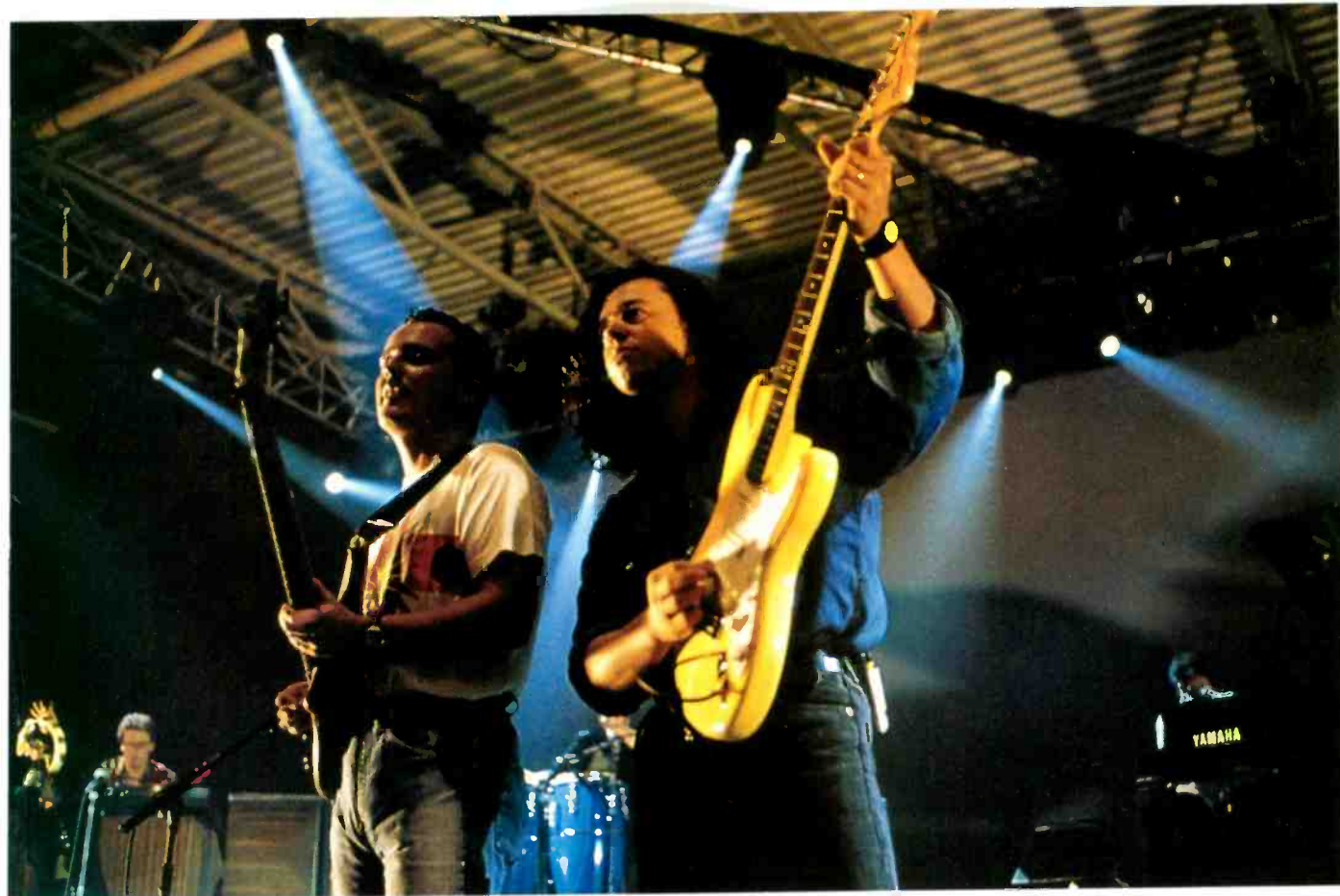
Sessions with producers Clive Langer and Alan Winstanley (Elvis Costello, Madness, They Might Be Giants) landed on the shelf. "We weren't ready for that project," Orzabal said. "We were still firmly entrenched in drum machines, synthesizers, sequencers. Clive and Alan don't particularly like complicated things. I do."

The five-year dry spell ended

can create problems with getting on and doing things. But on the other hand, it's good because we can continually question what we do, which leads to trying different things, making the whole thing grow.

"What we were trying to achieve with this album ["The Seeds of Love"] is different from the others. It's a kind of perspective: As you look at the speakers, the music seems to go back a long way," he said. "When we were working with sequencers, it was almost as if the music hovered at the front of the speakers."

Interpreting the new album's production values sends Orzabal into one of his regular dives into the psychological. "What we were trying to do here was get something dense and complicated, and therefore too difficult for the rational mind to sort out. And therefore, hopefully, the emotional aspects, the meaning aspects, come through a lot stronger," he said. "When the intellect serves the emotions, the whole



PHOTOS: FACING PAGE: MICHAEL PUTLAND/RETNA LTD.; THIS PAGE: CATARINA/STILLIS; RETNA LTD.

DR FEARS

thing has a phenomenal force. When it's abstract, you lose force."

Yet he seems unsure of the place of the intellect in pop. "There's always going to be an area of pop music that's throwaway, banal," he said. "That element waxes and wanes. There was one time when pop was a forum for ideas. I think it will pick up again some of the intellectual aspects it had during the Sixties and Seventies. I hope."

Orzabal's nod to the music of that period comes in the track *Sowing the Seeds of Love*. Its music is shamelessly Beatlesque, its lyrics angrily optimistic. "We wrote that on the eve of the 1987 election in Britain, which proved to be Margaret Thatcher's fourth victory," Orzabal said. "Her government evokes memories of the Victorian era when morality was right at the forefront. What I wanted to do was evoke another time when Britain was great: the Sixties, when we had a left-wing government. I wanted to counteract the Eighties in England,

to write a song which was like a protest song, but a little more clever. Billy Bragg writes protest songs; they put you off. I wanted to write one which was inspirational, enthusiastic, optimistic, possibly a little naïve."

Orzabal is a studio addict. With machines out and human players in, he's more in love with the studio than ever. Undaunted by less familiar studio techniques, he and Smith took their first turn at the helm on "The Seeds of Love." "Instead of programming machines, all our skill went into the editing. You spend days, sometimes weeks, just waiting for the right feel, the right take; then you put all the pieces together. I learned that production is what I'm best at."

He gained additional perspective when he produced Oleta Adams's solo debut. "When you produce somebody else, you have a clearer idea of who they are. Producing yourself is much more difficult because you want your work to reflect

yourself so much. It's a lot easier to nurture somebody else than to nurture yourself."

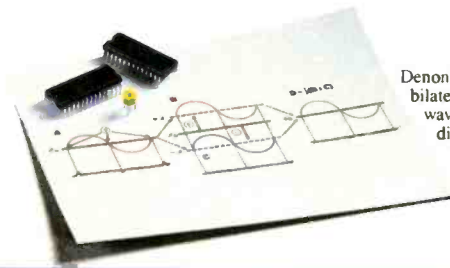
That was, perhaps, the message of the old Tears for Fears, the band that sent bleak messages yet managed to convey hope. Orzabal agreed. "All I can do is let people know they're not alone," he said. "I can try and decrease the amount of taboo which surrounds things. Through music you are offering experience to other people. By doing that you are saying, 'You are not alone.'"

"The next album will be a bit more forward-looking," Orzabal said. "We borrowed heavily from the Seventies and Sixties: the Beatles. Little Feat, Steely Dan. I'd like to take that further but introduce some more innovative things."

And what influences can we expect to turn up on the next Tears for Fears album? Who are you listening to now?

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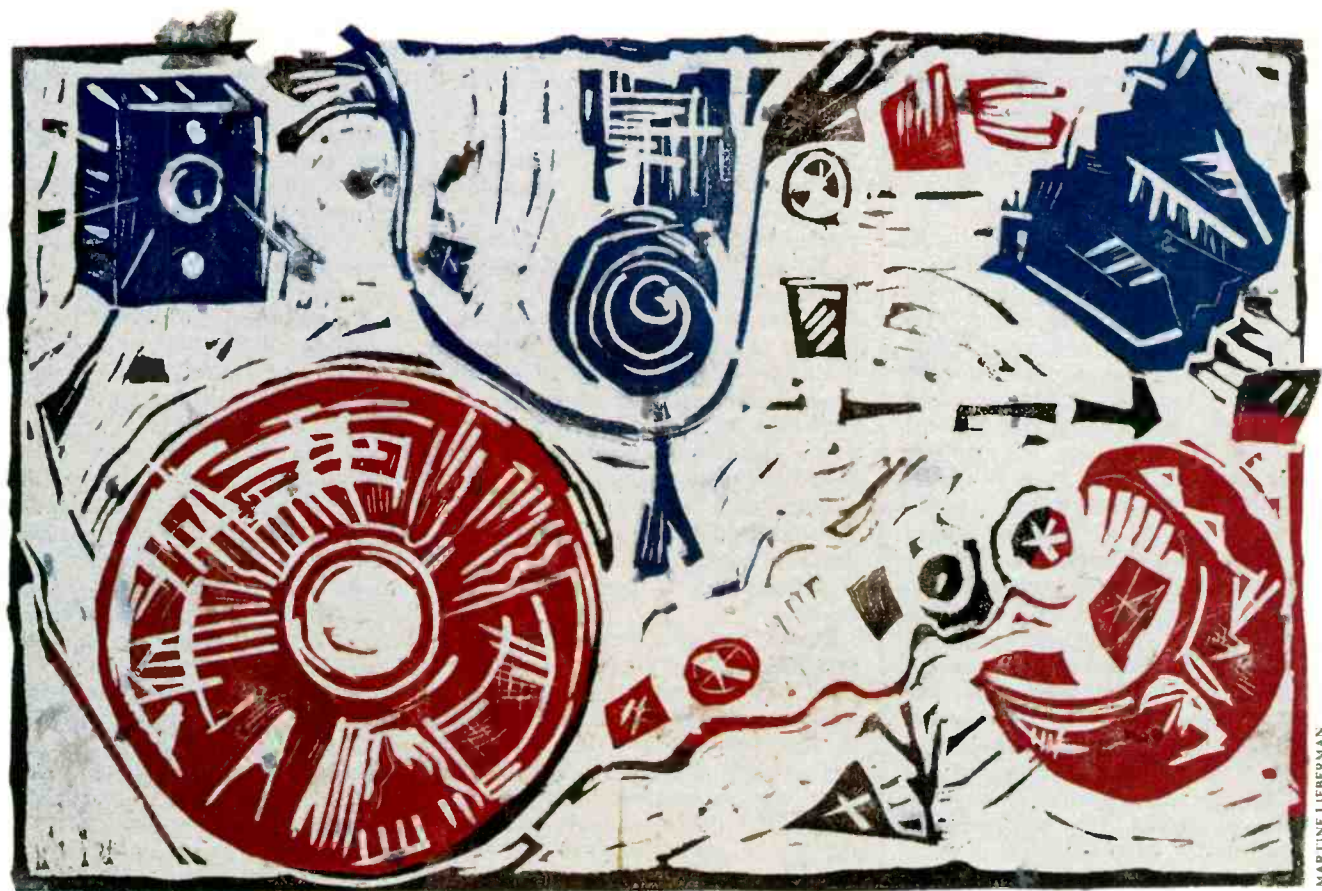
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SOUND DISPERSION

Understanding loudspeaker radiation patterns will help you choose speakers that are right for you.



MARTINE LIEBERMAN

L OUDSPEAKERS are funny. At first glance they appear to be the most basic and simple of audio components. After all, they are only electric motors that move back and forth instead of round and round. But speakers are actually the most complicated link in the audio chain, for they must interact with associated electronic equipment, the room, and the listener. While electronic components must only reproduce a signal, a speaker system must create an *effect*. Moreover, the *kind* of effect a good speaker should produce is a matter of some dispute, and different speaker designers take quite different approaches to achieve the results they want.

One very important aspect of speaker design involves “dispersion characteristics,” or the way in which sound radiates from the cabinet. Accord-

✱ by Howard Ferstler ✱



ing to one school of thought, extremely wide dispersion from a loudspeaker is not only unnecessary but often detrimental to good performance. The argument here is that the first-arrival signals coming from the speaker should be flat in amplitude and coherent in phase. These "clean" first-arrival signals should not have their purity muddied by many nearby wall and cabinet reflections arriving a very short



time afterwards. Such reflections, the argument goes, lead to comb filtering and amplitude errors that limit clarity and negatively affect imaging. For this school of design, the preferred kind of system is one with few drivers, sometimes of moderately large size for the frequencies they cover (at least in the midrange and treble) and usually mounted in some kind of phase-coherent arrangement. Good contemporary examples have been produced by B&W and KEF. Some of these speakers even have midrange and tweeter modules that must be aimed at the listener for the best effect, but almost any box-shaped system having large, front-aimed treble drivers that are "aligned" mechanically or electrically in some kind of phased array will perform best under near-field conditions, since its response typically will not be uniform beyond 60 degrees off-axis. Speaker systems of this kind are said to have a *narrow-field radiation pattern*.

But according to another school of thought, extremely wide dispersion is a very *good* thing. Proponents of wide dispersion argue that the first-arrival signals do no more than help a listener localize the various instruments and performers in a program. Because most of the sound that any loudspeaker emits is reflected before being heard, they point out, it is vital that all off-axis signals be as smooth and clean as the on-axis signals. Listeners who feel that the first-arrival signals are critical tend to sit in the near field, fairly close to their speakers, with

the speakers aimed at the prime listening position. Under such conditions, most of the reflected sound is *weaker* than the direct sound (the ultimate "near-field speaker" would be a pair of headphones). But most listeners sit in the more reverberant "far" field. Under those conditions, the reflected energy would be considerably *stronger* than the direct sound.

Depending on the speaker system's radiation pattern, the frequencies involved, and the reflecting/absorbing characteristics of the room, the transition from near-field to far-field listening can take place anywhere between 3 to 20 feet out from the speakers. With speakers having an erratic radiation pattern, the transition point will shift as the program frequency changes. While near-field listening can result in extreme clarity from a program, far-field listening, according to its advocates, can "open up" the sound without degrading clarity in any important respect. Most *live* music, they point out, is listened to in the far field.

One of the most famous far-field systems, and one that set the standard for along-the-wall far-field performance, was the legendary Acoustic Research AR-LST, which made use of four midrange drivers and four tweeters on three angled front panels. Another classic AR speaker, the AR-3a, also worked best in the far field because of the very wide dispersion characteristics of its individual drivers, although it could not match the LST in extreme off-axis uniformity. The discontinued Allison Models One, Two, and Four were similar to the AR-LST in radiation pattern, and the Allison IC-20 carries on that tradition. The newer Allison mid- and low-price models are also excellent far-field performers thanks to the very wide dispersion characteristics of their midranges and tweeters. The Ohm Walsh and original dbx Soundfield models display the wide and uniform dispersion characteristics necessary for good far-field performance. All of these systems are (or were) noted for very wide dispersion over at least the front hemi-

sphere, and some have relatively uniform 360-degree dispersion throughout the audible range.

