

Stereo Review

MARCH 1988 ● \$2.25

SPECIAL TAPE RECORDING ISSUE

LAB AND LISTENING TESTS: FIVE TOP TAPE DECKS GO HEAD TO HEAD

RECORDING SYSTEMS / TAPE BUYING GUIDE

PLUS: CHOOSING A COMPACT DISC PLAYER, PINK FLOYD, DBX'S SUPER NEW AMP AND PREAMP, AND MORE



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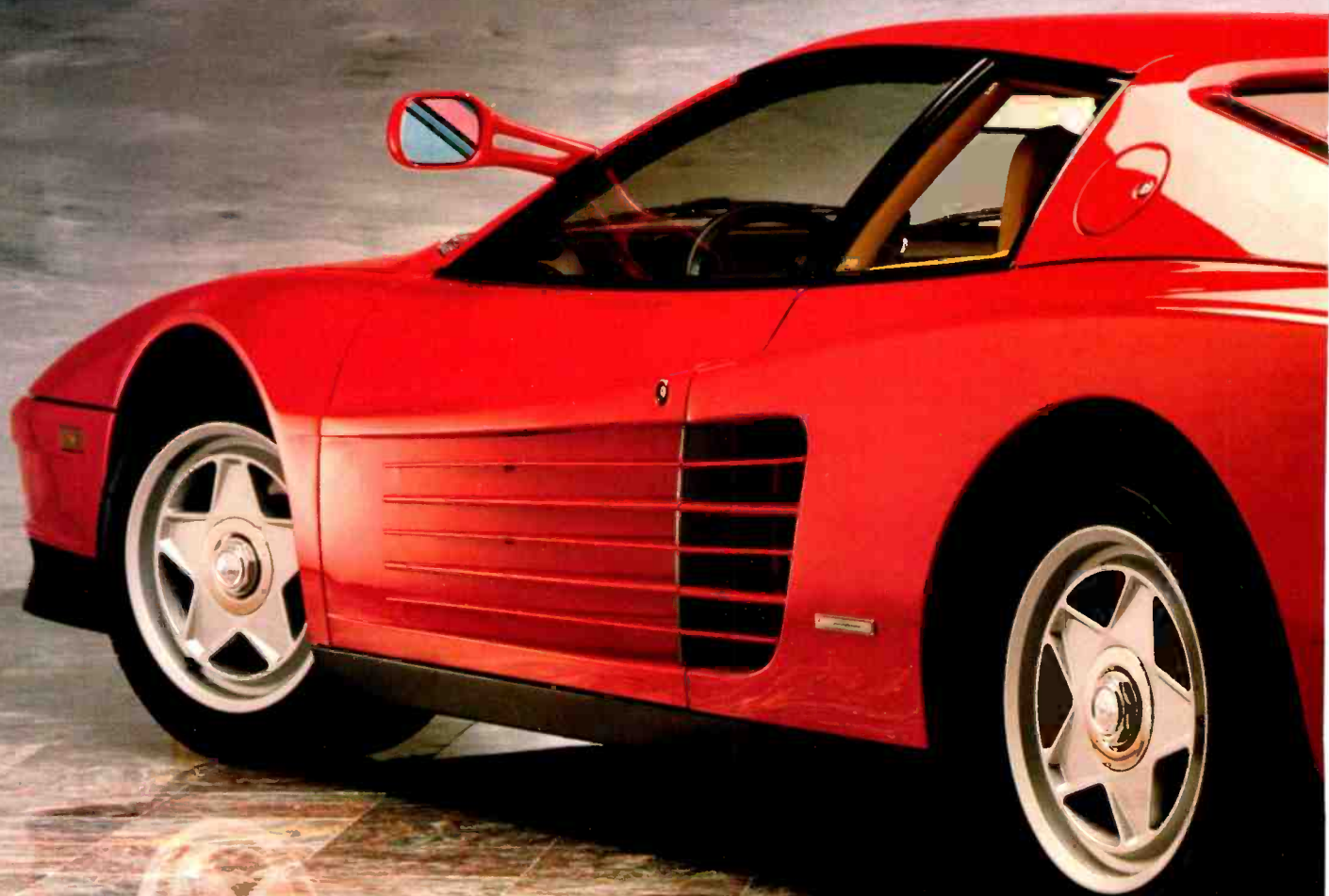
CAR STEREO REVIEW

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Where to buy Polk Speakers? For your nearest dealer, see page 106.



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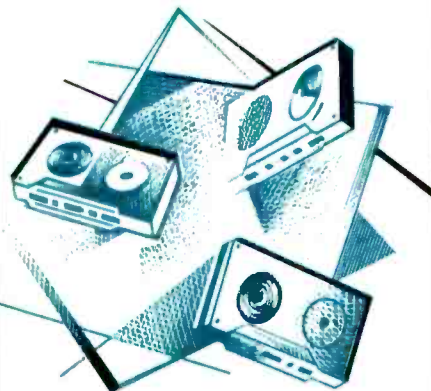
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Cover: The NAD 6300 cassette deck (see page 68) and the Tandberg 3014 A (see page 52). Design by Sue Llewellyn, photo by Jook Leung.

STEREO REVIEW BUYER POLL, SEE PAGE 75
Please fill in if you bought equipment in the past thirty days.
READER SERVICE INFORMATION CARD, FACING PAGE 75
Circle the items you want to know about.



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A Harman International Company

by Christie Barter and
William Burton

TAPE PRICE HIKES

Fuji, TDK, and Maxell, citing the drop of the dollar against the yen, will be raising prices of their audio tape between 10 and 20 percent in this country. Prices of Sony tape will increase by about 15 percent, with prices on other Sony products also increasing early this year.

RADIO, TV, VCR TAX?

The National Association of Broadcasters is proposing a "fee" on the sale of radios, television sets, and VCR's to support public broadcasting. The NAB says a tax of 1.5 percent could raise \$264 million in 1988, and a 2-percent tax could raise \$345 million. The proposal follows the Senate Commerce Committee's suggestion of taxing the transfer of broadcast licenses.

MUSIC NOTES

U2's rise to fame is chronicled in *Unforgettable Fire* by Irish journalist and broadcaster Eamon Dunphy, published this month by Warner Books. . . . George Martin, who made his name in the record business as the producer of the Beatles, was made a Commander of the British Empire by the Queen of England in her 1988 New Year Honors list. . . . Billy Crystal will again host the three-hour Grammy Awards telecast on CBS, March 2. The ceremonies, now in their thirtieth year, will be carried live from Radio City Music Hall in New York. . . . The mayor of the city of Vienna has named Claudio Abbado Music Director of Vienna, a position created especially for the Italian conductor. . . . Soprano Frederica von Stade stars in Telarc's soon-to-be-released recording of *The Sound of Music*, with the Cincinnati Symphony under Erich Kunzel. . . . Frank Sinatra, Dean Martin, and Sammy Davis, Jr., are getting together again for a forty-concert tour of twenty-nine U.S. cities beginning March 13 in Oakland, California. The tour ends in Denver on October 15.

SHOW NEWS

At the Winter Consumer Electronics Show in Las Vegas, JBL demonstrated an omnidirectional speaker and a new subwoofer. . . . Shure introduced a new line of cartridges called the VST series. . . . A new three-way Soundfield speaker from dbx, the trapezoidal Model 2500, will be priced at \$500 a pair. . . . New speakers from Acoustic Research are the powered 115P (\$400 a pair), TSW 105 two-way minispeakers (\$275 a pair), and the two-way Party Partners with 10-inch woofers (\$450 a pair). . . . Altec Lansing introduced a 250-watt subwoofer with loudness compensation. The output level and crossover point of the \$800 PSW-10 are adjustable. . . . Marantz's new line of audio components is called the Century Series. . . . Fried showed its D/2 slim transmission-line subwoofer for the first time. . . . Technics, Sony, and Casio demonstrated portable DAT machines. . . . Vector Research introduced a CD changer, a programmable remote control, and three audio/video receivers. . . . Meridian showed a new tuner, preamplifier, and power amplifier. . . . Bib has added home and car speakers to its line of accessories. . . . TDK's expanded line of accessories includes new tape-deck cleaning and demagnetizing cassettes.

CLAPTON SPECIAL

Guitarist Eric Clapton is celebrating his twenty-fifth year in the record business, an occasion being marked this spring by Polydor with a seventy-two-track retrospective album. Titled "Crossroads," the specially designed boxed set of six LP's, four cassettes, or four CD's spans the artist's career, from his earliest demo tapes with the Yardbirds to his latest solo albums, and includes many rare and previously unreleased tracks.

TECH NOTES

The sixth version of the Bose 901 speaker, the 901 Series VI, has been introduced at a price of \$1,485 for the two speakers and an equalizer module. . . . Vans are

cruising the country selling fake Acoustic Research speakers with the name "Acoustic Research Dynamics." The real AR is tracking down the counterfeiters. . . . Look for Hi-Bit processing and four-times oversampling in a \$319 Yamaha CD player. . . . Discronics, with CD plants in Australia and England, has acquired LaserVideo, with plants in Alabama and California. The four plants are set to produce 65 million CD's a year.

FIRST-DESK SOLOISTS

The New York Philharmonic's album "Soloists from the Orchestra" spotlights a number of the orchestra's first-desk players. It was produced for this year's WQXR Radiothon in February. Included are performances recorded live (and digitally mastered) by Glenn Dicterow, the Philharmonic's concertmaster, in Shostakovich's First Violin Concerto and principal clarinetist Stanley Drucker in the Copland Clarinet Concerto. The two-record set is available for a \$25 contribution. The double-CD set is given to donors of \$45. Phone 1-800-247-3030.

INSPIRING ROCKER

Paul Simon—along with Pope John Paul II, Elizabeth Taylor, Jessica McClure (the youngster rescued from a Texan well), and five other individuals—was named one of 1987's "10 Most Inspiring People" by the Millennium Society, formed by Yale University students to mark the year 2000. Their tenth honoree was the U.S. Constitution.



TERRY ALLEN

Monumental

Pioneer's Revolutionary 40" Projection Monitor

To go into all the reasons why the new Pioneer SD-P401 is the best projection monitor you can buy would require a great deal of engineering explanation...

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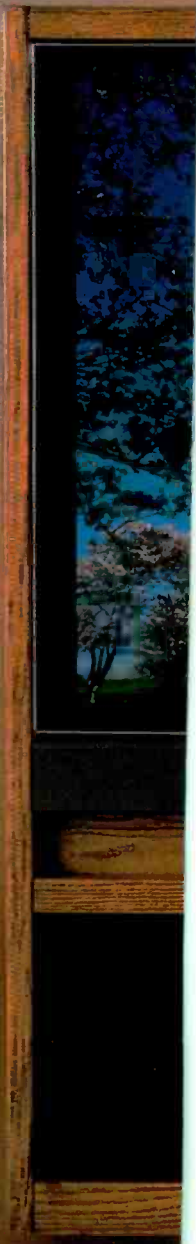
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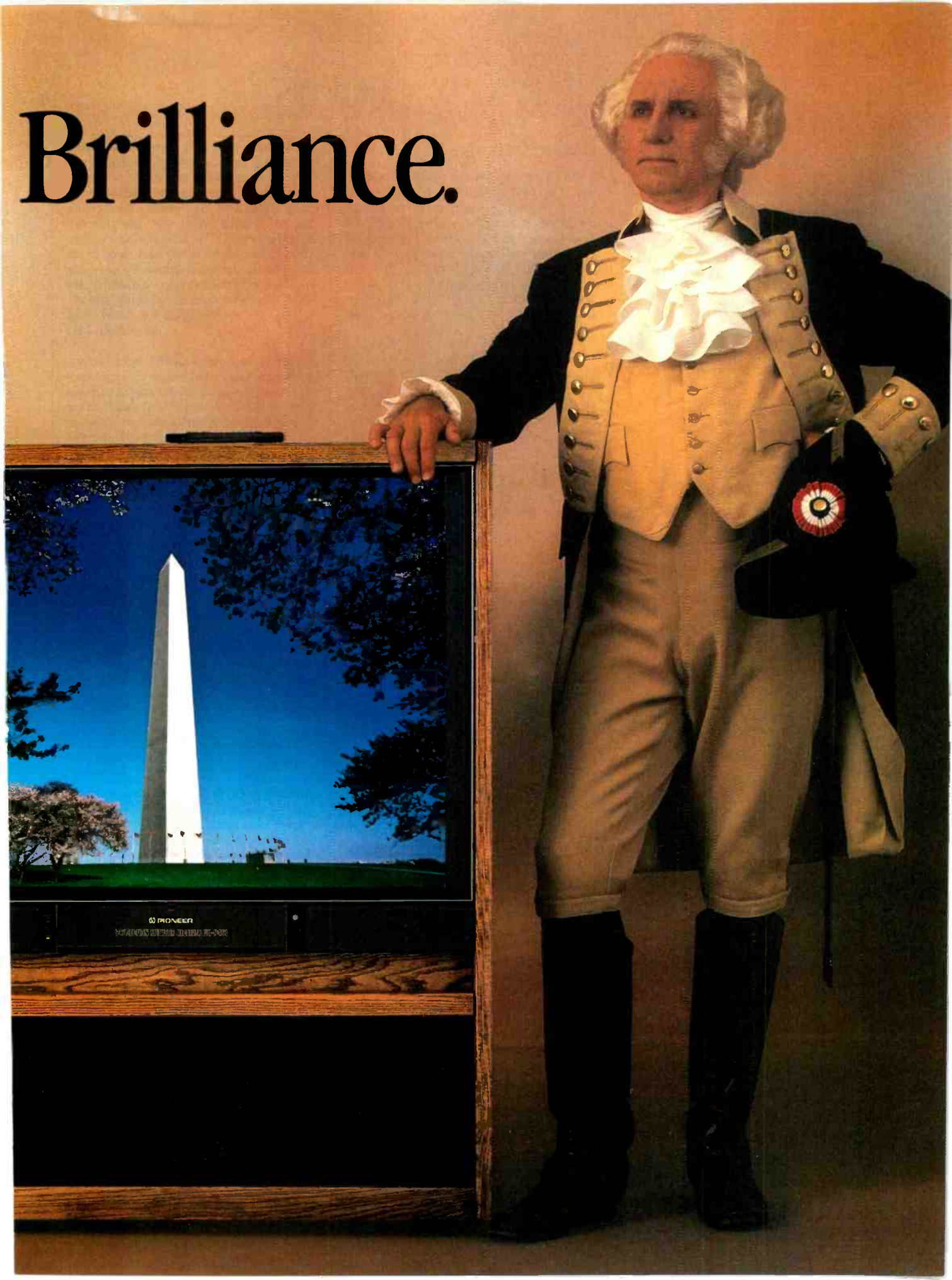
The SD-P401 is of course fully cable-capable. Stereo-capable too, with its MTS decoder. It has all the inputs and outputs needed for the most complex A/V system. And it's only 23 inches deep.

If you're impressed with what went into this monitor, you'll be doubly delighted to see what comes out of it. So see the SD-P401 at your Pioneer dealer today, and see for yourself why this big picture is today's revolution in high resolution. For more information, call 1-800-421-1404.

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Phono Cartridges

Do you really believe ("Feelin' Groovy," January) that the average reader of STEREO REVIEW is interested in phono cartridges priced from \$295 to \$1,240? Today you can purchase a CD player for \$100 that will make that \$1,240 cartridge sound like a vintage-1950's FM tuner! Why not evaluate and write about cartridges that have excellent sound quality *and* are cost effective in comparison with CD sound?

After I purchased my CD player, I replaced my older cartridge with a Grado F3E+ that I had had on the shelf for a while. Compared with CD's, the Grado delivers crisp, deep low frequencies with distinct separation of instruments and natural-sounding, balanced highs. The best part of this saga is that an improved version of the same cartridge, the XF3E+, is available for \$66 list, discounted to \$39.95 at J&R Music World in New York City.

HERBERT ELKIN
New York, NY

January's article comparing five leading phono cartridges was very timely for me as they were the exact same models I was trying to choose from. I finally decided on the Audio-Technica AT160ML, and am I ever impressed. Most notable are its "silent running" and its wide stereo separation.

I am a new convert to CD's, but I continue to buy LP's, as CD's don't yet have the jazz, folk, blues, and acoustic-guitar artists I listen to. I've been buying many LP's lately as their prices remain way below what they would be had CD's not come out. Also, I see LP's fading away—smaller areas in stores everywhere.

JOHN KIDWELL
Los Angeles, CA

CD Bells and Whistles

As the compact disc industry matures and gains acceptance, CD fans are wondering, "What next?" With other audio components, audiophiles could expect continuing improvements in quality and features, but CD players are beginning all to look the same. Quality is more than adequate, and all the machines seem to have the same features.

The only major feature of the CD format that no manufacturer seems to have touched upon, and one with some very interesting possibilities, is the digital subcode. Every CD has more than 200 million unused bits dispersed throughout its 20 billion bits of music, error-correction, and track information. The developers of the CD format left these eight bits per frame empty for future applications, but hardly anyone has suggested what to do with them.

The three uses that seem most practical are to provide video or computer output of song titles and lyrics, scores or MIDI (musical instrument digital interface) data, and the album cover and related images. Why not use the full potential that CD's offer, stimulate continued CD player sales, and give more features to the audiophile by agreeing on a subcode information standard and filling up some currently empty space?

MICHAEL D. ANDERSON
St. Louis, MO

This is an appeal to the manufacturers of compact disc players to incorporate a bell (or whistle) not now available that would be a wonderful addition: a programmable silent interval between playback of major selections on the disc—in effect, a short intermission. The interval could be based on a 15-second unit, selected one, two, three, or four times for up to a minute of silence.

Current CD's give us Beethoven's Fifth following hard upon the heels of Schubert's Eighth. There is no time to come down from the heights, no time for aftertaste. Customarily the interval between symphonies is the same as between movements. I have a CD of three Mozart violin sonatas that becomes one twelve-movement super-sonata. The 5-second programmable pause available on some players may be adequate for popular music but not for classical.

DAVID OHDE
Weaverville, CA

Hit List

Like Ian G. Masters ("Hit List," January), I was faced with the problem of organizing a large record collection. My more than 1,400 albums, mostly rock-and-roll, are the love of my life, and my task was a labor of love. I wrote a very simple program for my Apple GS computer that allows me to keep track of each album for personal use and insurance purposes, including the artist, title, catalog number, value, and condition; it can alphabetize the listings and also search for specific records. While it is by no means sophisticated, it has served my needs well. I would be very interested in hearing from readers who have similar programs or are interested in discussing mine.

DARYL BYKLUM
327 13th St., NE, #201
Watertown, SD 57201

I read "Hit List" by Ian G. Masters with interest. I wrote a computer program myself some time ago to keep track of the CD's in my collection and to list CD's that had been favorably re-

“The most significant advance in the control of auditory space since stereo.”

*David Ramada, Technical Editor
High Fidelity Magazine*



“The ultimate audio and video sound experience.”

“Produces an uncanny sense of being somewhere else listening to live music.”

“Sound improvement ranged from substantial to mind-boggling.”

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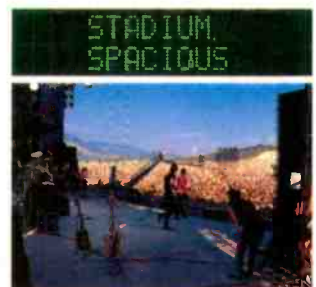
The DSP-1 is the heart of an experience called Yamaha Digital Home Theatre. A system of components that elevates home entertainment to a new, unparalleled level. Whether it's audio or video. Regardless of the format. No matter what the source.

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Dynamic Duo



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LETTERS

viewed in STEREO REVIEW. When I head for the record store with credit card in hand, I take in my other hand a printout generated by my computer so that I will not duplicate what I already have and will purchase something that has been well received.

I am willing to share this program with other readers who have IBM or IBM-compatible computers. The reader can create his own catalog of recordings with it or use mine, which includes hundreds of classical CD's that STEREO REVIEW's critics have rated favorably. Requests should enclose \$2 to cover my costs for the diskette and postage.

MATTHEW M. FRANCKIEWICZ
902 Lincoln Highway
North Versailles, PA 15137

10,000 Maniacs

The only thing "wispy" about "In My Tribe" by 10,000 Maniacs is Steve Simels's review of it in January.

GAYLEN HALBERT
Sacramento, CA

Steve Simels states that "In My Tribe" lacks spine. Who says that an album of beautiful folk-pop requires spine to give it value? Stop looking for some awesome message and simply soak up the music.

SCOTT W. GOODWIN
Davidson, NC

Opera on CD

Robert Ackart's survey of operas on CD (September and December 1987) was quite valuable. I only wish for three reissues in the format, which are among the best opera recordings ever: Rossini's *Barber of Seville* with De los Angeles and Bruscantini on Angel; Verdi's *Rigoletto* with Kraus and Merrill, directed by Solti, on RCA; and *Otello*, with Vickers and Gobbi, directed by Serafin, on RCA. Also very competitive is Wagner's *Die Walküre* with Vickers, London, and Nilsson, directed by Leinsdorf, issued by RCA and London.

CARLOS E. BAUZA
San Juan, P.R.

The Solti Rigoletto was one of the first ten CD reissues in RCA's new mid-price Victor Opera Series. The Serafin Otello will no doubt soon follow.

Roubin's Law

Why is it that no matter where you live or how many times you move, your neighbors' taste in music is always in inverse proportion to the volume it's played at?

M. B. ROUBIN
Estes Park, CO

When a CD Player is this good, what can you say?



What do you say about a CD Player whose Super Linear Converters are hand-tuned for reduced crossover distortion. Whose filters are computer analyzed for linear phase. Whose three-layer chassis includes impenetrable magnetic shielding and anti-resonant "Silent Steel."

In France, they called it a "milestone." In Germany they named it "Reference Class." In Japanese comparison tests of the world's top CD players, it came out on top. And in naming it the "Player of the Year" for 1987, *Digital Audio* called it "one of the most finely engineered pieces of audio gear on the planet."

The Denon DCD-3300. Once you listen to it, there's nothing more to say.

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CIRCLE NO. 27 ON READER SERVICE CARD

DYNAMIC RELATIONSHIP.

The remarkable FM sensitivity of NAD's new Monitor Series tuner is the perfect match for the exceptional dynamic power of our new Monitor Series amplifier.



In analyzing our new Monitor Series tuner and amplifier, it's easy to focus on specifications. For example, the 4300 tuner's real world FM sensitivity rating is unequalled and the 3300 amp can produce over 300 watts per channel of dynamic power.

But what makes them outstanding products can't be isolated to one or two specifications. What makes them a great combination . . . is a combination of a lot of things. They blend power and sensitivity. They mix the latest in state-of-the-art technology with proven ideas we've used for years. They combine major performance breakthroughs with subtle, yet highly useful, design features.

They are the result of a thousand thoughtful, careful and (we think) correct design decisions. For example . . .

- NAD's proprietary FM NR system in the 4300 tuner reduces noise in weak stereo signals by as much as 10dB (improving its sensitivity rating for 50dB stereo quieting to an astonishing 9 μ V at 300 Ω). It is, arguably, the world's most sensitive tuner.
- The 4300 uses a switchable IF circuit that allows you to choose between "full window" or "narrow window" tuning. The FCC assigns each station a 200kHz-wide "window" on the FM band. But in areas with numerous FM stations, small portions of the broadcast signal of one station will sometimes drift into another station's assigned "window." The 4300 lets you "zoom in" on the central portion of the 200kHz window for any specific station, eliminating annoying interference from adjacent broadcasters.
- Tuning the 4300 combines the accuracy of digital technology with the convenience of a traditional analog knob. We find that most people much prefer spinning a heavy flywheel to holding down a little button.



NAD 5300 Compact Disc Player
NAD 6300 Cassette Deck
NAD 4300 Stereo Tuner
NAD 3300 Integrated Amplifier

Rack handles are optional equipment.

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The Monitor Series From **NAD**

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City _____ State _____ Zip _____

NEW PRODUCTS



Canton

Canton's top-of-the-line CA series of active loudspeakers features separate power amplifiers for each driver. The series includes the three-way CA 10, the four-way CA 20, and the four-way, seven-driver CA 30 (shown), which stands 66½ inches tall and weighs 275 pounds. The internal power amplifiers are said to be stable at loads of 1.5 to 8 ohms, have bandwidths of 3 to 140,000 Hz, and have distortion ratings of less than 0.03 percent at rated power. The speakers are available in matte mahogany or black-ash veneers. Prices: CA 10, \$5,000 a pair; CA 20, \$10,000 a pair; CA 30, \$15,000 a pair. Canton North America, Dept. SR, 915 Washington Ave. S., Minneapolis, MN 55415-1245.

Circle 120 on reader service card

Shure

Shure has introduced three moderately priced cartridges that incorporate technology from its premium V15 series, the VST III (left), VST V (center), and VST III-P (right). The VST V and VST III are designed for standard half-inch headshells, and both include Shure's Dynamic Stabilizer. The VST III-P is a P-mount cartridge. All three feature Shure's Microwall/Be stylus shank, a telescoped beryllium tube with what is said to be the lowest known tip mass; Dura-Body Encapsulated construction, said to lock all internal cartridge components in place, eliminating spurious resonances; and Side-Guard stylus-protection system. The VST V has a Micro-Ridge stylus; the VST III and III-P have hyperelliptical stylus tips. Prices: VST V, \$200; VST III and III-P, \$100. Shure Brothers Inc., Dept. SR, 222 Hartrey Ave., Evanston, IL 60202-3696.

Circle 121 on reader service card



Cerwin-Vega

Cerwin Vega's AT-12 is a three-way speaker system with a 12-inch woofer, a 5-inch cone midrange, and a 1-inch microcell polymer-dome tweeter. It features midrange and tweeter attenuation controls and a circuit breaker for the tweeter as well as overall fuse protection. Rated frequency response is 28 to 28,000 Hz, sensitivity is 97 dB, and nominal impedance is 6 ohms. The cabinet has a beveled wood front, a black fabric grille, and woodgrain-vinyl finish on the top and sides. Dimensions are 30 inches high, 16 inches wide, and 14 inches deep. Price: \$345 each. Cerwin-Vega, Dept. SR, 555 E. Easy St., Simi Valley, CA 93065.

Circle 122 on reader service card

Audio Research

Audio Research has upgraded its two-piece hybrid tube/transistor SP11 pre-amplifier. The SP11 Mk II is said to provide more "openness" and "air" in its sound than the original SP11, with "better definition of fine detail," a "broader and deeper" sound stage, and more "solid" deep-bass response. Frequency response through a high-level input is rated as within ± 1 dB from 0.2 to 100,000 Hz.

There are seven inputs and six outputs in all, with two tape loops and a tape-copying function. Controls include gain (volume), level (to adjust the gain control's range), balance, mode (mono, stereo, left, right, and reversed stereo), input selection, and phono-input impedance selection. Other features include audio mute, a high-pass phono filter, and a bypass switch for use with



"audiophile quality" sources. The control and power-supply modules both measure 19 x 5¼ x 10¼ inches; combined weight is 29 pounds. Price:

\$4,995. Audio Research, Dept. SR, 6801 Shingle Creek Parkway, Minneapolis, MN 55430.

Circle 123 on reader service card

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NEW PRODUCTS



Nakamichi

The RD-450 is one of Nakamichi's first car stereo cassette receivers. The autoreverse tape player has a hard-permalloy head and a calibrated rotating mechanism said to provide uniform treble response in both directions. Dolby B, Dolby C, and both ferric and chrome/metal equalization are included. The tuner has twelve FM and six AM presets, with preset scan, and automatic channel blend on weak signals. It is rated for a usable FM sensitivity of 20

dBf and a signal-to-noise ratio of 60 db in mono.

The amplifier section can power either two or four speakers. Output is rated as 12 watts per channel in two-channel mode, 4 watts each into four channels, both with no more than 0.05 percent total harmonic distortion at normal operating levels. The tone controls are retractable, and there is a back-panel input for a CD player. Price: \$495. Nakamichi, Dept. SR, 19701 S. Vermont Ave., Torrance, CA 90502. **Circle 124 on reader service card**



Lotus Developments

The Jetset stereo headphone system from Britain's Lotus Developments is designed to be used on airplanes in place of airline-provided airpipe headphones. The system consists of an Airdaptor pickup/amplifier module and lightweight stereo headphones. The Airdaptor uses a pair of condenser microphones, with "correction baffles" to filter excess hiss, to convert the airline's piped sounds to stereo electronic signals, which are then amplified by a Class AB hi-fi stereo amplifier. Amplifier response is rated as 30 to 20,000 Hz. The Airdaptor module is available in a matte-black enclosure and measures 3 inches long, 2 $\frac{3}{8}$ inches wide, and $\frac{1}{2}$ inch thick. It is powered by two AAA batteries. Price: \$19.95 plus \$3 shipping and handling from Executive Travelware, Dept. SR, P.O. Box 59387, Chicago, IL 60659.

Circle 127 on reader service card



Revox

The Revox B203/205 control system, consisting of the B203 timer controller and the B205 remote unit, can be used to operate any or all components in Revox's 200 series, including the B285 receiver, the B286 tuner/preamplifier, the B226 compact disc player, and the B215 cassette deck. The system can provide random access to CD and cassette tracks, programming by date and time for unattended recording, automatic transfer from one music source to another at a selected time, with smooth

fade out and fade in, and preset turn-on and turn-off for wake-up or bedtime music.

The B203 can also be programmed using any fully IBM-compatible MS-DOS computer. It connects to the computer's serial port, and optional Revox software provides on-screen prompts, automatically sending the desired commands to the audio components. Prices: B203, \$600; B205, \$160; software price to be announced. Studer Revox America, Inc., Dept. SR, 1425 Elm Hill Pike, Nashville, TN 37210.

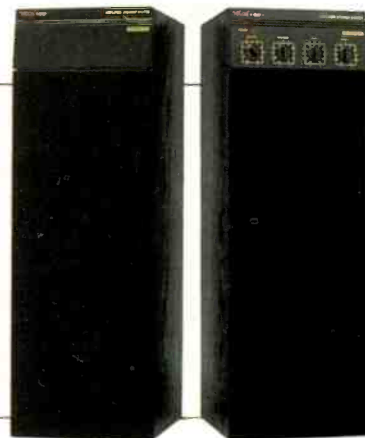
Circle 125 on reader service card

Universal

The Universal VX Series V-8800 amplified speaker system is specifically designed for use with stereo television sets, turning on and off automatically when the set does. Each speaker has a 4-inch woofer and a 2-inch tweeter. System frequency response is given as 100 to 17,000 Hz, and the power rating is 5 watts per channel. The master speaker of each pair has controls for bass, treble,

balance, and volume. The speakers come with all necessary cables and adaptors. The black, woodgrain-vinyl cabinets measure 18 inches tall and 6 inches square. The speakers have low magnetic leakage so they can be used next to a TV set without distorting the picture. Price: \$100 a pair. Universal Security Instruments, Inc., Dept. SR, 10324 S. Dolfield Rd., Owings Mills, MD 21117.