Advocates of wide dispersion point out that a controlled narrow radiation pattern is nearly impossible to obtain in a multiway system. The dispersion characteristics of speaker drivers are determined by their effective diameters. If a speaker is small in relation to the wavelengths it must handle, it will radiate them uniformly over a wide area. Woofers radiate the low bass uniformly in all directions because they are actually small in relation to the long bass wavelengths. As the frequency climbs, however, the wavelengths become shorter, and at some point the driver's off-axis output will begin to fall off. This characteristic is acknowledged (and approved) by the narrow-dispersion advocates. Wide-dispersion devotees point out, however, that as the frequency continues to climb, the signal is routed to another, smaller driver (a midrange in the case of a woofer and a tweeter in the case of a midrange) so that the *system's* off-axis response increases in strength. Thus, while the on-axis output of many two- and three-way loudspeaker systems may be flat, their off-axis performance typically has a "sawtoothed" characteristic (see Figure 1), particularly beyond the 45-degree off-axis point measured by most testers and especially in the 75- to 90-degree range.



A sawtoothed off-axis response can affect the sound of a loudspeaker system in two ways. First, because the ear perceives the complete wave front as unified, the total output of a system—its power response—will be irregular if the off-axis output is not smooth. A system with an irregular off-axis frequency response cannot present a smooth power response in a typical listening room, and a smooth power response is one of the things that high fidelity is all about. Most two-way systems, in particular, will have problems with this, since the woofer may be



called on to work far into the midrange. Some manufacturers try to overcome power-response losses by increasing the output of some drivers at the tops of their ranges. While that will result in a smoother power response, it can also result in an on-axis sound that is too bright.

The second effect of uneven off-axis response arises because the ear is also aware of the *difference* in broadband performance between a speaker's on-axis and extreme off-axis output. If the speaker system is being used in a normal listening room, an irregular radiation pattern will result in poor *spectral balance*. The sounds being reflected from nearby room boundaries should be similar in character to those of the first-arrival signals. If they are not, the speaker system sounds isolated, constricted, and boxy. No amount of individual-driver response contouring can correct this kind of imbalance. And typical A/B comparisons often fail to reveal the deficiency, since it is common to many loudspeakers. In a normal room, however, a system with a narrow and irregular radiation pattern sounds quite different from one having a very wide and uniform dispersion characteristic—that is, a near-flat response out beyond 75 degrees off-axis (see Figure 2).

Some narrow-dispersion advocates acknowledge the limitations of narrow-angle performance but advise anyone wishing the best in high-fidelity sound to stick with those kinds of speakers anyway and then acoustically treat the listening room. If special, high-grade acoustic padding is attached to the walls beside and behind the speakers, or used on free-standing panels, erratic off-axis signals will be absorbed and can be forgotten. As long as the on-axis signal is flat, appropriate acoustical treatment will insure that the power response remains flat in the midrange and treble.

The same people are also not in favor of letting the spectral balance of any system be determined by the room and speakers in combination. Instead, they feel that when the off-axis signals are quite subdued, the quality of a recording will deter-

mine the balance. If the first-arrival signals are clean and the recording is good, a very realistic panorama will result. What room reverberation there is, they argue, should come from the rear, so the back of the listening room is best left untreated and reflective. The resulting rear reflections will be appreciably delayed, will be derived mainly from the direct signals and the narrower off-axis signals, and, there-

fore, will be similar in content to the main signal. Spectral balance in such a "live-end/dead-end" (LEDE) room will depend mostly on the quality of the original recording (see Figure 3).

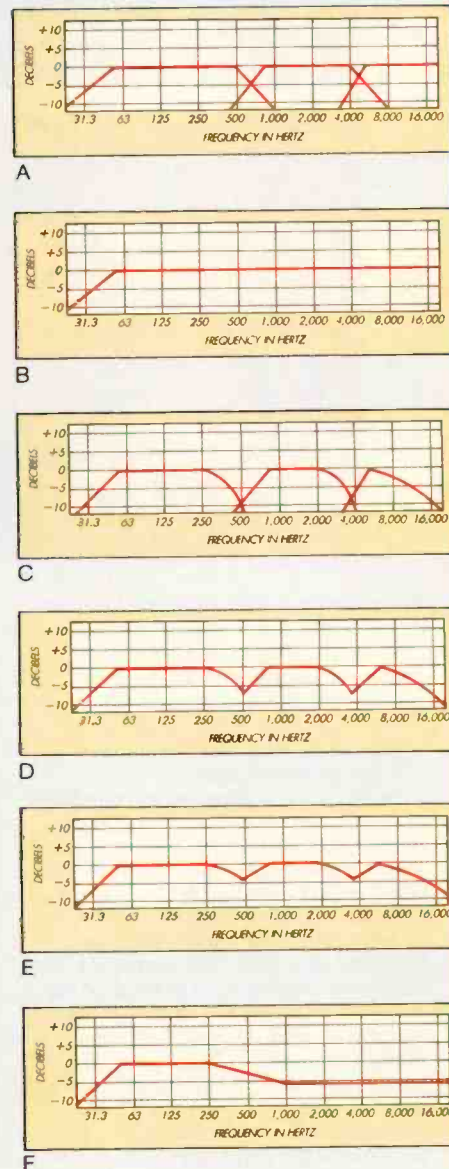
Both schools of thought have good reasons for their beliefs. Advocates of direct-signal, narrow-field response often see wide-dispersion speaker systems as "mid-fi" units designed for uncritical listeners. Ad-

Figure 1: Idealized response curves for a typical three-way speaker system with a 12-inch woofer, a 4½-inch midrange, and a 1-inch dome tweeter. Curve A shows the on-axis response of the individual drivers, with notches at the crossover points of 625 and 4,700 Hz and a bass rolloff at 50 Hz. Curve B shows the overall system response; the notches have disappeared because of signal overlap in the crossover regions.

Curve C shows the response of the individual drivers measured 75 to 90 degrees off-axis. The rolloffs at the tops of the woofer and midrange curves are steeper because those drivers are too large for the wavelengths they must handle at the high ends of their ranges; the tweeter also rolls off in the upper part of its range, but more gradually. Curve D shows the system response 75 to 90 degrees off-axis; its shape is sawtoothed because of off-axis power losses that are not offset by signal overlap in the crossover regions.

Curve E is the power response of the same system in a typical untreated listening environment (the curve combines all the response measurements through a 180-degree arc, 90 degrees on either side of the speaker's axis). The power response is clearly not smooth—the difference between the on-axis and off-axis response results in poor spectral balance.

Curve F shows the somewhat flatter power response in a good live-end/dead-end (LEDE) room where off-axis irregularities are absorbed. There is a relative increase in bass because the low frequencies are not absorbed by the room's acoustical treatment as well as the higher ones are. To get a truly flat power response, the tweeter and midrange driver would have to be driven harder than the woofer.



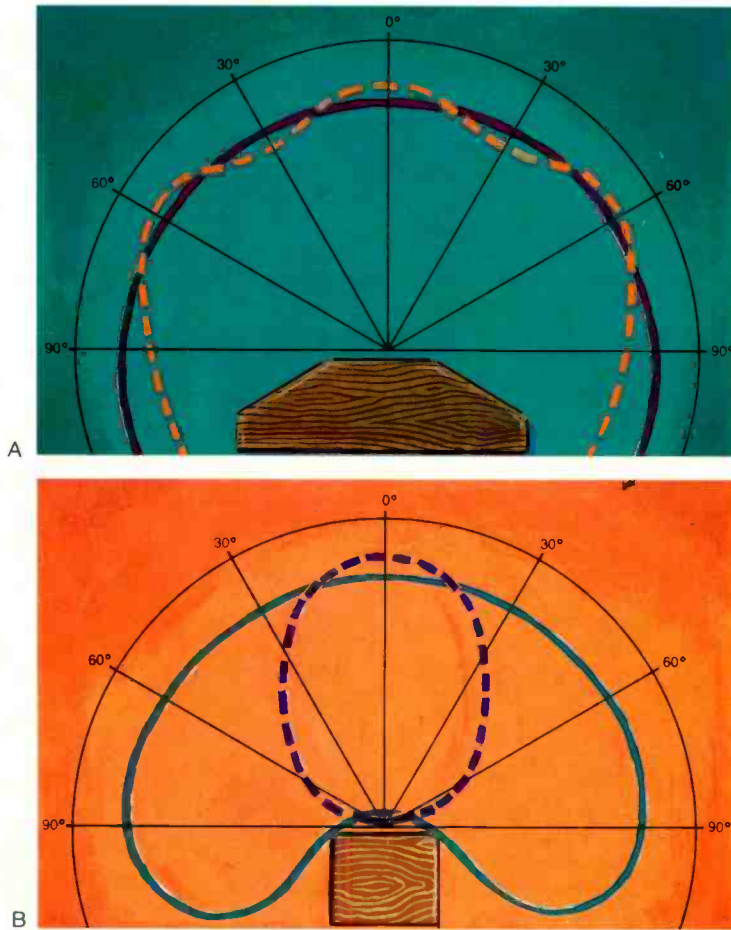


Figure 2: The polar characteristics of two different kinds of speakers. In each case, the solid line represents the combined response of the system's drivers with input signals at the bottoms of their respective operating ranges, the dotted line the response at the tops of their ranges.

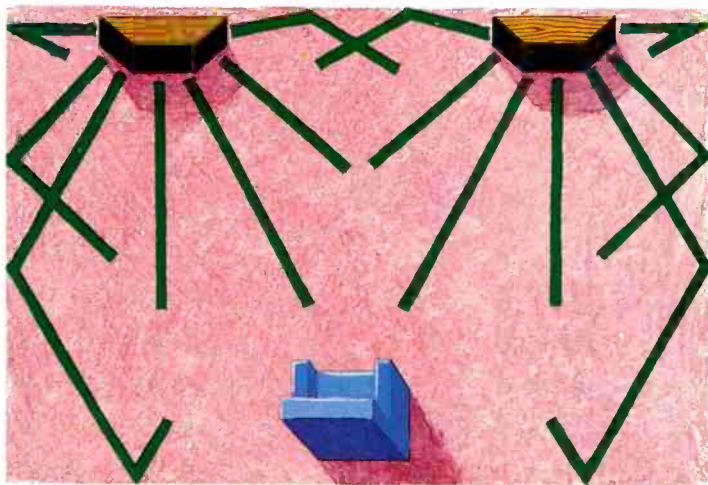
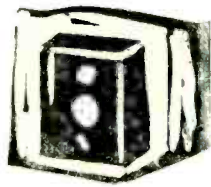
Speaker A is a three-way system with a woofer and several wide-dispersion midranges and tweeters mounted on angled panels. The solid line shows a very uniform response because of the drivers' small sizes relative to the wavelengths of the signals they are trying to reproduce. The dotted line is still fairly uniform, either because the drivers are still small relative to the frequencies they cover or because multiple drivers are being used for the same frequencies. Similar performance can be had from a system with one special, very wide-dispersion driver for each frequency band. An

omnidirectional system would produce a 360-degree curve having similarly uniform low- and high-range characteristics.

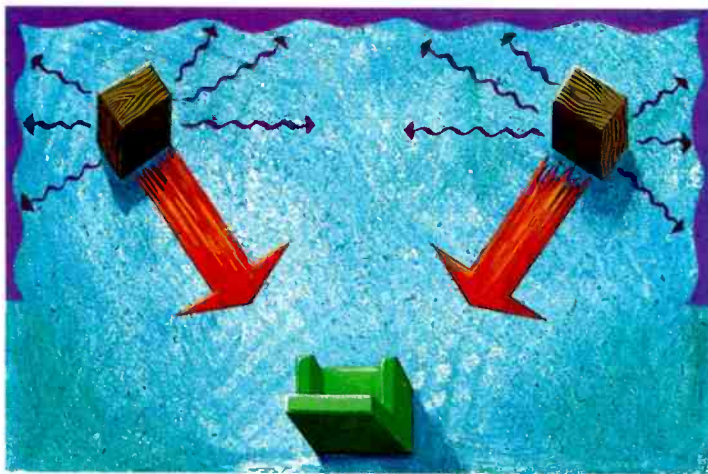
Speaker B is a conventional box-shaped, forward-radiating system. While the solid line shows a fairly uniform response, the dotted line indicates the typically narrowing response at the top of the range of drivers that are large relative to the frequencies they must handle. Unless the discrepancy between these response curves is nullified by special room treatment, such as acoustic padding, a pair of such speakers can produce a smooth power response at the listening position only when they are placed very close to it. Planar or dipole systems will produce response curves like Speaker B's at front and back, which in an untreated room will result in a synthetic openness like that of an omnidirectional system.

Advocates of wide-dispersion speakers point out that most people do not wish (or cannot afford) to set up a room just for listening, and they also remind us that most live music is listened to in the far field, not from 6 feet away. Near-field listeners—and narrow-angle proponents usually *do* like to snuggle up to their speakers—point out that room colorations, no matter how smoothed out they may be by a uniform off-axis signal, are colorations nevertheless. For the best fidelity, they insist that room effects be reduced by acoustic treatment, that speakers be placed away from room boundaries to reduce reflections even further, and that those speakers have clean, flat first-arrival signals with a minimum of off-axis response, even if it is a bit erratic. Wide-dispersion advocates counter that it is impossible to control room acoustics fully and that any system with erratic off-axis performance will have imperfect power response. They also note that reducing high-frequency reflections makes any system sound weaker in the high end unless the midrange and treble outputs are increased substantially, but that reduces the peak subjective volume potential and increases the possibility of distortion.

A number of near-field speakers on the market do not work well in the kind of LEDE environment described above. These dipole systems have narrow, controlled front-radiation patterns, particularly in the vertical plane, combined with equal radiation toward the rear; reflected off the walls behind the speakers, the rear output can add a sense of synthetic spaciousness to the overall sound. Examples include models from Carver, Magneplanar, Acoustat, and Martin-Logan, all of them line-source systems employing tall, narrow "planar" or multiple-driver arrays covering the same frequencies. With such a system, it is impossible for a listener to get into the far field in nearly any room, but the rear ambience adds a secondary far-field effect that many find pleasing. The old Dahlquist DQ-10 and the Quad ESL-63 perform in a similar manner, although the Dahlquist



A



B

Figure 3: Room-response characteristics. (A) When wide-dispersion, far-field-oriented systems are placed along the wall facing the listener, their radiation is uniform, and the first-arrival signals serve only to localize the sound source. Because one actually hears the room in a typical listening environment, uniform dispersion should make it easier to obtain smooth power response, and the spectral balance will be optimum.

(B) The response characteristics of a pair of narrow-dispersion, near-field-oriented systems. In this case, the room has a live-end/dead-end (LEDE)

configuration, with drapes lining the area around the free-standing speakers. The irregular, wide off-axis response of these units is absorbed by the acoustically treated walls. The strong, flat direct response results in the traditional near-field pinpoint imaging, and the overall power response will be subjectively flat provided the midrange and treble drivers are loud enough to compensate for off-axis losses in the room (the bass notes are not absorbed). In a more reflective environment, the same speakers would not have a flat power input to the room.

system has less vertical beaming than the planar models because it uses conventional drivers. The Bose 901, although it radiates its sound over a very wide area, is basically multidirectional, with the sound from its rear panels about 9 dB louder than that from the front. An interesting hybrid was the AR MGC-1, which combined near-field focus from its controlled main drivers and far-field ambience from its side-angled, delayed "reflecting" speakers.

It is doubtful that this controversy about speaker performance will end in the near future, and because each side is correct in its own way, it probably would not be a good idea for it to end anyway. Some recordings sound great with narrow-dispersion systems in specially treated rooms, some recordings sound great with wide- and uniform-dispersion speakers in more typical rooms, and some recordings sound excellent in either situation. Also, many listeners like the open sound of the wide-dispersion models, while others prefer the tighter, more analytical characteristics of the narrow-angle designs. Tastes vary, and either configuration can satisfy the definition of high fidelity if it delivers the requisite *smooth power response* into the listening room. While it is considerably easier (and usually cheaper) for a wide-dispersion system to do this in most rooms, there is no reason a narrow-dispersion model cannot deliver the goods with a bit of effort on the part of the owner.

Whichever configuration you favor, however, and whether you're trying to get the most out of speakers you already own or shopping for a new system, it pays to investigate such things as driver size and crossover points. In addition, don't be afraid to ask dealers and manufacturers about near-field and far-field characteristics, power response, and dispersion. Finally, take speaker test reports seriously, paying particular attention to the measured off-axis response. Choosing a speaker involves more than just reading ads and listening in the showroom, an environment quite different from the one you have at home. □



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risk is higher the younger you are, and may be as high as 50% for those who smoke cocaine. (Some crack users say they felt addicted from the *first time* they smoked.)

When you're addicted, all you think about is getting and using cocaine. Family, friends, job, home, possessions, and health become unimportant.

Because cocaine is expensive, you end up doing what all addicts do. You steal, cheat, lie, deal, sell anything and everything, including yourself. All the while you risk imprisonment. Because, never forget, cocaine is illegal.

There's no way to tell who'll become addicted. But one thing is certain.

No one who is an addict, set out to become one.

C'mon, just once can't hurt you.

Cocaine hits your heart before it hits your head. Your pulse rate rockets and your blood pressure soars. Even if you're only 15, you become a prime candidate for a heart attack, a stroke, or an epileptic-type fit.

In the brain, cocaine mainly affects a primitive part where the emotions are seated. Unfortunately, this part of the brain also controls your heart and lungs.

A big hit or a cumulative overdose may interrupt the electrical signal to your heart and lungs. They simply stop.

That's how basketball player Len Bias died.

If you're unlucky the first time you do coke, your body will lack a chemical that breaks down the drug. In which case, you'll be a first time O.D. Two lines will kill you.

Sex with coke is amazing.

Cocaine's powers as a sexual stimulant have never been proved or disproved. However, the evidence seems to suggest that the drug's reputation alone serves to heighten sexual feelings. (The same thing happens in Africa, where natives swear by powdered rhinoceros horn as an aphrodisiac.)

What is certain is that continued use of cocaine leads to impotence and finally complete loss of interest in sex.

It'll make you feel great.

Cocaine makes you feel like a new man, the joke goes. The only trouble is, the first thing the new man wants is more cocaine.

It's true. After the high wears off, you may feel a little anxious, irritable, or depressed. You've got the coke blues. But fortunately, they're easy to fix, with a few more lines or another hit on the pipe.

Of course, sooner or later you have to stop. Then—for days at a time—you may feel lethargic, depressed, even suicidal.

Says Dr. Arnold Washton, one of the country's leading cocaine experts: "It's impossible for the nonuser to imagine the deep, vicious depression that a cocaine addict suffers from."

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SYSTEMS

Adapting to the environment



by Rebecca Day

THE first time you sit in the "listening room" in Mike Silverton's Brooklyn loft, you expect to be blown away by the two imposing pairs of back-to-back Allison IC20 speakers, which are about 8 feet apart and 6 feet in front of you.

Being that close, you would also expect the ambience to suffer, but it doesn't. "You're close," Silverton explained, "but you get the benefit of a lot of natural reverberation." He chose his unorthodox speaker arrangement to overcome the acoustic difficulties created by the oddly shaped space. He adored the speakers but had no wall to place them against, so he wired the pairs in parallel and made them mirror images of one another, which he said creates the "wall" they require for good bass reproduction. The setup restores 3 dB of response to the low end, he said, and the radiation patterns from the four speakers combined with wall reflections produce an acoustically flat overall response.

The system is powered by two Carver Silver Seven-t power amplifiers and controlled by a Hafler Iris preamplifier. Source equipment

includes a Hafler Iris tuner and Denon's DCD-3520 compact disc player. The antenna is a Terk Pi, which lies flat on a plastic grate behind the electronic components.

All of the components sit on a carpeted shelf that runs along the bottom of two walls. The shelf was originally designed to cover Silverton's 1,500 LP's, but he became a digital convert and sold his LP collection to help pay for the second pair of Allison IC20's. His amplifiers may use vacuum tubes, but since the early days of CD's he's preferred digital to analog recordings. "I've never understood the thinking on the part of some audiophiles that analog is superior to digital," he said. He now has more than 2,000 CD's, which he stores in a modified pine bookcase on the wall opposite the equipment.

There's one TV in the apartment, but Silverton and his wife rarely watch it. "We've been threatening to buy a VCR for five years," he told us, but the need has never seemed quite pressing enough. "Young people are drawn to video," he said. "High-end hi-fi is a middle-aged preoccupation." □



PHOTOS BY BILL KONIZIAS



Unfortunately, most CD changers change more than the discs.

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The CDC-805. The only CD changer with a five-mode digital equalizer

Five digital presets designed to give every

type of music even more musical presence — even a flat setting so you can bypass the EQ altogether.

The CDC-805 is the only five-disc changer that can provide 10-disc relay play by patching two CDC-805s together — something definitely worth considering for custom installations.

Here's yet another point well worth considering.

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Stereo Review's critics choose the outstanding current releases

THE JEFF HEALEY BAND: "HELL TO PAY"

WITH his first album, "See the Light" (1988), Canadian guitarist Jeff Healey emerged as a monster talent. The new "Hell to Pay" proves that his rafter-rattling debut was no fluke. It is, if anything, even stronger. Healey has gained power as a vocalist, and he tears loose on guitar, bulldozing his way through eleven sizzling cuts with the blues-rock fervor of Eric Clapton onstage with Cream circa "Wheels of Fire." Healey, who is blind, sits in a chair with the guitar across his lap. That image in no way suggests the dirty, tube-type, Chicago-blues sound he gets from the instrument; he makes it scream, sing, cackle, and soar. Stopping short of self-indulgence—no track is longer than 6 minutes—he has his say and gets out of the way of the song.

Taking no chances with the follow-up to a double-Platinum debut, Healey includes the requisite number of star turns in "Hell to Pay." George Harrison and Jeff Lynne help out on a faithful cover of *While My Guitar Gently Weeps*. Mark Knopfler antes up a hand-wringing slow blues (*I Think I Love You Too Much*) that gives Healey a chance to stretch out. On keyboards, Paul Shaffer and Bobby Whitlock, late of Derek and the Dominoes, lend a hand. I suppose the record company handpicked *Let It All Go* and *How Much* for their commercial appeal. The strongest numbers, though, are originals by Healey and his bandmates that put as adventurous a spin on standard blues forms as Jimi Hendrix and Eric Clapton did two decades ago.

I Think I Love You Too Much opens with a stunning guitar figure and ends with an explosive drum finale. In between, the trebly double-lead guitar and bluesy vocalizing



Joe Rockman, Tom Stephen, and Jeff Healey

recall Cream's *Outside Woman Blues* while the fugal guitar noise brings back glorious memories of *Layla*. The last two cuts, *Highway of Dreams* and *Life Beyond the Sky*, are where Healey and band take off like the Jimi Hendrix Experience, climbing from ground-level blues-rock to cosmic blues for the ages. The clairvoyant reach and will to transcend exhibited in these numbers say that the sky's the limit for the Jeff Healey Band.

Parke Puterbaugh

THE JEFF HEALEY BAND: *Hell to Pay*. Jeff Healey (vocals, guitar); Joe Rockman (bass); Tom Stephen (drums); other musicians. *Full Circle*; *I Think I Love You Too Much*; *I Can't Get My Hands on You*; *How Long Can a Man Be Strong*; *Let It All Go*; *Hell to Pay*; *While My Guitar Gently Weeps*; *Something to Hold On To*; *How Much*; *Highway of Dreams*; *Life Beyond the Sky*. ARISTA AL-8632. © AC-8632. © ARCD-8632 (50 min).

AN IMPRESSIVE "DAS RHEINGOLD" FROM THE MET

THE much-acclaimed James Levine *Ring* cycle performed the last two seasons at the Metropolitan Opera was the first at the Met in fifty years—since the glory days of Flagstad and Melchior. It was also the first *Ring* to be recorded in this country and, except for a Leonard Bernstein *Carmen* in 1971, the first Met recording in a quarter of a century. All four works in the cycle were recorded by Deutsche Grammophon in New York between 1987 and 1989, and the first to be released, *Die Walküre*, won a Grammy in 1988. Now the prologue, *Das Rheingold*, is out, and the other two are scheduled to follow in late 1990 and 1991.

Much of the commentary on these

BEST RECORDINGS OF THE MONTH

performances has been devoted to the excellence of the orchestral playing. Under Levine, the Met orchestra, at one time in low estate, has become one of the finest organizations of its kind, and *Das Rheingold*, a work full of colorful scene painting, is a wonderful showcase for the Lincoln Center band and its energetic conductor.

Even more impressive is the casting. The recording offers some of the most lyrical Wagner singing I have ever heard, and after decades of Wagnerian hooting, it is much appreciated. This impression is due in large part to the superb interpretation of Wotan by James Morris, but except for a disappointing Erda, the rest of the international cast is right up there—notably Christa Ludwig as Fricka and the Alberich of Ekkehard Wlaschiha, who manages to sing every note and phrase musically while capturing the essential character of everyone's favorite evil dwarf. Siegfried Jerusalem's Loge, perhaps not quite so well sung, is likewise a striking vocal characterization. Kurt Moll and Jan-Hendrik Rootering neatly catch the similarities and differences of the fabulous Fasolt/Fafner brothers.

The whole production, perhaps not as heavy-handed as the Wagner epic style often tends to be, has a fairy-tale quality that's appealing.



James Morris: a superb Wotan

The recording catches every nuance, every color—just listen to those Valhalla tubas and fairy-tale harps—while keeping the singers in a proper foreground perspective within a larger and unified sonic picture.

Eric Salzman

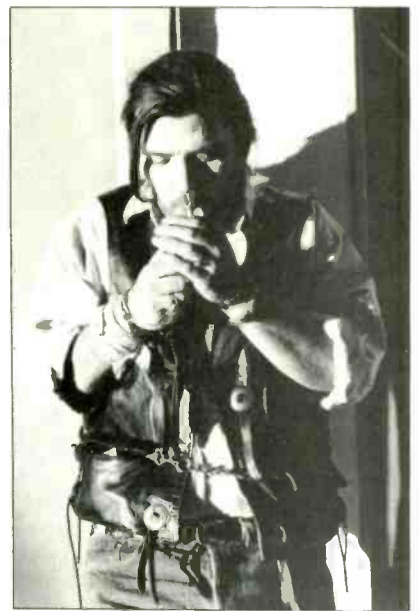
WAGNER: *Das Rheingold*. James Morris (baritone). Wotan; Christa Ludwig (mezzo-soprano), Fricka; Siegfried Jerusalem (tenor), Loge; Ekkehard Wlaschiha (baritone). Alberich; Kurt Moll (baritone). Fasolt; Jan-Hendrik Rootering (bass). Fafner; Heinz Zednik (tenor). Mime; Siegfried Lorenz (baritone). Donner; Mark Baker (tenor). Froh; Mari Anne Häggander (soprano). Freia; Birgitta Swendén (mezzo-soprano). Erda; Hei-Kyung Hong (soprano). Woglinde; Diane Kesling (soprano). Wellgunde; Meredith Parsons (mezzo-soprano), Flosshilde; Metropolitan Opera Orchestra. James Levine cond. DEUTSCHE GRAMMOPHON © 427 607-4 two cassettes, © 427 607-2 two CD's (157 min).

STEVE EARLE SEES AMERICA "THE HARD WAY"

As most country singers criss-cross America in their long, hulking tour buses, the asphalt ribbons of highway stretch out endlessly before them time and time again. No matter where they go, it all looks numbingly the same.

But the America seen from the back of Steve Earle's touring machine looks disturbingly different. When Earle peels back the curtain on his traveling stateroom, he sees a frightening canker, a raw and rotting America, festering to the bone. This underside of America is the subject of his gritty portrait in "The Hard Way," the album that just may take him from cult status to mainstream acclaim.

Produced by Earle with Joe Hardy (Georgia Satellites), it presents the singer at his most rock-oriented but also at his most angry. In *The Other Kind*, the opening track, he sings of a man who has two of everything but can't run away from trouble because he carries it around on his shoulders, in his head, and in his heart. It is rock as autobiography,



Steve Earle: rooted in reality

offered by a man who sings in a voice ravaged by alcohol and drugs and pain—the psychic kind of pain, mostly, the kind only the highway can chase away, however fleetingly.

When Earle isn't looking at his own grimy reflection in the glass, he pulls back the curtain to scowl at an American landscape blighted by the skeletal remains of rusting cars and the vermin that crawl the city's streets at night, such as the protagonist of *Esmeralda's Hollywood*, a dark and menacing portrait (co-written with Maria McKee) of a burned-out hooker/druggie cruising the Hollywood Strip.

From the Rolling Stones-like profile of *Country Girl*, a rose-faced girl corrupted by the cheap cocaine swirling in the city, to the frantic, dangerous dance of the razor-toting, white-trash teen caught in the *West Nashville Boogie*, Earle dredges up one luckless character after another, decent people driven to desperate acts by the kinds of politics congressmen never mention.

But if Earle is distressed at their fate, he is also sympathetic with their social plight. A songwriter whose greatest gifts are his power of observation, the economy of his language, and his ability to crawl inside the skin of the sloe-lidded characters who hang around the back alleys of his music, Earle has never before



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summoned his strength as he has with *Billy Austin*, the story of a Oklahoma hoodlum—"quarter Cherokee I'm told"—who sits on Death Row for the cold-blooded shooting of a filling-station attendant. Earle ends his saga with preachy, ultra-liberal questions that dilute the story's power, but he also uses an out-of-tune acoustic guitar to build an intensity and involvement that rival the best of Bob Dylan in his prime.