Circle 126 on reader service card



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

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

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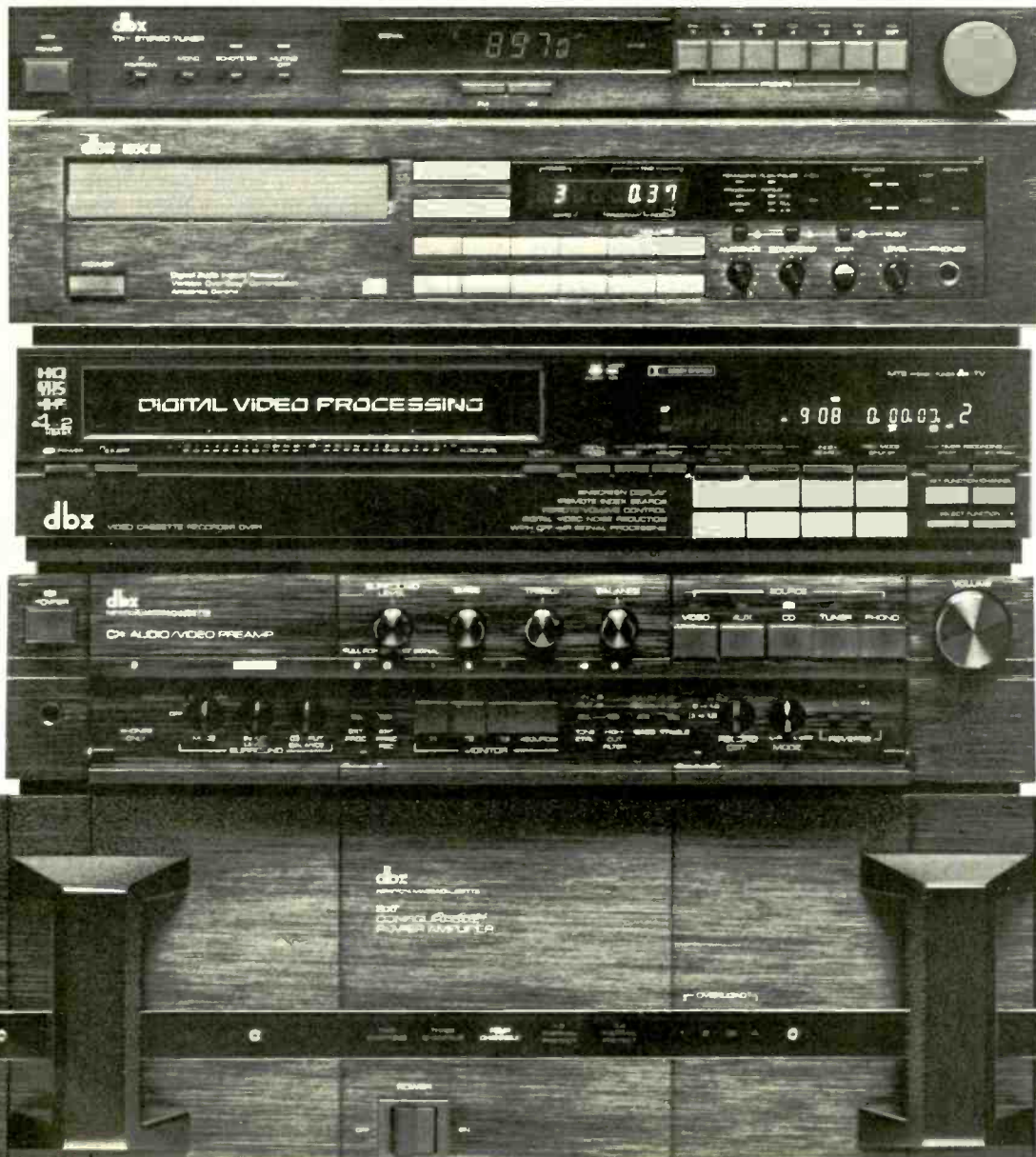
Our incomparable configurable 2/3/4-channel amplifier provides over 800 watts per channel in actual use. With a flatter response than amateur amps costing twice as much.

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

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

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VIDEO BASICS

by William Wolfe



VCR Options

BUYING a new videocassette recorder is easier now than it has ever been before in the history of the video medium. Previously, you had to decide which format of VCR you were interested in before you could consider anything else, and that was a tough one. Now, that decision has essentially been made for you by all the people who have purchased VCR's in the last five to six years: Thanks to overwhelming buying trends, VHS is the only viable format currently available in the United States. Don't feel that this is a one-format, one-choice situation, however. The theme may be VHS, but there are plenty of variations.

There are four major choices you should make when shopping for a new VCR: between the higher-quality Super VHS and the standard VHS picture circuitries, between the combination of an MTS (stereo-TV) tuner with VHS Hi-Fi sound and a standard video tuner with linear stereo audio circuitry, between good- and average-quality special effects, and between simplified on-

screen programming and standard front-panel programming.

If you opt for the better performance level when making each choice, you're likely to end up looking at a VCR costing about \$1,000 to \$1,500 retail. If you choose to compromise in one or two areas, or if some of the options listed are not important to you, you can bring that price down to \$500 or so. Some VCR's can be had for as little as about \$300, but you shouldn't expect much from these bare-bones models.

The appearance of Super VHS circuitry put the final nail in Beta's coffin—at least for buyers of new VCR's—since it largely won over Beta's last supporters, videophiles who sought the best available picture quality in a tape format. Super VHS picture quality is better than that of broadcast or cable television and of laser videodiscs. Standard VHS picture quality is a performance notch below that of broadcast TV, although it has proved satisfactory for over 40 million American VCR buyers.

Super VHS should appeal to forward-thinking videophiles. To see the full Super VHS difference, however, you must connect a Super VHS-equipped VCR to a television set or monitor that has special Super VHS inputs and use a program source of similarly high quality. At this time, the only such source is videotapes made on Super VHS camcorders, since no prerecorded Super VHS tapes are yet available. Super VHS VCR's can play standard VHS tapes, however, so existing VHS tape libraries won't be rendered useless while you wait for the program sources to catch up.

VHS Hi-Fi circuitry is a must for audio-minded videophiles as it enables you to record and play back tapes that are only a small performance step below compact discs. (Compare the following specifications with the dismal specs typical of standard-audio VCR's: a frequency response from 20 to 20,000 Hz and a signal-to-noise ratio ranging from 80 to more than 90 dB.) And an MTS tuner enables you to receive and record stereo TV broadcasts, which now average about 50 hours per week in most areas. Having

both of these features transforms a basic VCR into a powerful audio tool.

Special effects include such playback features as still frame, frame advance, and slow motion. The quality of special effects largely depends on the number of video heads built into the VCR. High-end VCR's use two or three extra video heads just for special effects, for a total of four or five heads. Other VCR's have only two heads, and the special effects they produce are of relatively low quality.

Having both VHS Hi-Fi circuitry and an MTS tuner transforms a basic VCR into a powerful audio tool.

Some manufacturers also include digital circuits to enhance special-effects playback, but the differences between digital effects and those produced by a good four- or five-head machine are minimal. Some special effects—such as PIP (picture-in-picture), strobe, and paintbrush—are available only on digital VCR's, but they are not likely to appeal to most VCR shoppers.

Surveys report that programming is the least understood and least used VCR feature. The reason may lie in the kind of programming controls found on first- and second-generation VCR's—and which are still used today on bare-bones models. If you plan to program your VCR often, you should opt for a model that uses a simplified programming procedure such as remote-control programming with on-screen prompts or light-pen programming.

There are other important decisions to make, of course, but they will be easy after you decide what you can afford and arrange your priorities. When you know what you want, take a look at products offered by manufacturers you trust. You'll find that it's difficult to discern vast qualitative differences between products with similar features, so don't be surprised if your ultimate choice turns on how the VCR looks and how easy it is to use. □

Brain vs. Bulk.

FOR UNDER \$625 YOU CAN OWN AN AMPLIFIER JUDGED TO HAVE THE EXACT SOUND CHARACTERISTICS OF AN ESOTERIC \$3000 MODEL.

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

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

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

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

BRAIN vs. BULK. Pictured is a photo of the 20-pound, cool-running M-1.0t. Above it are the outlines of the pair of legendary mono amplifiers used in the *Stereophile* challenge. Even individually, they can hardly be lifted and demand stringent ventilation requirements. And yet, according to some of the most

discriminating audiophiles in the world, Bob's new design is their sonic equal.

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

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

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

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

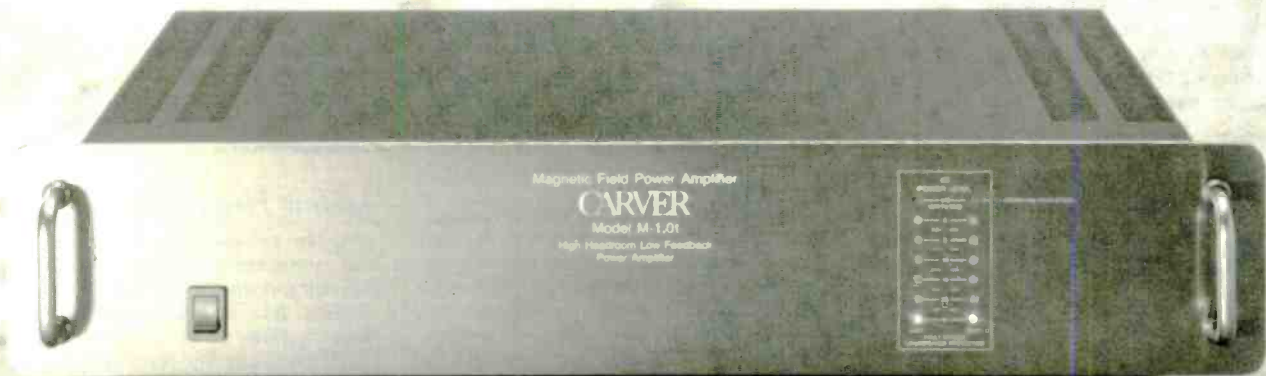
Delivers 1000 watts continuous sine wave output at 8 ohms in bridging mode without modification.

Is capable of handling unintended 1-ohm speaker loads.

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

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

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



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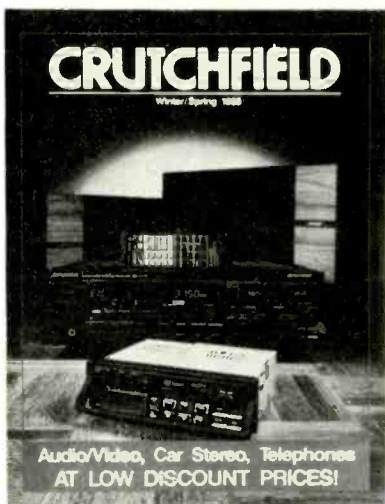
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AUDIO Q&A

by Ian G. Masters



Digital Dynamics

Q *The dynamics of my compact disc player are so extreme as to be very unpleasant. When I turn up the volume to hear the quiet passages, the loud sections are overwhelming. Yet, when I hear the same CD's over a local FM station, they seem well balanced. Is my system causing the difference?*

JAMES J. ALLAIN, JR.
Port Allen, LA

A Yes, it's your CD player doing what it's supposed to. One advantage of the digital format is that it has a dynamic range approaching that of live music—something few of us are used to in our homes. The FM stations love compact discs for other reasons: They are relatively maintenance-free, easy to handle and to store, and undeniably up to date. But the stations often defeat one of the CD's main benefits by compressing their signals.

The higher the level an FM station can feed to its transmitter, the farther its signal will reach. But simply turning up the level would overmodulate the transmitter, which is illegal. By deliberately reducing the music's dynamic range, however, the station can produce a higher average level without increasing the musical peaks that would cause overmodulation. The result is a sonic balance not unlike that of the vinyl records we are familiar with, most of which are also compressed.

There's no question that, in some cir-

cumstances, a really natural dynamic range can be irksome. At background levels or where there is a lot of ambient noise (in a car, for instance), the quieter passages tend to disappear when the fortissimo parts are comfortable. To compensate for this, at least one manufacturer (dbx) includes an adjustable compression circuit in its CD players to duplicate the effect you have observed with FM signals.

Subwoofer Amplification

Q *I plan to supplement my excellent bookshelf speakers with a subwoofer, but I have been told that I will need a separate amplifier for the low end. Is this really necessary?*

ROD GROUNDS
Columbia, MO

A Much of it depends on the particular subwoofer you choose. Some are designed for single-amplifier operation, and these generally contain passive crossover networks that route the appropriate frequencies to the various speakers and prevent serious impedance problems. Others are specifically intended to work with an outboard amplifier or their own built-in amps, and these are usually supplied with electronic crossovers that operate before the amplification stage.

The main appeal of the single-amplifier type is one of cost, but there are some drawbacks. For one thing, the addition of a subwoofer means you will be producing a lot more bass, and low-frequency material demands considerably more power than the rest of the audio spectrum. If your main amplifier has adequate power reserves you could use it to power both the bookshelf speakers and the subwoofer; if not you risk degrading the sound quality you now have. Also, you may not be able to match the level of the subwoofer to that of your main speakers. In this case you could end up with either unbearably boomy bass or not enough bass, which could defeat the whole purpose of adding a subwoofer.

Adding Headphones

Q *My system consists of solid, no-nonsense equipment. But perhaps it's a bit too simple—not one of my components has a headphone output. Is there anything on the market that would allow me to use line-level outputs to feed a headphone system?*

YVAN HUNEULT
Montreal, Quebec

A The only product I know of is the QED HA2 headphone adaptor, which was designed for just that pur-

True Story

KLIPSCH® speakers weren't the first I owned. Fact is, I had another 'highly touted' brand and thought they were wonderful. Those speakers were almost new when a friend came to live with me for a few days between apartments.

He'd put all his furniture in storage, but he brought his KLIPSCH FORTÉs® with him and hooked 'em up next to my speakers. I was ready for the duel and confident my speakers would win.

On the very first CD, the FORTÉs made it clear that I'd been missing a lot in my music. They delivered so much more detail and articulation. So much more dynamic range. The sound was alive. There was no contest.

As soon as my friend moved on, I sold my speakers and bought a new pair of FORTÉs. I was pleasantly surprised at the price. I could have bought them to begin with and saved some money.

I think the FORTÉs are just great. No component in my system, not even my CD player, ever made such a vivid difference. Music never sounded so good to me.

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“In its price category, the Adcom GFA-535 is not only an excellent choice; it’s the only choice.”

Sam Tellig, The Audio Cheapskate

stereophile

Vol. 10 No. 7 November 1987



Adcom GFA-535 power amplifier.

The complete report:

Sometimes products are too cheap for their own good, and people don't take them seriously: the Superphon Revelation Basic Dual Mono preamp, Rega RB300 arm, AR ES-1 turntable, Shure V15-V MR cartridge, and the B&K ST-140 power amp. They can't be any good because they cost so little, right?

Wrong, of course.

Adcom appears to be having the same problem with their \$299.95 GFA-535 amp. Credibility.

Now if this amplifier were imported from England and sold for \$599.95, then maybe it would be taken seriously. And highly praised, no doubt.

For the baby Adcom is one of the finest solid-state amps I have heard. No, not the best; I'm not sure what *is* the best. But it's an amplifier that is so good for so little money as to be practically a gift.

Actually, when Rob Ain from Adcom called, I was about as enthusiastic about the GFA-535 as you were before you finish reading this piece. But Rob insisted, "You've gotta hear this amp."

He brought it over the next day, along with the GFP-555 preamp (\$499.95), and we put both pieces into the rest of the system: a Shure Ultra 500 in a Rega RB300 arm on an AR ES-1 table, with Quad ESL-63 speakers on Arcici stands. Then we chatted for a half hour or so while the electronics warmed up.

And then, simultaneously, the two of us decided to shut up and listen.

"I've never heard the Quad ESL-63 sound better," Rob said. Of course, he was hardly an impartial observer, but the sound was extraor-

dinarily clean, detailed, and musical. If it wasn't the best sound I have ever heard from Quads, it was pretty close.

“Now if this amplifier were imported from England and sold for \$599.95, then maybe it would be taken seriously. And highly praised, no doubt.”

This humble \$300 amplifier was driving a pair of very revealing \$3000 speakers and giving a very good account of itself. (We listened first to some Goran Sollscher classical guitar.)

"So how come this product isn't flying off the dealers' shelves?" I asked Rob.

"I don't know. Everyone wants the GFA-555 with 200 watts per channel. Including people who don't need it."

"Does the GFA-555 sound any better?" I asked.

"No, it's our aim to have all our amps sound pretty much the same. You pay more money, you get more power."

Rob pointed out that while the GFA-535 is rated at 60Wpc, it puts out more like 80. And while I did not do any measurements, my experience with other amps tells me Rob's right. I suppose Adcom doesn't want to steal sales from its GFA-545, rated at 100Wpc and selling for \$200 more.

After a couple of hours, Rob left, grinning from ear to ear, and I later sat down to listen alone. True, when I tried certain Telarc and pushed hard I could get the amplifier to clip—

“... the baby Adcom is one of the finest solid-state amps I have heard... so good for so little money as to be practically a gift.”

two LEDs quickly light up (very useful). But the Quads were running out of the ability to use the power anyway. My first impressions were confirmed: the GFA-535 is one of the best amplifiers around for driving Quads. Spondor SP-1s, too.

Suddenly, it hit me what this meant. Conventional wisdom had been dealt a severe blow. You know, the old saw that you should never power a good pair of speakers with a cheap amplifier. Here was a cheap amp—one of the cheapest on the market—that sounded good with Quads, Spondors, later Vandersteens. Probably Thiels, too—at least the CS1. What it means is you can stretch your speaker budget a bit and get the speakers you really want, then economize by buying an Adcom GFA-535 for \$299.95. True, you may be a little power shy, but probably not much. And to say the least, the GFA-535 would make a decent interim amp.

What does the GFA-535 sound like? (You thought I'd forget that part, right?) Well, this is one of the most neutral amps I've heard. While it doesn't sound particularly tubelike, it avoids the typical transistor nasties through the midrange and into the treble. I wouldn't call it sweet—there's no euphonic coloring—but it isn't cold or sterile. What it is, is smooth. And detailed. Far more detailed than I would

ever imagine a \$300 amplifier could be. The GFA-535 reminds me of the Eagle 2A and PS Audio 200C, amplifiers that sell, respectively, for about three and five times the price. Of course, they have more power. And they *are* more detailed. The point is, the Adcom comes close. Very close.

"The GFA-535 reminds me of... amplifiers that sell... for about three and five times the price."

The bass, like everything else, is neutral, certainly not fat and overdone. But it's here where you notice that this amp is not a powerhouse. You just don't get the solidity and extension you get with a very powerful (and expensive) solid-state amp. Nor do you get the breadth and depth of soundstage that you often find with a very powerful amp. The Adcom GFA-535 sounds a wee bit small, which it is.

My only criticism, and it's more of a quibble, is that the speaker connectors are non-standard and unique (so far as I know). You insert bared speaker wire into a hole and twist the connector tight a quarter turn. Most speaker cables will fit, but some will not. Certainly MIT won't. Neither will the best Kimber, the kind with eight clumps of strands. The less costly four-clump Kimber will, and proved an excellent choice. My sample amp was quiet—no hum—and ran cool. There are selectors for two sets of speakers. And the 535 looks nice.

"This amplifier is so good and so cheap that I think any CD owner who buys an integrated amp is nuts."

And talk about economy: If you're not into LPs anymore, you could buy a Mod Squad, dbx or Old Colony line-level switching box—or possibly a B&K Pro 5 preamp, with its switchable line amp section (only \$350)—and run it with a CD player. In fact, if you are into CD only (no tape, no tuner, no phono), you could buy a CD player with a variable volume output and run it directly into the Adcom. This amplifier is so good and so cheap that I think any CD owner who buys an integrated amp is nuts.

In its price category, the Adcom GFA-535 is not only an excellent choice; it's the only choice. The real question is whether you should buy one even if \$299.95 is much *less* than you planned to spend for an amp—*ie*, whether you should put the money into a better CD player or pair of speakers instead.

ADCOM

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Pointe Claire, Quebec H9R 4X5

pose. It provides outputs for two pairs of phones and retails for \$45 in Canada. If you can't locate this device, or if you find it doesn't allow you enough control, you might add a small integrated amplifier to drive just your headphones. It could take its signal from one of the tape-monitor outputs on your main amplifier, and it would give you separate tone and level controls for your phones. The amplifier could be very modest as neither high output power nor elaborate features would be a consideration. Something like Radio Shack's SA-150 (\$60; \$79.95 in Canada) would probably do the trick, or you might be able to pick up a secondhand amplifier for even less money.

Alternatively, if the addition of a cassette deck is in your plans, you could simply use its headphone output. Many decks—particularly three-head models—continuously read the input signal when left in the source mode, and the recording-level control could be used to adjust the headphone listening level. This might seem to be a fairly extreme option if your only interest is private listening, but you would gain tape-recording capability in the bargain.

Video Hookup

Q *My two VCR's and my TV monitor receiver are connected directly to cable through a three-way splitter, and the video and audio outputs of the VCR's are connected to the two sets of external inputs on the monitor. This arrangement lets me tape two separate programs at the same time, while watching a third, but the setup does not allow copying from one recorder to the other. How can I add that capability?*

DAVID JULIANO
Murrieta, CA

A You might have to reconnect your system every time you want to copy, but equipment differs fairly widely in what it will allow you to do, so some experimentation may reveal a simpler alternative.

The ideal permanent setup would be to feed the audio and video outputs of each VCR to the corresponding inputs of the other and leave them that way. In your case, these outputs are already in use to feed your monitor, but the simple insertion of Y connectors in each output might get around this problem. On the other hand, that might affect your picture—the only way to find out is to try it. An alternative might be to insert switches allowing you to feed the outputs of one VCR either to the monitor or to the other recorder but not both.

One difficulty with such permanent wiring is that while a few video recorders provide switches to select line-level

or RF inputs, the majority are designed so that plugging anything into the line-level input jacks automatically disables the off-air recording capability. Unless you are willing to have the input circuitry altered in your machines, this feature means that you will have to do at least some plugging and unplugging.

A compromise solution would be to designate VCR A as the off-air machine and VCR B as the dubbing machine. Simply connect the A outputs to the B inputs. That would leave VCR A free to record programs from cable, and copies could be made from A to B without altering your wiring. Your only sacrifice would be the capability of recording two programs simultaneously, but this could easily be restored on the rare occasions you need it by unplugging the input jacks on VCR B.

Music Surround

Q *Both the Dolby and enhancement features on my surround-sound decoder work well with music, but when I play QS-encoded recordings, I don't hear the discrete four-channel effects I expect. Are today's surround decoders capable of working with the older quad systems?*

TIM STEVENS
San Antonio, TX

A No. The older recordings may produce some pleasant sounds when played through a modern decoder, but these effects won't be what the original recording engineers intended.

Although the older matrix four-channel systems—QS (or RM) and SQ—share with Dolby Surround the extraction of out-of-phase material as a means to create acoustic space, they did it in different ways and with a different purpose. Dolby Surround is designed to produce a center-front signal for dialogue, left and right signals for music and sound effects, and a single rear surround channel (usually fed to two or more speakers). The system works best with specially encoded material, but a simulation of the effect can be accomplished by using the out-of-phase signals inherent in conventionally recorded stereo programs.

The older systems were designed for two speakers in front and two behind, each receiving a distinct signal—at least in theory. This arrangement required a matrix quite different from that used by the Dolby Surround system and a different sort of mix in the recording process. The old and the new are, therefore, incompatible. In any event, the four-channel matrix systems of fifteen years ago hardly produced discrete signals at all four speakers. If they had, they might have survived. □

by Julian Hirsch



Amplifier Classes

BESIDES power and distortion levels, one of the most publicized characteristics of amplifiers is "class." Audio amplifiers are, or have been, variously referred to as Class A, AB, B, D, G, H, and so forth. The ads usually imply, if they do not state unequivocally, that the class of the newest amplifier is responsible for a host of superior sound qualities. Let's see what amplifier class really means.

For convenience, I will use vacuum-tube amplifiers to illustrate the differences between classes of operation, since in this respect tubes and transistors are very similar. Before the advent of the transistor, there were universally understood definitions of a tube's operating class, which refers to the portion of the signal cycle during which current flows between the tube's cathode and anode (plate). By "signal cycle" I mean the overall amplitude variation, from positive peak to negative peak, during the period of a repetitive signal waveform. In the case of a sine wave (normally used for mea-

surements and performance definitions), the two halves of the waveform have equal amplitudes.

For linear operation, with lowest distortion, the tube had to conduct current 100 percent of the time, and in a *Class A* amplifier the idling, or no-signal, plate current was set so that it was never cut off, even during the negative half-cycle of the signal. *Class A* operation is inherently very inefficient. The tube (or transistor) draws a constant current, and thus power, from its power supply, dissipating as heat all the current except the amount delivered to its load as useful output. The maximum theoretical efficiency of a *Class A* amplifier stage is 50 percent, but in practice it is likely to be about half that much.

Unlike the other classes, a *Class A* amplifier runs hottest with no signal input and coolest at maximum output. Incidentally, some power amplifiers claimed to be "Class A" are nothing of the sort. Look at the specifications: If the no-signal and full-signal power consumption from the power line are different, the amplifier's operation is *not Class A!*

A practical *single-ended Class A* amplifier is not actually "distortionless"; all else being equal, it merely has lower distortion than amplifiers in the other classes. To develop higher power without excessive distortion, the *push-pull* amplifier circuit was usually used. Two tubes were operated so that each amplified only half of the waveform, either positive or negative, with the two halves being combined in the output load.

The push-pull configuration cancels out even-order harmonics, making it superior to a single-ended stage in distortion as well as power output. In the push-pull configura-

tion, it is no longer necessary for each tube to conduct current 100 percent of the time, since each handles only half of the signal waveform. If each tube draws current only during the half-cycle during which it is amplifying the waveform, its average power consumption (and heat dissipation) will be greatly reduced. Theoretically the tubes could be operated with *no* static plate current, corresponding to a cutoff condition, in the absence of a signal.

The theoretical efficiency of such a *Class B* amplifier is about 75 percent, although in practice it is likely to be much lower. Also, the output devices of a *Class B* amplifier (or *Class AB*—see below) have their greatest power dissipation at about one-third of their maximum output, which is why the Federal Trade Commission chose that level for preconditioning a home hi-fi amplifier in order to bring it to its maximum temperature.

Unfortunately, theory and practice differ somewhat. Real tubes (and transistors) are not ideal devices, especially near their cutoff regions, so it is necessary to operate them with a small idling current. Even so, the transition between the two halves of a push-pull pair when the signal waveform reverses polarity is not perfectly smooth. There is inevitably a notch in the output waveform at the crossover point, giving rise to the term "notch distortion" (or "crossover distortion"). This distortion, which consists largely of higher-order harmonics, becomes more severe as the signal level decreases.

Although there are various ways to reduce the influence of crossover distortion, one of the most widely used is to allow each side of the push-pull stage to carry somewhat more than half of the waveform. In other words, the tubes conduct during more than half of the cycle. This type of operation is called *Class AB*, indicating that it falls between the two basic classes. It also shares some properties of each, with higher distortion and higher efficiency than a *Class A* amplifier but lower distortion and lower efficiency than *Class B* operation.

Virtually every hi-fi power ampli-

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Velodyne ULD-12
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fier uses some form of Class AB operation. In most cases, the output devices operate with a fixed bias current (the factor that determines the class of operation). In some amplifiers, however, the bias is controlled by the signal amplitude. Amplitude-controlled bias allows the amplifier to operate effectively in a pure Class A mode when the signal level is low, which is almost all the time in home music systems, and to make an automatic transition to Class AB or even pure Class B operation for high signal levels. Such a design provides the best features of both classes.

A practical single-ended Class A amplifier is not actually "distortionless"; all else being equal, it merely has lower distortion than amps in other classes.

What about the other classes of amplifier operation? Some have no official standing, being named by their designers to distinguish them from more conventional operation. Usually their novelty lies in a signal-controlled power supply, one whose voltage is low for normal

operation and increases to meet higher power demands. Hitachi used to call its amplifiers "Class G," and Soundcraftsmen for a time used "Class H" for a similar purpose. Carver, whose amplifiers using a signal-controlled power supply have been among the most enduring examples of that genre, forbore assigning a letter designation and describes the design in terms of one of its circuit elements, as a Magnetic Field power amplifier. In recent years, manufacturers have generally stayed with variations of the conventional designations for their amplifiers' operating classes.

There are a couple of other classes that are not commonly used but should be discussed. *Class C* is one of the oldest amplifier modes, but it is not suitable for audio amplifiers. A Class C amplifier is biased far beyond cutoff, drawing current only during the peaks of the waveform. The output is largely what we would call distortion—a series of brief pulses. In a radio-frequency (RF) amplifier, the resonant circuits forming part of the amplifier load filter out the harmonics, leaving the fundamental component. Class C amplifiers can be highly efficient (typically 75 percent or more, and sometimes over 90 percent) and are widely used in radio.

Class D amplifiers have appeared

from time to time, although they have never been widely used in home hi-fi systems. They are pulse amplifiers, using repetitive high-frequency pulses that are modulated in

Class AB amplifiers have higher distortion and higher efficiency than Class A amplifiers, lower distortion and lower efficiency than Class B amplifiers.

some form by the analog signal. The modulation may be in the form of pulse-width or repetition-rate variations or a group of pulses expressing an instantaneous signal amplitude as a digital number. One thing all Class D amplifiers have in common is a pulse signal that drives the output device between cutoff and saturation. Ideally, the efficiency of such an amplifier can approach 100 percent, since the output devices are either fully on or fully off. While on, they are passing the maximum current but have almost no voltage across them; while off, they carry the full power-supply voltage but are passing no current. The result is very low power dissipation.

The low heat dissipation of a Class D amplifier makes it ideal for use in confined spaces or when a high-power amplifier must be operated without adequate ventilation. Some automotive applications make good use of this property, as do a few powered speakers. I can recall only one Class D amplifier for home use, manufactured for a limited time by Sony a number of years ago. The shielding and filtering needed to confine the high-power pulses in the amplifier's cabinet made it rather expensive.

Now that you have been exposed to some of the "alphabet soup" of amplifier classes, you should be able to interpret advertising claims for a "Class XY" amplifier with a better understanding of what they mean. The operating class is important to the designer, sometimes even more important to the marketing department, but it really should be of little concern to the consumer. □



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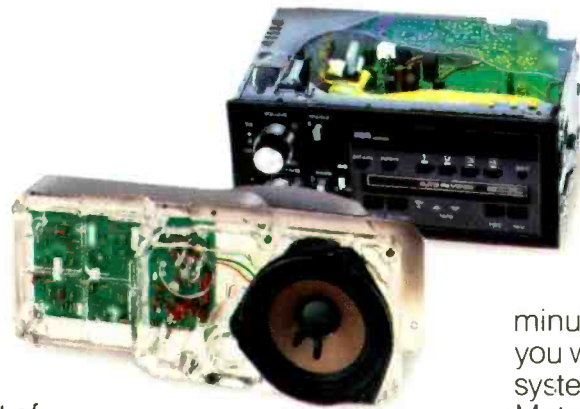
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TEST REPORTS



DBX CX1 PREAMPLIFIER AND BX1 POWER AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

THE dbx company is best known for its proprietary signal-processing and noise-reduction circuits and products, supplemented in recent years by the innovative Soundfield loudspeakers. Recently dbx displayed and demonstrated a remarkable preamplifier and power amplifier as well as a top-quality AM/FM tuner with Schotz noise reduction, thereby joining the ranks of full-line hi-fi manufacturers.

We have now had the opportunity to evaluate production samples of the dbx CX1 preamplifier and BX1 power amplifier. Each is unique in both its features and circuit design, and both units more than lived up to the promise of the prototypes we

saw at the Consumer Electronics Show last June. Although their prices mark them as "high-end" products, we would not be surprised to see lower-priced versions appear in the dbx lineup before too long.

CX1 Audio/Video Preamplifier

The CX1 preamplifier's video capabilities include input/output switching for both the video and audio sections of a VCR and a VDP (videodisc player). Selected video signals also appear at a video-monitor output jack in the rear of the preamplifier. Of course, the CX1 has full audio tape-monitoring facilities, and any or all of the video

switching circuits can be used for audio instead of video program sources.

Another feature primarily directed at video applications is a Dolby Pro Logic Surround decoder. Since Dolby is a major rival of dbx, the inclusion of a Dolby decoder raised a few eyebrows at the June presentation, but dbx explained that it has used its own proprietary rms detectors and voltage-controlled amplifiers to exceed Dolby's professional surround standards.