In contrast to the fresh-faced songwriter he was three years ago, Earle has little time for sentimentality any more—even his love songs have a harder edge. His music reflects an increasing mix of country shrewdness and urban steel, blending a plaintive mandolin, programmed synthesizers, and raw guitars that churn into overdrive, especially in *This Highway's Mine (Roadmaster)*, where the guitars almost emit the fumes of a roaring diesel. But he isn't afraid to go the conventional route either, employing a real-life gospel choir in *When the People Find Out*, a confrontation with Jim Bakker and his ilk.

In the end, Earle's songs of corruption, greed, outlaws, drink, and dope are so rooted in reality that they show up the kind of commercial country music that attempts to deal with the same subjects as the empty, smarmy dreck it is. It's no wonder that Earle's name is seldom spoken in Nashville any more. No matter what most country entertainers really see out of the back of their Silver Eagles these days, they close their eyes and plaster a big smile button over it, eventually selling it back to the people as Truth. Earle, slant-eyed and seething, strips it off for the hideous sight it is. *Alanna Nash*

STEVE EARLE AND THE DUKES: *The Hard Way*. Steve Earle (vocals, guitar, mandolin, mandoblaster, six-string bass, guitar synthesizer, percussion program); the Dukes (instrumentals, backing vocals); vocal and instrumental accompaniment. *The Other Kind*; *Promise You Anything*; *Esmeralda's Hollywood*; *Hopeless Romantics*; *The Highway's Mine (Roadmaster)*; *Billy Austin*; *Justice in Ontario*; *Have Mercy*; *When the People Find Out*; *Country Girl*; *Regular Guy*; *West Nashville Boogie*; *Close Your Eyes*. MCA MCA-6430. © MCAC-6430. © MCAD-6430 (56 min).

THE RUSSIANS ARE COMING FROM CHICAGO

THE Chicago Symphony Orchestra staked out a proprietary claim on Mussorgsky's *Pictures at an Exhibition* back in 1951 with its stunning monophonic recording of the work, under Rafael Kubelik, for Mercury. By the end of the decade, Fritz Reiner grandly asserted that claim in stereo, and his recording is one of the choice versions on compact disc even now. Neeme Järvi is the sixth conductor to record *Pictures* in Chicago, this time for Chandos, and his new recording is clearly the most persuasive since Reiner's.

role is even more critical. It will surprise no one that he and his colleagues in the great orchestra cover themselves with glory in both works, or that Chandos has recorded them superbly, but Järvi's exceptionally sympathetic response is something that cannot be taken for granted. While he has seemed content to skim the surface in some segments of his recorded survey of the Complete Works of Everybody, he seems to have approached *Pictures* with the thoughtfulness and respect one brings to a première, and he has brought his own refreshing insights to the work the way Kubelik and Reiner did on the same podium before him.

In the Scriabin, Järvi's emphasis on structure and momentum may be said to clarify rather than restrain the grand orgy of sound. There are



Neeme Järvi: refreshing and persuasive

One of the constants in all six recordings is the remarkable Adolph Herseth, who has been the Chicagoans' principal trumpeter since 1948 and whose statement of the opening "Promenade" still proclaims, as it did with Kubelik, "This is ours." Herseth receives solo credit in Chandos's labeling, as he does for the accompanying work, Scriabin's *The Poem of Ecstasy*, in which his

other excellent accounts of both works, but if this combination looks good to you, you can hardly fail to be delighted with the new disc.

Richard Freed

MUSSORGSKY: *Pictures at an Exhibition (orch. Ravel)*. **SCRIABIN:** *The Poem of Ecstasy, Op. 54*. Chicago Symphony Orchestra. Neeme Järvi cond. CHANDOS © CHAN 8849 (53 min).



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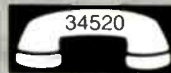
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*Discs and tapes reviewed by
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Ron Givens, Roy Hemming,
Alanna Nash, Parke
Puterbaugh, Steve Simels*

DAVID BAERWALD: *Bedtime Stories.* David Baerwald (vocals, guitar, keyboards); other musicians. *All for You; Good Times; Dance; Hello Mary; The Best Inside You; Young Anymore;* and six others. A&M SP-5289, © CS-5289, © CD-5289 (56 min).

Performance: *Smart*
Recording: *Very good*

Four years ago, the duo of David + David graced us with *Welcome to the Boomtown*, maybe the best song ever about Los Angeles. Now, we have a solo album from half of that partnership, David Baerwald. There is barely a trace of the other David (David Ricketts) here except for a couple of songwriting credits, but "Bedtime Stories" strongly resembles the work the two men did together—which is to say that the songs are filled with sharp observations and sharper wit and that the performances are immaculately arranged and intelligently realized.

All for You is a perfect example of what Baerwald does best. The song is a tragedy: A young man moves to Los Angeles with his wife and works hard to keep her, but the more he does for her the less she cares. The clean, spare instrumental drives the narrative forward, building tension by layering on a few stabbing riffs at crucial points in the story. Baerwald's slightly hoarse voice adds to the urgency with a biting delivery that attacks each phrase as if it were a target.

Even if the lyrics are overwritten at times, Baerwald often produces vivid images. His perspective is that of a hardened thinker haunted by moral and romantic uncertainty and feeling the undeniability of mortality for the first time. The pressure is on, and who knows what to do? Baerwald has invited us to share his quandary. *R.G.*

MARIAH CAREY. Mariah Carey (vocals); vocal and instrumental accompaniment. *Vision of Love; There's Got to*

THE LIFE AND ART OF MARIANNE FAITHFULL

AT the lowest ebb of her life, in the late Sixties, Marianne Faithfull was advised to make an autobiographical record. Faithfull, who followed a path from convent school to the shattering ruins of drug addiction, comas, and suicide attempts in the short span of her Top 40 career and her romance with Mick Jagger, thought the suggestion was mad. "I couldn't understand how it could be done," she's been quoted as saying, "so I forgot about it."

Twenty years later, Faithfull saw the wisdom of that advice, offering the thirteen songs in her new album, "Blazing Away," as "my life story on tape." Recorded live (except for the title cut) at St. Anne's Cathedral in Brooklyn, New York, last November, the album, culled mostly from the classic songs in comeback albums (starting with "Broken English" in 1979), is a startling revelation for anyone unfamiliar with her work since the original *As Tears Go By*, when she sang in what amounted to an innocent schoolgirl whisper. Today, Faithfull's gritty alto is a cracked and halting rasp, the voice of a woman who's been to hell and back on the excursion fare—which, of course, she has.

Backed by a stunning ensemble, including Garth Hudson, Mac Rebennack, and her co-writer and guitarist, Barry Reynolds, Faithfull begins her program with *Les Prisons du Roy* and Tom Waits's *Strange Weather*. The songs, set to loose and brooding jazz arrangements (with some deliberate dissonance here and there), present her as a kind of latter-day Marlene Dietrich or Lotte Lenya, and she wallows in sadness and defeat as if she were performing in some seedy cabaret in pre-war Germany. But in the third song, Reynolds's *Guilt*, which starts with a slow, tension-racked guitar and builds to psychotic frenzy, she sets a

pattern that makes her performance both as unsettling and mesmerizing as witnessing a violent, brutal slaying—you want to run and stay at the same time.

By the time she gets to *Sister Morphine*, which she co-wrote with Jagger and Keith Richards out of her own experience (the most hallucinogenic drug trip you'd never want to take), she is paralyzing in her power. She reaches her zenith with the shocking *Why'd Ya Do It?*, an X-rated tirade so angry and seething with rage that it makes any other recorded outburst of sexual jealousy pale by comparison. When her intonation starts to slip, it only strengthens her credibility as a woman riddled with emotion. The freedom of the live format, in fact, allows Faithfull to give a more theatrical reading of these songs than her studio versions allowed, imbuing them with an intensity that perhaps makes them seem better than they are.

It's a cliché these days to talk about recovery and survival, but Faithfull, who has recently taught several seminars in lyric writing at a Colorado college, has transformed herself, in the last twenty-five years, from being the quintessential rock-music groupie, strung out on excess, to one of the most challenging and artful of women artists. "Blazing Away" is a tour de force of rock at its most beautiful. *Alanna Nash*

MARIANNE FAITHFULL: *Blazing Away.* Marianne Faithfull (vocals); vocal and instrumental accompaniment. *Les Prisons du Roy; Strange Weather; Guilt; Working Class Hero; Sister Morphine; As Tears Go By; Why'd Ya Do It?; When I Find My Life; Ballad of Lucy Jordan; Times Square; Blazing Away; She Moved Through the Fair; Broken English.* ISLAND © 842 794-4, © 842 794-2 (73 min).

EXPLANATION OF SYMBOLS:

- ① = DIGITALLY RECORDED LP
- © = TAPE CASSETTE
- Ⓢ = COMPACT DISC (TIMINGS ARE TO NEAREST MINUTE)



Be a Way; I Don't Wanna Cry; Someday; Vanishing; All in Your Mind; and four others. COLUMBIA C 45202, © CT 45202, © CK 45202 (47 min).

Performance: *Technical brilliance*
Recording: *Excellent*

Whew! Mariah Carey's debut album is as exhilarating as a ride on the World's Tallest Roller Coaster, and just about as headspinning, too. In a multi-octave voice that calls to mind Yma Sumac and the late Minnie Riperton, twenty-year-old Carey slips and slides up and down the treble clef (and beyond), belting out intense messages of romantic and spiritual love and even doing a little social-consciousness raising in the gospeling *There's Got to Be a Way*. But while her voice is truly extraordinary in both range and power (Carey's mother, a vocal coach and former singer with the New York City Opera, trained her from infancy), none of the ten songs sticks in the mind either lyrically or melodically.

Carey, who co-wrote most of the songs and also co-arranged them with Ben

delivers these driving pop-soul tunes with verve and interpretive skill.

With the right material, she could displace Whitney Houston as the princess of processed r-&b. For now, though, Carey is just a very talented background-music machine. *A.N.*

HARRY CONNICK, JR.: *We Are in Love.* Harry Connick, Jr. (vocals, piano); orchestra. *We Are in Love; Only 'Cause I Don't Have You; Recipe for Love; Drifting; Forever, for Now;* and seven others. COLUMBIA ● C 46146, © CT 46146, © CK 46146 (53 min).

Performance: *Too Frankish*
Recording: *Excellent*

Love ballads, it seems, are enjoying a renaissance. Carly Simon does them fairly well, Linda Ronstadt fairly destroys them, and now Harry Connick, Jr., slips through them in vintage Frank Sinatra style. So far, none of today's young singers has begun to capture the silken eloquence of Ella Fitzgerald, Sarah Vaughan, and Frank Sinatra in the Fifties, and they don't even come close to Mel Tormé or Doris Day. "We Are in Love." Connick's new pop album (he also has a new jazz release; see page 102), is a collaboration with Marc Shaiman, who also orchestrated Connick's album of songs from the film *When Harry Met Sally*. All but two of the songs here were composed by Connick, who is no Porter or Gershwin, and while he shows some promise, I can't say that this record knocked me out. Connick's voice is fairly smooth and not at all unpleasant, but he lacks Sinatra's timing, and he tries to introduce into some of the songs a nasal Forties "hepness" that simply sounds contrived.

Harry Connick, Jr., is a very talented young man who, having recently also entered the acting arena, may be trying to cover too many bases at once. The public has taken to him, but he has yet to give us the kind of extraordinary performance that would place him on the top shelf. To put it more plainly, his talent still lags behind the hype. *C.A.*

STEVE EARLE AND THE DUKES: *The Hard Way* (see *Best of the Month*, page 88)

THE JEFF HEALEY BAND: *Hell to Pay* (see *Best of the Month*, page 87)

PATTY LOVELESS: *On Down the Line.* Patty Loveless (vocals); vocal and instrumental accompaniment. *Overtime; The Night's Too Long; Blue Memories; Some Morning Soon; You Can't Run Away from Your Heart; On Down the Line;* and four others. MCA MCA-6401, © MCAC-6401, © MCAD-6401 (34 min).

Performance: *Straight to the heart*
Recording: *Very good*

Producer Tony Brown admits that not many people believed in Patty Loveless when she first went to Nashville. An

attractive young woman, she nonetheless lacked a certain confidence and star quality, and as a vocalist she had an unnerving tendency to sound as if she were about to fall hopelessly and irretrievably off-key. But Loveless had an abundant gift for ferreting out the honest emotion in traditional country music—even occupying a song as her own—and conveying the pain with an affecting, wild and wounded delivery. She was, in short, a diamond in the rough.

Three years after her debut, Loveless still threatens to abandon pitch every once in a while, but she has polished her interpretive gifts. Never has that been so apparent as in her new album, where she places herself in the ranks of Loretta Lynn and Reba McEntire for emotional intensity. And while, like McEntire and Lynn, she possesses an authentic country voice, she has surpassed them, with the help of producer Brown, in her choice of material, going beyond the usual plastic radio fodder with songs of resonant beauty. The program is also suitably balanced: Lucinda Williams's *The Night's Too Long*, for example, is a haunting ballad of a woman's struggle with spiritual isolation; *Some Morning Soon* picks up the pace with a bluegrass drive and a genuine, intelligent lyric; and *I'm That Kind of Girl* is a brash, Rosanne Cash-like punk declaration.

There is the occasional strained line, but on the whole this is an album of unusual dignity and warmth, made more so by low-key production and sparse, smart playing. *Lovely.* *A.N.*

LORRIE MORGAN: *Leave the Light On.* Lorrie Morgan (vocals); vocal and instrumental accompaniment. *Trainwreck of Emotion; Out of Your Shoes; I'll Take the Memories; Far Side of the Bed; Dear Me;* and four others (six others on CD). RCA 9594-1-R, © 9594-4-R, © 9594-2-R (32 min).

Performance: *In family tradition*
Recording: *Very good*

Lorrie Morgan, the widow of country singer Keith Whitley and the daughter of the late Grand Ole Opry crooner George Morgan, could probably float a country-music career just on the memory of the men she's loved and outlived. But, as it turns out, she's a real singer, favoring the kind of country-pop ballads that Patsy Cline popularized in the early Sixties and Reba McEntire revitalized in the Eighties.

Most of the songs in "Leave the Light On" are in a woman-to-woman vein—largely complaints about romance gone cold, they're ostensibly addressed to the man in the situation but are really meant for other women to savor. This is especially true of the steely-eyed fatalism of *Far Side of the Bed*, the divorce weeper *I'll Take the Memories*, and *Dear Me*, a song ostensibly based on a letter the protagonist has written to herself. Morgan is equally adept at sassy rhythm numbers, however, especially *Train-*



Mariah Carey: headspinning

Margulies, says her influences were Gladys Knight, Aretha Franklin, and Stevie Wonder—all of whom have a few tunes she might have covered, or at least studied for the kind of material that helped make them tops in their field. But apparently neither Carey nor her handful of producers thought about anything except showing off her range and putting her through all the motions common to a calisthenics instructor. The result is all workout and no fun. For all the swirling synthesizers, energy is the operative word, not music, and certainly not audience involvement, even though Carey



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wreck of *Emotion*, which rattles down the tracks of impossible romance and heartache. Like her late husband, she knows how to get the most out of a lyric without turning maudlin, and she hits and handles her notes with a precision and control unusual in traditional country music. That talent, plus a comely resonance in her lower register and a subject matter of great interest to female record buyers, might just make Morgan a real contender for McEntire's "Queen of the Sob Sisters" crown. *A.N.*

NEW KIDS ON THE BLOCK: *Step by Step*. New Kids on the Block (vocals), other musicians. *Step by Step; Tonight; Baby, I Believe in You; Call It What You Want; Let's Try It Again; Happy Birthday; Where do I go from here?*; and five others. COLUMBIA C 45129, © CT 45129, © CK 45129 (48 min).