In addition to the preamplifier's normal stereo outputs (left and right front), the CX1 has a pair of rear outputs that can supply decoded surround signals to a second stereo power amplifier for speakers located at the rear or sides of the listening/viewing room. In addition, a center-channel output from the preamplifier can supply a summed (L + R) signal above 100 Hz to an extra amplifier and a center front speaker in order to maintain centered dialogue for viewers far off the center

JOOK LFUNG

TEST REPORTS

FEATURES

CX1 Preamplifier

- Inputs for phono (MM or MC), tuner, auxiliary, CD, video sources
- Tape inputs and outputs for audio and video sources
- Tape-dubbing facilities for video and audio programs
- Video-monitor output
- External-processor signal loop; processed signals switchable to tape-recorder input
- Separate front- and rear-channel outputs
- Switchable center-channel audio output with level control
- MM phono input capacitance switchable to 50, 100, or 200 pF
- MC phono input resistance set at 100 ohms; internally adjustable to 50 or 200 ohms
- MC phono gain set at 20 dB; internally adjustable to 26 dB
- Ambience-recovery system with separate time delays for each channel
- Dolby Surround Pro Logic decoder
- Tone controls with switchable characteristics
- High-cut filter
- Variable channel separation; channel-reversing buttons
- Five AC outlets (three switched)

- Headphone jack; switchable mute for other outputs
- Gold-plated connectors and jacks
- Separately regulated power supplies for time delay, headphone amplifier, line amplifier, phono preamplifiers, video section

BX1 Power Amplifier

- Switchable to two-, three-, or four-channel operating modes
- Contains four power amplifiers, bridged for two-channel mode
- Rated continuous output 400 watts per channel into 8-ohm speakers in two-channel mode, 100 watts per channel in four-channel mode
- Class A operation at low power outputs, Class B at higher outputs for greater efficiency
- Direct-coupled throughout, with input capacitor
- Thirty-two discrete 250-watt high-speed bipolar output transistors
- Two 3,200-VA toroidal power transformers with separate rectifiers for each channel
- Thermal-protection circuits
- Speaker fuses in feedback loop
- Front-panel indicator lights for output mode and overload

LABORATORY MEASUREMENTS

CX1 Preamplifier

Frequency response (through high-level inputs, EIA-standard load): 20 to 20,000 Hz ± 0.1 dB

Output at clipping: 10 volts

Harmonic distortion (THD + noise at 1,000 Hz): 0.0016% at 1 volt; 0.0027% at 9 volts

Sensitivity (for a 0.5-volt output): high-level input, 60 mV; MM phono, 1 mV; MC phono (20-dB gain), 0.1 mV

A-weighted noise (referred to a 0.5-volt output): high-level, -99 dB; MM phono, -85 dB; MC phono (20-dB gain), -80 dB

Input-overload level: MM phono, 130 to 180 mV, depending on frequency

Phono-input impedance (MM): 47,000 ohms and 70, 105, or 175 pF

RIAA phono-equalization error: +0.1, -0.03 dB from 20 to 20,000 Hz

Tone-control range: 100 Hz, ± 4 dB with 120-Hz turnover, ± 8.5 dB with 300-Hz turnover; 10,000 Hz, ± 5.7 dB with 4,000-Hz turnover, ± 6 dB with TILT setting

Rear-channel (ambience)

frequency response: +0.2, -1.3 dB from 10 to 8,000 Hz

BX1 Power Amplifier

1,000-Hz continuous power output at clipping (two-channel mode): 512 watts into 8 ohms, 812 watts into 4 ohms, 1,225 watts into 2 ohms

Clipping headroom (relative to rated output): 1.1 dB (8 ohms), 0.97 dB (4 ohms), 1.85 dB (2 ohms)

Dynamic power output: 935 watts into 8 ohms, 1,580 watts into 4 ohms, 1,600 watts into 2 ohms

Dynamic headroom: 3.7 dB (8 ohms), 3.9 dB (4 ohms), 3 dB (2 ohms)

Harmonic distortion (1,000 Hz): 8 ohms, 0.0047% at 1 watt, 0.01% at 500 watts; 4 ohms, 0.0072% at 1 watt, 0.024% at 800 watts; 2 ohms, 0.0153% at 1 watt, 0.07% at 1,200 watts

Sensitivity (for a 1-watt output): 50 mV

A-weighted noise (referred to a 1-watt output): -86.3 dB

Frequency response: ± 0.1 dB, 5 to 20,000 Hz; -3 dB at 135 kHz

axis of the speakers. Below 100 Hz, the program information is channeled only to the regular left and right speakers, permitting the use of a small center speaker without loss of bass. There is a rear-panel CENTER LEVEL control, and a switch restores normal Dolby directional enhancement when a center speaker is not used.

The CX1 also has a SURROUND LEVEL control, a SURROUND INPUT LEVEL control (with lights to show when the level is in the proper range), and a SURROUND INPUT BALANCE control. Internal noise-test sources simplify adjustment and calibration of the Dolby Surround system.

Another feature of the dbx CX1 is its digital time-delay system, which is used in Dolby Surround decoding and also for stereo ambience enhancement. A switch selects normal two-channel operation, one of three modes of ambience recovery, or Dolby Surround decoding. The ambience system uses two digital delays, factory set to 19.1 milliseconds (ms) for the left channel and 21.8 ms for the right channel. The delays can be adjusted individually between 13.7 and 32.8 ms, in steps of 2.7 ms, by shifting small jumpers and switch settings on the unit's digital circuit board.

One ambience mode sends the delayed difference signals (L - R and R - L) to the two ambience speakers, another sends the left- and right-channel delayed signals directly to the corresponding rear speakers, and the third introduces a constant 90-degree phase difference between the left and right signals, sums and subtracts the modified signals, and feeds the result to the side or rear ambience speakers. Each of these techniques favors music recorded with a particular type of miking (simple or complex). The delayed channels have an 8,000-Hz nominal upper limit.

The more conventional features of the CX1 include center-detented balance, bass, and treble controls and a stepped (detented) volume control. Pushbuttons select a 120- or 300-Hz bass turnover frequency and change the treble-control characteristic from a 4,000-Hz shelved response, which provides a nearly

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uniform boost or cut from 5,000 to 20,000 Hz, to a unique TILT mode, which introduces a uniform, gentle up or down slope over the full audio range above 200 Hz. The maximum slope is only 1 dB per octave, which amounts to 7 dB at 20,000 Hz. The tone controls give truly flat response in their center positions, but they can be completely removed from the circuit by a bypass pushbutton. There is also a switchable high-cut filter with a 12-dB-per-octave slope above 8,500 Hz.

The phono preamplifier has separate inputs for a moving-magnet (MM) or a moving-coil (MC) cartridge, and the latter has its own separate amplifying stages. A switch in the rear of the preamplifier selects shunt capacitances of 50, 100, or 200 picofarads (pF) across 47,000 ohms for an MM cartridge. The MC amplifier normally has a gain of 20 dB and an input resistance of 100 ohms (shunted by 1,000 pF), but these values can be changed, respectively, to 26 dB and either 50 or 200 ohms by shifting internal gold-plated jumpers on a circuit board. The instruction manual gives explicit information on these procedures.

The major visible controls of the CX1 are the large power button and the surround-level, balance, tone, and volume knobs. Five flat push-buttons select the program source (video, auxiliary, CD, tuner, phono); lights above them identify the input selection.

The lower half of the CX1's front panel hinges downward, exposing a number of less frequently used controls. Small knobs operate the ambience-recovery and surround functions, including setting the input level (with high and low indicator lights) and the Dolby balance. Another knob selects the recording output signal: the selected listening source, the tuner, or, for dubbing, any of three connected tape decks. The last knob is a continuously variable channel-separation control, which varies the program from mono (L + R), through stereo, to a difference (L - R) signal. Large buttons select the tape-monitoring source (T1, T2, T3) or the listening source. Two small buttons can be used to connect either channel to

both stereo outputs or to reverse the normal channel orientation.

Other buttons behind the hinged panel select the tone-control characteristics, bypass the tone controls entirely, activate the high-cut filter, insert a device connected to the rear external-processor jacks into the signal path, feed the external device's output to the tape-recording outputs, or silence the preamplifier's line-level outputs for listening only through headphones.

The rear apron of the CX1 contains the audio and video input and output jacks, all of which are gold-plated. The five AC convenience outlets have a total power rating of 1,000 watts, and three of them are switched, allowing the CX1 to control the other components of the system.

The dbx CX1, finished in black, measures 17 inches wide, 15½ inches deep, and 3½ inches high. It weighs 17 pounds, and it comes with premium-quality signal cables (Monster Cable Interlink 300).

BX1 Configurable Multichannel Amplifier

The CX1's companion, the BX1, is as unique among power amplifiers as the CX1 is among preamplifiers. Its name offers clues to two of its unusual features: It can be configured by a simple slide switch to operate as a two-, three-, or four-channel amplifier. The BX1 is designed to drive *any* conceivable loudspeaker load at its full rated power without loss of performance or damage to the amplifier. And that power is enormous: In its two-channel mode, the BX1 is rated for 400 watts per channel into 8 ohms, 650 watts into 4 ohms, 800 watts into 2 ohms, and 1,200 watts into 1 ohm! Except for the last, these ratings are for *continuous* power per channel, both channels driven, from 20 to 20,000 Hz with no more than 0.05 percent distortion. The 1-ohm rating is a short-term figure, not because of limitations in the amplifier itself but because its fuses cannot sustain such a power drain continuously.

Sliding the mode switch to its four-channel position converts the BX1 to an amplifier with a contin-

uous rating (per channel) of 100 watts into 8 ohms, 200 watts into 4 ohms, 325 watts into 2 ohms, and 400 watts into 1 ohm. The last figure is set by the unit's continuous-current capability of 20 amperes; it will deliver peak currents of 100 amperes into 0.1 ohm on the 20-millisecond tone bursts of an EIA dynamic-headroom test signal. The third mode, three-channel operation, is designed for use with a conventional pair of stereo speakers plus a subwoofer. The main speakers are driven by two of the BX1's amplifiers in their four-channel configuration, while the other two are bridged to form a higher-power amplifier for the subwoofer.

Essentially, the dbx BX1 contains four separate power amplifiers, which are switched to a bridged configuration for higher-power two-channel operation. This design imposes the usual limitation of bridged amplifier operation; in the two-channel mode, the speakers cannot have a common ground connection.

The BX1 is a huge, heavy amplifier. Its power stages have no output-limiting protection circuits, depending only on thermal-protection devices to safeguard the transistors. It is also unusual among high-power amplifiers in having no cooling fan, thereby eliminating a major source of acoustic noise in a music system. Each of its four amplifiers has eight 250-watt bipolar power transistors—a total of thirty-two in all. The power supply uses two huge 3,200-VA toroidal transformers, with separate rectifiers for each channel. The amplifiers are direct-coupled throughout, with an AC-coupled input and a DC servo to maintain the output offset at less than 5 millivolts.

The *only* control on the front panel of the BX1 is a large rocker-type power switch. Illuminated labels show its operating mode and the operation of its thermal-protection systems as well as instantaneous overload in each of its four sections. On the rear of the amplifier are four pairs of speaker connectors (five-way binding posts that accept wires or banana plugs), four gold-plated input connections, and the three-position mode-selector switch.

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Clear markings show which speaker terminals are to be used for each mode and the polarities of their outputs. There are holders for the two line fuses and four speaker fuses (the speaker fuses are normally rated for 3 amperes, but 7-ampere fuses are also furnished for two-channel operation into very low-impedance speakers). In order to keep the resistance of the speaker fuses from affecting the system's frequency response, the fuses are located within the amplifier's overall feedback loop.

The dbx BX1, finished in black, measures 19 inches wide, 24½ inches deep, and 7 inches high, and it weighs 84 pounds. The amplifier is furnished with four dual-banana plugs (and a small screwdriver) for the speaker connections. Its heat sinks occupy the full length of both sides. Sturdy handles on the front panel assist in lifting the amplifier (if you *can* lift 80 pounds!), and handles on the rear allow it to be rested on its end without damaging the speaker connectors. Prices: CX1, \$3,700; BX1, \$2,500. DBX, Dept. SR, 71 Chapel St., Newton, MA 02195.

Lab Tests

The CX1 preamplifier surpassed its maximum-output-voltage rating of 9 volts, clipping at 10 volts into an EIA standard load of 10,000 ohms and 1,000 picofarads (pF). Its

1,000-Hz distortion between 1 and 9 volts output was between 0.0013 and 0.0027 percent. A reference output of 0.5 volt required a high-level input of 60 millivolts (mV), an MM phono input of 1 mV, and an MC phono input of 0.1 mV (0.025 mV with the optional higher gain setting of the MC preamplifier). The A-weighted noise level through these inputs was respectively -99, -85, and -80 dB referred to a 0.5-volt output.

The MM phono input overloaded at 130 to 180 mV over the 20- to 20,000-Hz audio range. Its input impedance was 47,000 ohms in parallel with a capacitance of 70, 105, or 175 pF, depending on the setting of the switch in the rear of the unit. The stereo channel separation was 85 dB at 1,000 Hz and 66 dB at 20,000 Hz. Crosstalk from the AUX input to the MM phono input was -105 dB at 1,000 Hz and -90 dB at 20,000 Hz.

The rear (ambience) channels had exactly the specified time delays, 19.1 and 21.8 ms. The frequency response of the delayed channels was flat within ± 0.2 dB from 20 to 4,000 Hz, dropping to -1.3 dB at 8,000 Hz and -5.8 dB at 9,000 Hz.

The tone controls had the specified characteristics. The 300- and 4,000-Hz settings provided the response of an excellent conventional tone control. The 120-Hz bass setting affected the response only be-

low that frequency and was able to enhance the low-bass portion of a speaker's output without introducing any perceptible heaviness on most program material. The high-frequency "tilt" began at about 200 Hz and increased uniformly at the rated 1 dB per octave to a ± 7 -dB variation at 20,000 Hz.

The high-cut filter lowered the response 3 dB at 9,000 Hz, with the rated 12-dB-per-octave slope above that frequency. The RIAA phono equalization was virtually perfect, varying less than 0.15 dB overall from 20 to 20,000 Hz.

The impressive power ratings of the BX1 amplifier proved to be exceedingly conservative. The obligatory 1-hour preconditioning at one-third rated power made the external surface of the amplifier, including its heat-sink fins, only moderately warm, and its 1,000-Hz output clipped at 512 watts per channel into 8-ohm loads, 812 watts into 4 ohms, and 1,225 watts into 2 ohms. We measured the output into 2 ohms with only one channel driven because of the limitations imposed by a standard 15-ampere power circuit, but the others were measured with both channels driven. A 50-mV input drove the amplifier to a reference output of 1 watt, and its A-weighted noise level was 86.3 dB below that power.

The dynamic power measurements were equally noteworthy. The maximum short-term (20-ms) outputs ranged from 935 watts into 8 ohms to 1,600 watts into 2 ohms. These figures dropped only slightly with burst durations up to 300 ms. The amplifier's slew factor was 6.5, with a slight visible waveform distortion appearing at about 130,000 Hz when we drove it to its rated 400 watts into 8 ohms. The low-level frequency response was flat within 0.1 dB overall from 5 to 50,000 Hz, falling to -3 dB at 135,000 Hz. Driving 8-ohm loads at levels from full to one-tenth rated power, the amplifier had distortion levels between 0.003 and 0.006 percent from 20 to 1,000 Hz, rising to just under 0.1 percent at 20,000 Hz.

Comments

In the excellent instruction manual for the BX1, dbx points out that



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the sonic differences sometimes reported to exist among power amplifiers generally reflect the variations with frequency of the speaker impedance and the internal impedance of the amplifier. To a great extent, these internal variations are caused by the series inductors used in many amplifiers to isolate them from the load at ultrasonic frequencies. The amplifier's source impedance increases with frequency because of the inductor, and, together with the speaker's changing impedance, it produces a frequency-response variation that can amount to a good fraction of a decibel in the audible range. Keen-eared listeners, hearing this effect, tend to blame (or credit) the amplifier.

The dbx BX1 does not have an output inductor, and its damping factor is over 100 even at 20,000 Hz. The manufacturer calls the result a "load-invariant response" and claims that the amplifier's frequency response is unaffected by any speaker they know of.

We did not have an opportunity to use the BX1 with many different speakers. We did our listening with Allison IC20's, which may not have put the "load-invariant response" of the BX1 to the test but are exceptionally neutral-sounding speakers,

and the combination was highly compatible. Initially, we used the two-channel mode of the amplifier. We later switched to the four-channel mode, using the ambience channels of the CX1 preamplifier and playing them through small speakers along the sides of the room just forward of the listening position.

The effect was, in many respects, superior to what we have heard from a number of more elaborate time-delay systems. The sound was more natural, with time delays ideally suited to a normal room size. We did not try out the Dolby Surround system, but we have no doubt that it performed at least as well as the stereo ambience enhancement.

The CX1's tone controls were outstanding. The TILT high-frequency characteristic was extremely effective in taming the harsh and uncomfortable highs found in some CD's (which have been wrongly accused of demonstrating a fundamental weakness of the CD format). The system was 100 percent free of transients while being turned on or off and during any control operations. We also appreciated the dead silence of the fanless amplifier, as well as the fact that no part of its exterior became more than faintly

warm during any part of our normal-use testing.

Nothing is perfect, however, not even these superb components. On our CX1 sample, the set screw of the knob that selects the ambience-recovery system came loose, and the knob came off in my hand. Ordinarily, this is hardly a matter to complain about, but I found that the portion of the knob containing the set screw was completely within the preamplifier and totally inaccessible. Short of a major disassembly, I could see no way to tighten the knob. Maybe it won't happen often—but it happened to me.

A more basic design weakness concerns the action of the tone-control bypass switch and its signal light (a red LED on the upper panel that shows the setting of this switch when the hinged part is closed). The switch marking says TONE CTRL, which according to good human-engineering practice should *activate* the indicated function when the button is pushed, but it actually *disables* the circuit. The red light comes *on* when the button is pushed, so that it indicates when the tone controls are *out* of the circuit instead of in use as one would expect.

Unless there is some special significance to the tone-control bypass arrangement that escaped our attention, it is an ergonomic flaw—but it is the only thing we could find about the CX1 or the BX1 that was less than ideal. These components, while undeniably expensive, deliver commensurate value. It would perhaps be a slight exaggeration to call a \$6,200 preamplifier/power-amplifier system a "bargain," but these come pretty close to qualifying. They are superbly constructed, imaginatively engineered, and highly flexible, and the BX1 is one of the most powerful amplifiers ever manufactured for home use. Perhaps best of all, they sound as good as they measure, thanks in good part to genuinely useful tone controls and a built-in ambience-recovery system that ranks with the best. All in all, the CX1 and BX1 place dbx squarely in the high-end market, and with products that deliver *true* value for the money.

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DAVID KELLEY

VAN ALSTINE TRANSCENDENCE COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

FRANK VAN ALSTINE specializes in modifying stereo components that are basically well designed but which use some components or circuits that may limit their potential sound quality. In almost every case, he uses the original chassis and most of the original components, changing or adding parts only when the result is a significant listening benefit at a moderate increase in cost. A typical Van Alstine product modification thus provides many of the listening advantages of high-end components at a fraction of their price.

The Transcendence is the first Van Alstine-modified CD player we have seen. Like his previous modifications, it is based on a moderately priced commercial product offering exceptional performance for its price. In this case, Van Alstine uses one of a number of Philips CD players, which are sold in this country as the Magnavox Models 460, 560, 465, 471, 472, or 473 or as the equivalent Sylvania or Philco models. New, stock machines are used, or the customer can supply any of these models for modification provided it is in good condition.

The original CD player has

separate quadruple-oversampling (176.4-kHz) digital-to-analog (D/A) converters with digital and analog filtering for each channel. According to Van Alstine, the analog section of the standard player does not have a high enough slew rate or current capacity to drive its analog filters and line outputs without reaching saturation or cutoff under some conditions. Since these effects can cause audible intermodulation distortion in spite of the ultrasonic frequency of the signal, the Van Alstine modification consists of adding a new driver stage before the analog filter.

Two new circuit boards are used for each channel. The first is a current-to-voltage converter with a much higher current capability than the original amplifier stage. According to Van Alstine, it can deliver almost one hundred times the signal current of the original analog driver, and its slew rate of nearly 200 volts per microsecond enables the player to handle 176.4-kHz signal components from the D/A converter without overloading.

The second board is a 12-dB-per-octave active analog filter with a 44-kHz cutoff frequency, driven by an

other high-current stage like the one used in the first board. Since these circuits are required for each channel, an assembly of four boards is used in each conversion. It is mounted on an unused portion of the original chassis and wired to the main board of the player. A fifth added circuit board, located just behind the front panel, is the power supply for the new circuits.

Van Alstine points out that his modifications have little or no effect on the standard measured audio performance of a CD player and indicates that such measurements of the Transcendence should be about the same as those of an unmodified unit. Our test sample was based on the Sylvania CD-1465. To compare its performance, both measured and subjective, with that of the original unit, we also obtained a stock Sylvania CD-1465. The two were measured side by side under identical conditions and compared in A/B listening tests using synchronized playback of identical discs.

The Sylvania CD-1465 is a relatively inexpensive product (\$279) with most of the standard operating features of current CD players. Like other models based on the same basic player, the CD-1465 has the Philips Favorite Track Selection (FTS) feature, which allows the nonvolatile storage of track playback sequences for a large number of discs. Once a program has been memorized, the player recognizes

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the same disc at any later time and plays its tracks in the programmed sequence. Depending on the number of programmed tracks per disc, up to 254 discs can be entered in the FTS memory.

A new Van Alstine Transcendence player retails for \$870, including UPS delivery anywhere in the continental United States. The price to modify a customer's own machine is \$670. Audio by Van Alstine, Dept. SR, 2202 River Hills Dr., Burnsville, MN 55337.

Lab Tests

For the most part, the modified machine and the stock CD-1465 yielded identical measurements, within the normal range of variation to be expected between different production samples. The only clear differences were in frequency response and channel separation.

The standard player had an extremely flat response, ± 0.05 dB from 20 to 20,000 Hz, but the Transcendence's output began to roll off above 3,000 Hz, to -0.5 dB at 10,000 Hz and -1.3 dB at 20,000 Hz. Both channels were identical and, as in the stock unit, very closely matched in level. Both players had the same channel separation, an

exceptionally good 106 to 110 dB, up to 1,000 Hz. The stock CD-1465 continued that characteristic to the top of the audio range, reading over 110 dB at 10,000 Hz and 101 dB at 20,000 Hz, but the Van Alstine modification's separation decreased to 92 dB at 10,000 Hz and 86 dB at 20,000 Hz.

The observed differences were consistent with the nature of the modifications, and neither effect has the slightest audible significance. Van Alstine's aim, as we understand it, is to trade off minuscule "degradation" of some measurable parameters, such as harmonic distortion, for what he considers to be a worthwhile improvement in the overall sound quality.

Therefore, we gave little weight to these measured differences, preferring to rely on listening comparisons to judge the value of the modifications. The modified and unmodified units were connected to a dbx CX1 preamplifier, which drove a dbx BX1 power amplifier and a pair of Allison IC20 speakers. Identical compact discs were placed in the two players and cued to within 1 second.

Considering that we have not been able in the past to detect mean-

ingful differences in sound quality between comparable CD *players* (as distinguished from *CD's*), we were especially curious about the effect of the Van Alstine modifications. Unfortunately, using the several duplicate discs on hand, we were never able to detect the slightest change when switching between the two players. The dbx preamplifier switched with total silence, so that there were no extraneous audible indications that any change had taken place. Of course, the high-frequency difference would probably be audible in an A/B comparison if the program contained substantial energy between 10,000 and 20,000 Hz, but very few CD's do. In any case, no recording we used disclosed this response change, which certainly would be trivial even if audible.

Comments

Some people with very acute hearing might be able to hear the frequency-response effects that we measured. That is hardly the point, however. Van Alstine's changes to the stock player can be meaningful only to those who have previously been bothered by (or, at least, aware of) the intermodulation effects that the modifications were designed to eliminate.

So, regretfully, I must conclude that as far as I am concerned Van Alstine's hypothesis is as yet unproven. That does not mean that his modifications do not bring the claimed benefits, only that perhaps the problems they were designed to solve are subtle enough or infrequent enough that solutions to them are not necessary.

Whether the price of a Van Alstine Transcendence is justified is something each prospective purchaser must decide for himself. It is worth mentioning, however, that the Sylvania CD-1465 and its close relatives, modified or not, are impressively good CD players. They do not have the mechanical smoothness and silence (especially of the disc-loading mechanism) or the quality of finish of some CD players we have used, but they also do not have their price tags! And few CD players at any price can better their performance measurements.

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FEATURES

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- Repeat entire disc

LABORATORY MEASUREMENTS

Maximum output level: 2.14 volts
Total harmonic distortion at
1,000 Hz: 0.0022% referred to 0 dB, 0.0084% referred to -10 dB, 0.012% referred to -20 dB
Signal-to-noise ratio (A-weighted): 120 dB
Dynamic range: 96.6 dB
Channel separation: 106 dB at 1,000 Hz, 86 dB at 20,000 Hz
Frequency response: $+0$, -1.3 dB from 20 to 20,000 Hz

Maximum phase shift (from 100 to 20,000 Hz): 3.6 degrees at 100 Hz
Cueing time: 4.5 seconds
Cueing accuracy: A
Impact resistance: top, C; sides, B
Defect tracking: tracked maximum-level defects on Philips TS5A test disc



Instant-on radar: How it works. How to defend yourself.

Instant-on radar—sometimes called “pulse” radar—has been around for years. But it’s being used more frequently now as radar operators try to defeat detector users. Here’s how it works.

First things first

Ordinary radar and instant-on radar use exactly the same type of radar beams. In fact, most radar guns can operate either way. It’s just a matter of which buttons the operator pushes.

How ordinary radar works

In an ordinary radar trap, the radar gun is aimed at traffic and it continuously transmits a beam of radar waves. The effective range for the radar to “see” your speed is less than a half mile for most cars, longer for trucks.

How radar detectors work

A radar detector is a radio receiver tuned to radar frequency. A high-performance radar detector is sensitive enough to pick up the radar waves before you drive within speed-measuring range. It’s as simple as that.

How instant-on radar works

The instant-on radar trap is set up just like an ordinary radar trap. The only difference is that the gun doesn’t transmit until the operator pushes a button. So there is no radar signal for a radar detector to find.

Then when you’re within speed-measuring range, the operator triggers the beam. Hence the term “instant-on.” The radar reads your speed within a fraction of a second, too quickly for a human to respond.

Your only hope

Because instant-on radar is faster than your reflexes, your only defense is to identify it before you are within its range. You must detect it when the operator zaps the traffic ahead of you. For this, your detector must reach out for distant radar signals.



The Kustom Signals HR-8 and KR-11, two of the many radar units that can be operated in an instant-on, or “pulse” mode.

You’re looking for weak radar that lasts only a few seconds. Finding even one such “pulse” is cause for alert. Finding a series of them, each stronger than the previous one, indicates you’re approaching an instant-on radar trap that’s picking off traffic ahead.

Same old strategy

Identifying instant-on radar before you come in range is the only defense today, just as it was when we first introduced Escort. That’s why our warning system, used on both Escort and Passport, tells you both the strength of the signal and the length of it. You need to know both to defend yourself.

Nothing but the truth

Our warning system indicates signal strength two ways: by a meter for a visual check, by a variable-rate beeper if you prefer to listen. The length of the signal is indicated by the duration of the alert. Knowing signal strength and signal length of every radar encounter is the only way to find instant-on radar before it finds you.

Escort and Passport are the most effective radar-warning instruments available. But don’t take our word for it.

In 1987, *Car and Driver*, *Popular Mechanics* and *Roundel* each published independent tests of radar detectors. And each gave us the highest ratings. Call toll-free and we’ll send reprints of the complete tests, not just excerpts or quotes.

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DOING IT WRONG

When you understand that instant-on radar is nothing more than ordinary radar being turned on and off, the threat loses its mystery. Defense comes down to detecting the radar before it’s strong enough to find you.

Baloney breakthrough. Yet one detector maker has added a feature it calls “Pulse Protection” to one of its models. Here’s what it does:

When this unit detects the sudden presence of a high-strength signal, a “P” appears on its display and it sounds a special alarm. This is your “Pulse Protection.”

The fine print. Unfortunately, the sudden presence of a high-strength signal describes an instant-on encounter when you’re within range. True protection from instant-on depends on responding to weak signals, but “Pulse Protection” doesn’t respond to weak signals.

The maker says this feature “tells you when you’re being shot at.” And that’s the problem. When you’re being shot at, it’s too late.

Grateful Dead: In The Dark • Touch Of Grey, Hell In A Bucket, West L. A. Fadeaway, Black Muddy River, etc. Arista 163214

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Decade/Best Of Steely Dan • Rikki Don't Lose That Number, Reeling In The Years, Do It Again, 11 more. MCA 154135

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Kitaro: The Light Of The Spirit • Sundance, Mysterious Encounter, The Field, In The Beginning, etc. Geffen DIGITAL 164228

Andrew Lloyd Webber, Variations • more Julian Lloyd Webber, cello. London Philharmonic/Mazael, Philips DIGITAL 115473

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John Cougar Mellencamp: The Lonesome Jubilee 134420

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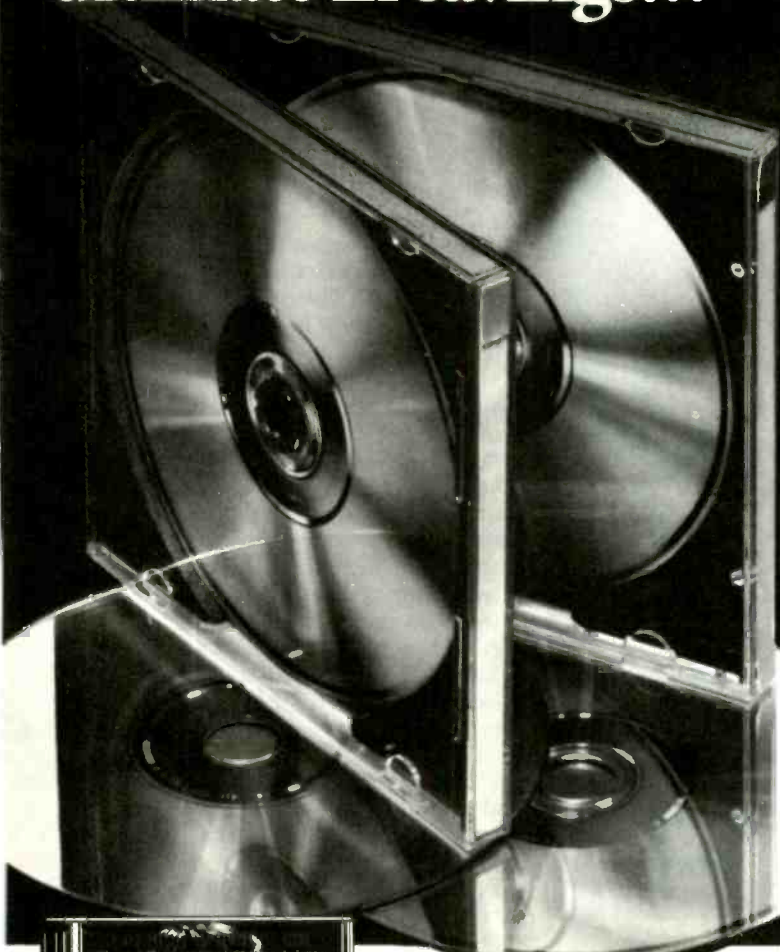
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VELODYNE ULD-12 SUBWOOFER

Julian Hirsch, Hirsch-Houck Laboratories

THE Velodyne Acoustics ULD-12 powered subwoofer brings the essential characteristics of the company's previous models, which used 15- and 18-inch drivers, to a smaller, lighter, and less expensive product. The "ULD" nomenclature stands for "ultra-low distortion." All the Velodyne ULD subwoofers are *motional-feedback* speakers; that is, an accelerometer attached to the voice coils supplies a negative-feedback signal to the input from the driving amplifier. Negative feedback has the same effect on a speaker's output as it does in amplifiers—it extends and flattens the frequency response and reduces distortion.

The 12-inch driver of the ULD-12 has an 80-ounce magnet structure and a 2½-inch voice coil capable of a ¾-inch (peak-to-peak) linear ex-

cursion. The downward-facing driver is mounted on the bottom of the sealed cabinet, which measures 21 x 16 x 17 inches, including its 2¾-inch feet, and weighs about 50 pounds. The cabinet also contains a 250-watt Class D switching amplifier whose heat-sink fins are on the bottom of the enclosure.

Although Class D amplifiers are extremely efficient and generate little heat even at very high power outputs, they have not been very successful as full-range audio amplifiers. Filtering the ultrasonic frequencies from the output and shielding the amplifier to prevent the radiation of interfering signals add expense and complexity.

A subwoofer, on the other hand, operates only at the low end of the audio range, which allows its switching frequency to be much

lower than would be required for full-range operation. In the Velodyne ULD-12, the amplifier does not even have a power transformer, since it is fully contained within the speaker cabinet and the user cannot come into contact with any part of its circuitry. The signal path uses optical coupling to isolate the input jack from potentially dangerous voltages. The system is protected against overdriving or other mishaps by circuits that shut down the amplifier if its chassis temperature exceeds 140° F. or if there is a short or open circuit in the phono cable running between the speaker and its controller unit. To protect the system against excessive drive levels, there is also an automatic-gain-reduction (compression) circuit that limits the speaker-cone excursion to safe values even if the input drive is excessive.

The controller, a vital part of the ULD-12 system, is a black box about 8 inches wide, 6 inches deep, and 1¾ inches high. It has phono-jack inputs and outputs that connect to the preamplifier outputs and power-amplifier inputs, respectively. Alternatively, the controller can be connected between the power-amplifier outputs and the speakers through spring-loaded clips that accept stripped wire ends. A single phono-jack output carries the low-frequency signals to the ULD-12 speaker unit through a provided 25-foot cable (its length may be extended as desired).

The controller is essentially a passive unit, requiring no connection to the power line. The speaker module, however, must be plugged into a 120-volt AC outlet and can be left energized at all times. Its internal power supply shuts off automatically about 5 minutes after input signals stop and switches on automatically when a signal is applied to the controller. The front panel of the controller contains a pushbutton switch that turns the subwoofer on or off (after its power supply has been switched on by an input signal). A knob varies the drive level to the subwoofer module from fully off to maximum.

The input impedance of the controller is rated as 20,000 ohms, and a 300-millivolt signal is sufficient to



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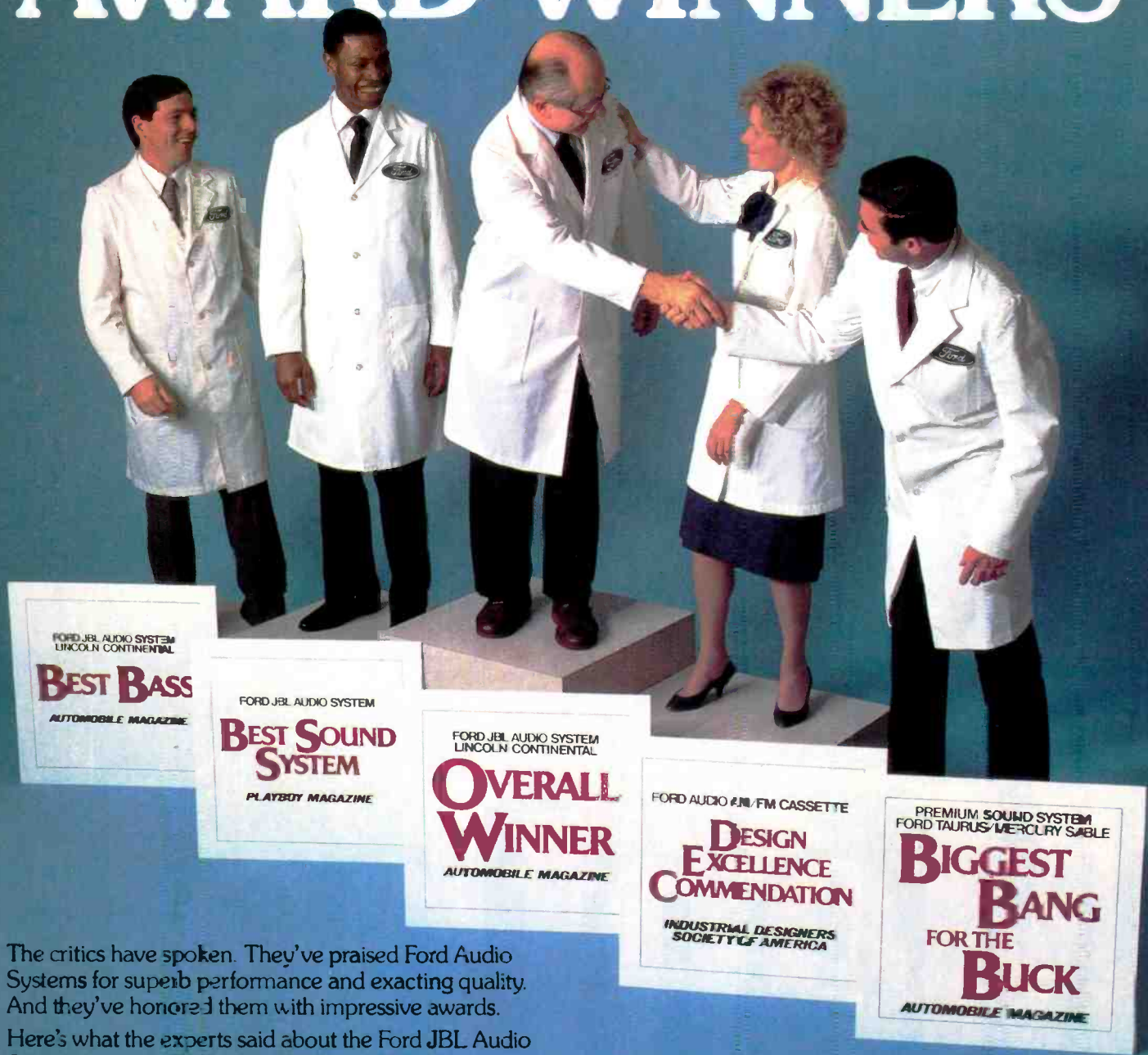
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AUDIO SYSTEMS

TEST REPORTS

drive the subwoofer's amplifier to full power when the controller's level is set to maximum. When the subwoofer is in use, the low frequencies in the signal going to the main speakers are rolled off below 85 Hz by a 6-dB-per-octave crossover in the controller, which eases the load on the system's main amplifier. Setting the controller switch to off restores a full-range drive signal to the main speakers.

The Velodyne ULD-12 is available finished in a satin black or in oiled walnut or oak veneer with rounded hardwood edges. The size and shape of the speaker module allow its use as a small end table or plant stand. Price: \$950. Velodyne Acoustics, Dept. SR, 2565 Scott Blvd., Santa Clara, CA 95050.

Lab Tests

We measured the frequency response of the Velodyne ULD-12 at two different microphone positions: in the gap between the bottom of the cabinet and the floor, and close to the woofer cone (with the cabinet inverted). The two response curves were essentially identical in shape, but the latter was about 4 dB higher than the former. These measurements were made with a drive level well below the speaker's maximum of 300 millivolts to insure that its output would not be compressed.

The output reached its maximum at 45 Hz and was down 6 dB at 21 and 85 Hz, closely matching the manufacturer's rating of 20 to 85 Hz \pm 3 dB. We also measured the frequency response at the controller's high-pass output (which goes to the main system speakers). It was flat through the middle and high frequencies and rolled off gently below 100 Hz to -6 dB at 30 Hz. The bass response at a maximum drive level (300 millivolts) clearly showed the effect of the amplifier's protective compression circuit. It was identical to the lower-level response down to its maximum at 70 Hz and rolled off at 18 dB per octave below that frequency.

As might be expected from its motional-feedback design, the distortion of the ULD-12 was extremely low. We drove it at a 300-mv input level from 100 Hz downward in frequency. The sound-pressure

level (SPL) at 1 meter from the woofer was very high, with the cone nearing its excursion limits at the lower frequencies, but the distortion remained under 1 percent (typically about 0.6 to 0.8 percent) from 100 to 25 Hz. Even at 20 Hz it was only 1.7 percent. These measurements support Velodyne's rating of less than 1 percent distortion at half power and 3 percent at full power at any frequency.

During our tests, the speaker's protection system shut it down a number of times (we were driving it at full power for prolonged periods), but it always returned to service in a few seconds when the input was reduced. An hour or so of this treatment left the speaker's heat sink only mildly warm. The high efficiency of its Class D amplifier can be inferred from its specified power consumption: less than 5 watts with no signal and a maximum of 275 watts at full power (about 90 percent efficiency). The standby power consumption of the system is only 3 watts, no more than that of an electric clock.

Quasi-anechoic FFT measurements confirmed the steady-state response data. Our group-delay measurement showed excellent phase linearity over the speaker's operating range. The variation was less than 40 milliseconds overall from 30 to 100 Hz.

Comments

Impressive as the specifications and measurements for the Velodyne ULD-12 are, they are overshadowed by its performance in a music system. We used it with several types of main speakers, none of which could be described as lacking in low bass, and its impact was frequently overwhelming. Even at a moderate level, it could be felt through the entire house on some organ-pedal and bass-drum notes.

The only way to adjust the level of the ULD-12 subwoofer is by ear, and the resulting setting is necessarily a function of the amount of low bass in the program. If it is set too high, even the upper bass may be boosted somewhat, producing the unnaturally heavy or tubby sound that mars so many speaker systems. If it is set correctly, the

speaker will not be audible on most program material, which is as it should be. Even so, switching it on or off in our tests often disclosed a bass "floor" that was not audible in the main speaker output.

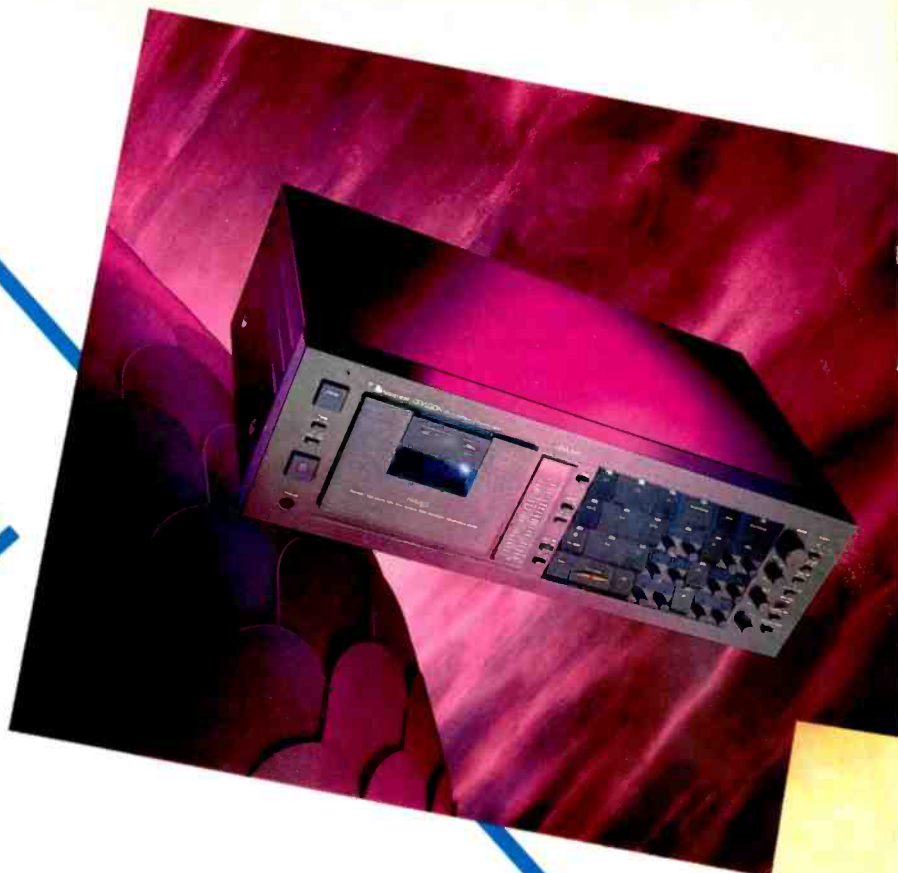
We had expected to find a major improvement when using the ULD-12 with smaller speakers, ones whose lower limit was perhaps 45 to 60 Hz. What we did *not* expect was the tremendous improvement it provided even with the largest, most bass-potent systems at our disposal, which went down to 30 or 35 Hz without external help. Possibly the very low distortion of the Velodyne system was responsible for the improved bass we heard, or perhaps the fact that its output could be boosted above normal woofer levels, compensating for their natural rolloff at the lowest frequencies. Whatever the explanation, we are convinced that there are very few speakers whose low-bass performance could not be improved by adding a ULD-12 to the system.

Because of the nondirectionality of the frequencies radiated by the ULD-12, it can be placed almost anywhere in the room without compromising the stereo qualities of the main system. As with any speaker, its output is enhanced by corner or wall placement, but its performance did not suffer noticeably even in a freestanding location. We found only one limitation in the applicability of the ULD-12. If it is used with highly efficient main speakers, it is important that the main power amplifier have level adjustments. When we teamed it up with the Klipsch Chorus (sensitivity of 96 dB), for example, the subwoofer was not able to produce a worthwhile enhancement even at its maximum level setting. With other speakers having more usual sensitivity ratings (less than 88 to 90 dB), however, we had no problems.

The Velodyne ULD-12 is not inexpensive, but it is difficult to imagine any neater or more cost-effective way to enhance the bass end of your system, whatever speakers you may now have. It is an attractive, compact, intelligently designed product. And be warned—it can be habit-forming!

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TOP TAPES DECKS



BY CRAIG STARK

**Head-to-head
laboratory and
listening tests
of five of the
world's finest
cassette decks**

A COUPLE of months ago, STEREO REVIEW sent me five of the very finest cassette decks in the world. Lest my joy be unbounded, however, they arrived with this injunction: "Now report which is best, and within a fortnight." What a task!

Four of the decks have been reviewed in these pages—the Nakamichi Dragon (\$1,995) in 1983, the Tandberg 3014 A (\$1,995) in 1984, the Onkyo TA-2090 (\$900) in 1985, and the Revox B215 (\$1,880) in 1986. Except for minor updates, all are mature rather than brand-new designs—the Dragon, indeed, dates back to November 1982. The same also holds for our fifth deck, Harman Kardon's top-of-the-line CD491 (\$950), which was introduced in June 1983.

The need to return to these classic machines in search of the best reflects the fact that world-class cassette decks are no longer economical to design. They're a kind of concession to the relatively small proportion of potential buyers who are really dedicated audiophiles and engineers and who tend to hate the whole business of building to a price

point. Unhappily, if there are still major analog-cassette-deck secrets waiting to be found, they're likely to remain undiscovered: The scientists who might have found them have been moved on to newer projects such as DAT.

All five of the decks use separate record and playback head elements, which enables the user to make immediate, critical A/B comparisons between the source and the just-taped signals. More important from a design point of view, however, it permits the playback head to have the very narrow magnetic gap, less than one micrometer, needed to resolve very high frequencies (short wavelengths) while also allowing the record head to have the relatively wide gap, three micrometers or so, needed to penetrate the tape's oxide coating fully and thus maximize signal-to-noise ratio at low frequencies (long wavelengths).

The Nakamichi and the Tandberg decks use physically separate record and playback heads; the other three use "sandwich" heads in which the separate record and playback elements are housed in a common case with a shielding barrier between.

PHOTOS BY MING



Totally separate heads require (or, as purists would insist, permit) a method of adjusting the azimuth, or perpendicularity, of either the record or the playback head so that their gaps remain perfectly parallel despite some small amount of tape skew inside the cassette shell itself. Common-case heads eliminate the need for azimuth adjustment, but they require an act of faith that the gaps were manufactured, and will remain, exactly parallel magnetically and that the shielding is adequate to prevent leakage of the record-bias signal into the playback electronics.

All five decks also use closed-loop, dual-capstan drive systems to minimize irregularities in tape motion. (Slow, periodic tape-speed variations are heard as wow; more rapid speed variations, which create a "gritty" or "edgy" character in the sound, are called flutter.) In a closed-loop configuration the critical portion of the tape—where it passes across the heads—is isolated by the two capstans and pinch-rollers from the tape packs on the two reel hubs. The trailing capstan tries to rotate at a very slightly slower speed than the pulling capstan, creating a controlled amount of tension that presses the tape against the heads. In an optimum design, the diameters of the capstan shafts and the masses of their associated flywheels differ so that they have no common resonant frequency.

All five decks supply both Dolby B and Dolby C noise reduction; the Onkyo also provides the alternative dbx system. In addition, the Revox, Harman Kardon, and Onkyo machines incorporate Dolby HX Pro, a system that increases tapes' high-frequency capabilities at high signal levels by dynamically adjusting the amount of record-bias current being used. Tandberg uses its own Dyneq system for the same purpose.

To optimize performance from different cassette brands, each of the five machines provides a procedure using calibrated, internal test tones for making fine adjustments of record bias and sensitivity. With the exception of the Dragon, all the machines also incorporate tape counters that register playing time as well as hub revolutions. And all support some variety of memory-rewind/play options, provide for external timer activation, and have defeatable FM-multiplex filters. (Switching the filter off is necessary for achieving 20,000-Hz response.)



NAKAMICHI DRAGON (\$1,995)

NAKAMICHI is pre-eminent in the design of tape heads, transports, and ultra-low-noise electronics, and the Dragon is the company's crowning cassette-deck achievement. An autoreverse deck in playback, it records in only one direction, and it uses completely separate record and playback heads. The resulting problems of azimuth alignment are solved in an absolutely uncompromising manner.

A four-channel playback head is used, so no head shifting is required for autoreverse. At the same time, the right-channel head element in each direction is actually split into two ultrathin tracks whose separate outputs can be compared. If the playback head is even slightly tilted toward one side or the other, there will be a slight phase difference between the outputs from the two halves of the right channel. This difference, detected and amplified, is used to drive a servomotor mechanism that readjusts the azimuth of the head on the fly until the difference is eliminated. Though it was invented to deal with the problem of tape skew within a single cassette shell while the tape is winding and unwinding, the Nakamichi Auto Azimuth Correction (NAAC) technique also serves to restore the high-frequency response of tapes made on less accurate machines.

Unique also to Nakamichi is the use of an old professional open-reel trick. The Dragon's heads are pre-slotted at the tape edges so that a wear groove, which can play havoc with left-channel response, can never develop as the heads themselves wear. The playback head has a 0.6-micrometer head gap, the record head a 3.5-micrometer gap.

The Dragon's transport uses a total of five motors. Two are quartz-crystal-controlled and directly drive the capstans in a closed-loop configuration. These motors have been specially designed to avoid the "cogging" that frequently induces flutter in direct-drive systems. The transport's precision is such that the cassette's pressure pad is actually pushed back and away from the playback head, thus eliminating it as a source of modulation noise. The

Dragon's third motor powers the reel hubs, and the fourth is used in place of solenoids to control the head-gate functions smoothly. The fifth is used for the automatic azimuth-adjustment system. Flywheel masses and capstan diameters have been selected to prevent common resonance.

The Dragon incorporates a twenty-segment-per-channel fluorescent peak-reading level display that is also used in optimizing bias and adjusting for variations in tape sensitivity. Built-in 400- and 15,000-Hz tone generators are used (the tones are available at the output jacks for calibrating other parts of the system), and the adjustment procedure is easy, though manual. Bias/EQ switching for different tape types is also manual. Other features include dual-speed cueing, dual-speed auto fading, and an output-level control.



ONKYO TA-2090 (\$900)

IF there's a feature missing from the Onkyo TA-2090, it's hard to imagine what it might be. In addition to its three-head, three-motor, dual-capstan, closed-loop transport design, it adds the option of dbx to the usual Dolby B and Dolby C noise-reduction systems, and the Dolby HX Pro headroom-extension circuit is selectable rather than automatic.

The record and playback heads of the TA-2090, made of long-wearing sendust, are housed (as in most three-head decks) in a common case. The transport uses a direct-drive motor on the pulling capstan (the rear capstan is belt-coupled), a second motor to rotate the reels, and a third to provide smooth, quiet operation of the head gate, pinch-rollers, and brakes. The wow-and-flutter on the unit we tested was actually the lowest we have yet encountered.

Bias and equalization selection for the various tape types is automatic, but differences between brands of the same type can be eliminated by selecting the Accubias function, which uses internal tone generators to determine the proper bias settings, then rewinds the tape to the beginning of its adjustments. (A manual adjustment to compensate for different tape sensitivities is also provided.) The tape counter directly registers the remaining time per side (you

do have to set it for the tape length you're using), and the sixteen-segment-per-channel level display provides clear indication of signal peaks. Bidirectional program search and a playback output-level control are provided, and the Onkyo TA-2090 is one of the few decks that still provide microphone inputs.



TANDBERG 3014 A (\$1,995)

THE Tandberg 3014 A has recently been upgraded (hence the A designation) in its electronics, with polypropylene coupling capacitors and a new variable-output stage, and its dual capstans have been roughened to reduce slippage, which can create modulation noise. Basically, however, it remains the same high-end, purist-oriented deck I reviewed here in 1984.

Built like the proverbial battleship, with massive castings, a 5-mm-thick base plate, and internal cross braces, the 3014 A uses a pair of servo-coupled direct-drive motors to turn the reel hubs. This arrangement allows constant-speed fast winding at sixty times playing speed (the speed can be reduced for cueing by holding the wind button down). The closed-loop, dual-capstan system uses large, different-sized flywheels to prevent system resonances, and it is belt-driven by a third motor. A fourth motor handles the head gate and associated functions.

The record and playback heads of the 3014 A are totally separate units, so a record-head azimuth adjustment is provided to insure absolute matching of record and playback azimuth. The adjustment makes use of a built-in 15,000-Hz test-tone generator. The same generator, along with a second generator that operates at 315 Hz, is also used in the manual tape-optimization procedure. While dyed-in-the-wool audiophiles will not object, the process of optimizing bias and adjusting for tape sensitivity is somewhat cumbersome, requiring insertion of a special screwdriver into a series of four small holes on the face of the deck to engage the controls. Fortunately, optimization need be done only when changing brands within the same type. In normal operation the 3014 A, like most decks, automatically senses which tape type is in use and switches its pre-

set bias and equalization accordingly.

Tandberg is probably the last company to use analog peak-reading meters instead of some form of LED level display, but meters have the unquestionable advantage of providing more precise readings. Moreover, in Tandberg's case the meters are "equalized," that is, they reflect the degree of record treble boost being fed to the head and so provide an accurate warning against accidental overload. Tandberg pays particular attention to the record signal, which is mixed with the record bias in a special amplifier stage (the patented Actilinear II circuit). A second unique recording stage dynamically varies the record treble boost to maximize the signal-handling capability of the tape at high frequencies. Tandberg claims that this Dyneq circuitry introduces less intermodulation distortion than the Dolby HX Pro system.

The 3014 A provides memory settings for up to nine programmed selections, and its rear-panel contains controls for manual rather than automatic tape-type selection and for record sensitivity. A front-panel output-level control is also provided.



REVOX B215 (\$1,880)

THE solidity of design that marks Revox's professional open-reel decks is evident as well in the Revox B215. Its dual-capstan, closed-loop transport uses a pair of quartz-crystal-controlled Hall-effect direct-drive motors for the capstans. A second pair of microprocessor-controlled direct-drive motors is used to turn the reel hubs, which are electrically rather than mechanically braked. The record and playback heads in the B215 are separate elements in a common case, and the record and playback head gaps are optimally sized for their respective functions.

Selection of bias and equalization for the different tape types is automatic, but a manual override is provided so that prerecorded chrome tapes designed to use 120-microsecond (nominally ferric) playback equalization can be accommodated. Optimizing performance between brands within the same tape type is fully automated: Press one button and the deck does the rest, including rewinding to the starting point of

its adjustments. Memory storage of optimal settings is provided for two brands of ferric, three brands of chrome-equivalent, and one brand of metal tape. Record levels can be set manually or with a single-touch level-sensing button.

Signal levels are shown on a twenty-four-segment-per-channel liquid-crystal display, and the electronic tape counter indicates elapsed time directly. A button is provided to create smooth fades in or out. While there are rear-panel connections on the B215 for an accessory remote-control device and even for a serial computer port, no playback output-level control is provided.



HARMAN KARDON CD491 (\$950)

THE Harman Kardon CD491 is an attractively finished deck that seems designed to appeal to a high-end audiophile who wants a full range of features without a lot of fuss. Its transport is a simpler affair than most of those reviewed here: It uses only two motors, one of which directly drives the pulling capstan in the dual-capstan closed-loop configuration. Its separate record and playback heads are made of sendust and ferrite, respectively, housed in a common casing that needs no adjustments.

Signal levels are displayed on sixteen-segment-per-channel peak indicators, which can be switched to a weighted position that reflects the record equalization being fed to the heads, an entirely sound approach.

While a complete bias/sensitivity optimization procedure is incorporated in the CD491, it involves inserting a special screwdriver through a hole in the front panel. Further, the fact that only one set of adjustments is provided means that if you ever use the optimization procedure, you can never be sure of getting back to the factory settings. My guess is that few users will take advantage of the feature.

The tape counter also displays the playing time, which is a definite convenience to the home recordist. Another convenience is the inclusion (a rarity these days) of microphone inputs. Bidirectional program search and a playback level control are also provided.

LABORATORY MEASUREMENTS

	HARMAN KARDON			NAKAMICHI			ONKYO		
Fast-forward time (C-60, seconds)	68			57			66		
Rewind time (C-60, seconds)	69			54			65		
Speed error	-0.5%			+0.17%			+0.33%		
Wow and flutter (wrms/DIN peak-weighted)	.028%/035%			.015%/026%			.014%/024%		
Line input for indicated 0 dB (millivolts)	31			57			40		
Line output at indicated 0 dB (millivolts)	410			1,000			1,050		
Meter indication at IEC-standard 0 dB	-1			+1			±0		

TAPE: TDK AD (TYPE I, FERRIC)	HARMAN KARDON			NAKAMICHI			ONKYO		
Distortion (third-harmonic) at IEC-standard 0 dB	1.0%			0.5%			1.25/0.44%*		
Meter indication at 3% distortion	+2			+5			+5		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	50.0	57.6	54.8	53.9	59.4	57.3	52.6	57.6	55.1
Dolby B on	51.2	65.0	64.8	59.8	68.5	67.3	58.4	66.4	64.3
Dolby C on	52.6	71.8	73.7	62.0	74.0	76.5	59.6	70.9	72.0
dbx on (at +12-dB output)							77.6	85.2	83.5

TAPE: TDK SA (TYPE II, CrO ₂ -TYPE)	HARMAN KARDON			NAKAMICHI			ONKYO		
Distortion (third-harmonic) at IEC-standard 0 dB	1.0%			0.75%			1.25/0.31%*		
Meter indication at 3% distortion	+2			+5			+3		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	49.5	58.8	56.2	56.5	62.4	60.0	54.0	58.9	56.2
Dolby B on	50.5	65.4	66.0	60.5	70.5	70.1	58.0	67.2	66.0
Dolby C on	52.0	72.1	74.5	62.6	77.0	78.7	59.0	72.6	73.1
dbx on (at +12-dB output)							78.5	86.9	85.3

TAPE: TDK MA (TYPE IV, METAL)	HARMAN KARDON			NAKAMICHI			ONKYO		
Distortion (third-harmonic) at IEC-standard 0 dB	1.0%			0.5%			1.25/0.75%*		
Meter indication at 3% distortion	+2			+10			+3		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	52.0	60.4	57.5	59.0	64.6	62.2	53.6	58.5	55.7
Dolby B on	53.0	67.3	67.4	63.5	73.2	72.2	58.0	66.9	65.6
Dolby C on	54.4	74.0	76.0	65.6	79.4	81.2	59.5	72.3	73.2
dbx on (at +12-dB output)							79.0	87.8	86.5

*with dbx at equivalent output level

Lab Tests

As usual, the battery of lab tests to which each deck was subjected began with calibrated playback frequency response, using our IEC-standard ferric (120-microsecond) and CrO₂/metal (70-μs) BASF test tapes. The Harman Kardon showed the greatest variation from flat response at the extremes (+4 dB at 31.5 Hz, -5 dB with ferric and -3 dB with chrome at 18,000 Hz), and the Nakamichi showed a slight (1.5- to 2-dB) dip in the midrange. The other three decks were outstandingly flat, within ±1.5 dB throughout the entire test range.

Record-playback response was

measured using our reference center-line-sample TDK cassettes: AD (ferric), SA (CrO₂-equivalent), and MA (metal). Since these are not the same tapes generally used by the five manufacturers for factory setup, we checked the curves both at the IEC-standard 0-dB level (250 nanowebers per meter) and at -20 dB, the customary level for frequency-response measurements, both before and after following each manufacturer's optimizing procedure. (The curves shown in the accompanying graphs are all after optimization.) The difference between the pre- and post-optimization response was generally limited to a couple of decibels, but in one

case it ran as high as 7 dB at 20,000 Hz. Certainly, in all cases the results proved the importance of including such calibrated fine-tuning procedures in a top-of-the-line deck.

The effectiveness of the Dolby HX Pro and the Tandberg Dyneq circuits in extending high-level high-frequency response can be judged by comparing the 0-dB curves. Only the Onkyo deck permitted the HX Pro system to be switched out so that the amount of high-end extension could be measured, but a comparison with the curves for the Nakamichi deck, which lacks HX Pro, is suggestive. In fairness, it should be noted that the 0-dB curves for *all* the decks

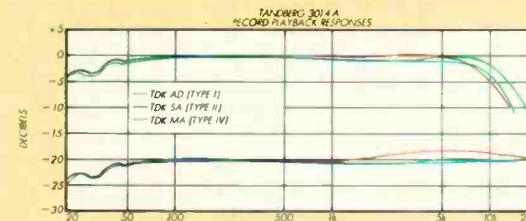
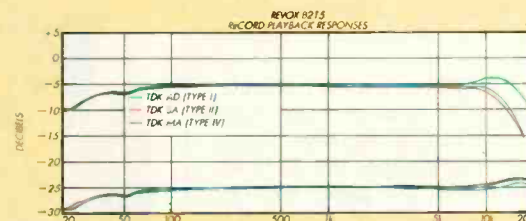
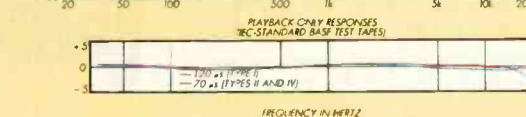
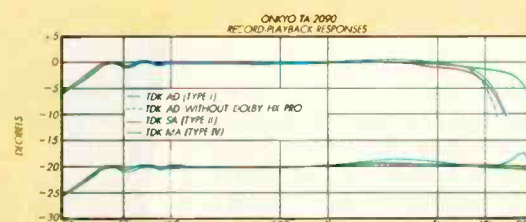
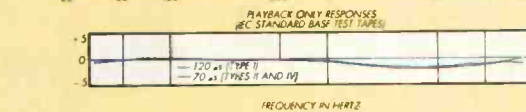
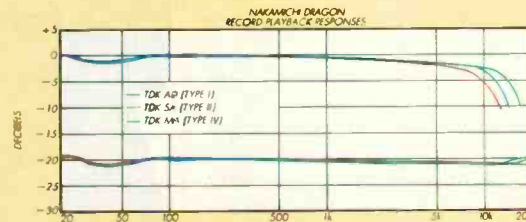
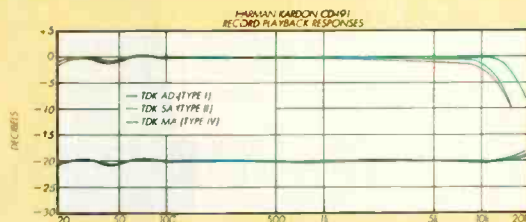
REVOX		TANDBERG	
55		39	
54		38	
+0.27%		-0.13%	
.0155%/.023%		.025%/.048%	
47.5		102	
775		3,250	
±0		-2	

REVOX			TANDBERG		
1.4%			0.15%		
+3			+4		
unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
51.0	55.4	52.2	51.5	57.2	54.7
55.5	64.4	62.4	59.0	66.1	64.8
59.5	70.0	71.3	62.2	72.1	73.4

REVOX			TANDBERG		
2.3%			0.51%		
+1			+4		
unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
52.2	56.5	53.4	52.7	58.6	56.6
57.0	65.2	63.5	58.5	66.8	66.3
58.8	71.2	72.3	61.4	72.9	74.0

REVOX			TANDBERG		
1.2%			0.51%		
+4			+4		
unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
55.2	59.5	56.4	53.5	59.2	57.5
60.5	68.2	66.6	59.8	67.2	67.3
61.8	74.2	75.5	62.6	73.8	75.5

At the conventional -20-dB measuring level, all five decks had no difficulty reaching 20,000-Hz response. Wow-and-flutter was extremely low on the Tandberg and Harman Kardon decks and extraordinarily low on the other three decks.



improved significantly in the 10,000- to 20,000-Hz range when—as would be normal practice—the Dolby C noise-reduction system was switched in.

At the conventional -20-dB measuring level, all five decks had no difficulty reaching 20,000-Hz response. At both levels, the bass response of the Harman Kardon and the Nakamichi units was superb; the other three decks dropped off by 3 to 5 dB in the lowest octave (20 to 40 Hz) and showed some response undulations, though they were not audibly serious.

Wow-and-flutter, measured both on a weighted-rms and on a weighted-peak basis, was extremely low on the Tandberg and Harman Kardon decks and extraordinarily low—the best I've ever measured—on the Onkyo, Nakamichi, and Revox. Pitch accuracy was exceptionally good for all but the H/K deck, whose 0.5-percent speed error, although certainly acceptable for most purposes, was run of the mill.

Listening Tests

All the decks in this survey were included because they were already known to be among the best in the world. It should be no surprise, then, that all of them could play back prerecorded material superbly and produce *virtually* flawless recordings from all of the CD's and LP's we tried. The problem was to distinguish among winners, which required us to match signal levels from each unit to within 0.1 dB and to use an ABX comparator double-blind switching system. The ABX comparator has a microprocessor that randomly assigns the X push-button to one of two audio sources, A and B, and records the assignment. The listener then flips between A, B, and X and decides whether X is really A or B. The computer records the answers over a series of trials. If a listener can consistently distinguish which signal is X, there is an audible *difference* between A and B—though which one is *better* is not automatically determined.

Since Dolby B noise reduction is obsolete for anything but playback of existing tapes, we concentrated our listening tests on tapes recorded using Dolby C or, in the case of the Onkyo deck, dbx. And we used metal tape as well (Maxell MX, optimized for each unit). Starting

with manual source-vs.-tape switching and using the ABX comparator box as necessary, we listened for the amount and character of the residual background noise in music with a wide dynamic range, the overall smoothness of response, the clarity of piano tones, the spatial imaging, the presence or absence of grittiness (edginess) on violin attack transients, the depth of bass response (organ pedals and the cannon in Tchaikovsky's *1812 Overture*), and the feeling of depth conveyed by a sense of air or space *around* an instrument.

The envelope, please.