Performance: *Give 'em a break*
Recording: *Very good*

Any critic having fits trying to knock down New Kids on the Block is wasting his or her time. For one thing, the group has a mandate; I don't know whether fifty million screaming girls can be wrong, but they sure aren't listening to anyone who says so. Second, it's a tired old cliché: Critics have always jumped

on pubescent entertainment, especially when an older svengali or corporate overseer is involved. Why bother? It's too much like stating the obvious. Third, and most difficult to admit for a case-hardened critic, several songs in "Step by Step" are actually passably pleasant, synthetic pop-soul.

On the plus side, the Kids've got one of Boston's best-kept secrets, Michael Jonzun, on board as co-producer. While they're way short on originality, *Let's Try Again* is a damn fine Spinners cop, and *Funny Feeling* nods convincingly toward Stevie Wonder's soulful songbook. Their antidrug song *Games*, part of an ongoing New Kids crusade, may do more to curb drug use among the young than William Bennett and Nancy Reagan put together (it couldn't do less). As for the rest—a regrettable foray into Jamaican dub, a song called *Happy Birthday* that's too treacly for a five-year-old, the zillion and one thank you's on the jacket, and so on—well, you know. The men don't know, but the little girls understand. *P.P.*

IGGY POP: *Brick by Brick*. Iggy Pop (vocals, guitar); vocal and instrumental accompaniment. *Home; Main Street Eyes; I Won't Crap Out; Candy; Butt Town; The Undefeated; Moonlight Lady; Something Wild; Neon Forest;*

and four others. VIRGIN © 91381-4, © 91381-2 (54 min).

Performance: *Iggifful*
Recording: *Good*

A sort of incongruity, an embrace of nastiness as well as sentimentality, runs all the way through Iggy Pop's new "Brick by Brick." Pop will display a goofy naïveté one moment, only to slam into jaded nihilism in the next. This seeming contradiction is a fundamental feature of his personality, and, to his credit, he does not consider it to be unnatural. It makes him all the more human. Also to his credit, and that of producer Don Was, the music adapts to Pop. The guitars are only as nasty as he is. When he lightens up, so does the beat.

Pop clearly has problems with the way things are, though. He hurls serious charges at the materialistic, antipiritual nature of American civilization in general and slams the superficial nature of Los Angeles in particular in the wickedly funny *Butt Town*. He also wants to stay honest and true to his own nature. In *My Baby Wants to Rock and Roll*, he recalls the way he kept from going crazy: "I hadda rock." As always, Pop's therapy is our gain. *R.G.*

THE PURSUIT OF HAPPINESS: *One-Sided Story*. The Pursuit of Happiness

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(vocals and instrumentals). *Food*; *Two Girls in One*; *New Language*; *Something Physical*; *The One Thing*; *No Safe Place*; *Shave Your Legs*; *Runs in the Family*; and four others. CHRYSALIS 21757-1, © 21757-4, © 21757-2 (39 min).

Performance: *Somber*
Recording: *Very good*

The last time they checked in, with their 1988 album "Love Junk," the Pursuit of Happiness revealed themselves to be a splendid anomaly of a band, virtually the creators of their own genre: Wiseguy Pop/Metal with great tunes and honest lyrics about sex. Led by Moe Berg (whom I referred to at the time as the first important guy named Moe in rock history), they dispensed music that was at once witty and serious, tuneful and hard-edged, playful and almost profound, all in the context of an examination of the sorry state of relations between the sexes here in the declining days of the century Isaac Bashevis Singer called "on balance, a complete flop." Clearly, this was a significant bunch of musicians.

Well, here they are again at the dawn of the Nineties, and their latest record, "One-Sided Story," proves that their debut was by no means a fluke. The music is as tough and mature (in the best sense) as one could hope, and again Todd Rundgren's production fits the band like the proverbial you-know-what. Nevertheless, and at the risk of sounding churlish, I have to say that some of the fun has gone out of the enterprise. Serious as "Love Junk" may have been, it was also one of the best dance-around-the-house albums since the first Pretenders album, and "One-Sided Story" is a far more somber affair. In fact, if there's a unifying emotional theme to Berg's new songs, it's a sort of rueful desperation. And while most of us will recognize the feeling, even identify on some level, the songs don't exactly make you want to do the boogaloo. The most wrenching emotionally is *Shave Your Legs*, in which Berg sets you up for a sort of collegiate sexist joke and then shifts gears into an absolutely heart-breaking lover's plea to save a disintegrating relationship. It's an astonishing performance.

Of course, not everything is slash-your-wrists depressing. *Food*, for example, has one of the funniest openings ever penned for a rock song, and the eminently hummable *Runs in the Family* notes that beauty is "as easy as DNA," an insight unlikely to occur to, say, Jon Bon Jovi. But even though the band's execution of Berg's tunes retains its admirably ferocious (but not overbearing) crunch-guitar attack, and even though Berg's singing is taking on an endearingly Lou Reedian cast, there's no getting around the fact that—perhaps deliberately—"One-Sided Story" is something of a bummer. That's a relative judgment, of course—on an off day these kids make smarter music than 99 percent of the

HENRY BUTLER'S BLUES



ALTHOUGH he doesn't command the fame of a Ray Charles or Stevie Wonder, the superb New Orleans-born pianist, vocalist, composer, and arranger Henry Butler possesses comparable musical brilliance, technical virtuosity, and soulful intensity. While Charles fused gospel with r-&-b to define soul back in the Fifties, and Wonder became the standard-bearer for innovation in popular music during the Seventies, Butler has drawn from the rich tradition of Louisiana piano blues to create a compelling personal sound.

Sightless since childhood, Butler first studied music at the Louisiana State School for the Blind in Baton Rouge, going on to earn a degree in voice from Southern University and a master's from Michigan State. Along the way he studied with Alvin Baptiste, the mentor of so many Crescent City musicians, and the venerable Roy Byrd, better known as Professor Longhair, the dean of New Orleans blues piano.

Butler's first two recordings leaned toward jazz, but his new one, "Orleans Inspiration," is firmly based on the irresistible blues of his native city. This is music that springs from traditional funk, a profoundly earthy sound that resonates with the ornately embellished, infinitely spiraling statements and pulsing rhythms of the basic black blues. The title tune, which opens the set, begins with an urgently repeated chordal pat-

tern that could lead into anything from a formally classical piece to a jazz improvisation, but it soon breaks out into a strutting blues that announces its New Orleans origins. This is where Butler most closely resembles his mentor Professor Longhair. But he moves quickly into a gospel groove that resolves again into the r-&-b evergreen *Something You Got*, in which his quivering falsetto creates a mood that calls up images of honky-tonk joints and sweaty blues bars where workaday woes dissolve in the magical elixir of music.

From the kicking rhythms of *Dixie Walker* through the sassy song-story of *Madame Roux* the hoodoo queen to the mournful grind of *Goin' Down Slow*, Butler holds us in his spell. "Orleans Inspiration" is a brief but pungent lesson in the origins of modern popular music. It is a delight, every step of the way.

Phyl Garland

HENRY BUTLER: *Orleans Inspiration*. Henry Butler (vocals, acoustic piano, synthesizer); Leo Nocentelli (guitar); Chris Severin (bass); Michael Goods (synthesizer); Herman Jackson (drums). *Orleans Inspiration*; *Something You Got*; *Dixie Walker*; *Madame Roux*; *Tip-tina's*; *Somewhere*; *Come Back Jack*; *Goin' Down Slow*; *Dr. James*; *Hey Little Girl*; *Mardi Gras in New Orleans*; *Good Night Song*. WINDHAM HILL © WT-0122, © WD-0122 (47 min).

metal bands in the Western World. But what the album ultimately sounds like is the soundtrack for Moe Berg's evolution from undergraduate smart aleck into certifiable adult, which is to say that it's a little strained and a little awkward. That doesn't mean you shouldn't buy this record for your personal collection. In fact, you should. It just means that growing up is a bitch, and I for one wish Berg and Company all the luck in the world while they do it. S.S.

GEORGE STRAIT: *Livin' It Up*. George Strait (vocals); vocal and instrumental accompaniment. *Someone Had to Teach You; Heaven Must Be Wondering Where You Are; I've Come to Expect It from You; Lonesome Rodeo Cowboy; When You're a Man on Your Own; Drinking Champagne*; and four others. MCA MCA-6415, © MCAC-6415, © MCAD-6415 (31 min).

Performance: *Old-fashioned*
Recording: *Very good*

With his new album, George Strait, the current darling of the country-music industry, still rides the celluloid image of the mild-mannered cowboy, rescuing children, dogs, and comely young ladies from perilous situations and seeing to it that the town remains fit for decent,

churchgoing folks to prosper. You could always sense that image in Strait's selection of stalwart western swing, but it's especially obvious in "Livin' It Up," which sounds oddly old-fashioned, as if it were recorded decades ago, when the cowboy serials were still in vogue. Part of that effect is from the songs themselves, but part, too, is from producer Jimmy Bowen's choice of instrumentation and treatment of background vocals—the way he keeps things lean and unfrilly, with Strait standing more out front than he has in past albums.

As a singer, Strait is technically smooth and unfettered. He nails his notes with the precision of a finely tooled machine, then bends his baritone around the trail of sound in a honky-tonk, curlicue fashion. But as an interpreter—as a man who puts his soul into his music—he too often seems detached, treating the songs as if they were camera angles chosen to favor the pretty, dimpled visage of his virtuous persona. How well you respond to that will determine how much you enjoy this record. A.N.

KEITH SWEAT: *I'll Give All My Love to You*. Keith Sweat (vocals); other musicians. *Interlude (Just One of Them Things); Make You Sweat; Come Back; Merry Go Round; Your Love (Part 1);*

Your Love (Part 2); Just One of Them Things; and three others. ELEKTRA 60861-1, © 60861-4, © 60861-2 (51 min).

Performance: *Seductive*
Recording: *Good*

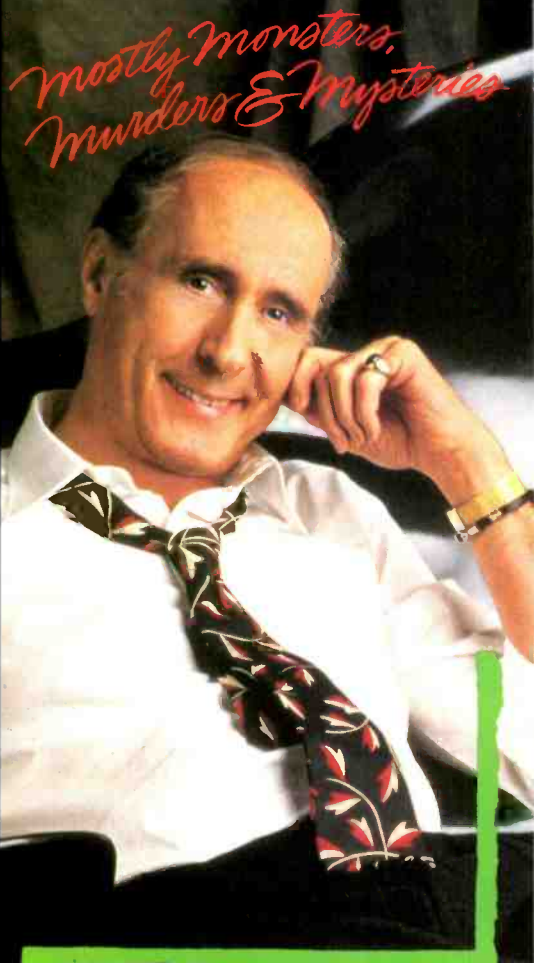
Seduction is the name of the game, and Keith Sweat is one of its ablest practitioners. "I'll Give All My Love to You" is an album about and for women; guys will want to buy it only to set a mood. Most of the songs ooze along in a slow, throbbing groove intended to hasten the action from living room to bedroom. Sweat raps hot without breaking a sweat in *Your Love (Part 2)*, wherein he pleads, "I wanna take you where you never been before," and then gets right to the point: "I wanna make love all night long." These songs seem to have no beginning or end; they are, in fact, not songs so much as synthesized backdrops for romantic discourse. A couple of up-tempo cuts, *Make You Sweat* and the first part of *Your Love*, prove that Sweat has a durable, masculine voice that drips with old-fashioned soul. Another stand-out track, *Love to Love You*, has a carefree, summery feeling and sounds like a hit. In general, though, Sweat needs better material, as his voice is wasted on all the redundant heavy-breathing fantasies. P.P.

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TONY! TONI! TONÉ!: *The Revival*. Tony! Toni! Toné! (vocals and instrumentals); other musicians. *Feels Good; All the Way; Oakland Stroke; The Blues; Let's Have a Good Time; It Never Rains (in Southern California); Whatever You Want; I Care; Sky's the Limit*; and five others. WING/POLYGRAM 841 902-1, © 841 902-4, © 841 902-2 (62 min).

Performance: *Engaging*
Recording: *Satisfactory*

Something about the whimsical approach of Tony! Toni! Toné! summons up memories of Sly and his Family Stone. The reference is not only a personal one but is deliberately evoked by one of the selections on this playful new disc. In *Oakland Stroke*, the trio reminds us that this northern California city, though overshadowed by the beauty and celebrity of San Francisco, has spawned some major popular artists of its own, most notably Sly and Larry Graham, who once worked as Sly's bassist. These newer-generation Oaklanders, however, not only draw from Sly but are at times reminiscent of the rambunctious Ohio Players in their ability to come up with catchy songs. Much of the time these are overtly amusing, and sometimes they're pensively inviting, such as my favorite track here, and the prettiest, *It Never Rains (in Southern California)*. Throughout the set there is also evidence of the group's willingness to mix things up a bit, changing the beat unexpectedly or introducing walking jazz licks in the middle of a song that seems totally pop or funk-based. This willingness to explore and ability to surprise insure that Tony! Toni! Toné! will never blend into the woodwork. P.G.

COLLECTION

BEN BAGLEY'S FRANK LOESSER REVISITED. Blossom Dearie, Johnny Desmond, Rhonda Fleming, Madeline Kahn, Emily Loesser, Jo Sullivan, Gloria Swanson, Margaret Whiting, others (vocals); instrumental accompaniment. *Kiss the Boys Goodbye; Three-Cornered Tune; I Wish I Didn't Love You So; Dancing on a Dime; Rumble, Rumble Rumble; Snug As a Bug in a Rug; Where Are You Now That I Need You; Hamlet; Poppa Don't Preach to Me; Why Fight the Feeling*; and twelve others. PAINTED SMILES © PSCD-115 (69 min).

Performance: *Bright and breezy*
Recording: *Very good*

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some of them on CD with a generous infusion of newly recorded additional tracks.

For the Frank Loesser album, he's added six stylistically well-matched new tracks to the original sixteen. Loesser's widow, Broadway veteran Jo Sullivan, and angel-voiced daughter Emily sing a delightful medley from his underappreciated movie score for *Hans Christian Andersen* plus such little-known gems as *You Understand Me* (from the unproduced *Señor Discretion Himself*) and the

wryly (or is that ryely?) liting *Delicateness of My Dreams*. These join such marvelous earlier tracks as Margaret Whiting and Johnny Desmond's touching duet in *Spring Will Be a Little Late This Year* and Blossom Dearie's delicious *Snug As a Bug in a Rug*. Virtually all the other tracks are full of musical pleasures, too—and a few nice surprises such as Rhonda Fleming's wonderfully sultry *Let's Get Lost*. And, as always, Bagley's off-the-wall liner notes deserve an award of their own. *R.H.*

JAZZ

BENNY CARTER: *Cookin' at Carlos I*. Benny Carter (alto saxophone, trumpet); Richard Wyands (piano); Lisle Atkinson (bass); Al Harewood (drums). *You'd Be So Nice to Come Home To; All the Things You Are; Key Largo; Just Friends; Time for the Blues*; and two others. MUSICMASTERS © CIJD6 0230 (61 min).

Performance: *Impressive*
Recording: *Fine remote*

Benny Carter's dexterous, thoroughly modern alto playing in this album belies the fact that he celebrated his eighty-third birthday in August. Here is a musician who was playing professionally in the early Twenties, yet he expresses himself with more energy and fresher ideas than most of today's overnight wonders. Carter's distinguished career is amply documented on discs, going back well before 1932, when he made his recording debut as a leader, but "Cookin' at Carlos I" is his first live club recording. Made in 1988, with Richard Wyands on piano, Lisle Atkinson on bass, and Al Harewood on drums, it is a characteristic Carter set, alternately pretty and perky.

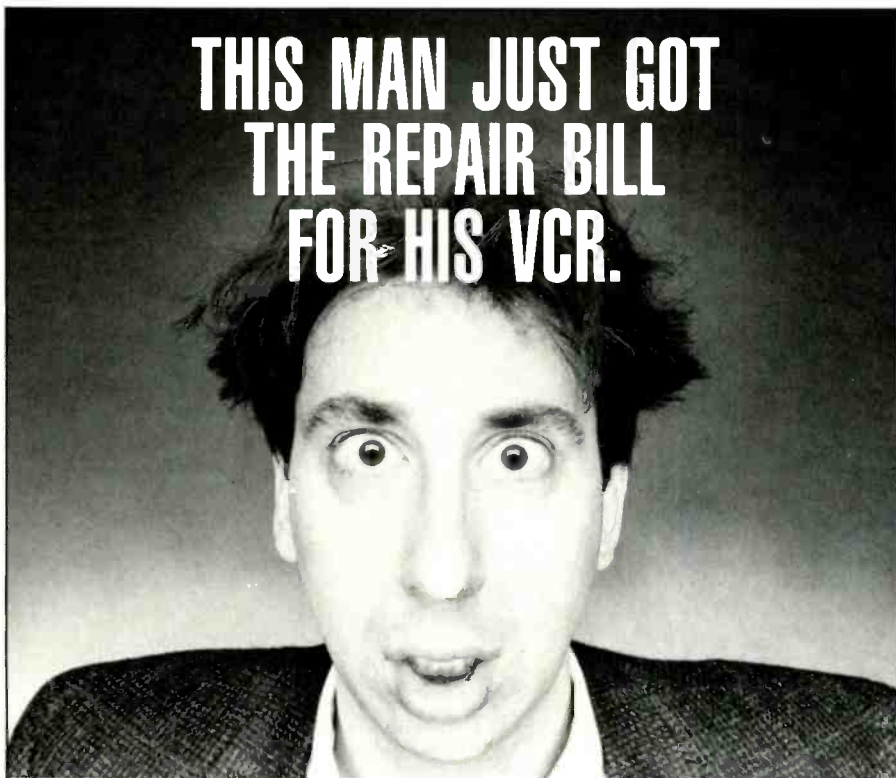
New York-born, Carter moved to Los Angeles in 1945 and spent several years writing scores for films and television shows. He has made numerous concert appearances in the past four decades, including some frenetic early-Fifties jams with Jazz at the Philharmonic, but not until the mid-Seventies did he return to the club scene, where he perhaps thrives best. A multi-instrumentalist, composer, and arranger, he has always been a remarkably versatile artist. No mere dabbler, he mastered every facet of his trade and talent, and while he is best known today for his alto saxophone work, he can still blow a mean trumpet, which he does in this album's final track, *Time for the Blues*. In the rest of the set he breezes eloquently through five standards and his own *Key Largo*, a tune he recorded in 1952. This is a worthy addition to any jazz collection. *C.A.*

HARRY CONNICK, JR.: *Lofty's Roach Soufflé*. Harry Connick, Jr. (piano); Benjamin Jonah Wolfe (bass); Shannon Powell (drums). *One Last Pitch; Hudson Bommer; Mr. Spill; Lofty's Roach Soufflé; Mary Ruth*; and five others. COLUMBIA © C 46223, © CT 46223, © CK 46223 (63 min).

Performance: *Monkish*
Recording: *Excellent*

Harry Connick, Jr.'s career continues to grow. He has benefited greatly from his record company's publicity machine, but it's not all hype—the twenty-two-year-old pianist/singer is indeed talented. "Lofty's Roach Soufflé" is the somewhat unappetizing title of his new

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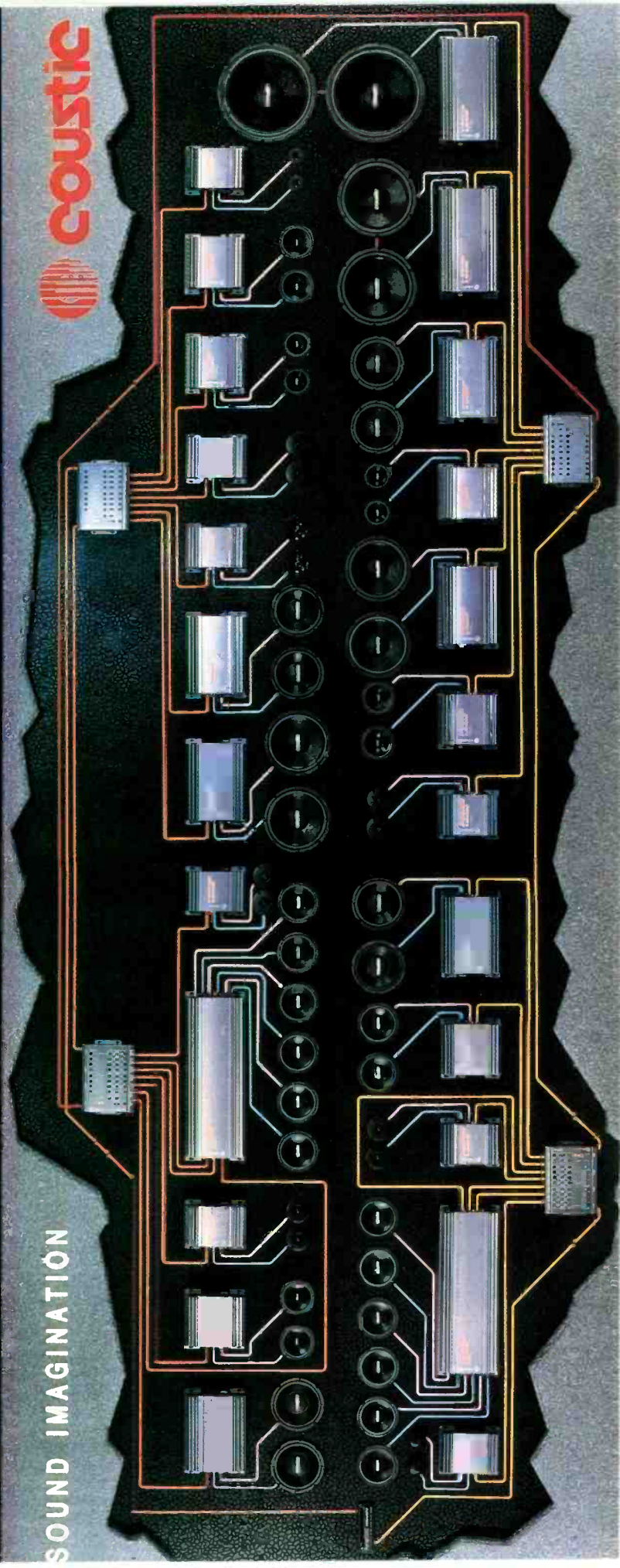
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jazz album, a trio session featuring his own compositions. It reveals an eclectic mix, which is not surprising when you consider that Connick grew up in New Orleans, where you find a cornucopia of musical styles. The city's rich jazz heritage is evident in his music and adds much to its appeal, but it is the influence of Thelonious Monk that dominates Connick's playing today, which is a mixed blessing. Monk's unusual approach to jazz reflected an equally eccentric personality, and the odd plinks and plonks—which defied convention but somehow always seemed to work—never sounded forced. Connick's Monkish ways often sound contrived, but then he makes amends by modulating into something completely different.

Stylistically, this album is a nomadic trek from Jelly Roll Morton and Piano Red to Duke and Monk, but one searches in vain for Connick. Well, he's still very young, and if he doesn't stretch his talent in too many directions, all those influences will eventually jell into a Connick style. Here he weaves the historic threads tastefully, and bassist Benjamin Jonah Wolfe and drummer Shannon Powell give him splendid support. I hope we hear more from this trio. C.A.

BUNKY GREEN: *Healing the Pain.*

Bunky Green (soprano and alto saxophone); Buddy Childs (piano); Art Davis (bass); Ralph Penland (drums). *The Thrill Is Gone; Walter's Theme; Who Can I Turn To; I Concentrate on You; Love Theme; You've Changed;* and six others. DELOS © DE 4020 (66 min).

Performance: *Good*
Recording: *Very good*

In his notes for Bunky Green's album "Healing the Pain," producer Ed Bland places the saxophonist in the ranks of those "great and unique jazz improvisers John Coltrane, Charlie 'Bird' Parker, and Louis Armstrong." I wouldn't quite go that far, but Green—a Chicago musician and teacher who has worked with the best but whom the spotlight never really captured—is an absorbing alto and soprano saxophone player who likes to play Name That Tune by turning familiar material around. Green's thing is to take a well-known song and paraphrase the melody to the point that it becomes barely recognizable. Unlike his hop ancestors who took the familiar, poured new melodies over the chords, and renamed the result, Green makes sure that you *can* name that tune—eventually. His approach is not new, but as an invariable *modus operandi* it borders on gimmickry. Green does not need gimmicks; he improvises beautifully, and I like this quartet album, containing a mixture of standards and a few numbers drawn from producer Bland's score for last year's PBS production of *A Raisin in the Sun*. C.A.

MARIAN MCPARTLAND: *Plays the Benny Carter Songbook.* Marian McPart-

land (piano); Benny Carter (alto saxophone); John Clayton (bass); Harold Jones (drums). *When Lights Are Low; I'm in the Mood for Swing; Key Largo; Another Time, Another Place; Summer Serenade;* and four others (six others on CD). CONCORD JAZZ © CJ-412-C. © CCD-4412 (54 min).

Performance: *Delightful*
Recording: *Excellent*

"Marian McPartland Plays the Benny Carter Songbook" is a superb quartet session that features Carter himself on alto. McPartland has demonstrated a wonderful feeling for jazz through the years, as well as the ability to adapt her playing to just about any performance style. She has strided alongside Eubie Blake, swung with Teddy Wilson, romped with Earl Hines, bopped with the best of them, and even trekked to the outer limits with Cecil Taylor. Here she covers most bases, which is not surprising when you consider Carter's enormous scope as a musician and composer. McPartland and Carter are a classy pair. They make wonderful music together and obviously enjoy every meaningful note of it. This is an album permeated by good taste and musicianship, a tribute not only to the compositions of Benny Carter but to jazz itself. C.A.

SONNY ROLLINS: *Falling in Love with Jazz.* Sonny Rollins (tenor saxophone); other musicians. *For All We Know; Tennessee Waltz; Little Girl Blue; Falling in Love with Love;* and two others (three others on CD). MILESTONE © M-9179, © 5M-9179, © MCD-9179-2 (47 min).

Performance: *So-so Sonny*
Recording: *Okay*

Mark Twain once said of Wagner that his music is better than it sounds. I am reminded of that line whenever I hear a recording by Sonny Rollins, because I have always felt he is a better player than most of his recordings would indicate. There have been some wonderful exceptions, of course, but I'm afraid "Falling in Love with Jazz" is not one of them. In it the venerated jazz giant is heard with three different groups, performing six selections (seven on the CD) ranging from robust, inventive variations on *For All We Know* and a beautiful, almost tender reading of *I Should Care* to some inexplicably detached, unstructured ramblings in the title track. He treats Rodgers and Hart's *Little Girl Blue* well and his own *Sister* with indifference.

There is a tendency among jazz writers to hear no evil when it comes to established artists, but I have to tell you that this is an album offering some arresting passages of brilliant improvisation along with some downright bad solo work. Among the good moments are those provided by fellow tenor Branford Marsalis (who plays a better solo than his leader in *I Should Care*), trombonist Clifton Anderson, pianist Tommy Flanagan, and guitarist Jerome Harris. C.A.

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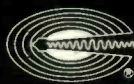
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Discs and tapes reviewed by Robert Ackart, Richard Freed, David Hall, Stoddard Lincoln, Eric Salzman, and David Patrick Stearns

BACH: *St. John Passion*. Ian Partridge (tenor), Evangelist; David Wilson-Johnson (bass), Jesus; Patrizia Kwella (soprano); David James (alto); William Kendall (tenor); Michael George (bass), Pilatus; The Sixteen Choir and Orchestra, Harry Christophers cond. CHANDOS CHAN 0507/8 two CD's (112 min).

Performance: *Spiritual to a fault*
Recording: *Mushy*

BACH: *St. John Passion*. Christoph Prégardien (tenor), Evangelist; Harry van der Kamp (bass), Jesus; Barbara Schlick (soprano); René Jacobs (alto); Nico van der Meel (tenor); Max van Egmond (bass); Choir and Orchestra of La Petite Bande, Sigiswald Kuijken cond. DEUTSCHE HARMONIA MUNDI/BMG 77041-2-RG two CD's (122 min).