There were two fairly clear winners: the Nakamichi Dragon and the Revox B215. The Dragon had the lowest noise level, especially high-frequency noise, by a clear margin, and in source-vs.-tape comparisons I judged it marginally more accurate and realistic sounding even than the Revox. The Revox, however, seemed to have a little more "presence" than the Nakamichi without the tendency toward stridency (overly brassy brassy, steely-sounding violin strings) that affected, to varying degrees, tapes made on the other three machines. Both decks were virtually flawless, and if I deem the Dragon slightly more musical than the Revox, you may deem it slightly dead-er sounding.

The Tandberg deck was not faulty in any respect: Its imaging was just not quite as sharp, the "air" around its instruments not quite as clear as with the Nakamichi Dragon and the Revox B215.

With Dolby C, the Onkyo seemed to have a slightly strained quality—a little too sharp and tending toward (but not reaching) tinniness. With dbx, on the other hand, the Onkyo had the quietest, clearest background of any of the five units, although a little "pumping" was apparent on low-level percussive sounds. (You'd be unlikely to notice it in any but the most stringent head-to-head comparisons, however.) Also, on our sample at least, a very slight buzzing was audible within its residual noise level with both Dolby and dbx.

The character of the Harman Kardon's noise—low-frequency motor rumble and transistor shot noise as well as hiss—militated against it too. Its low-frequency bass reproduction was superb, but it seemed overly bright and spatially less well defined compared with the Revox and the Nakamichi. Nonetheless, the H/K is a fine tape deck—better than all but a few that I get in for testing.

Your own ears may or may not agree with mine, of course: What is strident and unmusical to one may be "live" to another. Between the Nakamichi and Revox cassette decks you will certainly not go wrong, and among all five any serious audiophile should feel no loss of purist status if he chooses on the basis of differences in features or price. □



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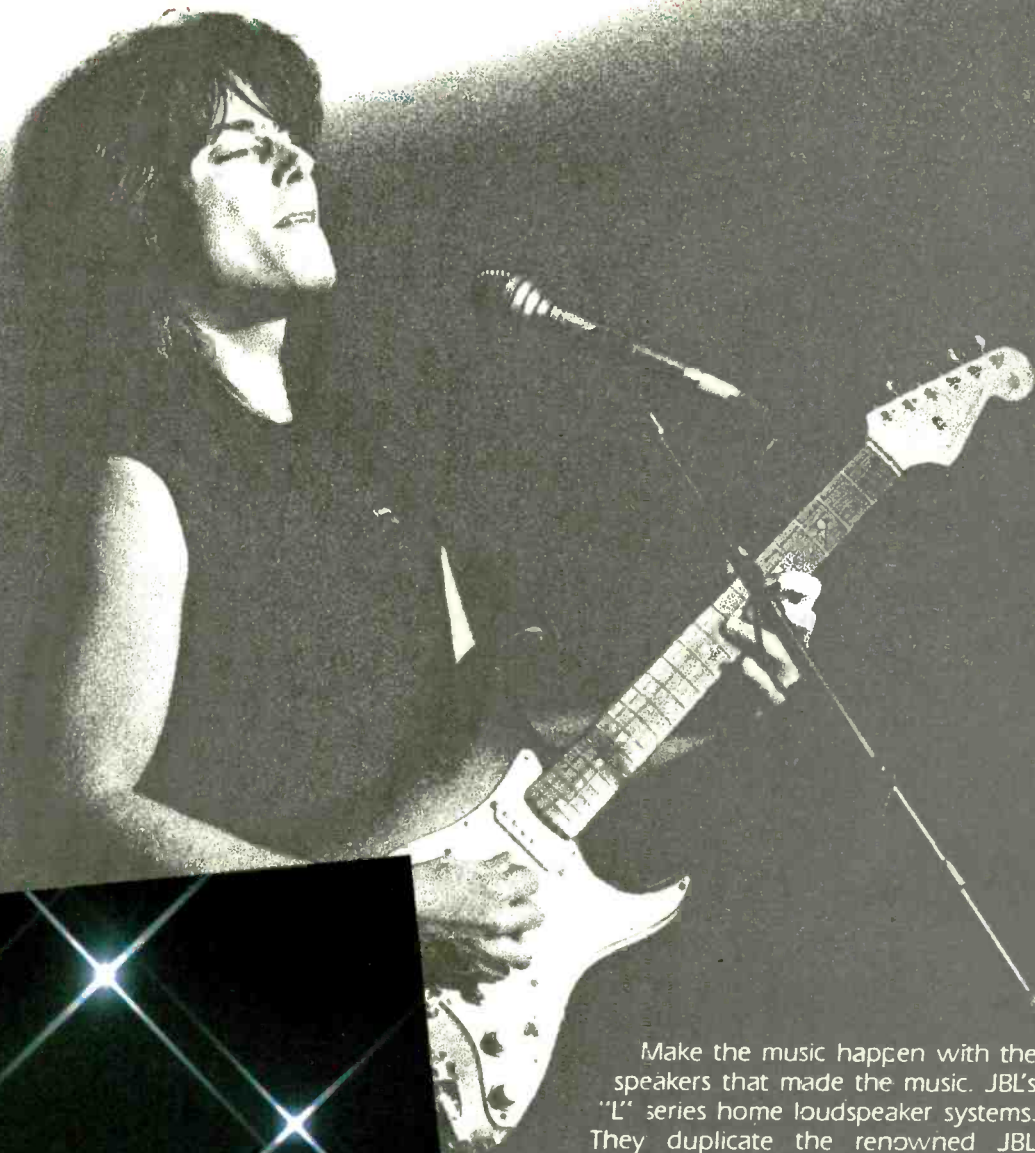
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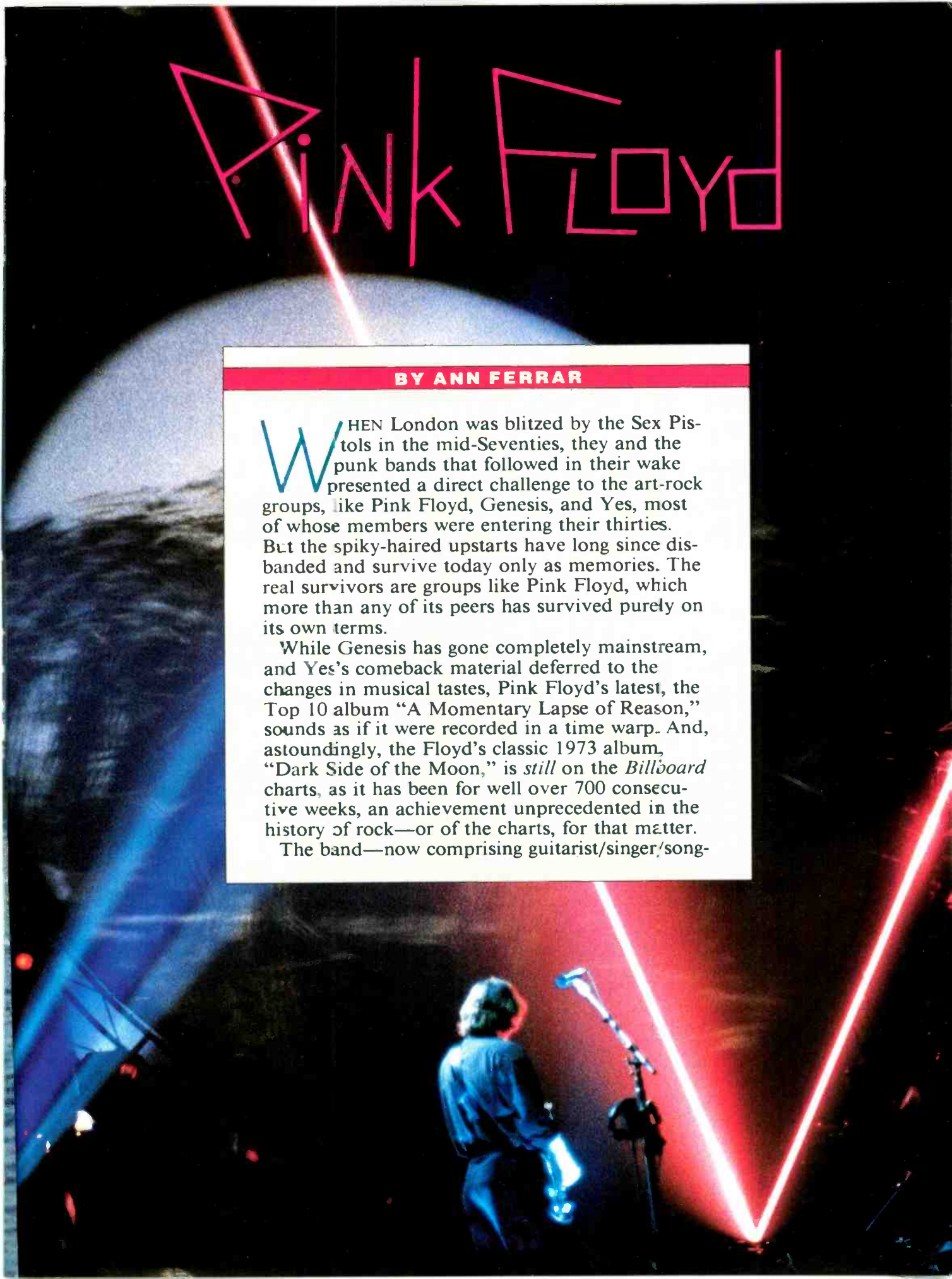
Pink Floyd

BY ANN FERRAR

WHEN London was blitzed by the Sex Pistols in the mid-Seventies, they and the punk bands that followed in their wake presented a direct challenge to the art-rock groups, like Pink Floyd, Genesis, and Yes, most of whose members were entering their thirties. But the spiky-haired upstarts have long since disbanded and survive today only as memories. The real survivors are groups like Pink Floyd, which more than any of its peers has survived purely on its own terms.

While Genesis has gone completely mainstream, and Yes's comeback material deferred to the changes in musical tastes, Pink Floyd's latest, the Top 10 album "A Momentary Lapse of Reason," sounds as if it were recorded in a time warp. And, astoundingly, the Floyd's classic 1973 album, "Dark Side of the Moon," is *still* on the *Billboard* charts, as it has been for well over 700 consecutive weeks, an achievement unprecedented in the history of rock—or of the charts, for that matter.

The band—now comprising guitarist/singer/song-







Pink Floyd arrived in the U.S. last fall for its first live performances in seven years. (Photos: above, Ebet Roberts; all others, Gary Gershoff/Retna Ltd.)

writer David Gilmour, keyboard player Richard Wright, and drummer Nick Mason—is currently in the midst of a twelve-month worldwide tour. During its sold-out engagement in New York City, I spoke with Gilmour about Pink Floyd's lasting popularity. "I suspect it's entirely due to our not caring about musical trends but being interested in quality," he said.

The forty-one-year-old Gilmour, a "junior" member of the band for twenty years, assumed the role of front man after its ill-received 1983 album, "The Final Cut," and the subsequent angry departure of charter member Roger Waters. The writer of most of "Animals" and "The Wall," Waters was considered the band's principal creative force. He was also the main purveyor of its trademark cynicism. Unlike those of the band's progressive peers, Pink Floyd's lyrics have usually painted bleak pictures, and the music has often been weighty, sometimes downright depressing.

In Waters's absence, the Floyd's

outlook, with Gilmour in front, is slightly brighter. Of the new album Gilmour said, "There is definitely a different lyrical viewpoint, though I do tend to dwell on the darker side of things as well. If one wants to convey powerful, emotional things and move people, the darker elements of emotion are easier to get across.

"But in terms of the music," he continued, "there's no radical difference. Our sound comes from very diverse forms of music, all merged in together. My background is from Celtic folk music to blues, to Broadway musicals, pop, and rock. It's all in there."

Indeed it is, from the melodic near-hymn *On the Turning Away*, with its church-like chorus and somewhat preachy message, to the ominous, hard-edged *The Dogs of War*, which is, according to Gilmour, "a bit of ranting against political mercenaries, generally inspired by 'Irangate' and Ollie North." *Learning to Fly*, the first single, is a catchy pop tune that seems to be the closest expression of pure joy ever to come from a Pink Floyd album. But Gilmour was quick to squash that notion. "There's an unfulfillable longing in the song, so it's not all joyful. Good Lord, I'd hate to admit to anything happy."

According to Gilmour, the purpose of Pink Floyd's more esoteric lyrical and musical stance has been simply "to provoke thought in people and to move them. If you reveal too much, it simplifies things and prevents people from thinking for themselves."

Gilmour's solo work, however, particularly his 1984 album, "About Face," has been lighter, more melodic, and more accessible than his work with the group. Since he is now the "voice" of Pink Floyd, will the band turn in that direction?

"The songs on 'About Face' are not that different from what I'm doing with Pink Floyd now," replied Gilmour, "and certainly, with a slight change of attitude and direction, that record could have been a Pink Floyd record."

Having been second banana to Roger Waters for two decades, Gilmour is now determined to lead the Floyd on his own terms, despite Waters's efforts to stop him.

Waters left the band in the midst of a clash of egos. According to Gilmour, "Roger insisted on doing all the work. On 'The Final Cut' he

insisted on having total control. My attempts to achieve a better balance and [make] some compromises were frustrated. He thought he was right, and I thought I was right, which is what commonly happens in life. I guess when he felt he could no longer tolerate it, he left."

Waters is suing his former bandmates over their right to continue using the Pink Floyd name. Apparently, Waters believes that because he is no longer in the band, the abridged group should not be called Pink Floyd. Since rock musicians quit groups all the time, leaving their bandmates to continue, on the surface it seems like a monumental case of sour grapes.

Gilmour said: "There have been two basic court applications that have been entered against us, which will probably be heard in court in late 1988 or 1989. There have been threats and promises from the other side to take various actions if we do things like go on tour or sell tickets or anything like that, but none of them have materialized. It's not something that has affected us very much. To me it's a minor issue."

The lawsuit only serves to confirm what Pink Floyd has become—an institution, literally a corporation, with shareholders and holdings, houses in Hollywood, and even the services of Rogers & Cowan, the giant show-biz public-relations agency hired to represent the band in the U.S.

The ongoing "Momentary Lapse of Reason" tour, resuming in this country on April 12 in Los Angeles, is in the Pink Floyd tradition of elaborate, multimedia productions. A huge circular screen rimmed with flashing lights, surreal film clips, clouds of smoke, robot-like equipment emitting laser beams, a giant pink pig, and a bed that speeds across a wire suspended from the ceiling all go to make the band an almost incidental part of the show. With all this to divert the audience's attention, the promoters could just as well play Pink Floyd tapes.

On stage, the band members are as enigmatic and faceless as on their albums. And yet, they have attracted an entire new generation of fans, MTV kids with short attention spans, some of whom were still in their cradles when Pink Floyd began making its peculiar brand of "psychedelic" rock in the mid-Sixties. Which just goes to show . . . it's only rock-and-roll, after all. □

T A P E S Y S T E M S

**A \$600 recording system
that covers all the bases**

COULD easily spend \$600 on a good tape deck, and recording studios could spend \$600 on a microphone stand, but for that same sum a careful shopper can put together a versatile system able to make cassette recordings of live music, AM and FM broadcasts, long-playing vinyl records, 45-rpm singles, and even other cassettes. The list prices of the components in this system actually total \$585, leaving some money for speaker wire and a few blank tapes.

With the same \$600, I could have put together a system with fewer sources and spent the savings on higher-quality components, but this system will make decent recordings from almost every popular source. And for as little as \$100 more, you could upgrade it to include a compact disc player as well.

□ **Microphones:** Two Recoton MM100's (\$32), plus mini-to-phone-plug adaptors (about \$2 each, from a variety of manufacturers).

□ **Turntable:** ADC LT34 (\$100). High-end turntables tend to be completely manual and come without tonearms or cartridges. The LT34 is fully automatic and comes with a linear-tracking tonearm and a P-mount cartridge.

□ **Receiver:** Scott RS30 (\$150). The RS30 has inputs for phono and tape, an auxiliary input for a compact disc player or digital audio tape recorder, a quartz-synthesis AM/FM tuner, a high-frequency filter and power meters. Rated output is 25 watts per channel.

□ **Cassette deck:** Realistic SCT-46 (\$150). This is a dual-transport deck with two microphone inputs, Dolby B noise reduction, high-speed dubbing, a headphone jack, and more.

Wow-and-flutter is rated as 0.1 percent wrms.

□ **Speakers:** Pinnacle PN5+ (\$149 a pair). Julian Hirsch said it all in his rave review in January. These small speakers need a subwoofer to reproduce the full audible frequency range, but so do many speakers that are much larger and much more expensive. □

BY WILLIAM BURTON

Photo by Hing/Norton





T A P E S Y S T E M S

High performance and high style for just under \$4,500

THE desire for high style doesn't have to conflict with the demand for high performance—at least when designing a tape-based audio system. To put together a good-looking, good-sounding system, I was given a ticket of \$4,500, a tidy sum that represents both the solid middle ground for serious audio enthusiasts and, not surprisingly, the average system price of STEREO REVIEW readers.

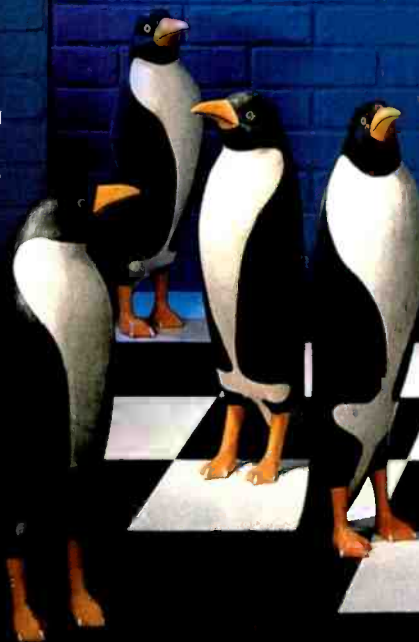
The NAD 6300 cassette deck (\$858) is a good starting point. It's smart because it includes both Colby B and Dolby C noise reduction and both Dolby HX Pro and Dyneq headroom-extension circuits for nearly unparalleled high-frequency response. The 6300's front panel is as clean as that of a \$100 no-frills model, yet its performance specs rival those of many fine decks costing more than twice as much. It's also flexible: A CAR switch compresses dynamic range and boosts bass and treble on recordings for the noisy automotive environment, and Dolby-compatible PLAY TRIM circuitry compensates for high-frequency problems in playing tapes made on other decks.

As source components I chose the Yamaha RX-900U (\$659), a receiver with a great tuner, flexible audio/video switching, and a rated 35-watt-per-channel continuous output enhanced by the Absolute Linear Amplification circuit; the dbx DX5 compact disc player (\$699), which combines ease of use with excellent performance and proprietary signal-processing circuits; and a Denon DP-35B direct-drive turntable (\$320) fitted with a Signet MR5.0m cartridge (\$350). The RX-900U drives a pair of Design Acoustics PS-5's (\$350), mini-bookshelf speaker systems with a particularly clean high end and midrange. Low frequencies are managed by a Velodyne ULD-12 (\$849), a 12-inch subwoofer with built-in 250-watt amplifier that sounds as good as it looks. Late-night listening isn't a compromise with Azden's DSR-50 phones (\$80).

The total system price of \$4,245 leaves you just enough to buy some CD's, LP's, and blank tapes. Take a week off from work. You have some taping to do. □

BY WILLIAM WOLFE

Photo by Hugh Norman





T A P E S Y S T E M S

A recordist's dream for less than
the price of a good sports car

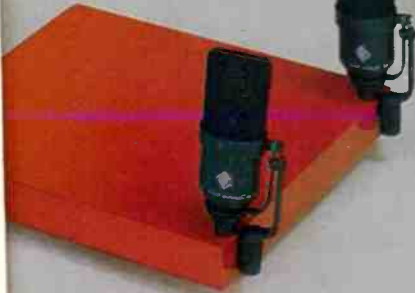
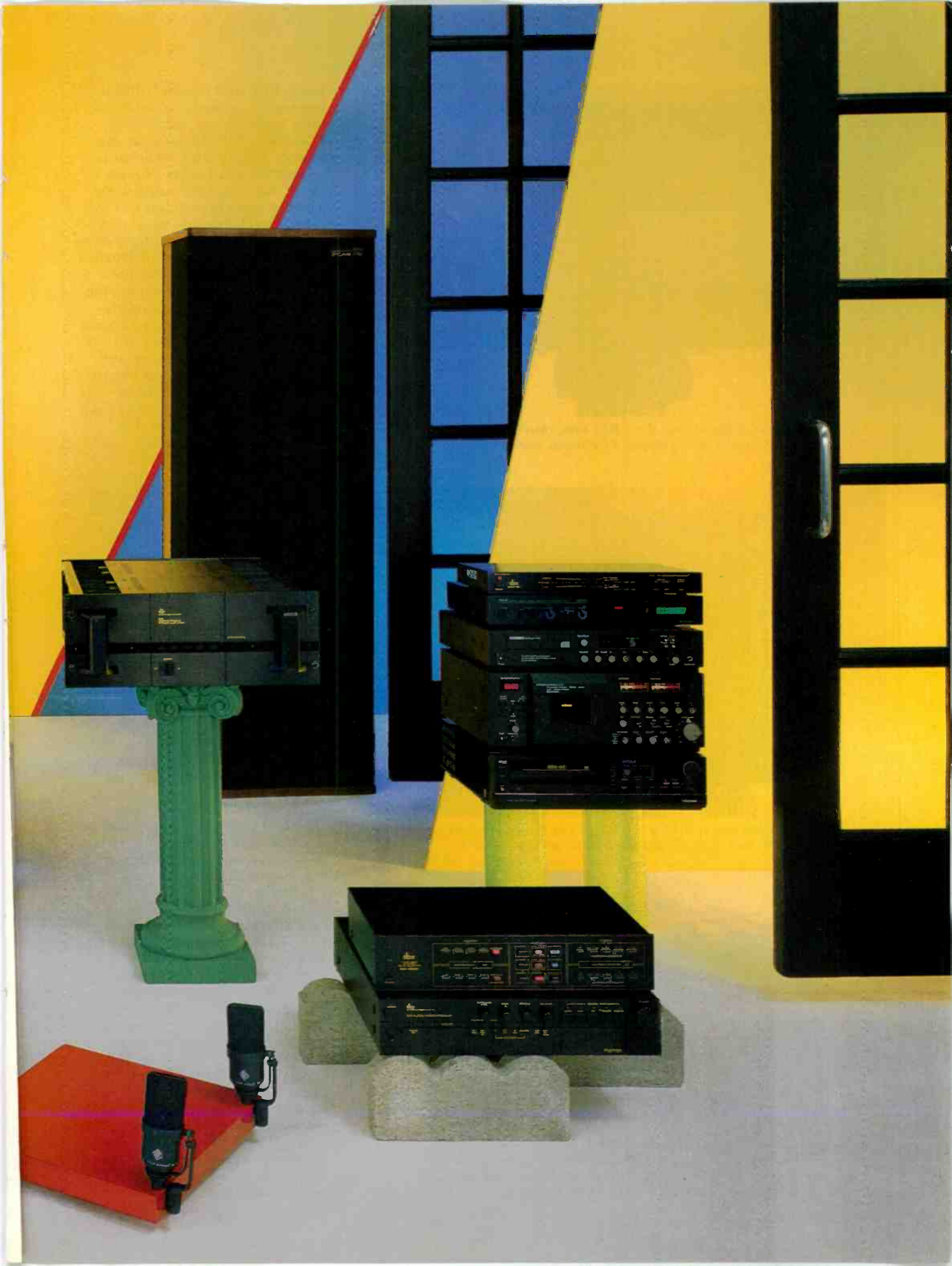
GIVEN unlimited spending ability, I could probably have come up with an even more elaborate system than the one waiting to be assembled and powered up in the accompanying photos. As it stands, however, \$33,230 is at least the down payment on a house, and I'd stack this system up against just about anything.

Any stereo system, for recording or otherwise, is only as good as its basics—the power amplifier, preamplifier, and speakers. I chose two of dbx's new BX1 power amplifiers (\$3,700 each) and the dbx CX1 preamplifier (\$2,500) to drive two pairs of Polk SDA-SRS loudspeakers (\$2,990 a pair). The amps provide a minimum of 400 watts per channel into 8 ohms, the preamp includes a dbx-tweaked Dolby Pro



BY MICHAEL SMOLEN

Photo by Roberto Brasan

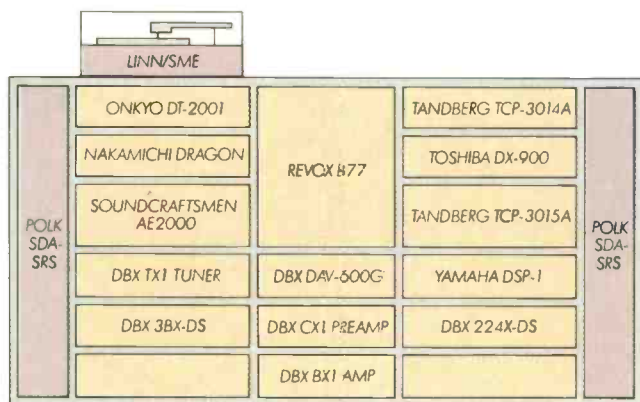




The heart of the system: dbx's BX1 two-, three-, or four-channel configurable power amp, CX1 preamp, and TX1 tuner.



Processing and switching are handled by Soundcraftsmen's AE2000 and dbx's 224X-DS, 3BX-DS, and DAV-600G.



For ease of use, a system like this should be installed with tape decks at eye level and switching devices at chest level.

Logic Surround decoder, digital time-delay ambience circuits, and three buffered tape loops. The SDA-SRS, Polk Audio's flagship system, simply must be heard to be appreciated. I think "sound stage" was redefined when these speakers were introduced in 1984.

Multitrack formats aside, and acknowledging that digital tape decks must still be purchased in Japan, a recording system of this caliber must offer all available taping possibilities. For my main cassette deck I chose Nakamichi's Dragon (\$1,995), with a Tandberg 3014 A (\$1,995) serving as back-up and dubbing partner. For DAT recording Onkyo's DT-2001 (about \$1,800) is my choice of what's currently available overseas. For open-reel recording I chose an old standby, the Revox B77 (\$2,250), that has been around for years and is still a standard by which other open-reel machines are measured. Finally, if you've never tried any digital PCM recording onto half-inch VHS videotape, you should—with Toshiba's DX-900 (\$1,300).

The Linn Sondek LP12 turntable (\$945) was an obvious choice. Even the "twekiest" high-end audiophiles tend to compare almost everything else to the stalwart Linn. It's outfitted with SME's spectacular Mark IV tonearm (\$1,250) and Talisman's silky-smooth Virtuoso DTi cartridge (\$1,200).

Other sources for the system include the remarkable-sounding Tandberg TCP 3015 A CD player (\$1,895) and a dbx TX1 tuner (\$600) to match the amp/preamp.

Effective routing and processing of signals in a system of this size is a key to its sonic success, and here I turned to Soundcraftsmen for the very flexible AE2000 one-third-octave graphic equalizer/analyzer (\$799) and to dbx for a plethora of signal processors, including a DAV-600G signal router (\$399), a 3BX-DS compander/ambience generator (\$499), and a 224X-DS Type II noise-reduction system (\$299). For surround sound I chose Yamaha's DSP-1 (\$899).

Accessories for the system include two Neumann KMS84 microphones (\$1,000 each) for live recording and AKG's studio-quality K340 headphones (\$215) for careful monitoring of the recorded signal and late-night sessions.

Rock on! □

BASF

Metal IV Cassette
Metal-particle formulation.
C120. 60 min a side \$5.99

Chromdioxid Maxima II Cassettes
High-density chrome formulation.
C90. 45 min a side \$2.99
C60. 30 min a side \$2.24

Chromdioxid Extra II Cassettes
Pure chrome formulation.
C120. 60 min a side \$2.99
C90. 45 min a side \$2.49
C60. 30 min a side \$1.74

LH Maxima I Cassettes
Ferric tape designed for high MOL for increased S/N.
C90. 45 min a side \$1.79
C60. 30 min a side \$1.49

LH Extra I Cassettes
Ferric tape designed for extended S/N.
C90. 45 min a side \$1.49
C60. 30 min a side \$1.24

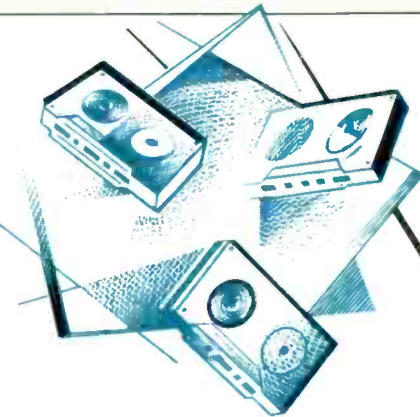


DENON

All Denon cassettes feature large window, lifetime warranty, head-cleaning leader, and transparent, H-shaped slip sheets for optimal back tension.

HD-M Metal Cassettes
High-stability pure metal tape formulation uses high-density dispersion technology for residual magnetic flux density of over 3,500 gauss and coercivity of 1,200 Oe.
HDM-90. 45 min a side \$6.50
HDM-60. 30 min a side \$5.00

HD8 High-Bias Cassettes
High-density metal-particle formula uses High Technoroum magnetic pigment to increase residual flux density to 2,800 gauss yielding MOL of -3.5 dB at 10 kHz.
HD8-100. 50 min a side \$4.99
HD8-90. 45 min a side \$4.75
HD8-60. 30 min a side \$3.75



BLANK TAPE BUYING GUIDE

OVER 320 million blank cassettes and some 380 million prerecorded cassettes were sold in the U.S. last year, making the cassette America's favorite music format. Tapes are still being made for open-reel and eight-track decks, but in fewer numbers.

All the information here was provided by the manufacturers, some of which have already announced price increases that will take effect by the time you read this. Actual selling prices, however, are set by each dealer. Since lines of tape change constantly, a guide of this kind cannot be complete, but it can help you find tapes in your price range to try out in your own deck. The manufacturers' addresses can be found on page 77.

HD7 High-Bias Cassettes
Type-II formulation designed for extended high-frequency response and low noise. Residual flux density 1,700 gauss, MOL -7.0 dB at 10 kHz.
HD7-90. 45 min a side \$3.00
HD7-60. 30 min a side \$4.00

HD6 High-Bias Cassettes
Type-II formulation designed for extended high-frequency response. Residual flux density 1,700 gauss, MOL -6.0 dB at 10 kHz.
HD6-90. 45 min a side \$3.25
HD6-60. 30 min a side \$2.50

DX4 Normal Ferric Cassettes
Type I formulation designed for extended frequency response. Residual flux density 1,700 gauss, MOL -4.5 dB at 10 kHz.
DX4-90. 45 min a side \$4
DX4-60. 30 min a side \$3

DX3 Normal Ferric Cassettes
12% increase in retentivity and coercivity for better high-frequency response and dynamic range. MOL -6.0 dB at 10 kHz.
DX3-90. 45 min a side \$3.00
DX3-60. 30 min a side \$2.50

DX1 Normal Ferric Cassettes
Low-noise high-output Type I cassette designed for high sens and high MOL (-9.5 dB at 10 kHz).
DX1-90. 45 min a side \$2.25
DX1-60. 30 min a side \$1.75

FUJI

Digital Audio Tape
Super Fine Metallix formulation.
DA-R120. 120 min price N/A
DA-R90. 90 min price N/A
DA-R60. 60 min price N/A
DA-R46. 46 min price N/A



FR Series Cassette Tape
Type I normal-bias cassettes designed for 120-μs EQ and cobalt-modified fine Beridox particles.
FR (C-46). 23 min a side \$2.69
FR (C-60). 30 min a side \$2.99
FR (C-90). 45 min a side \$3.99

FR Series Metal Cassette Tape
Metal-coated tape with tensilized polyester base; for metal bias. 70-μs EQ; in hinged plastic box.
FR (C-46). 23 min a side \$4.49
FR (C-60). 30 min a side \$4.99
FR (C-90). 45 min a side \$6.99

FR-II Series Cassette Tape
Chromium-dioxide cassettes with tensilized polyester base; designed for Type II/CrO₂ bias, 70-μs EQ; packaged in hinged plastic box. Features super-fine Beridox magnetic particles.
FR-II (C-46). 23 min a side \$2.69
FR-II (C-60). 30 min a side \$2.99
FR-II (C-90). 45 min a side \$3.99

FR-II Super Series Cassette Tape
Super-premium Type II high-bias cassettes with 70-μs EQ and cobalt-modified super-fine Beridox magnetic particles.
FR-II Super (C-46). 23 min a side \$3.49
FR-II Super (C-60). 30 min a side \$3.99
FR-II Super (C-90). 45 min a side \$5.49

DR Series Cassette Tape
DR (C-46). 23 min a side \$1.39
DR (C-60). 30 min a side \$1.59
DR (C-90). 45 min a side \$2.29
DR (C-120). 60 min a side \$3.19

ILLUSTRATION: BILL RUSSELL

BLANK TAPE

GOLDSTAR

All tapes have tensilized polyester base material; tape width 3.81 mm; tape length 135 m; yield strength (5%) kg; breaking strength 1.0 kg; residual elongation 0.05%; squareness ratio 0.85; sens uniformity 0.3 dB; output fluctuation 0.4 dB (except for HD: 0.5 dB).