Performances: *Vigorous*
Recording: *Clear*

At the center of Bach's *St. John Passion* is an aria in which the bass urges us to hurry and the chorus responds, over and over and in considerable agitation, "To where?" For Sigiswald Kuijken and La Petite Bande this is a rather urgent matter: it is a moment of high drama. But for Harry Christophers and his English performers, it's a purely spiritual matter; you almost have to strain to hear the ghostly choir ask the question at all.

In short, these are very different performances. The Chandos recording is endlessly beautiful, full of delicate timbres, superb musical and verbal phrasing, a falsettist singing the alto part, a number of exquisite vocal and instrumental solos, and some of the best and most natural-sounding chorales I've ever heard. The down side comes from the small scale of the performance and the mushy acoustics of St. John's Church, Smith Square, London. It is a quiet, intense, small-scale *Passion*, spiritual to a fault—and sometimes to the vanishing point. Although this is a modern, digital, early-music recording employing small musical forces, it is still

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DMITRI HVOROSTOVSKY

THE Siberian baritone Dmitri Hvorostovsky seems to have come out of nowhere to stand listeners on their collective ear. Not many listeners in our country so far, but no one who heard Hvorostovsky's New York or Washington recitals last spring will have to be urged to buy his debut recording, a collection of Verdi and Tchaikovsky arias taped in Rotterdam last February by Philips. Those who were not in either audience, and are perhaps wondering what all the fuss was about, can find out at once by sampling this disc. But no one will be content with just sampling it. No matter where you

will sag or sentiment will turn to sentimentality—but it works, because once again Hvorostovsky seems to be deep inside the character, as he does unfailingly throughout this stunning recital. From first track to last, in Tchaikovsky and Verdi alike, what confronts us is not just an exceptional voice but a noble artist.

Hvorostovsky is twenty-eight years old now. He has been a soloist with the Krasnoyarsk Opera for four years, and in that period he has won three big competitions (in the U.S.S.R., France, and Britain). He is scheduled to make operatic and concert debuts in various American cities in the next two or three years.



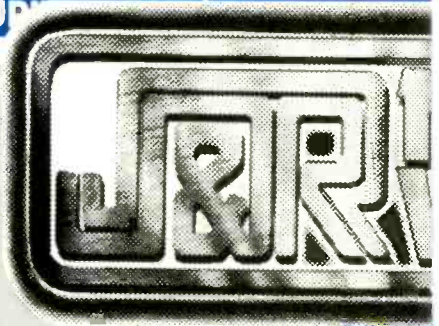
choose to begin, you will feel compelled to listen to the entire sequence.

The voice itself, first of all, is phenomenal in its beauty and its amplitude. And, whether through instinct or cultivated taste, Hvorostovsky shows exceptional flexibility and sensitivity to his texts. He is not, after all, simply giving a demonstration of an instrument, but he is assuming roles at specific points in specific dramas in these eleven scenes. He never allows that big voice to overwhelm the material but suggests an effortlessness based on limitless reserves of strength. His cantabile singing, as in the *Trovatore* excerpt ("Il balen"), is seamless. The dramatic contrast between Evgeny Onegin's condescending admonitions in Act I of the Tchaikovsky opera and his total surrender in Act III are striking indicators of the singer's full identification with the character. He takes Geront's "Di Provenza il mar" (*Traviata*) a bit more slowly than the norm, and at first one may fear that the momentum

and Philips has signed him for more recordings in the meantime. This one sets quite a standard. The Rotterdam Philharmonic is conducted very sympathetically by the Kirov Theater's superb Valery Gergiev, and the engineers have put voice and orchestra in the most effective perspective. There are also full texts and translations. *Richard Freed*

TCHAIKOVSKY: *Evgeny Onegin*, Op. 24: *Onegin's arias, Acts I and III. The Queen of Spades*, Op. 68: *Yeletsky's aria, Act II. The Sorceress: Kurtyatev's arioso, Act II. Yolanta*, Op. 69: *Robert's aria. Mazeppa: Mazeppa's arioso, Act II. VERDI: La Traviata: "Di Provenza il mar." Macbeth: "Perfidi! Pieta, rispetto." Luisa Miller: "Sacra la scelta." Il Trovatore: "Il balen." Don Carlos: "Son io, mio Carlo . . . Per me giunto . . . O Carlo, ascolta."* Dmitri Hvorostovsky (baritone); Rotterdam Philharmonic Orchestra, Valery Gergiev cond. PHILIPS Ⓢ 426 740-4, Ⓣ 426 740-2 (57 min).

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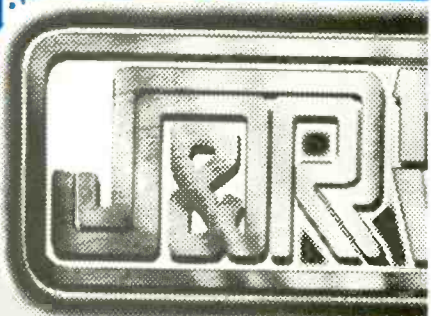


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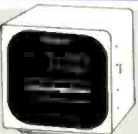
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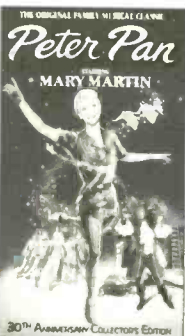


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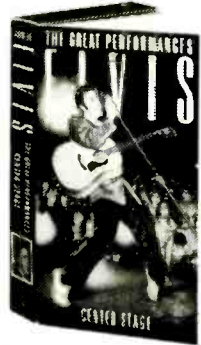


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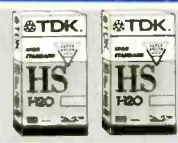
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astonishingly difficult to hear the contrapuntal strands and nuances of this complex and rich work. It is, rather, the gentle and reflective surfaces that shine here.

If Christophers's reading is spiritual, then Kuijken's must be rated as worldly. His is a stronger and more traditional version. The singers are more robust, the chorus is more vigorous and clearer, vocal and instrumental counterpoints cut through nicely, and the acoustic is much more precise. Some of the performing is heavy-handed, the phrasing is not always subtle, and there is an occasional distressing tendency to punch out sixteenths in ho-ho-ho fashion. Thus even in the still-new world of early-music performance there can be vast differences. "Authenticity" remains an elusive goal; taste and musicianship are still the final arbiters. *E.S.*

DEBUSSY: *Images pour orchestre; Trois Nocturnes.* Montreal Symphony Orchestra and Women's Chorus, Charles Dutoit cond. LONDON © 425 502-2 (60 min).

Performance: *Intense but flexible*
Recording: *Exceptional*

Another stunning release from Charles Dutoit and his wonderful Montreal orchestra. I was struck not only by the brilliant playing but by the *clarification* in these performances—not, by any means, clarification in the sense of dry, X-ray analysis but what seems to come as a natural result of Dutoit's intense yet flexible approach to making music. He doesn't wash away all the Debussian haze yet makes certain that every glistening aural facet is discernible without self-conscious spotlighting. The glimmers of light in *Sirènes*, the last of the *Nocturnes*, are as impressive as the sun-drenched "holiday morning" that winds up *Ibéria* in the *Images*. Earlier recordings of one or the other of these works by the likes of Baudo, Haitink, Monteux, and Martinon are not to be abandoned and can never be forgotten, but Dutoit's performances are refreshing and inspiring, and the exceptional sound quality that we now accept as the norm for London Records' Montreal Symphony Orchestra recordings makes the very most of them. *R.F.*

MENDELSSOHN: *Symphony No. 4, in A Major, Op. 90 ("Italian"); Octet in E-flat Major, Op. 20, Scherzo; Symphony No. 3, in A Minor, Op. 56 ("Scottish").* Scottish Chamber Orchestra, José Serebrier cond. ASV/HARMONIA MUNDI USA © CD DCA 700 (71 min).

Performance: *Enchanting*
Recording: *Bright and spacious*

Most of José Serebrier's recordings have presented him in out-of-the-way repertory for which he had to make a case, or with out-of-the-way orchestras he had to coax above their accustomed norms. Here, with a first-rate ensemble at his disposal for two of the best-loved works

in the standard repertory, he is able to devote his considerable powers to interpretive ends, and the result is notably assured and refreshing. The performances abound in unforced charm and vitality; the tempos, the way the various choirs are balanced, and the size of the orchestra itself all seem just right for the material at hand. The first-movement repeat is taken in the *Italian Symphony*, and there is a lovely little bonus in the form of the scherzo from the Octet for Strings in the delicious (though unaccountably neglected) orchestral version Mendelssohn prepared as a substitute for the menuetto in his First Symphony. It is especially welcome in its thoughtful placement here between the two big works, and the bright, spacious sound does full justice to the enchanting performances. *R.F.*



Yehudi Menuhin: a prize Prague

MOZART: *Piano Sonatas in G Major (K. 283), A Major (K. 331), F Major (K. 332), and B-flat Major (K. 333).* Alicia de Larrocha (piano). RCA © 60407-2-RC (73 min).

Performance: *Refreshing*
Recording: *Just fine*

After more than six decades before the public, Alicia de Larrocha has begun recording for RCA Victor with commitments for nothing less than the complete piano sonatas and concertos of Mozart, in addition to remakes of some of the Spanish material with which she has been so closely identified. Of course, De Larrocha was only five years old when she made her debut, but that's a lot of years at the keyboard no matter how you figure, and one of the more striking elements in her playing continues to be her vitality. It's not just a matter of sustained vigor but of something more like delighted rediscovery of thrice-familiar works. That is certainly the impression given on this disc by the witty delineation of the variations in K. 331,

the unencumbered freshness of that work's *Alla turca* finale, the fizzy brilliance that never gets out of hand in the finale of K. 332, the smiling songfulness in the opening of K. 333. No new depths are probed here, but there's nothing superficial either. It's the sort of deceptively uncomplicated musicmaking that, in Alec Wilder's wonderful phrase, "takes you where you want to go," and the sonic focus is just fine. *R.F.*

MOZART: *Symphony No. 38, in D Major (K. 504, "Prague"); The Marriage of Figaro, Overture.* Orchestra of the 18th Century, Frans Brüggen cond. PHILIPS © 426 231-2 (42 min).

Performance: *Good*
Recording: *Spacious*

MOZART: *Symphony No. 38, in D Major (K. 504, "Prague"); Symphony No. 39, in E-flat Major (K. 543).* Sinfonia Varsovia, Yehudi Menuhin cond. VIRGIN © VC 91078-4, © VC 91078-2 (56 min).

Performance: *Superb*
Recording: *Ideal*

MOZART: *Symphony No. 35, in D Major (K. 385, "Haffner"); Symphony No. 39, in D Major (K. 504, "Prague").* Staatskapelle Dresden, Colin Davis cond. PHILIPS © 416 155-2 (52 min).

Performance: *Refined*
Recording: *Spacious*

After hearing these three recordings in succession, I am tempted to speak of "three roads to Prague." The only one of Mozart's late symphonies lacking a minuet, the *Prague Symphony* stands out as the most operatic in spirit—hardly surprising given its chronological position between *The Marriage of Figaro* and *Don Giovanni*.

Frans Brüggen's reading with period instruments is the most operatic of the three, notably in his somberly measured treatment of the extended slow introduction where the shadow of the Commendatore in *Don Giovanni* becomes almost palpable. The slow movement seems just a mite fussy in its phrasing, but the *Figaro*-style finale goes with great dash. As far as I know, this is the only period-instrument recording of the *Prague* that takes every repeat, and it's preceded by a splendidly stylish performance of the *Figaro* overture. Considering that the recording was made during a concert, the sound overall is remarkably spacious and transparent.

The prize among the three *Pragues* is Yehudi Menuhin's with a modern-instrument chamber orchestra of crack Warsaw players. This disc is the first in what looks like a Mozart-symphony series under Menuhin's baton, for recordings of the G Minor and the *Jupiter* have followed close on the heels of this one. The crispness, vitality of phrasing, and rhythmic address in both the *Prague* and E-flat symphonies provide a simply breathtaking sense of exhilaration and *(Continued on page 120)*

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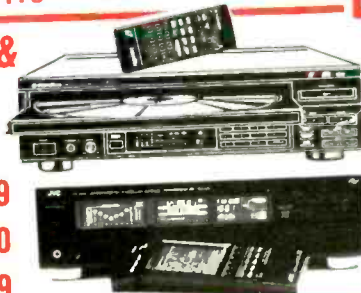
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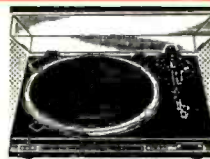
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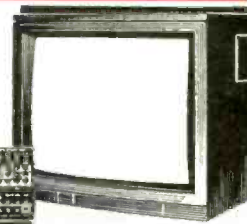
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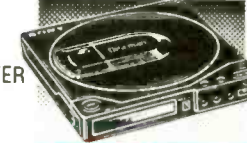
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Edo de Waart

AT the dress rehearsal for the première of *An Alpine Symphony* in 1915, by which time he had composed *Der Rosenkavalier*, *Salome*, and his most celebrated tone poems, Richard Strauss remarked, "At last I've learned to orchestrate." Orchestration, or, more specifically, exploitation of the resources of the modern orchestra, would seem to be very much the point of *An Alpine Symphony*. That might also explain its sudden emergence, in the age of digital recording and phenomenal new playback systems, from decades of possibly benign neglect to the point at which no fewer than four new recordings appear at the same time to join the seven already on CD. Indeed, two of the new versions are remakes for their respective conductors: André Previn, who conducts the Vienna Philharmonic on Telarc, had previously recorded the work with the Philadelphia Orchestra for Angel; Zubin Mehta conducts the Berlin Philharmonic on Sony Classical, his earlier recording with the Los Angeles Philharmonic having been reissued on a London Jubilee midprice CD. These remakes illustrate dramatically how critical the matter of sound quality is to the effectiveness of this work, but they and the other new recordings—by the San Francisco Symphony under Herbert Blomstedt on London and the Minnesota Orchestra under Edo de Waart on Virgin Classics—go a long way, too, toward convincing us that there is more to the piece than demonstration material for audio enthusiasts.

Choosing among these four new recordings is pretty much a no-lose situation. Mehta and the Berliners revel in the work, and the orchestra's superb first horn, Gerd Seifert, gives a handsome account of Strauss's Horn Concerto No.

1 by way of encore. The recording may be a little close-up for some tastes, but it is agreeably rich and well defined. Previn's recording, which clocks in at 2 minutes shorter than De Waart's and 4 or 5 minutes shorter than the other two new versions, is the only one of the four without a second work on the disc (and the only one with the various sections of the *Alpine Symphony* indexed rather than on separate tracks), but his is also the one with the creamiest, most sumptuous orchestral sound. The Viennese strings have a unique sheen, and the horns suggest something more like a phenomenon of nature than mere generic brilliance, qualities Telarc exploits impressively without losing definition.