HD Normal-Bias Cassettes

Coercivity 340 Oe; retentivity 1,300 gauss; sens +0.5 dB (315 Hz).
C-90. 45 min a side \$2

HR Normal-Bias Cassettes

Coercivity 340 Oe; retentivity 1,500 gauss; sens +1.0 dB (315 Hz).
C-90. 45 min a side \$3

HZ Normal-Bias Cassettes

Coercivity 360 Oe; retentivity 1,600 gauss; sens +2.0 dB (315 Hz).
C-90. 45 min a side \$4

CRX High-Bias Cassettes

Cobalt-doped iron-oxide particles. Coercivity 550 Oe; retentivity 1,600 gauss; sens +2.5 dB.
C-90. 45 min a side \$5

MTX Metal-Bias Cassettes

Pure metal particles. Coercivity 1,050 Oe; retentivity 3,000 gauss; sens +2.0 dB (315 Hz).
C-90. 45 min a side \$6

IRISH

High-Output Cassettes

Precision-shell ferric cassette in Norelco box.
XR-90. 45 min a side \$2.70
XR-60. 30 min a side \$2.10

Low-Noise Cassettes

Precision-shell ferric cassette in Norelco box.
LN-90. 45 min a side \$2.15
LN-60. 30 min a side \$1.75
LN-30. 15 min a side \$1.50

JVC

ME-PROII Metal Cassette Tape

Metal-particle tape designed for high magnetic density and high particle acicularity for high MOL. Coercivity 1,100 Oe.
ME-90PII. 45 min a side \$3.90

UFII High-Bias Cassette Tape

Coercivity 660 Oe.
UFII-90. 45 min a side \$1.75
UFII-60. 30 min a side \$1.50

UFI Normal-Bias Cassette Tape

Coercivity 380 Oe.
UFI-90. 45 min a side \$1.65
UFI-60. 30 min a side \$1.20



GI Normal-Bias Cassette Tape

Popular series. Coercivity 370 Oe.
C-90. 45 min a side \$1
C-60. 30 min a side \$0.85

LASER BY SWIRE MAGNETICS

Laser UHD-II Cassettes

High-bias ferric cassettes designed for high energy and extended frequency response.
C-90. 45 min a side \$2.59
C-60. 30 min a side \$1.99

Laser UHD-I Cassettes

Normal-bias ferric cassettes with high-energy, high-density formulation.
C-90. 45 min a side \$2.59
C-60. 30 min a side \$1.99

Laser XL Cassettes

Normal-bias ferric cassettes designed for extra low noise for voice or music.
C-120. 60 min a side \$2.49
C-90. 45 min a side \$1.89
C-60. 30 min a side \$1.49
C-45. 22.5 min a side \$1.39



MAXELL

Digital Audio Tape

Ceramic-Armor metal-particle formulation.
R-120DM. 120 min price N/A
R-60DM. 60 min price N/A

MX Metal Cassettes

Metal bias/EQ.
MX-46. 23 min a side \$5.29
MX-60. 30 min a side \$5.89
MX-90. 45 min a side \$7.39

XLII-S Epitaxial Cassettes

High-level bias; 70- μ s EQ.
XLII-S60. 30 min a side \$4.59
XLII-S90. 45 min a side \$5.69

XLII-S Epitaxial Cassettes

Normal bias; 120- μ s EQ.
XLI-S60. 30 min a side \$4.59
XLI-S90. 45 min a side \$5.69

XL-II Epitaxial Cassettes

Chrome type; high-level bias; 70- μ s EQ.
C-46. 23 min a side \$3.79
C-60. 30 min a side \$3.89
C-90. 45 min a side \$4.59

UDS-I Normal Bias Cassettes

Features phase accuracy shell, frictionless slip sheets, Quin-Lok hubs, cleaning leader.
C-46. 23 min a side \$2.79
C-60. 30 min a side \$2.89
C-90. 45 min a side \$3.29

UDS-II High-Bias CrO₂ Cassettes

Features phase accuracy shell, frictionless slip sheets, Quin-Lok hubs, cleaning leader.
C-46. 23 min a side \$2.79
C-60. 30 min a side \$2.89
C-90. 45 min a side \$3.29

Normal-Bias Cassettes

UR-46. 23 min a side \$1.49
UR-60. 30 min a side \$1.59
UR-90. 45 min a side \$1.99
UR-120. 60 min a side \$2.99

Open-Reel Tapes

XLII Open-Reel Tapes

Designed for use with EE-tape-capable decks.
XLII 35-90. 1,800 ft \$22.99
XLII 35-180. 3,600 ft \$62.99

XLI Back-Coated Open-Reel Tapes

XLI 35-90B. 1,800 ft. 7" reel \$17.39
XLI 35-180B. 3,600 ft. 10.5" reel \$48.69

Ultra-Dynamic Open-Reel Tapes

UD50-60. 1,200 ft. 7" reel \$11.99
UD35-90. 1,800 ft. 7" reel \$12.39
UD35-180. 3,600 ft. 10.5" reel \$38.69

MEMOREX BY MEMTEK

CDX II High Bias Cassettes

Metal tape for High Bias (type II) setting. Greater headroom for distortion-free reproduction at significantly higher recording levels than conventional high-bias tapes. Permanent reference cassette mechanism shell.
C-90. 45 min a side \$4.99

HBX II High-Bias Cassettes

High-performance ferric/cobalt tape for use at high-bias 70- μ s setting. Higher MOL's, greater sensitivity than standard high-bias and CrO₂ tapes. Permanent reference cassette mechanism.
High-Bias C-90. 45 min a side \$3.79
Type II C-60. 30 min a side \$2.99

HB II High-Bias Cassettes

Premium tape for high-bias 70- μ s EQ. Improved low-end MOL, greater sens, permanent reference cassette mechanism.
High-Bias C-90. 45 min a side \$2.79



Type II C-60. 30 min a side \$2.29

MRX I Normal-Bias Cassettes

Full lifetime warranty; high-visibility clear shell.
C-90. 45 min a side \$2.69
C-60. 30 min a side \$2.19

HELP US HELP YOU!

PARTICIPATE IN THE STEREO REVIEW BUYER POLL

Stereo Review wants to know more about our readers. How much equipment you buy (and how often), how much you spend on it, what sort of product features you like. That will help us create a better, more informative magazine, specially geared to your tastes and preferences.

To gather this important information, we've created the Stereo Review Buyer Poll. And we need your help to make it work.

If you've bought any equipment within the past 30 days, we'd like you to participate (see instructions below). We'll use the information you give us to keep manufacturers up to date on the buying habits of stereo enthusiasts—the most knowledgeable group of audio buyers in the country. And in the long run, that will mean better service for you.

HOW TO PARTICIPATE

You can participate in the Stereo Review Buyer Poll by sending in the Reader Service Card appearing next to this page. We've provided space for you to list any equipment purchased in the past 30 days. Any kind of audio/video equipment qualifies.

For example:

Home Audio Components

- Amplifier ■ Receiver/Tuner
- Speakers ■ Turntable
- Cassette Deck ■ Equalizer
- CD player

Portable Stereo

- Portable Cassette Player
- Portable CD Player
- Headphones

Car Stereo

- Tuner ■ Cassette Deck
- Speakers

Home Video

- VCR ■ Camcorder
- Videodisc Player
- Stereo TV

Fill in the type of equipment, manufacturer, model number, and price you paid. Include all the equipment you bought this month. Then print your name and address and drop it in the mail (we pay the postage). It's that simple!

Free Information Service ★ ★ ★

Get free literature on stereo products featured in this issue. Simply fill out your name and address, circle the number on the card that corresponds to the key number at the bottom of the advertisements and mail this card today.

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STEREO REVIEW BUYER POLL

1. In the past 30 days, have you purchased any audio or video equipment or accessories?
A YES B. NO → Thank You!

2. Which type(s) of equipment did you purchase in the past 30 days?
A. Home audio B. Portable stereo
C. Car stereo D. Video

3. In the space below, please write in the type (speakers, car CD player, stereo VCR, etc.), the make, the model number and the price paid for each item purchased in the past 30 days.

TYPE	MAKE	MODEL	PRICE PAID
Car stereo	Alpine	MR-5923	\$ 379.00
car radio/cassette deck	Bliss	BS3-20	\$ 145.00
Speakers	Speaker	KT 4372 (4)	\$ 1699.00

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LOOK FOR THE BUYER POLL EVERY MONTH

The Stereo Review Buyer Poll will appear in every issue—just check the Table of Contents for that month's location. You can participate in any month in which you purchased audio/video equipment. Of course, even if you don't join our Poll, you can still send in the Reader Service card to get information about products advertised in that month's issue.

We hope you'll participate regularly in the Stereo Review Buyer Poll. Your answers are important to us—and you'll find the resulting benefits important to you.

Thanks for helping us out!

Stereo Review

BLANK TAPE

dB'S Normal Bias Cassettes

Normal-bias tapes for all general purpose voice or music recording. Features high-visibility clear shell.

C-120. 60 min a side	\$2.59
C-90. 45 min a side	\$1.79
C-60. 30 min a side	\$1.49
C-46. 23 min a side	\$1.29

NAKAMICHI

ZX Reference Cassette Tapes

Metalloy (metal-particle) formulation for recording on metal-compatible decks only; features ultra-high coercivity and retentivity for lower distortion and improved MOL; 70- μ s EQ.

ZX-C60. 30 min a side	\$7.25
ZX-C90. 45 min a side	\$10

SX II Reference Cassette Tapes

Double-coated ionized cobalt and ferric-oxide formulation. CrO₂ bias and EQ (70 μ s).

SXII-C60. 30 min a side	\$6.50
SXII-C90. 45 min a side	\$8.90

SX Reference Cassette Tapes

Single-coated ionized cobalt and ferric oxide formulation; high coercivity permits use of CrO₂ bias and EQ (70 μ s) for 4-5 dB better S/N.

SX-C60. 30 min a side	\$4.50
SX-C90. 45 min a side	\$6.50

EX II Reference Cassette Tapes

Single-coated ferricobalt formulation; same bias and EQ (120 μ s) as EX tape; extra-low noise, high output.

EXII-C60. 30 min a side	\$4.25
EXII-C90. 45 min a side	\$6

PANASONIC

CrO₂ Position Cassettes

RT-90EX2. C-90 length (45 min a side); 2 pack	\$9.95
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Normal-Bias Cassettes

RT-60EN2. C-60 length (30 min a side); 2 pack	\$3.95
RT-80EN2. C-90 length (45 min a side); 2 pack	\$5.45
RT-60FS2. Fashion series. C-60 length (30 min a side). Color-tinted shell. 2 pack	\$5.45

REALISTIC

Cassette Tape

Prices vary according to quantity purchased.

MIV Type IV Metal Cassette Tape

Fine-grain metal particles; 5-screw housing; hinged storage box.

MIV-90. 45 min a side	\$6.99-\$4.89
MIV-60. 30 min a side	\$5.99-\$4.19

MII Metal Type II High-Bias Tape

Metal tape for recording and playback with Type II bias and EQ; head-cleaning leader; hinged storage box.

MII-90. 45 min a side	\$5.69-\$3.99
MII-60. 30 min a side	\$4.89-\$3.43

HD Hi-Definition Chrome-Equivalent

For recording and playback with high-bias Type II bias and EQ; head-cleaning leader; hinged storage box; index card.

HD-90. 45 min a side	\$4.29-\$2.97
HD-60. 30 min a side	\$3.49-\$2.45

XR Type I Premium Ferric Tape

Hinged storage box with index card.

XR-120. 60 min a side	\$4.99-\$3.29
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XR-90. 45 min a side	\$3.79-\$2.59
XR-60. 30 min a side	\$2.79-\$1.89
XR-45. 22.5 min a side	\$2.45-\$1.79

LN Low-Noise Type I Standard Ferric

Hinged storage box with index card.

LN-120. 60 min a side	\$3.49-\$2.29
LN-90. 45 min a side	\$2.79-\$1.85
LN-60. 30 min a side	\$1.99-\$1.29
LN-30. 15 min a side	\$1.59-\$1.05

Concertape Type I Cassettes

C-120. 60 min a side; 3-pack	\$4.99-\$4.39
C-90. 45 min a side; 3-pack	\$3.59-\$3.19
C-60. 30 min a side; 3-pack	\$2.59-\$2.29
C-30. 15 min a side; 3-pack	\$1.99-\$1.79
C-90. Single; 45 min a side	\$1.25
C-60. Single; 30 min a side	\$0.88

Open-Reel Tape

Supertape Premium. Polyester base. super-calendared.

5" reel; 900 ft; 1.0 mil; 1-9 tapes	\$3.99 each
5" reel; 900 ft; 1.0 mil; 10+ tapes	\$3.19 each
7" reel; 1,200 ft; 1.5 mil; 1-9 tapes	\$5.99 each
7" reel; 1,200 ft; 1.5 mil; 10+ tapes	\$4.79 each
7" reel; 1,800 ft; 1.0 mil; 1-9 tapes	\$6.99 each
7" reel; 1,800 ft; 1.0 mil; 10+ tapes	\$5.59 each
7" reel; 3,600 ft; 0.5 mil; 1-9 tapes	\$12.99 each
7" reel; 3,600 ft; 0.5 mil; 10+ tapes	\$10.39 each

Low-Noise. Polyester base.

7" reel; 1,800 ft; 1.0 mil	\$5.99-\$4.39 each
7" reel; 2,400 ft; 0.5 mil	\$6.99-\$5.19 each
7" reel; 3,600 ft; 0.5 mil	\$7.99-\$6.39 each

Concertape. Polyester base.

7" reel; 1,800 ft; 1.0 mil	\$2.49 each
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8-Track Cartridges

Supertape. 45 min total time.

1-11 cartridges	\$3.99 each
12-24 cartridges	\$3.49 each
25-49 cartridges	\$3.19 each
50+ cartridges	\$2.99 each

Low Noise. Polyester base. 40 min.

1-11 cartridges	\$1.99 each
12-24 cartridges	\$1.79 each
25-49 cartridges	\$1.59 each
50+ cartridges	\$1.39 each

Low Noise. Polyester base. 80 min.

1-11 cartridges	\$2.69 each
12-24 cartridges	\$2.39 each
25-49 cartridges	\$2.15 each
50+ cartridges	\$1.89 each

RECOTON

Studio Standard Cassettes

High-bias tape on Teflon-treated reels in smoke-colored shells; flanged idler rollers; lubricated liners; 5 screws; in plastic boxes.

SHB90. 45 min a side	\$2.69
SHB60. 30 min a side	\$2.39
High Energy formulation.	
SHE90. 45 min a side	\$2.09
SHE60. 30 min a side	\$1.89

SCOTCH

Digital Audio Tape

C-120. 120 min	\$13
C-90. 90 min	\$11
C-60. 60 min	\$9
C-46. 46 min	\$8

ASM IV Cassettes

Fine metal magnetic particle formulation; delivers maximum output up to 10 dB better than typical oxide tapes and up to 7 dB greater than chrome tapes; designed for low distortion, added high-frequency response, and improved S/N.

60 min. 30 min a side	\$5.49
90 min. 45 min a side	\$6.99

XS II Cassettes

Redeveloped premium grade formula designed for improved S/N, less tape hiss; dual-layer, cobalt-modified ferric oxide; for use with chrome or 70- μ s EQ; improved shell for critical mechanical permanence.

60 min. 30 min a side	\$2.99
90 min. 45 min a side	\$3.79

CX Cassettes

Normal-bias ferric oxide cassette featuring improved low frequency output and clarity. 6-screw impact polymer shell houses inner assembly with low-friction roller guides.

60 min. 30 min a side	\$2.40
90 min. 45 min a side	\$2.99

BX Cassettes

Ferric-oxide formulation for all-purpose use; polyester base. 5-screw polymer shell featuring low-friction roller guides and high-impact case.

60 min. 30 min a side	\$1.69
90 min. 45 min a side	\$1.95



SONY

ES Metal Cassette

Type-IV position (70- μ s EQ).

ES-90. 45 min a side	\$9.99
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UX Series Cassettes

Type-II position (70- μ s EQ).

UX. C-60 (30 min a side)	\$2.49
UX. C-90 (45 min a side)	\$3.29
UX-S. C-60 (30 min a side)	\$2.99
UX-S. C-90 (45 min a side)	\$3.99
UX-ES. C-60 (30 min a side)	\$3.99
UX-ES. C-90 (45 min a side)	\$5.49
UX-Pro. C-60 (30 min a side)	\$5.99
UX-Pro. C-90 (45 min a side)	\$7.99

HF-S Series Cassettes

Type I position (normal bias, 120- μ s EQ).

HF-S 60. 30 min a side	\$1.99
HF-S 90. 45 min a side	\$2.69

BLANK TAPE

HF Series Cassettes

Type I position (normal bias, 120- μ s EQ).

HF 46. 23 min a side	\$1.49
HF 60. 30 min a side	\$1.79
HF 90. 45 min a side	\$2.29
HF 120. 60 min a side	\$2.99

TDK

Digital Audio Tape

Super Finavinx metal-particle formulation.

DA-R120. 120 min	price N/A
DA-R90. 90 min	price N/A
DA-R60. 60 min	price N/A

MA-XG Metal-Alloy (Type IV) Cassette Tape

Metal bias; 70- μ s EQ; 3-layer RS-II vibration-damping mechanism designed to eliminate sympathetic vibrations for reduced modulation noise.

MA-XG 90. 45 min a side	\$9.25
MA-XG 60. 30 min a side	\$7

MA-X Metal-Alloy (Type IV) Cassette Tape

Metal bias; 70- μ s EQ; 2-layer plastic mechanism; improved Finavinx formulation designed for superior output level and wide dynamic range.

MA-X 90. 45 min a side	\$5
MA-X 60. 30 min a side	\$4.25

MA Metal-Alloy (Type IV) Cassette Tape

Metal bias; 70- μ s EQ; Laboratory Standard mechanism.

MA-90. 45 min a side	\$4
MA-60. 30 min a side	\$3.50

HX-S High-Bias (Type II) Cassette Tape

Metal-particle tape for high-bias setting; Laboratory Standard mechanism.

HX-S 90. 45 min a side	\$4.50
HX-S 60. 30 min a side	\$3.75

SA-XG High-Bias (Type I) Cassette Tape

RS-II high-performance cassette mechanism; Super Avilyn formulation.

SA-XG 90. 45 min a side	\$9.25
SA-XG 60. 30 min a side	\$7

SA-X High-Bias (Type II) Cassette Tape

2-layer shell; dual-coated Super-Avilyn formulation; 70- μ s EQ.

SA-X 90. 45 min a side	\$3.50
SA-X 60. 30 min a side	\$3

SA High-Bias (Type II) Cassette Tape

Laboratory Standard Mechanism.

SA 90. 45 min a side	\$3
SA 60. 30 min a side	\$2.50

AD-X Normal-Bias (Type I) Cassette Tape

Super Avilyn particles for extra headroom; Laboratory Standard Mechanism. 120- μ s EQ.

AD-X 90. 45 min a side	\$3
AD-X 60. 30 min a side	\$2.50

AD-S Normal-Bias (Type I) Cassette Tape

Rigid plastic C-Thru mechanism designed to control resonances; 120- μ s EQ.

AD-S 90. 45 min a side	\$2.50
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AD Normal-Bias (Type I) Cassette Tape

Linear ferric-oxide particles; Laboratory Standard Mechanism; 120- μ s EQ.

AD-X90. 45 min a side	\$2.50
AD-X60. 30 min a side	\$2.25

Super D High-Bias Cassette Tape

For Type II bias and EQ; Super Avilyn particles; Laboratory Standard Mechanism.

SD-90. 45 min a side	\$2.50
SD-60. 30 min a side	\$2.25

D (Dynamic) Cassette Tape

Normal bias; 120- μ s EQ; precision mechanism.

D-60. 30 min a side	\$1.75
D-46. 23 min a side	\$1.60
D-30. 15 min a side	\$1.50



TRIAD

Petroleum-lubricated Delta transport mechanism has hub-tensioning device machined into slip pad for precise azimuth. Magnetic particles made of powdered ferrous chloride mixed with other materials and reduced to goethite (FeO₂H) needle-shaped ferrous hydroxide particles. Goethite is reduced by hydrogen to magnetite (Fe₃O₄).

CD-IV Metal Tape

Metal-particle tape for metal bias and EQ.

CD-IV. 76 min (38 min a side)	\$5.99
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CD-II Metal Tape

Metal-particle tape for chrome bias and EQ.

CD-II. 102 min (51 min a side)	\$5.49
CD-II. 76 min (38 min a side)	\$4.19

MG-X Metal Tape

Type IV bias; 70- μ s EQ. FR to 10,000 Hz +0 dB; MOL +5 dB at 315 Hz; saturated output level -10 dB at 10,000 Hz; retentivity 3,300 gauss; coercivity 1,150 Oe.

MG-X90. 45 min a side	\$5.99
MG-X90. 2 pack; 45 min a side	\$11.48
MG-X60. 30 min a side	\$4.99
MG-X60. 2 pack; 30 min a side	\$9.48

EM-X Metal High-Bias Tape

Metal formulation; Type II bias; 70- μ s EQ; designed for more high-frequency headroom and higher overload levels than other high-bias tapes. FR to 10,000 Hz +0.5 dB; MOL +5 dB at 315 Hz; saturated output level -3 dB at 10,000 Hz; retentivity 3,100 gauss; coercivity 720 Oe.

EM-X90. 45 min a side	\$4.99
EM-X90. 2 pack; 45 min a side	\$9.48

F-X Normal-Bias Tape

Oxidized cobalt-treated magnetite particles; Type I bias; 120- μ s EQ. FR to 10,000 Hz +3

dB; MOL +5.5 dB at 315 Hz; SOL -6 dB at 10,000 Hz; retentivity 1,800 gauss; coercivity 380 Oe.

F-X90. 45 min a side	\$3.99
F-X90. 2 pack; 45 min a side	\$7.48

VISA BY INTERWORLD

UCX-I-S High Tech Turbo

High-bias cassette tape with ultra-refined CrO₂ coating and special housing.

60 min. 30 min a side	\$3.49
90 min. 45 min a side	\$4.99

UCX-II High Tech Turbo

High-bias cassette tape.

60 min. 30 min a side	\$2.99
90 min. 45 min a side	\$3.99

UFX-I High Tech Turbo

Ferric cassette tape with clear housing.

60 min. 30 min a side	\$2.99
90 min. 45 min a side	\$3.99

CX-II Professional Tape

High-bias cassette tape.

60 min. 30 min a side	\$2.49
90 min. 45 min a side	\$3.49

FDX-I Professional Tape

Ferric cassette tape.

60 min. 30 min a side	\$1.99
90 min. 45 min a side	\$2.79

Extra Performance II Tape

High bias cassette tape.

60 min. 30 min a side	\$1.99
90 min. 45 min a side	\$2.49

High Performance I Tape

Ferric cassette tape with iron-dioxide coating.

60 min. 30 min a side	\$1.59
90 min. 45 min a side	\$1.99

DIRECTORY OF MANUFACTURERS

BASF, Crosby Dr., Bedford, MA 01730-1471

Denon, 222 New Rd., Parsippany, NJ 07054

Fuji, 555 Taxter Rd., Elmsford, NY 10523

GoldStar, 1050 Wall St. West, Lyndhurst, NJ 07071

Irish, 270-78 Newtown Rd., Plainview, NY 11803

JVC, 41 Slater Dr., Elmwood Park, NJ 07407

Laser by Swire Magnetics, 301 E. Alondra Blvd., Gardena, CA 90248

Maxell, 60 Oxford Dr., Moonachie, NJ 07074

Memorex by Memtek, 2155 S. Bascom Ave., Campbell, CA 95008

Nakamichi, 19701 S. Vermont Ave., Torrance, CA 90502

Panasonic, One Panasonic Way, Secaucus, NJ 07094

Realistic by Radio Shack, 1700 One Tandy Center, Fort Worth, TX 76102

Recoton, 46-23 Crane St., Long Island City, NY 11101

Scotch by 3M, 3M Center, Building 223-5N-01, St. Paul, MN 55144

Sony, Sony Dr., Park Ridge, NJ 07646

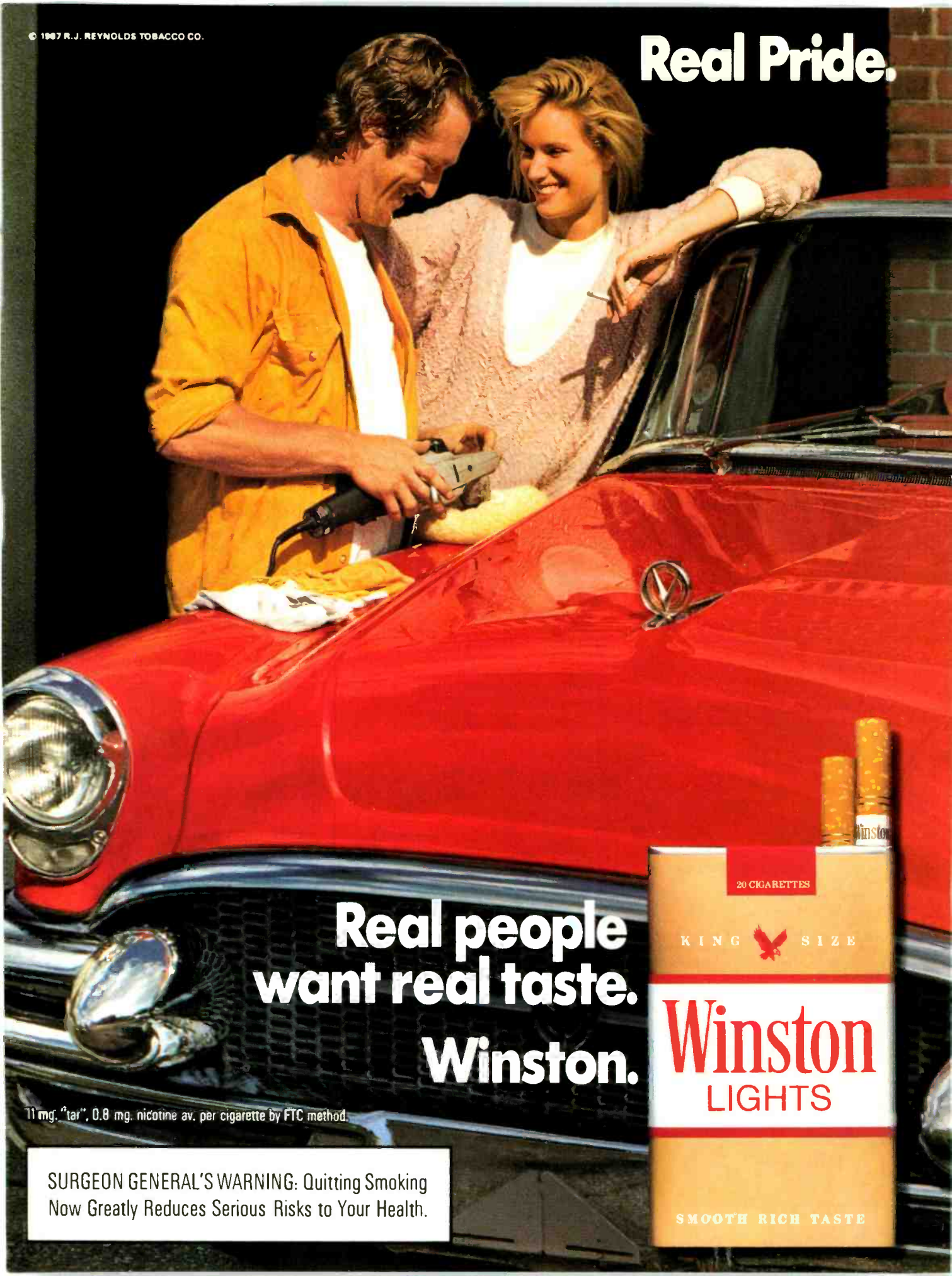
TDK, 12 Harbor Park Dr., Port Washington, NY 11050

Triad by Harman America, 240 Crossways Park West, Woodbury NY 11797

Visa by Interworld Electronics, 9920 N.W. 12th St., Miami, FL 33172



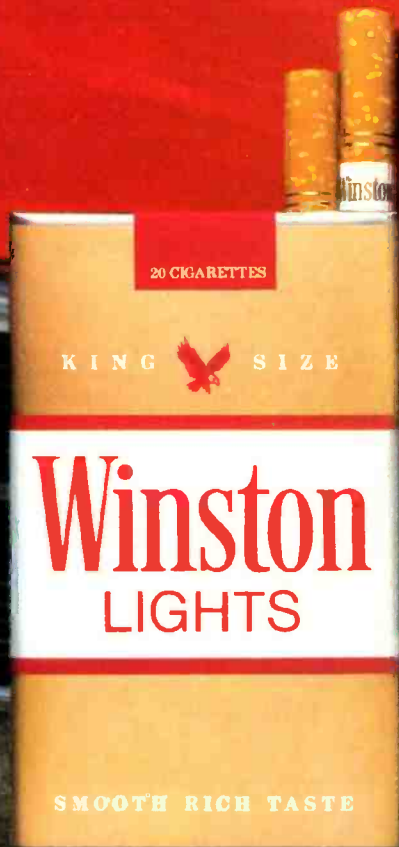
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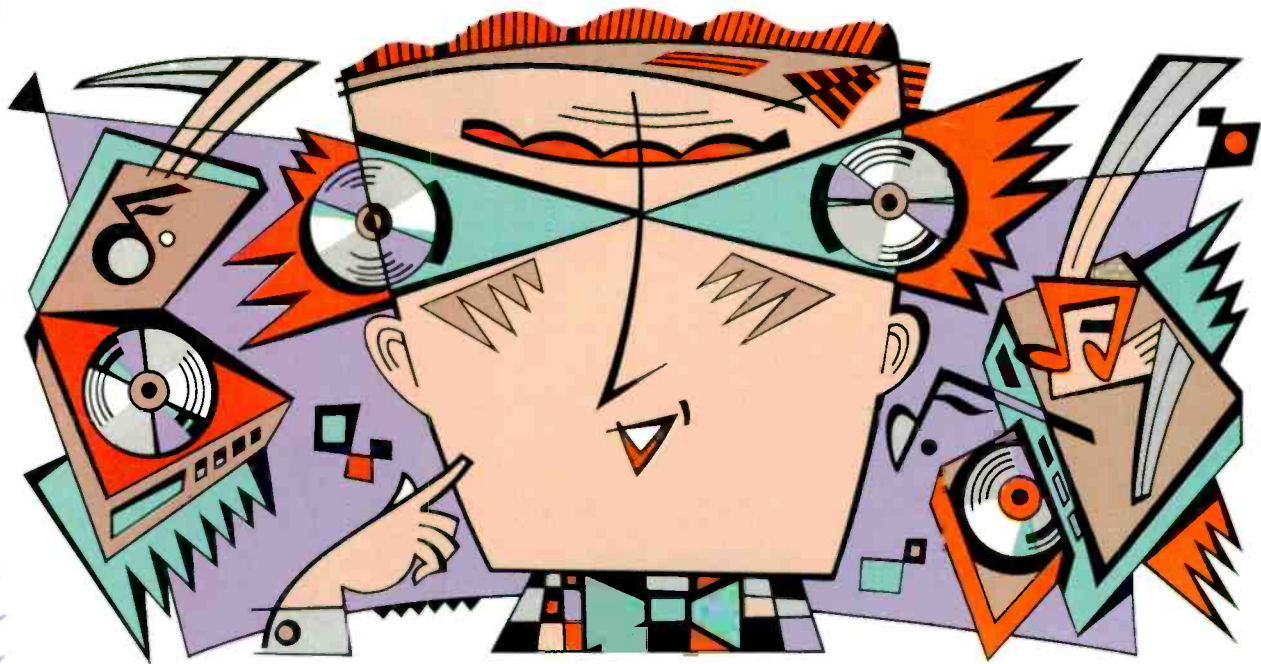
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CHOOSING A CD PLAYER



BY IAN G. MASTERS

If all you're looking for is high-quality sound, choosing a compact disc player should be a snap. Even a critical, golden-eared audiophile will concede that sonic differences between machines are subtle at most, and there are others who feel that such differences simply don't exist. Whichever camp is ultimately proved to be correct, it's clear that audio performance varies so little from one CD player to the next that sound quality is not a very crucial factor for most buyers.