Blomstedt comes into competition with himself in a different sense, as his disc includes *Don Juan*, a work he recorded only a few years ago in his

Strauss cycle for Denon with the Dresden State Orchestra—Strauss's own favorite orchestra, the one for which he composed *An Alpine Symphony* and conducted in the work's Berlin première. But no allowances need be made for the San Franciscans; their *Don Juan* is superior orchestrally as well as sonically to the Dresden recording, and the big work is sheer glory. Blomstedt shows ample warmth of heart without ever hinting at overindulgence, and he makes the strongest case imaginable for the structural integrity of the supposedly sprawling score. De Waart, another seasoned Straussian (and Blomstedt's immediate predecessor in San Francisco), draws characterful playing from his Minnesota forces, too, and he presses on just a bit more to achieve a sense of adventurousness with a definite undercurrent of nervous tension, a state of exhilaration something like levitation. Virgin's rather soft-focused sound treatment brings out the delicacy as well as the power of the music, and the filler is Strauss's early *Serenade for Winds* (a work De Waart recorded earlier with the Netherlands Wind Ensemble for Philips).

All four conductors and their orchestras bring out a good deal more substance than many of us might have been willing to acknowledge in the *Alpine Symphony*, because all of them obviously believe in it, but it is Blomstedt who makes the strongest overall impression. While the sound of the Vienna Philharmonic in this music is indeed something to be reckoned with, Blomstedt draws somewhat more precise playing from the San Francisco Symphony, and, in addition to the virtues noted above, his pacing is at every point the most persuasive in respect to both the expansive and the dramatic qualities of the work.

Richard Freed

André Previn



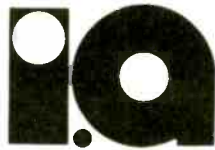
R. STRAUSS: *An Alpine Symphony*, Op. 64; *Don Juan*, Op. 20. San Francisco Symphony Orchestra, Herbert Blomstedt cond. LONDON © 421 815-4, © 421 815-2 (70 min).

R. STRAUSS: *An Alpine Symphony*, Op. 64. Vienna Philharmonic Orchestra, André Previn cond. TELARC © CD-80211 (48 min).

R. STRAUSS: *An Alpine Symphony*, Op. 64; *Serenade in E-flat Major for Thirteen Wind Instruments*, Op. 7. Minnesota Orchestra, Edo de Waart cond. VIRGIN © VC7 91102-2 (59 min).

R. STRAUSS: *An Alpine Symphony*, Op. 64; *Horn Concerto No. 1, in E-flat Major*, Op. 11. Gerd Seifert (horn); Berlin Philharmonic Orchestra, Zubin Mehta cond. SONY CLASSICAL © SK 45800 (68 min).

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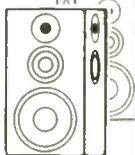
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OCTOBER

lyric beauty. For all the merit of Brüggén's "historical" presentation, it is Menuhin who emerges the real Classicist in his sinewy rendering of the *Prague*. In the accompanying E-flat Symphony, there's a neat dramatic touch that Menuhin says is based on Mozart's autograph score: an unexpected pause between the end of the *Ländler* trio in the minuet and the reprise. In terms of presence and instrumental balance, the recording is absolutely ideal.

As big-orchestra Mozart performances go, the ones by Colin Davis and the Dresden orchestra of the *Prague* and *Haffner* Symphonies are distinguished and well paced. The opening of the *Prague* sounds a bit stolid and four-square next to Brüggén's and Menuhin's readings, but otherwise all goes well in both works. The slow movement in the *Prague* is gorgeously silky, and notable in the *Haffner* is the elegance of the trio. Woodwind balances are more than usually well maintained in both. *D.H.*

MUSSORGSKY (orch. Ravel): *Pictures at an Exhibition* (see *Best of the Month*, page 90)

RACHMANINOFF: *Piano Sonata No. 1, in D Minor, Op. 28; Piano Sonata No. 2, in B-flat Minor, Op. 36*. Alexis Weissenberg (piano). DEUTSCHE GRAMMOPHON © 427 499-2 (44 min).

Performance: *Splendid*
Recording: *Very good*

Rachmaninoff composed his Second Piano Sonata in 1913 and revised it substantially a dozen years later, cutting its original length by nearly half. Most of the pianists who have recorded it lately have opted for the original version, feeling that the revision was not the effective tightening-up Rachmaninoff intended but an ill-advised fixing of something that wasn't broken. Some performers, like Vladimir Ashkenazy in his London recording, incorporate features of both versions. Alexis Weissenberg, however, has simply accepted the composer's final thoughts on the work, and he makes a very convincing case for it.

The First Piano Sonata, of which there is only one version, has been relatively neglected. It's hard to imagine why, for it boils over with ideas and is fully characteristic of its composer's style in the phenomenally rich period that produced his popular Second Symphony. There is no other recorded performance, at present, to compare with Weissenberg's, but he gives the sonata the sort of advocacy it needs and deserves. The disc is not too generously filled—there would have been room for, say, the *Corelli* Variations, or a set of *Études tableaux*—but the music is so well served (by the engineers as well as Weissenberg himself) that no one is likely to feel short-changed. *R.F.*

SCHIFRIN: *Song of the Aztecs*. Conchita Julian (soprano); Martha Felix (contral-

to); Plácido Domingo (tenor); Mexico Philharmonic Chorus and Orchestra, Lalo Schiffrin cond. PRO ARTE © CDD 494 (39 min).

Performance: *Big, big, big*
Recording: *Live but okay*

Despite appearances, this splashy new work by Lalo Schiffrin, recorded with massive forces at a televised concert given at the pyramids of Teotihuacan, Mexico, in October 1988, is not just another multimedia Plácido Domingo extravaganza. *Song of the Aztecs* isn't an exercise in high art, either, but anyone whose interest in classical music stems from the soundtracks for various Biblical film epics will probably enjoy this recording. The Aztec poems on which Schiffrin's orchestral song cycle is based don't add up to much, and some of the sentiments are a bit smarmy, but there are some lovely individual images, which find fairly obvious but never overly sentimental characterization in Schiffrin's music. For all its Stravinskian harmonies and Bernsteinish emotionalism, the music has a sincerity that shows through at every turn, and while the performance overall could have used a little more polishing, Domingo's singing is unusually inspired and occasionally thrilling. *D.P.S.*

SCHUBERT: *String Quartet No. 15, in G Major, Op. 161 (D. 887)*. Tokyo String Quartet. RCA © 60199-2-RC (46 min).

Performance: *Refined*
Recording: *Excellent*

Schubert's last, biggest, and probably greatest string quartet has been well served in different ways in several recordings. Personally, I've been most stimulated by the Quartetto Italiano's, on Philips. The Italians made the quartet even bigger, in a sense, by not only investing the music with almost unimaginable intensity but taking the big exposition repeat in the first movement as well. To some, that made the work seem a little lopsided; to others, like me, it was just a little more of a wonderful thing.

The Tokyo Quartet approaches the work quite differently, as if the objective were to leave the listener refreshed and ready for more rather than wrung out and in need of silence. Here the music is not *without* intensity, and certainly not without commitment, but the outlook is more lyrical than dramatic; the overriding characteristics are subtlety and refinement, and they apply to the sound quality as well as the performance itself. This may not be one of the great recordings of this work, but its combined musical and technical virtues add up to a safe recommendation among those currently available on CD. *R.F.*

SCRIABIN: *The Poem of Ecstasy, Op. 54* (see *Best of the Month*, page 90)

WAGNER: *Das Rheingold* (see *Best of the Month*, page 87)

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by Ralph Hodges



TESTING . . .

HAVING taken the measure of the center-channel issue at the Eighth International Audio Engineering Society Conference last month, it seems appropriate to go back and see what the rest of the affair was about. Titled "The Sound of Audio," the conference was largely review for many of the attendees—a chance to be reminded of how much we have forgotten. Still, it is extremely valuable to learn from specialists what views are falling out of favor and what views have supplanted them since the last time we looked. The modes of presentation were by and large familiar, but there were some surprises.

Take, for example, Neal F. Viemeister, a psychologist at the University of Minnesota, and his discussion of the dog with the whistling ears. The whistles were at about 7,000 Hz, as I recall, and loud enough to have caused the dog's owner to seek medical advice. Bizarre? Preposterous? No, normal. All ears make noises, though this dog was evidently something of an overachiever in that regard. The noises human ears make usually have to be measured in the ear canal, and the wearers of the ears seem

to ignore them—or at least I think/hope that I do.

The Canadian contingent grows ever more hyperactive within the Audio Engineering Society, always in amiable but vigorous competition with themselves and everybody else. Floyd Toole of the National Research Council of Canada was in charge of much of the show, choosing and assigning the papers, and many were the authors' stories of late-night nagging from a telephone voice somewhere in the frozen North. For years the NRCC has waged a single-minded crusade to make the measured numbers conform to the audio experience (or perhaps even vice versa), and with continuously refined listening-panel techniques it seems to be succeeding at this objective better than anybody else. The numbers are rarely a surprise around the council's offices any more, which may go to show what can be accomplished when your national budget is not the captive of a vast military machine.

Much of what the NRCC had to say this time around involved new (to me) measurements and subjective evaluations of popular studio monitors and microphones favored by the producers of audiophile recordings. As anticipated, the news was not heartening. The monitor loudspeakers at least had the excuse of having to serve in situations where indestructibility counts at least as much as fidelity, but Toole and his colleague Sean Olive seem to feel that more fidelity has been sacrificed than the increase in reliability warrants. Of the microphones, too many displayed on-axis frequency-response misbehavior and much worse things off-axis. That better performance is possible was shown 1 by the curve for the B&K Model 4133 instrumentation mike used as a reference, which could be the curve for an amplifier. In true NRCC fashion, all the measured data were fully supported by controlled listening tests. The conclusion: chaos in the recording studio, with no hope of anyone's knowing what's going on the master tape.

Another eminent Canadian, Stanley Lipshitz of the University of Waterloo, aired a grievance that has lately been taking on overtones of a

sort of betrayal: the refusal of some audiophiles to cooperate with the procedures and verdicts of double-blind listening tests, which have been accepted, especially in Canada, as the most rational and reliable means of discovering audible differences between components.

The favorite apparatus for a double-blind test is the ABX box. In an amplifier comparison, for example, you can switch to amplifier A or to amplifier B or to amplifier X. Amplifier X is actually either amplifier A or B, but the box randomly selects which one and won't tell you the selection until the conclusion of the test, when it presents a readout of the various trials. Not even the administrator of the test knows which unit is playing when X is selected, hence the designation double-blind.

I have participated in double-blind tests, and they are hard work, which I object to on philosophical grounds. Also, they are emotionally distressing, because there's the distinct possibility you'll "hear" significant differences between, say, amplifier A at 11:00 a.m. and amplifier A at 11:03 a.m., and you will have to live with the imagined behind-the-back snickering of the testing organization for the rest of your life. Fear of this is not conducive to concentration. Furthermore, a considerable investment, financial and otherwise, may be involved if you find you consistently voted against the amplifier you bought—at twice the price. Fortunately, such embarrassment rarely happens. Most publicized double-blind tests, competently conducted, have turned up no statistical evidence for genuine audible differences between the amplifiers under test. You'll probably condemn amplifier B as often as amplifier A.

Ultimately I agree with Prof. Lipshitz that the double-blind test embodies the best approximation to good science that we have in audio. But, alas, good science does not prosper in a business as irrational as high fidelity. Frustrating as it is to have rationality rejected, it is often more frustrating to try to get loudspeaker A to sound good in room B. Irrationality remains part of the territory, and in this particular world, I think we must allow each listener to wander where he or she will. □

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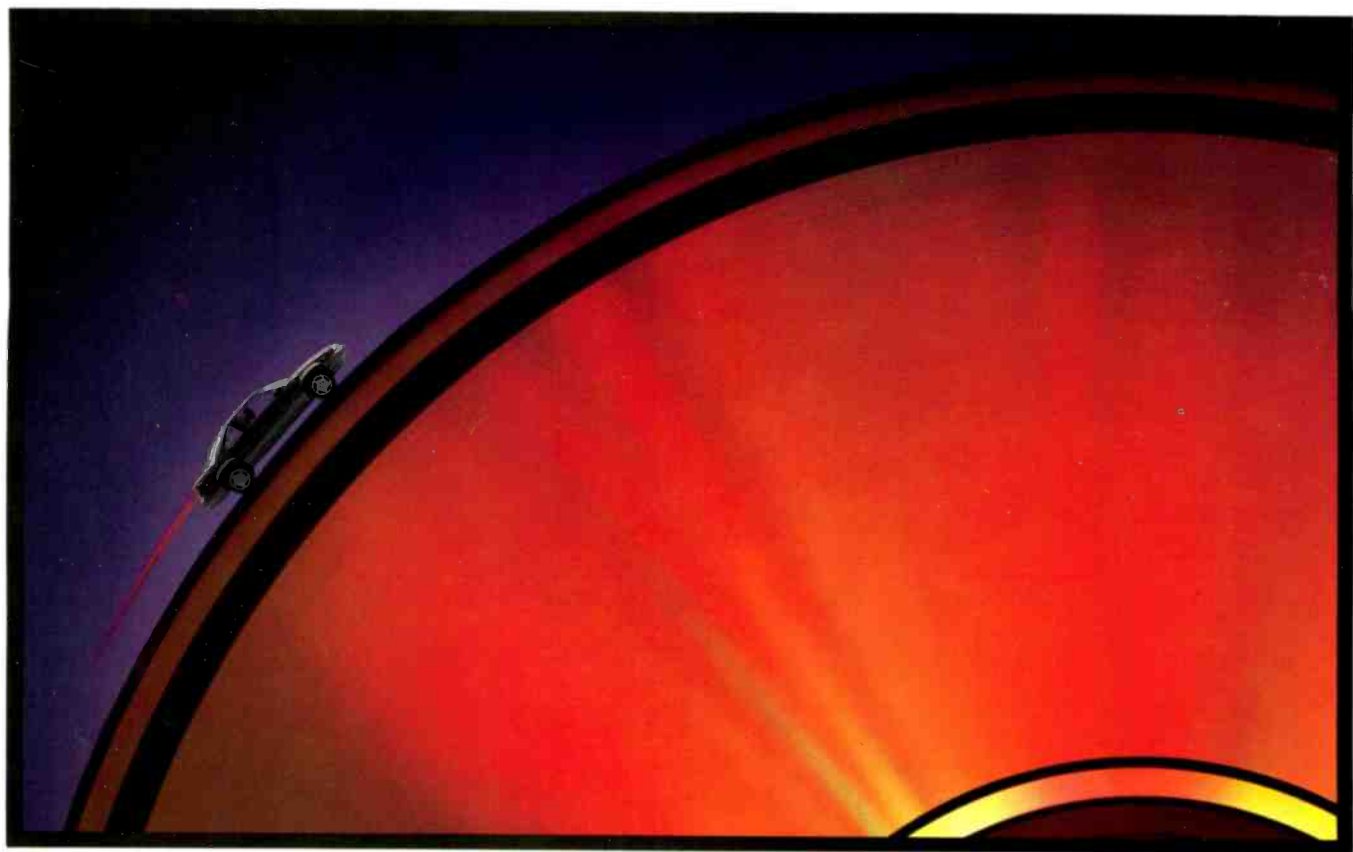
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