But that doesn't mean the choice is easy. At present there are more than 250 compact disc players on the market (not including thirty or so more designed to be used in automobiles), and prices range from several hundred to several thousand dollars. Though many of these may sound pretty much alike, they are all different in the range and complexity of features they offer. As with anything else in audio, however, a progressive narrowing of the field will reduce the choice to a manageable number from which you can make your final selection on the basis of price or brand name or looks or control "feel" or whatever is important to you.

Compact disc players fall into several broad categories, and choosing the one that comes closest to your needs right at the beginning will make the selection process much easier—there's little point in even looking at a partic-

ular style of player if it doesn't do what you want it to. The first step is to give some thought to the circumstances under which you want to listen to your discs.

For example, although portable players are greatly outnumbered by home units, there is a fairly wide selection on the market. Obviously, if your primary aim is to listen to digital sound away from home, a portable is a must, but even in this category there are several types to choose from.

Portables

Most of the major manufacturers offer "pure" portables—players no bigger than a stack of three or four discs—and these are appropriate if you wish to listen while walking, running, or skiing. Another sort of portable is the "boom box" with a built-in CD player, which may appeal if you want to listen to music on the beach or take your own music to social occasions. Typically, these offer more than just compact disc capability; most include an AM/FM tuner and at least one cassette tape deck.

A portable player may be appropriate for you even if you expect to do most of your CD listening at home. Virtually all of them have line outputs so they can be patched into your home system and yield sound comparable to that from units designed only for domestic operation. Not only does buying a portable

with line outputs give you the option of using the player outside your home when an occasion arises, but if you have audio equipment in more than one room, it allows you to move the player from system to system with ease. Another benefit of a portable player is its size: If your equipment shelves are already full, a miniature player will give you digital capability without your having to rearrange your whole system.

Bear in mind, however, that even though most portables are used more at home than on the go, that's not their main purpose. Few offer the programming flexibility of domestic models, and the advanced technical refinements now common in home players are still rare in portables. Also, remote controls are available with only a handful of portables. On the other hand, features affording great shock resistance are virtually universal with portables but available in only a minority of home players, so if that is an important consideration, you should look seriously at a portable.

Wherever you intend to use a portable, take a good look at how it gets its power. Some models require an external battery pack, which reduces the size of the player itself but requires you to carry around a second piece of equipment. Others will take ordinary batteries, which can be an expensive proposition but does allow you the flexibility of replacing the batteries immediately when power gets low rather than having to wait for a rechargeable battery to get up to power.

Most rechargeable portables use nickel-cadmium batteries, sometimes internal ones, and these have the advantage that they can be reused almost indefinitely. Usually a charger is supplied with the player, and some of these are built in. In most cases, the charger also allows you to run the player on AC power, which is a necessity if you intend to use the portable with your home system. Before you pick a particular model, make sure you know what power options are available—what's built in, what's included as an external source, and what's available as an optional extra. There is very little consistency in this area from machine to machine.

Home Players

Choosing a portable CD player for home use does make sense in some circumstances, but it also involves



Denon's DCD-3300 uses the company's Super Linear Converter circuitry in a dual configuration, with a separate D/A converter for each channel. Price: \$1,700.



The Sony CDP-950 incorporates technology from Sony's premium ES series. It has a Custom File system to store programming data for up to 226 CD's. Price: \$450.



Yamaha's CDX-1100U employs Hi-Bit technology in its quadruple-oversampling digital filter, D/A converter, and digital volume control. Price: \$1,099.



The NEC CD-510 includes a floating optical mechanism isolated from the base chassis for accurate tracking and less frequent error compensation. Price: \$359.



Citizen's CBM-1000 programmable portable unit comes with a line-out pin-jack and line cord, AC adaptor, battery cradle, and "earbud" headphones. Price: \$250.

The a/d/s/ Atelier CD3 uses "computer-on-a-chip" microprocessors for tracking-system control, error correction, and digital filtering. Price: \$1,200.



some technical and functional compromises. To take full advantage of today's digital technology, you will have to look at players designed for use with home audio systems. The selection becomes harder here because there are so many models to choose from and a wider range of prices. Still, it is possible to bring the selection process into focus by eliminating things you don't need.

For instance, there are some very distinctive products on the market that you can either reject out of hand because they don't meet your needs or choose to buy because they are the only ones that do what you want. Such unusual items as Sharp's combination CD player/clock radio, the same company's "CDver" (a receiver with a CD player built in), or Bang & Olufsen's turntable/CD player may be exactly what you need. If so, they are the only products of their kind on the market, which makes your choice a very easy one. Teac offers a pair of combination CD player/cassette decks that may solve your problems, and a small number of companies market audio/video "combi" players that will not only handle your normal CD's but will play CD videos and standard videodiscs as well. Technics has adapted its professional players for high-end consumer use; these not only offer a full range of programming functions but also allow you to cue up individual notes or to vary the playing speed.

Somewhat more common are CD changers, available from twenty or so manufacturers. The most modest of these will allow you to program selections in any order from up to half a dozen discs. This facility can be very convenient if you have a small number of current favorite recordings that you keep loaded in the machine, which can be programmed like a jukebox. A changer also allows you to play several hours of preprogrammed music when you are entertaining and have better things to do than be a disc jockey. The ultimate machine in this category is Nikko's sixty-disc changer, which can be programmed by your personal computer. It carries a price tag of \$4,600, but more modest changers can be bought for less than \$400, and one of them might be ideal for you even if you use its multi-disc capabilities only rarely.

By far the largest portion of the market, about three-quarters, is made up of straightforward single-

disc home players, and while these share some basic similarities, they vary widely both in the features they offer and in their technical sophistication. To whittle this large number of models down to size, you need to make some decisions.

The most fundamental, of course, is price. Even without taking discounts into consideration, you can buy a home CD player for less than \$200 . . . or for as much as \$8,000. Fortunately, the field is so wide that you should be able to choose a price range you are comfortable with and still find a player within that range that will do what you need. By all means spend more if you encounter a model you particularly like, but make sure that the increase is reasonably justified by more advanced circuitry, increased flexibility, a preferred brand, greater operating ease, or the like.

Give some thought to a player's physical configuration. Size can be an important factor if your space is limited, and the disc-loading method may also eliminate some candidates—for instance, you won't choose a top-loading unit if you intend to place other equipment on top of it.

One basic functional consideration in a CD machine is its programming functions. All players provide some means to choose the pieces of music you wish to hear, or not to hear, but they vary widely in the number of random-access selections you can make. If you are in the habit of playing your discs all the way through, you will need minimal programming, but if you wish to be more selective, make sure the player's capabilities meet your requirements. Many players also offer a variety of repeat functions that allow you to play parts of a disc over and over. Some restrict repetition to full tracks or the whole disc, but others let you define the repeating section, starting and stopping anywhere on the disc. Another nice programming feature is index cueing. Some CD's have subcodes that identify the start of specific musical passages *within* a larger track—an operatic aria or jazz solo, for instance—and a player that reads index codes can locate these almost instantly.

Some special programming functions have been introduced recently that should not be overlooked. For instance, several players allow you to choose the tracks you wish to hear in the normal manner but can



Onkyo's Integra DX-330 employs an Opto-Coupling system to isolate the digital and analog stages electrically. Other features include sixteen-track random-access programming, a three-beam laser, a double-oversampling digital filter, a floating transport to dampen vibrations, and audible fast scan. Price: \$480.



The Sansui CD-X310M CD changer can play up to thirty-two selections in any order from any of the six discs loaded into its magazine. It also features audible fast scan in forward and reverse as well as repeat of a single track, an entire disc, all six discs, or a programmed sequence. Price: \$390.

play them back in random order, lending an element of spontaneity and surprise to your music listening. Some players feature "shuffle play," which automatically plays all the tracks on a disc in random order. And some Magnavox players contain a memory circuit that recognizes your favorite discs and automatically plays their tracks in the order you last programmed.

A LARGE number of today's players are supplied with infrared remote controls. These have obvious value as long as you need them, but if your player is right beside your listening chair or hidden behind an opaque door, there's not much point in paying for a remote control. In addition, with some remote-controlled players certain functions can be controlled *only* from the remote; if you plan to operate your equipment from its front-panel controls, it may be irksome to have to use the remote when you wish to take advantage of a particular feature. And if you do intend to use the remote control, make sure that the player displays what's going on clearly. Why have a remote if you have to cross the room to see what you are doing?

Technical Considerations

While your choice of a CD player will probably be determined mainly by its features, there are several technical factors that should be considered. For instance, the way the player reads the information contained on a disc can affect its ability to perform smoothly, particularly with flawed discs.

The digital signal on a CD is contained in a spiral of very tiny deformations, which are detected by bouncing a low-powered laser beam off the disc's shiny surface and measuring the reflections photoelectrically. Unlike a vinyl record, however, a CD has no physical guide for the laser—no grooves—so positional information included with the digital audio signal is used to control the motor that moves the laser beam across the disc. Slight wanderings of the beam are not too serious; the system's error-correction circuitry can smooth things over until the laser is back in position. But if the beam strays too far, the player cannot correct for this,

and it skips. To minimize the skipping effect, many manufacturers split the laser beam into three spots that track the information spiral side by side. The middle spot reads the audio information, and the outer two detect minor positional errors, which can be corrected before they become serious.

"Three-beam" or "three-spot" operation is common now in all but the most modest home CD players, although it is still a rarity in portable and automotive units. Technics has taken a different approach, however, using a single spot in conjunction with a very fast linear motor for correcting positional errors.

The signal on a compact disc is made up of 16-bit digital "words" that the player changes to a conventional audio signal using a digital-to-analog (D/A) converter. In the early days of the CD format, integrated circuits that could handle 16 bits were rare, so most players used 14-bit converters, manipulating the data to simulate 16-bit operation. Now, 16-bit chips are widely available, so the better machines boast "true 16-bit D/A conversion." Taking this a step further, certain manufacturers provide "quasi 18-bit" operation, using the same sort of simulation that was required when 14-bit chips were used but applied to the more powerful integrated circuits, and a few others have announced *true* 18-bit operation in their top players.

Another area of technical improvement that may or may not actually result in better sound has to do with the filtering of the audio signal in the player. When a digital signal is converted to analog, it contains some spurious information that must be removed before the audio is fed to your amplifier. If the spurious signals remain in the player's output, they may produce large amounts of intermodulation distortion, so an "anti-imaging filter" is used to remove them. This filter's slope must be very sharp, and it must go into operation just above the audio band since the sampling frequency, 44.1 kHz, is only one octave above the top audio information. Unfortunately, both the proximity to the audio spectrum and the sharpness of the filter can cause some phase shifting in the upper frequencies.

To lessen this phase shifting, many manufacturers use a technique called "oversampling." In-

stead of simply using the 44.1-kHz information, the digital signal is passed through a digital filter that, in effect, multiplies the amount of data two or four times. This lets the designer use a less steep anti-imaging filter and place it further away from the audio band, thus reducing phase shifting.

Both double and quadruple oversampling are widely used (with frequencies of 88.2 and 176.4 kHz, respectively), and even higher rates are used in some players. But while oversampling results in a measurable technical improvement, there is still some debate as to whether the offending phase shifts are audible in the first place.

Nevertheless, makers of compact disc players share with other audio designers the desire to improve their products even if the benefits are not immediately apparent. Quite a few players are now available with digital outputs, for instance, and amplifiers with appropriate inputs have been introduced as well, on the theory that the greater the digital portion of the signal path the better. To this same end, fiber-optic linkages are used in a number of compact disc players to reduce the risk of radio-frequency interference in the analog output.

IRONICALLY, there are also circuits to make the sound of a compact disc seem less "digital." Because the very wide dynamic range of digital sound is not desirable in every application—quiet signals tend to be inaudible where there are high ambient noise levels, for instance—a few manufacturers, notably dbx, have added switchable signal compressors to their players. And one company, Carver, includes a circuit that simulates what some people feel is the superior out-of-phase characteristics of analog recording.

All of these refinements carry price tags, of course, but they increase the options for anyone looking to buy a compact disc player. The choice has undoubtedly become very wide. That very range of choice, however, means that the perfect machine for you is out there somewhere. Finding it can be daunting at first, but the key to the selection process is simply deciding what you need and eliminating all the players that don't fit the bill. □



by *Christie Barter*
& *Steve Simels*

VETERAN Sixties songstress **Marianne Faithfull** may now sound like a cross between **Tom Waits** and a chainsaw, and her once-ethereal schoolgirl beauty has, shall we say, matured, but we still think she's the sexiest woman in pop music. Her remarkable new Island album, "Strange Weather," is wonderfully eclectic, with songs ranging from *Boulevard of Broken Dreams* to a remake of her first-ever hit, *As Tears Go By*.

Faithfull sang numbers from the new album, as well as oldies like her New Wave comeback, *Broken English*, in a memorable show recently at New York's Bottom Line. She was supported at the Greenwich Village club by a brilliant band starring **Lou Reed's** bassist, **Fernando Saunders**, and **Mac "Dr. John" Rebennack**. □

SUCH a flurry of **Bruce Springsteen** activity lately: First, the Boss appeared in what was easily the best musical show we've seen on television in years, the **Roy Orbison** tribute just aired on Cinemax (the videotape will be released by fall, we understand). Then he showed up at a concert memorial for the late singer-activist **Harry Chapin**, where he sang two

Faithfull: sexy as ever



EBET ROBERTS

Chapin songs, no less. And then he made the first video in which he looks comfortable and compelling, the title tune from his "Tunnel of Love" album.

All that would be enough for most mortals, but **Springsteen** also participated in December's Madison Square Garden benefit for the homeless hosted by **Paul Simon**. **Springsteen**, **Simon**, **Billy Joel**, and **Lou Reed** provided stunning Belmonts-style harmony behind first-generation rock legend **Dion**. That performance was taped too, and perhaps eventually it will also be released as a home video-cassette. □

THE actor **F. Murray Abraham**, who won an Oscar for his portrayal of the composer **Salieri** in *Amadeus*, has recorded for Caedmon a reading of *The Phantom of the Opera*, the classic **Gaston Leroux** novel that inspired Broadway's latest hit musical. The reading is available only as a two-cassette package, however, since Caedmon no longer releases LP's except for its spoken-word recordings made specifically for children. The original London-cast recording of **Andrew Lloyd Webber's** musical version of *Phantom* is available on the Polydor label in both formats as well as on compact disc. □

THE Swedish **Bis** label has got to hold the current record for speedy production of a compact disc. Two popular piano concertos, the **Tchaikovsky First** and the **Grieg A Minor**, were recorded with pianist **Roland Pöntinen** and the **Bamberg Symphony** under **Leif Segerstam** over the last four days of October. The tapes were edited in Stockholm on November 1 and sent to a pressing plant in the rural county of Sussex, England, on November 2. While the CD was being mastered and pressed, the insert booklet was being printed in Hamburg, West Germany.

The finished discs and booklets were packaged together on November 3—



Springsteen: busier than ever

according to **Bis**, only "sixty-nine hours and fifty minutes for the whole process, from the end of the [recording] ses-



Dion's back-up: Joel, Simon, Springsteen, and Reed

sions to the first production copy!" That's fast. And, courtesy of **Qualiton Imports**, **Bis** had the **Tchaikovsky-Grieg** coupling in U.S. stores in time for Christmas. □

THE world's longest-playing package of three compact discs is probably the new recording of *Show Boat* just released by **Angel**. It features **Frederica von Stade**, **Jerry Hadley**, **Teresa Stratas**, and **Bruce Hubbard** in the leading roles and is conducted by **John McGlinn**, who has been quoted as saying that "literally every single note **Jerome Kern** and **Oscar Hammerstein II** wrote for this show at any point is accounted for." An appendix of fourteen numbers includes songs

dropped from the original 1927 and 1928 productions in New York and London, most of which were discovered a few years ago in a Secaucus, New Jersey, warehouse, as well as music written for the 1936 movie version and the 1946 Broadway revival. The total playing time for the album is three hours and forty-five minutes. □

STILL only twenty-two years old, pianist **Andrea Lucchesini** has already achieved international status. It all began when he won **First Prize** in the fourth annual

Dino Ciani Piano Competition in Milan in 1983, the first native-born Italian to do so. He was immediately booked for recitals throughout the rest of Italy as well as in Paris, Monte Carlo, Frankfurt, and Amsterdam.

Lucchesini made his U.S. debut last season with the **Indianapolis Symphony** and has been busy on the American concert circuit ever since. He's also made four records for **EMI**, one of which, a coupling of **Beethoven's Moonlight** and **Hammerklavier Sonatas**, recently released by **Angel**, constituted his American recording debut. An album of **Chopin** featuring the **B Minor Sonata** and the **B-flat Minor Scherzo** greeted the New Year. □

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ALEX VON KOELLITZ/EMI



Lucchesini: new concert star

DANISH recorder player **Michala Petri**, introduced to U.S. record buyers by Philips Classics, has now signed an exclusive, worldwide RCA contract. She made her U.S. concert debut five years ago with the New York Chamber Symphony and has subsequently returned to the city for three seasons of Mostly Mozart at Lincoln Center.

Currently on tour through mid-March, Petri bows on Red Seal with an all-Vivaldi record featuring *The Four Seasons*, in which she's accompanied by the Guildhall String Ensemble of London and harpsichordist **George Malcolm**. Coming up is an album of contemporary works written for Petri. □

Petri: recorder classics old and new

SUZIE E. MAEDER/RCA RED SEAL



BEEN wondering what **Joe Strummer** has been up to since the demise of everybody's favorite original punk band, the **Clash**? Well, movie scoring, actually. Strummer's currently represented by original work for *Walker*, the Nicaraguan epic by director **Alex Cox**, who did *Sid and Nancy*. More recently, Strummer's been helping out with the American tour of British punk/folk stalwarts the **Pogues**, coming on board when the band's regular guitarist took ill at the last minute. Considering that the Pogues already sound like a cross between Joe's old band and a bunch of Irish street buskers, it's apparently a match made in heaven. And the report is that Strummer *does* get to warble a clutch of Clash classics for old times' sake. □

AMERICAN conductor **Michael Tilson Thomas**, who has succeeded **Claudio Abbado** as principal conductor of the London Symphony, has signed a new, long-term contract with CBS Masterworks that calls for several recordings with the orchestra later this year. Thomas is also scheduled to record his first opera, *Tosca*, with **Eva Marton** and **Samuel Ramey**.

On the home front, Thomas has just launched the inaugural season of Miami's New World Symphony, which runs through March 27. As the orchestra's artistic advisor, he hopes to create in Miami "a community of outstanding young musicians who... will have the opportunity to grow in understanding of their

son; they will work together on the show for the rest of this season. . . . Why God made VCR's: the just-released-on-video 1984 feature *Voyage of the Rock Aliens*, starring **Ruth Gordon** and the great **Pia Zadora**. . . . Reasons to be cheerful: Arista says there will definitely be a new **Patti Smith** album this year. The punk poet made her last re-



Strummer (right) and Pogues: heavenly match

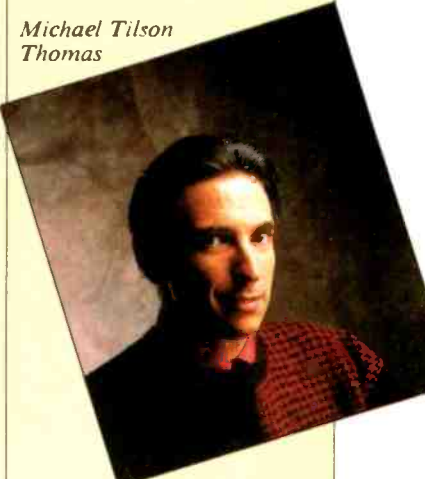
art." And late next month he opens the ninety-fifth Ann Arbor, Michigan, May Festival, conducting the first of four programs by the Pittsburgh Symphony.

Also noted as a pianist, Thomas recently abandoned the Baldwin piano and now endorses the one made by Yamaha. He is one of the first major classical pianists, with **André Watts** and **Anton Kuerti**, to show a preference for the instrument that for some time has been the choice of a number of popular keyboard artists including **Barry Manilow**. □

cording in 1979. Husband **Fred "Sonic" Smith**, formerly the guitarist for the MC5, is said to be backing her in the new one. . . . Must read: *Psychotic Reactions and Carburetor Dung* (Knopf), a wonderful anthology of rock criticism by the late **Lester Bangs**, a former STEREO REVIEW contributor. . . . The **Beach Boys** received this year's Award of Merit during the recent American Music Awards show at Hollywood's Shrine Auditorium. □

Michael Tilson Thomas

GRACENOTES. Good news for graying party animals! Rhino's new "Frat Rock" CD features such immortal *Animal House*-era dance tunes as the **Swinging Medallion's** *Double Shot of My Baby's Love* and **Barrett Strong's** *Money*. . . . **Jan Hammer**, whose high-tech synthesizer scoring helped set the tone for *Miami Vice*, is leaving the show for the greener pastures of film composing. His successor is New York musician **John Peter-**

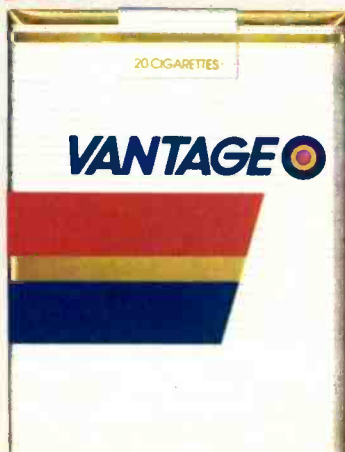
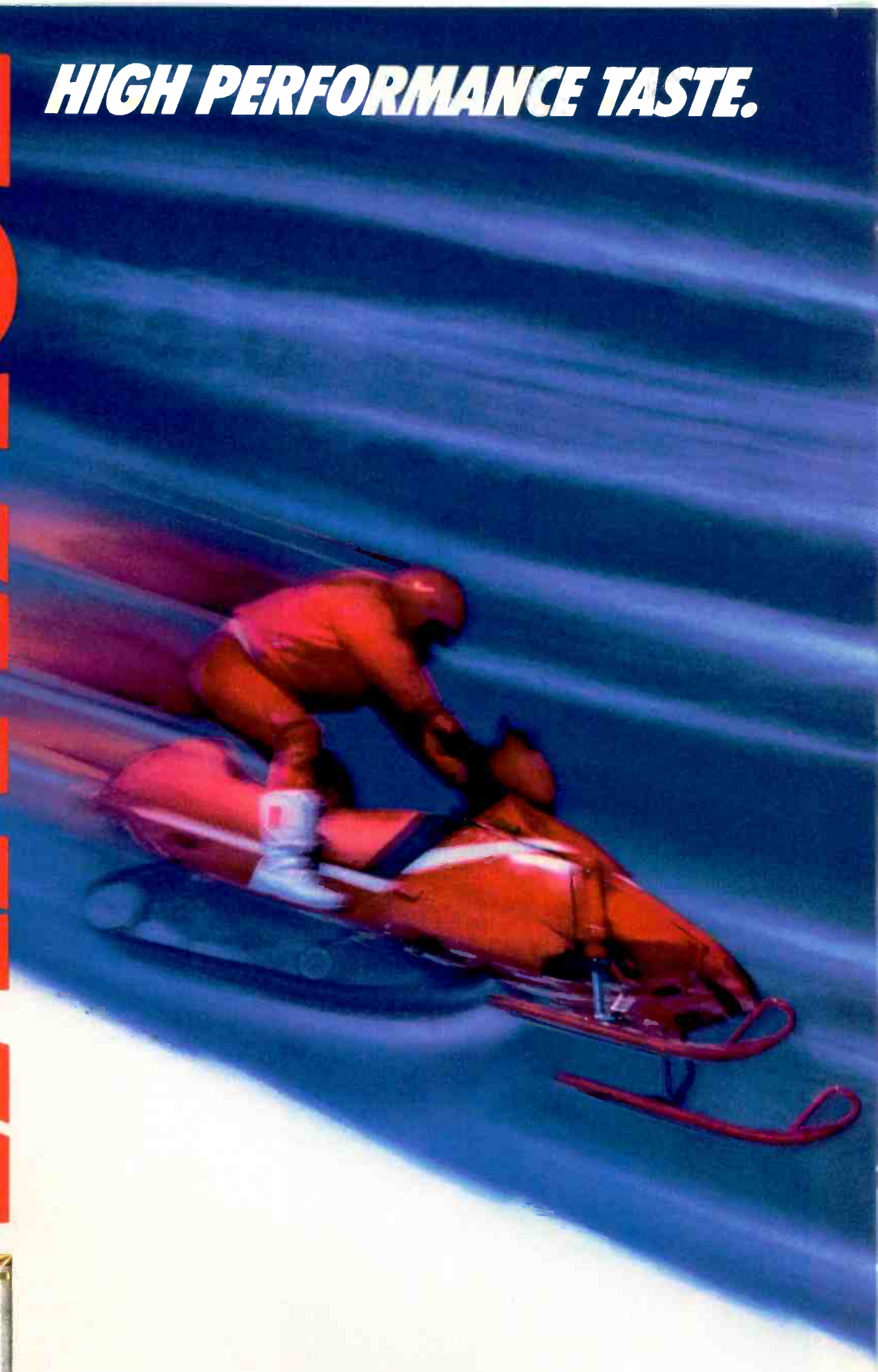


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Stereo Review's critics choose the outstanding current releases

BRYAN FERRY RETURNS TO FORM

BRYAN FERRY isn't so much a musician as a dramatic role in search of an audience. Rueful, seductive, elusive, Ferry's voice is the voice of decadence, beckoning one more dance as the city burns around him. It's impossible to listen to him without imagining tuxedos and styling mousse.

"Bête Noire" finds Ferry back in the best form he's been in since "Avalon." Working with Madonna's producer Pat Leonard, he has shaped an album of sleek, understated dance music, dripping with sophistication and the suggestion of forbidden pleasures. It was recorded

at four different studios with over forty musicians, yet it sounds as though it had been done in one sitting—seamless kid-glove blues and gospel-inflected melodies, subtle funk riffs, and undulating rhythms punctuated with exotic percussive and guitar effects.

The production techniques are predictable but hypnotic nonetheless. In *Limbo*, for instance, Ferry leads a chorus of female singers through a jungle of cackling percussion and slithering guitar. You've heard the staccato rhythm phrase that leads into the thwacking bass of the song's bridge a hundred times before, yet here, even with its restrained execution, it seems deliriously frenzied, as though your dark host were welcoming you to a night of passion beyond your experience. "Bête Noire" has lots of superheated moments like that—the hammering layers of funk guitar and gospel choir in *The Right Stuff*, the echoing piano and barbed guitar of *New Town*, the melodramatic, minor-key chorus of *The Name of the Game*.

Ferry's romantic crooning is won-

derfully camp, but behind the trembling voice is the Eighties version of the Perez Prado big band—a mixture of sin and sweat, swinging the machine-age rhythms of synth-funk. Typically, you don't learn anything about who Bryan Ferry might actually be listening to this record. As "Bête Noire" concluded with the gypsy violin of the title cut, I couldn't decide whether I'd spent the evening with Marcello Mastroianni or Mephistopheles. But I knew I'd been listening to a hot band.

Mark Peel

BRYAN FERRY: *Bête Noire*. Bryan Ferry (vocals); vocal and instrumental accompaniment. *Limbo*; *Kiss and Tell*; *New Town*; *Day for Night*; *Zamba*; *The Right Stuff*; *Seven Deadly Sins*; *The Name of the Game*, *Bête Noire*. REPRISE 1-25598, © 4-25598, © 2-25598 (44 min).

NORRINGTON RETURNS TO BEETHOVEN

ROGER NORRINGTON'S recording of Beethoven's Second and Eighth Symphonies was one of last year's most stimulating releases, and now his Ninth is surely one of this year's. The point of Norrington's cycle with the London Classical Players is not merely to record all the Beethoven symphonies using period instruments, but also to follow Beethoven's metronome markings, which in many instances call for brisker tempos than those we've been accustomed to in "traditional" interpretations. In his own annotation, Norrington lays out the justification and benefits of this practice in a delightfully unstuffy manner, and the performances themselves are irrefutable corroboration.

The brisk pacing of the Ninth's opening movement supports a view Norrington describes as "not so much mystical as fiercely dramatic." The adagio movement takes only eleven minutes, actually less time than the scherzo and about 50 percent faster than what has become the norm. Beethoven's metronome marking here is a reminder that in

Bryan Ferry: rueful, seductive, elusive



BEST RECORDINGS OF THE MONTH

Classical tradition the term "adagio" was often more an indication of mood than of actual speed. The gain in dignity and loftiness of spirit is impressive with the momentum provided by the faster pacing.

But the pacing is not always faster than the norm. The scherzo's trio is taken at the same basic speed as the scherzo itself, making for a nice bucolic effect. (There's no repeat in the scherzo's return, since Beethoven didn't want one, as he himself made clear in a letter quoted by Norrington.) And in the finale the tenor's march episode, at the "natural marching speed" Beethoven indicated, has "a humour and a humanity about it," as Norrington observes, rather than the unwelcome tinge of jingoism that so often creeps into it. Moreover, it provides greater musical cohesiveness with the sections that follow.

Earlier, the start of the vast final movement is refreshingly free of the expected monumentalism: When the great "Joy" theme makes its first appearance, it does not lumber, it flows. The bass recitative, still in tempo, may strike some listeners as being too nervously agitated when what is wanted is a reassuring gesture of peace, but that is probably the only conceivable objection one might have to the entire performance, and surely not every listener will respond to it the same way. As for the period instruments, they are not conspicuous as such except when the drums come to the fore (they are small leather ones, struck with wooden sticks) and in what seems a generally greater flexibility of articulation.



Roger Norrington: unstuffy

All the participants, instrumental and vocal, are splendidly responsive on a very high level, and the documentation is splendid, too, with a background piece by David Wyn Jones as well as Norrington's own invaluable notes. The recording is at all points more than adequate to convey the remarkable qualities of the performance. This Ninth may not displace our venerated favorites in the more traditional mold, but, as an alternate rather than an alternative, it is uniquely refreshing.

Richard Freed

BEETHOVEN: *Symphony No. 9, in D Minor, Op. 125 ("Choral")*. Yvonne Kenny (soprano); Sarah Walker (mezzo-soprano); Patrick Power (tenor); Peteri Salomaa (bass); Schütz Choir of London; London Classical Players, Roger Norrington cond. ANGEL • DS-49221, © 4DS-49221, © CDC-49221 (62 min).

The Broadcasters: a healthy affection for speed, distortion, and volume

UNCOMPROMISING ROCK FROM THE BROADCASTERS

IN an era when far too many people believe that rock-and-roll is something best experienced in a twenty-thousand-seat hockey rink, it's nice to know that there are still groups whose natural milieu is some smoky, sweaty, hole-in-the-wall dive with poor plumbing and cheap beer on tap. I am therefore happy to report that the Broadcasters, whose Enigma debut, "13 Ghosts," is one of the unexpected delights of the season, is that kind of a band—raw, real, and uncompromising.

Fueled by the twin guitar and vocals of leaders Billy Roues and Blackie Pagano and the incendiary harmonica of Billy's brother, Steve "Muddy" Roues, the Broadcasters is a punk blues band in the Sixties mold, a bunch of kids with chops and energy to burn, a reverence for history and tradition, and a healthy affection for speed, distortion, and volume. The most obvious comparison would be the original Them with Van Morrison, and "13 Ghosts" just happens to include a revelatory version of Them's *I Can Only Give You Everything*. Other points of reference include the Yardbirds and any number of graduates of Chess Records.

But comparisons, even apt ones, are beside the point. The Broadcasters' sound may be familiar, but the spirit and drive are unique. That these guys are also excellent songwriters (*Down in the Trenches* has hit single written all over it) is just icing on the cake.

In short, this is as exciting an album (produced, incidentally, by ex-MC5 member Wayne Kramer, for whom it can be considered a triumphant comeback) as I've heard lately. I suggest you acquire "13 Ghosts" immediately. You'll be a better person for it. *Steve Simels*

THE BROADCASTERS: *13 Ghosts*. The Broadcasters (vocals and instrumentals); other musicians. *Down in the Trenches; Dangerous World; Hole in*



BEST RECORDINGS OF THE MONTH

My Heart (And My Love Leaked Out); A Darker Shade of Night; Black Water; I Can Only Give You Everything; Walls of the City; Letters from the Dead; Endless Night; Turn the Lights Low; Burnin' Bloody Sun; House of Blue Lights; Goodbye. ENIGMA/CAPITOL ST-73315, © 4XT-73315, © CDP-73315 (41 min).

LEVINE'S BERG, WEBERN, AND SCHOENBERG

JAMES LEVINE'S new recording, with the Berlin Philharmonic, of what might well be termed basic works of the so-called Second Viennese School—one each by Arnold Schoenberg and his pupils Alban Berg and Anton Webern—makes this music more accessible than it has been in almost any of its previous recordings. While Schoenberg's *Five Pieces for Orchestra*, Berg's *Three Pieces*, and Webern's *Six Pieces* were conceived in part as reactions to and in rejection of the excesses of the Romantic tradition, Levine apparently regards these works as being more in the nature of a simple extension of that tradition—a modification in terms of dimensions, perhaps, but not very far from its core. In place of the dry, austere interpretive approach that has been more or less the norm, his is expansive and expressive, bringing out the considerable color and drama of the music in a way that connects it directly with Mahler (whom all three of these composers adored), Richard Strauss, and the Wagner of *Tristan* as well as the earlier, full-blown Romantic works of Schoenberg himself.

Levine's approach may raise some eyebrows among those accustomed to the performances of Pierre Boulez, the most conspicuous of this music's recent champions. But it will also surely be welcomed as a corrective by a great number of listeners who have been put off by what they perceive as an antiseptic quality in both the music and the "specialist" approach, and who will now find their ears opened to the remarkable beauty and emotional

power of these supposedly austere works. Most of these pieces are, after all, little tone poems of one sort or another. The Webern is a fairly explicit autobiographical document, a six-part outpouring of grief over the death of the composer's mother. Berg's conspicuously longer pieces take us still closer to Mahler, and that is very aptly and effectively emphasized in Levine's reading.

Arnold Whittall's otherwise excellent notes contain no information on the alternative performing editions of the respective works. Those used by Levine are identified only on the program page of the booklet (and in the tiniest type imaginable).



ERNSI HAAS/DEUTSCHE GRAMMOPHON

James Levine: expansive and expressive

They are all eminently sound choices: original 1909 versions for both the Schoenberg and Webern, the 1929 revision for the Berg. For these sessions Deutsche Grammophon went back to Berlin's Jesus-Christus-Kirche, the site of some of the company's finest-sounding recordings in the past, and that decision too was surely a good one. The rather hard sound of so many of Karajan's recordings made in the Neue Philharmonie would not have suited Levine's warmhearted performances, but the sound on this demonstration-quality CD is itself warm, rich, and vivid.

Richard Freed

BERG: *Three Pieces for Orchestra, Op. 6.* **WEBERN:** *Six Pieces for Orchestra, Op. 6.* **SCHOENBERG:** *Five Pieces for Orchestra, Op. 16.* Berlin Philharmonic Orchestra, James Levine cond. DEUTSCHE GRAMMOPHON © 419 781-2 (52 min).

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- **SUGAR BABIES** (Jimmy McHugh). IBR CLASSICS CDIBR-9012. Original-cast recording of the "burlesque" musical of 1979, with Ann Miller and Mickey Rooney (73 min).
- **SUPERTRAMP:** *Crime of the Century.* MOBILE FIDELITY UDCCD-505. The first rock title to be released in the label's gold-surfaced Ultradisc series.

CLASSICAL

- **BARBER:** *Antony and Cleopatra.* Hinds, Wells; Badea. NEW WORLD NW 322/23/4 (two CD's). The Spoleto Festival production of 1983.
- **BEETHOVEN:** *Cello Sonatas Nos. 1-5.* Ma, Ax. CBS M2K 42446. "Highly virtuosic in the best sense" (September 1984).
- **CANTELOUBE:** *Songs of the Auvergne.* Davrath, De la Roche. VANGUARD VBD-2090. "Something special" (July 1961).
- **P. LIEBERSON:** *Piano Concerto.* P. Serkin, Ozawa. NEW WORLD 325-2. "Fascinating, in the New Romantic vein" (Best of Month, March 1985).
- **VERDI:** *Ernani.* Price, Bergonzi, Sereni, Flagello; Schippers. RCA 6503-2-RG (two CD's). *Macbeth.* Rysanek, Bergonzi, Warren, Hines; Leinsdorf. 4516-2-RG (two CD's). *Rigoletto.* Moffo, Merrill, Elias, Kraus; Solti. 6506-2-RG (two CD's). Three of the ten historic opera recordings RCA has digitally remastered and released on mid-price CD's.

*Discs and tapes reviewed by
Chris Albertson, Phyl Garland,
Alanna Nash, Mark Peel,
Steve Simels*

JOHN ANDERSON: *Blue Skies Again*. John Anderson (vocals); vocal and instrumental accompaniment. *Blue Skies Again; Quittin' Time; Just for You; Somewhere Between Ragged and Right; His and Hers*; and five others. MCA ● MCA-42037, © MCAC-42037, © MCAD-42037 (30 min).

Performance: *Back on track*
Recording: *Sparkling*

When John Anderson won his two Country Music Association awards in 1983, he was being rewarded for a number of things the presenters failed to mention: Anderson was among those at the forefront of the return to a hard country style, he's had an uncanny gift for unearthing first-rate material (*I'm Just an Old Chunk of Coal, Would You Catch a Falling Star*), and he has written some engaging, off-the-wall songs (*Swingin'*) with his friend Lionel A. Delmore. But for some reason, Anderson couldn't quite keep his streak ablaze. After his initial success he cooled off rather quickly, and his albums of the last several years have fallen short of their promise.

Now, however, Anderson is back with the kind of high-quality album we expect of him. His writing, evident in four songs, is as strong, if not as witty, as before, and he has found one irresistible, quiet gem, *Quittin' Time*, by John Jarrard, Ben Dover, and Russell Smith, which details the end of a relationship. Anyone searching for a megahit like *Wild and Blue* will be disappointed, but the new album, co-produced with Jimmy Bowen, carries the kind of tasty instrumental licks that distinguished Anderson's earlier efforts, and it preserves his sizable musical integrity. On top of that, his vocals sound confident again, so much so that he holds his own in a duet with Waylon Jennings, *Somewhere Between Ragged and Right*. All in all, "Blue Skies Again" is aptly named, marking the return of one of country music's most distinctive talents. *A.N.*

TONY BENNETT: *Berlin*. Tony Bennett (vocals); Ralph Sharon Trio; other musicians. *They Say It's Wonderful;*

Isn't This a Lovely Day; The Song Is Ended; Shakin' the Blues Away; Let's Face the Music and Dance; Now It Can Be Told; and six others. COLUMBIA ● FC 44029, © FCT 44029, © CK 44029 (30 min).

Performance: *Great*
Recording: *Very good*

Between now and May 11, we will all be hearing a lot of Irving Berlin songs as performers everywhere join in celebrating the one-hundredth birthday of the man who, as Jerome Kern once so rightly said, "is American music." But it's unlikely that we'll hear many of those songs sung with as much flesh-and-blood feeling as Tony Bennett brings to them in his latest album. Characteristically, his approach is sometimes unorthodox—as in a driving, exuberant *Cheek to Cheek* and a daringly unaccompanied, beautifully understated *When I Lost You*—but refreshingly so. Whether he's warmly caressing a tender ballad (*Now It Can Be Told*) or jauntily cutting loose in a jazz vein (*Let Yourself Go*), there are still few singers around who can put as meaningful a personal stamp on a good pop song as Bennett can. And the Berlin songs here are about as good as pop classics can get.

Roy Hemming

CHUCK BERRY—HAIL! HAIL! ROCK 'N' ROLL. Original-soundtrack recording. Chuck Berry (vocals, guitar); Keith Richards (guitar); Johnny Johnson (piano); Linda Ronstadt, Etta James, Julian Lennon (vocals); other musicians. *Maybellene; Around and Around; Sweet Little Sixteen; Brown Eyed Handsome Man; Memphis, Ten-*

nessee; Too Much Monkey Business; Back in the U.S.A.; and six others. MCA MCA-6217, © MCAC-6217, © MCAD-6217 (35 min).

Performance: *Sensational*
Recording: *Excellent*

If you've ever seen a Chuck Berry concert, you know that they're often lackluster affairs. If, however, you've seen *Hail! Hail! Rock 'n' Roll*, the superb Berry concert film/documentary from which this album derives, you know that *this* Chuck Berry concert was a magnificent exception. It was, in fact, one of the finest performances of Berry's career, all the more remarkable in that the guy is sixty. He looks and sounds three decades younger.

Most of the credit for the success of the record, which uses different mixes from those heard in the film, clearly belongs to Keith Richards, who assembled the band and forced Berry to rehearse with them (in itself, something of a miracle). The band, meanwhile, is absolute, idiomatic perfection, especially the rhythm section—NRBQ bassist Joey Spampinato and drummer Steve Jordan, who have that Fifties Chess sound down cold—and longtime Berry pianist Johnnie Johnson, coaxed out of retirement for the occasion by Richards. They all sound as if they're having a ball, and some of the guest-star turns are particularly exciting, especially Etta James's fire-breathing take on *Rock 'n' Roll Music* and Robert Cray's version of *Brown Eyed Handsome Man*, a song that could have been written for or about him. Except for an embarrassing *Johnny B. Goode* by poor, outmatched Julian Lennon, all the performances are

Déjà's Curtis Jones and Starleana Young: sophisticated funk



SIMON FOWLER/VIRGIN RECORDS

EXPLANATION OF SYMBOLS:

- = DIGITAL-MASTER LP
- Ⓢ = TAPE CASSETTE
- Ⓢ = COMPACT DISC (TIMINGS ARE TO NEAREST MINUTE)

sensational, and Berry and Richards sound every bit as good together as fans of either one could hope. This album won't replace any of Chess's Chuck Berry reissues, but it's worthy of a place on your shelf next to them. S.S.

THE BROADCASTERS: 13 Ghosts (see Best of the Month, page 88)

DÉJÀ: Serious. Starleana Young, Curtis Jones (vocals); vocal and instrumental accompaniment. *Serious; Some Things Turn Around; That's Where You'll Find Me; Heart Beat; Premonition; Life; What to Do Now;* and three others. VIRGIN 90601-1, © 90601-4, © 90601-2 (47 min).

Performance: *Lively*
Recording: *Very good*

Starleana Young and Curtis Jones have had several musical identities in the past decade while performing as a duo or with the funk group Slave. The two also had some success under the name Aurra, particularly in Britain, but now they call themselves Déjà, and they have packed this album with quality dance music that retains the visceral thrust of funk while moving several steps beyond it in musical sophistication. Déjà is at its best in spirited numbers that are both tuneful and rhythmically varied. The beat is never overwhelming, and classy instrumentals support the robust vocals. The title song, *Serious*, sets a high standard as an opener, and *Life*, which leads off the second side, features sizzling, jazz-like piano work by Ricky Peterson. Dance music this good holds up well long after the party is over. P.G.

FAIRPORT CONVENTION: Heyday. Fairport Convention (vocals and instrumentals). *Close the Door Lightly When You Go; I Don't Know Where I Stand; Some Sweet Day; Reno, Nevada; Suzanne; If It Feels Good, You Know It Can't Be Wrong; I Still Miss Someone;* and five others. HANNIBAL HNBL-1329, © HNBL-1329.

Performance: *Sweet*
Recording: *Okay*

"Heyday" offers live-in-the-studio performances by the original folk-rock Fairport lineup from a time (1968) when the band was still evolving out of its early stance as a British version of the Jefferson Airplane and toward its eventual Childe Ballads Meet Rock-and-Roll apotheosis. The emphasis is mostly on American country and singer/songwriter material, and except for a couple of duds (such as Eric Anderson's *Close the Door Lightly When You Go*), the results are entertaining in a loose-limbed sort of way. The highlights are a really lovely version of the Gene Clark/



GEORGE ON CLOUD NINE

CONSIDERING how long it's been since George Harrison last made a record that a reasonably active person could listen to without becoming catatonic, it's remarkable how eagerly awaited his new "Cloud Nine" has been. Well, actually, it's not that remarkable; Harrison retains a vast residue of public good will from his Beatles days. What is remarkable, though, is how much unpretentious fun the album turns out to be.

For whatever reason—and my guess is it's because Harrison is surrounded by friends who are his artistic peers rather than the customary L.A. session musicians—the author of the immortal Fab Four number *Don't Bother Me* weighs in here with an almost thoroughly contemporary-sounding record. Not surprisingly, given that Harrison's coproducer is Jeff Lynne, the record suggests a cross between George circa "All Things Must Pass" and the Electric Light Orchestra. And that proves to be a good thing, because ELO has always dispensed a nice modernist gloss on the Beatles' stylistic devices.

While nothing here is more than puddle deep, it's appealing and tuneful, which really is all anybody should want from Harrison. Highlights include *Fish on the Sand* (Harrison rocks! He actually plays Rickenbacker twelve-string for the first time in years!); *Just for Today*, a thoroughly lovely reflective ballad that Elvis Presley should have lived to record; *This Is Love*, a genuine example

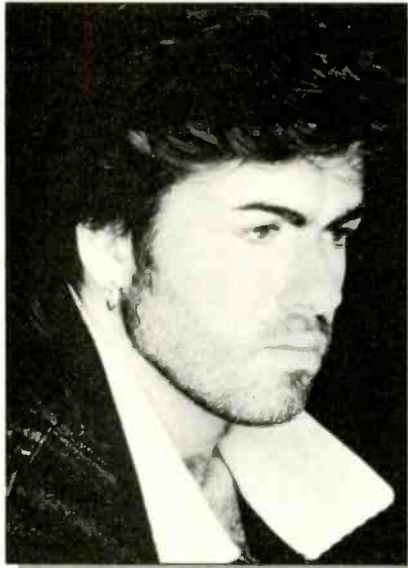
of what used to be called power pop, featuring killer guitar riffs; and, of course, the single *Got My Mind Set on You*, one of the more original resuscitations of an obscure Fifties number in many a moon.

The only clinker is the overly self-conscious *When We Was Fab*, which is far too literal in its evocation of the halcyon days of Beatlemania. All the rest is thoroughly listenable, and Harrison's trademark slide-guitar work sounds especially apt, thanks to the gutsier-than-usual backdrop provided by Lynne and a splendid cast of musicians—with special kudos to the rock-solid rhythm section led by Jim Keltner and Ringo Starr.

In short, "Cloud Nine" is a very nice record by a guy most of us assumed would just ride out the Eighties as a successful film producer. Welcome back, George! Steve Simels

GEORGE HARRISON: Cloud Nine. George Harrison (vocals, keyboards, guitar); Eric Clapton (guitar); Jeff Lynne (bass, guitars, keyboards); Elton John (piano); Ringo Starr (drums); Jim Keltner (drums); other musicians. *Cloud Nine; That's What It Takes; Fish on the Sand; Just for Today; This Is Love; When We Was Fab; Devil's Radio; Someplace Else; Wreck of the Hesperus; Breath Away from Heaven; Got My Mind Set on You.* DARK HORSE/WARNER BROS. 1-25643, © 4-25643, © 2-25643 (41 min).

DARK HORSE/WARNER BROS.



George Michael: Wham!-ified

Burritos ballad *Tried So Hard* and Dylan's great *Percy's Song*, not as overwhelming here as in the band's famous studio version but still a terrific showpiece for Sandy Denny's heartbreaking lead vocals. All in all, a nice period piece from a particularly nice period, with medium-fi sound that actually adds to the understated charm of the package. S.S.

BRYAN FERRY: *Bête Noire* (see Best of the Month, page 87)

DOBIE GRAY: *Love's Talkin'*. Dobie Gray (vocals); vocal and instrumental accompaniment. *Love Letters; He Don't Love You; I Should Know by Now; Steady as She Goes; Twenty-Five Hours a Day*; and five others. CAPITOL CLT-48051, © 4XT-48051, © CDP-48051 (32 min).

Performance: *Heartfelt*
Recording: *Good*

Dobie Gray is such an ingratiating singer, so full of warmth and honest emotion, that he can make the most mediocre material throb with life. That's a gift Gray counts on in "Love's Talkin'," since producer Larry Butler has presented him with two standards, *Love Letters* and *He Don't Love You*, two songs, *Steady as She Goes* and *What She Is*, that speak about love's triumphs and disappointments with some depth, and six songs—two written by the producer and presumably "suggested" to the singer—that lope along enjoyably if predictably. But Gray, one of the most underrated singers in all of country and pop, infuses the entire program with good-natured respectability, turning in performances that rise above the material with integrity, spirit, and compassion. With the right producer, and the right material, he could cut a truly great album. In the meantime he remains, unquestionably, a joy. A.N.

THE HOUSEMARTINS: *The People Who Grinned Themselves to Death*. Norman Cook (bass, vocals); Dave Hemingway (drums, vocals); P.d. Heaton (vocals, guitar, trombone); Stan Cullimore (guitar, vocals). *The People Who Grinned Themselves to Death; I Can't Put My Finger on It; The Light Is Always Green; The World's on Fire; Pirate Aggro; We're Not Going Back*; and six others. ELEKTRA 60761-1, © 60761-4, © 60761-2 (37 min).

Performance: *Didactic*
Recording: *Good*

What's the difference between the Housemartins and Mötley Crüe? The Housemartins forgot to turn on their amps. Okay, I oversimplify. The Housemartins, in fact, are about as far removed from heavy metal as you can get, though they do play their guitars very fast. These nice young British men, like the Smiths, have a dour view of Maggie Thatcher, materialism, and Western civilization in general. And, like the Smiths, they couple their misanthropic observations with sunny, schoolyard melodies and perky rhythms. Why this stuff doesn't go over well here in America is easy enough to figure out—we don't like to be lectured at, especially by four blokes who look and sound like the Brothers Four. One Morrissey is quite enough. M.P.

GEORGE MICHAEL: *Faith*. George Michael (vocals, instrumentals); vocal and instrumental accompaniment. *Faith; Father Figure; I Want Your Sex; Hand to Mouth; Look at Your Hands*; and four others. COLUMBIA OC 40867, © OCT 40867, © CK 40867 (48 min).

Performance: *Growing pains*
Recording: *Very good*

Now that Andrew Ridgeley is a name destined for future editions of *Trivial Pursuit*, George Michael is hot to prove he's an Artist to Be Reckoned With, not just leftover Wham! on wry. His first solo album, "Faith," is a bona fide tour de force; Michael wrote all the songs, co-produced, plays a number of instruments, and provides the majority of vocals, including back-up. He also demonstrates both the strength and weakness of his former incarnation.

From the opening strains of the title tune, with its infectious, rhythmic guitar licks, Michael lays out his patterns. If Wham! was concerned with "youth, suntans, pleasure, money, endless holidays, and endless sex," as one writer observed, Michael, now twenty-four, is eager to leave all that behind in his quest for adulthood. In the opener, *Faith*, the singer says he is looking for the one true woman, someone with whom he can forge a commitment, an understanding, and a trust, hence the title of the tune and the album. The next eight songs follow him as he moves through the various stages of such a relationship.

Musically, "Faith" is Michael's chance to rummage through the entire catalog of pop-rock and pull out ideas that connect him to the future as well as to the past. The title track is, of course, ersatz rockabilly, done up with pimply teenage jitters. *Kissing a Fool* harks back to the Forties, when returning soldiers danced with upswept young women under the mirrored ball at the Starlight Ballroom. And *Father Figure* gives a nod—if only in brief musical noodling—to the mysticism-and-Maharishi era of the Sixties.

But the overriding musical style is Wham!-ified disco, or, as Michael would probably have it, white soul. The genre works both for and against him. When it succeeds, as it does with *Hand to Mouth* and *Look at Your Hands*, it carries the listener away on a dark, seductive daydream, and it grabs with very sharp tentacles indeed. But the disco groove almost obscures whatever Michael has to say, although, as with Wham!, there isn't much evidence to suggest that he has any wisdom to impart.

The notorious *I Want Your Sex*, for example, gets downright embarrassing—not for the subject matter, but for its interminable, indulgent dance mix and inane lyrics. When Michael does attempt profundity, as in *Hand to Mouth*, about the tragic endings of those who rushed through life heedless of the rules, he again relies too much on mood, burying his lyrics in layers of disco thump.

Far more frustrating, however, is that Michael shows an unattractive knack for reducing significant issues to petty ones. On *Look at Your Hands*, the most muscular offering here, he confronts his ex-girl friend, who has given him up to marry a man who beats her. But instead of compassion, Michael gives her only scorn. And in *Monkey*, he is not worked up because his lover has a drug problem

Dobie Gray: ingratiating



but because she gives her habit more attention than she gives him. While Michael wears an earring to symbolize what he stands for as a man, he has yet to realize what it means to be a person. And no amount of faith will get him there by itself. *A.N.*

MÖTLEY CRÜE: *Girls, Girls, Girls.* Mötley Crüe (vocals and instrumentals); vocal and instrumental accompaniment. *Wild Side; Girls, Girls, Girls; Dancing on Glass; Bad Boy Boogie; Nona;* and five others. ELEKTRA 60725-1, © 60725-4, © 60725-2 (40 min).

Performance: *Pornographic*
Recording: *Very good*

"Girls, Girls, Girls" is vinyl pornography. All of the responsible scientific evidence indicates that pornography is quite harmless. But experience tells us that there's something pathetic about it, too. "Girls, Girls, Girls" celebrates strip joints, groupie sex, male prostitution, suicide, and living life on the edge in general. It also contains a one-minute song bassist Nikki Sixx wrote for his grandmother. The lyrics in "Girls" are morbidly clever, like a crude joke you can't help laughing at, but the music is predictable, overheated, and willfully simple-minded. *M.P.*

TAJA SEVELLE. Taja Sevelle (vocals); other musicians. *Love Is Contagious; Wouldn't You Love to Love Me?; Popular; How Could You Do Me So Bad?; Take Me for a Ride;* and five others. PAISLEY PARK 25546-1, © 25546-4, © 25546-2 (42 min).

Performance: *Promising*
Recording: *Excellent*

The latest artist to appear on Prince's Paisley Park label is the Minneapolis-based singer-songwriter Taja Sevelle. She blasts off here on a solo trajectory with an ingratiously tuneful debut album. She gets a lot of help from her producer, Bennett, who has provided arrangements that play up the pixie-like appeal of her high voice. The rhythms range from the lilting to the propulsive dance tempo of *Wouldn't You Love to Love Me*, a contribution from Prince. There are times when more energy comes across than talent, but Sevelle does more than hold her own on such numbers as the catchy *Love Is Contagious* and *If I Could Get Your Attention*. With a big assist from a very influential friend, Taja Sevelle has gotten off to a promising start. *P.G.*

THELONIOUS MONSTER: *Next Saturday Morning.* Thelonious Mon-

ster (vocals and instrumentals). *Swan Song; Looking to the West; Hang Tough; Michael Jordan; Low Boy (Butterflies Are Free); Key to Life . . . Tonite;* and six others. RELATIVITY 8174-1, © 8174-4.

Performance: *Okay*
Recording: *No big deal*

Thelonious Monster will remind you of a lot of things—Led Zeppelin, Los Angeles, reruns of *The Odd Couple*—but what it will remind you of most is what it's like to be in your mid-twenties, hanging around a neighbor's garage drinking beer, picking up an electric guitar, and doing ragged versions of whatever dumb songs occur to you at the moment. That experience is, of course, a great tradition for adolescent American males (believe me, I know), and Thelonious Monster is a group of guys that get to do it in front of real audiences and to record it for a major indie label. "Next Saturday Morning" sounds, then, pretty much as you'd expect, like a bunch of bright, middle-class kids goofing on the idea of being rock stars. But in its own woozily cheerful way, it's good for a couple of laughs. Besides, you have to like a band that identifies one of its members as "Communist Sympathizer." *S.S.*

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ROLL ON, ODETTA

THE magic of Odetta remains intact and undiminished. It certainly comes across in "Movin' It On," recorded live at a concert she gave in Madison, Wisconsin, on November 22, 1986, to celebrate her fortieth year as a performer. The album is her first new recording to be released in twelve years.

Authenticity is the word that most easily comes to my mind when I attempt to describe Odetta's unique artistry. Born in 1930 in Alabama at the dawn of the Depression, she has drawn much of her material from black American tradition, but her breadth of spirit enables her to capture the power and majesty of earthy human expression of any land, any time. Many of the selections in "Movin' It On" are evergreens of the folk repertoire such as *Take This Hammer*, *Michael Rowed the Boat Ashore*, and *This Little Light of Mine*. Familiar as they are, they take on new life as she sings them.

Odetta has fashioned some of the material closely identified with her to form two suites, *Ancestors 1* and *Ancestors 2*, in which she imparts heartfelt expression and a kind of universality to

prison work songs, blues, and popular ballads. *Sail Away, Ladies*, a song sung by slaves as they loaded boats in New Orleans, vividly brings the past to life, and even so familiar a tune as *Irene Goodnight* gets poignant new meaning.

Odetta's acoustic guitar work in this set is a miracle in itself, with its vitality, invention, and constant surprise. So many of today's performers mistakenly equate quality with high volume and electronic enhancement, but real music, Odetta reminds us, is about heart and soul and spiritual majesty. She possesses more of these qualities than just about anybody else I can think of.

Phyl Garland

ODETTA: *Movin' It On*. Odetta (vocals, acoustic guitar). *Give Me Your Hand; Sail Away, Ladies; Suite, Ancestors 1 (Roll On Buddy/Take This Hammer/Lowlands/Deep Blue Sea/Michael Rowed the Boat Ashore); Suite, Ancestors 2 (Ol' Howard's Dead and Gone/House of the Rising Sun/When I Was a Young Girl/Irene, Goodnight); Movin' It On; This Little Light of Mine.* ROSE QUARTZ/FLYING FISH RQ 101, © RQC 101.

JAMES COTTON: *Take Me Back*. James Cotton (vocals, harmonica); Sam Lawhorn (guitar); Pinetop Perkins (piano); other musicians. *My Babe; Take Out Some Insurance; Dust My Broom; Killing Floor; Hungry Country Girl;* and four others. BLIND PIG BP 2587.

Performance: *Solid urban blues*
Recording: *Quite good*

As befits the common image of a blues man, James Cotton paid his dues. First he knocked around the Midwest with his idol, Alex "Rice" Miller (one of several blues-harmonica players who used the pseudonym Sonny Boy Williamson), then he spent more than a decade as a member of the Muddy Waters Blues Band. In the late Sixties, when British rock groups spurred renewed interest in the real thing, Cotton took off on his own. "Take Me Back," his latest, self-produced album, which has been available in Canada for more than a year, doesn't take the blues in any new direction, nor does it offer any surprises. It is deliberately predictable since Cotton wanted to preserve the sound to which he'd already devoted a lifetime. This is solid urban blues, performed with a degree of mastery that only comes with wide experience and deep devotion. *C.A.*

JAY MCSHANN: *Going to Kansas City*. Jay McShann (vocals, piano); Buddy Tate (clarinet, tenor saxophone); Julian Dash (tenor saxophone); Gene Ramey (bass); Gus Johnson (drums). *Doggin' Around; Blue and Sentimental; Four Day Rider; Moten Swing;* and three others. NEW WORLD © NW 358-2 (39 min).

Performance: *Terrific*
Recording: *Excellent*

This 1972 date by Jay McShann originally appeared on a Master Jazz album, and, if anything, it sounds even better today. I'm not just referring to the sound reproduction, which CD technology has vastly improved. This is timeless music, served Kansas City style, with McShann's dynamic Hines-plus-Basie piano and the robust tenor saxophones of Buddy Tate and Julian Dash poured generously over a foundation of infectious rhythm. For many years McShann was best known for having hired an unknown Charlie Parker to play in his big band in the late Thirties. He made numerous recordings throughout the Forties and Fifties but was largely unnoticed by the public until the late Sixties, when he toured Europe as part of a Parker tribute. "Going to Kansas City" is one of several albums McShann made in the past twenty years, all of them terrific. *C.A.*

OREGON: *Ecotopia*. Oregon (instrumentals). *Twice Around the Sun*; *Zephyr*; *Song of the Morrow*; *ReDial*; and four others. ECM 833 120-1, © 833 120-4, © 833 120-2 (49 min).

Performance: *Disappointing*
Recording: *Excessive echo*

When Oregon was recording for Vanguard in the mid-Seventies, the group's members wove delicate acoustic patterns reflecting their wide listening experience, and the results were exquisite. Their new ECM album, "*Ecotopia*," is very disappointing, however. The musicianship is still very much in evidence, but gone is the structure that was such an asset in the earlier period. What's left is something akin to the New Age style that brought Muzak out of the elevator and into the home. The recording, too, is a dreadful example of echo excess; the reverberation is so overdone that even the few decent moments are difficult to listen to. C.A.

GARY THOMAS: *Seventh Quadrant*. Gary Thomas (flute, tenor saxophone); Paul Bollenback (guitar, guitar synthesizer); Renee Rosnes (piano); Anthony Cox (bass); Jeff Watts, Billy Murphy (drums). *First Sketches*; *Labyrinth: The Eternal Present*; *No*; and three others. ENJA 5047, © 5047-27 (53 min).

Performance: *Full of surprises*
Recording: *Very good*

Baltimore saxophonist Gary Thomas's solo record debut is indeed an event. Thomas is still largely unknown, although in 1986 he played briefly with Miles Davis and was a member of Jack DeJohnette's group *Special Edition*. But this album ought to take him a long way toward the recognition he deserves. Thomas displays an impressive technique, which he applies to what appears to be a style in the making. He is not a Coltrane clone, although the influence is apparent, nor does he take after Ornette Coleman, and he displays none of the fumbling ineptness that all too many modern saxophonists pass off as avant-garde. Make no mistake about it, Gary Thomas can play his instruments, and he has a fertile musical imagination. Here he mixes dexterity with a dash of the daring and comes up with the kind of excitement that is all too lacking in jazz today.

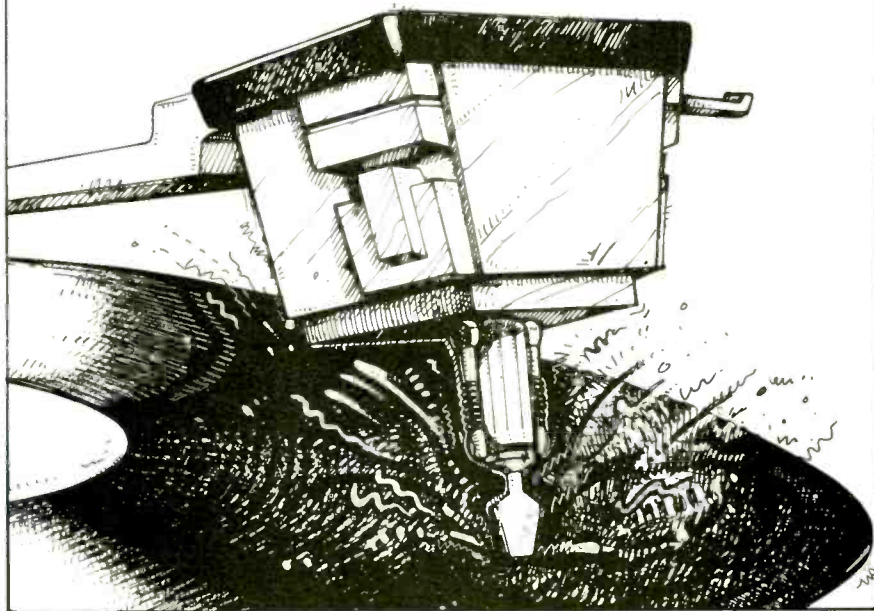
Apparently Thomas has excellent taste in sidemen too, for the group he has assembled here is superb. Guitarist Paul Bollenback and pianist Renee Rosnes are marvelous together, though neither has recorded before. Bassist Anthony Cox toured Europe with trumpeter Jack Walrath's quintet in 1983, and you may know drummer Jeff Watts from his work with Wynton Marsalis, although we hear a whole new and more challenging side of his talent in this album (Billy Murphy replaces him on one track). In sum, I predict a fine future for Gary Thomas. C.A.

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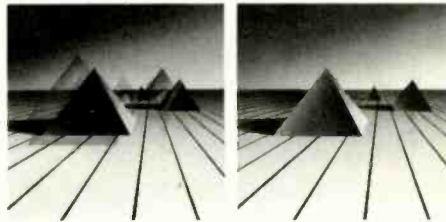
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Discs and tapes reviewed by Robert Ackart, Richard Freed, David Hall, Stoddard Lincoln

BEETHOVEN: *Symphony No. 9, in D Minor, Op. 125* (see Best of the Month, page 87)

BERG: *Three Pieces for Orchestra, Op. 6* (see Best of the Month, page 89)

BRUCKNER: *Symphony No. 1, in C Minor*. Frankfurt Radio Symphony Orchestra, Eliahu Inbal cond. TELDEC/KOCH IMPORT SERVICE ① 6.43619. © 4.43619, © 8.43619 (48 min).

Performance: *Winning*
Recording: *Good*

In comparison with the awesome late symphonies, Bruckner's First is something of a post-Schubertian essay, the kind of piece you would logically expect to follow Schubert's "Great" Symphony in C Major, a work by turns rugged and bucolic. In the Bruckner First, the rugged quality is most evident in the march pulse of the opening movement and the unabashedly self-assertive finale, while the bucolic flavor permeates the lovely slow movement and the scherzo, especially its central section.

In this recording, Eliahu Inbal seeks out the music's lyrical and vernal elements to excellent effect throughout. The recorded sound, from a live performance, is good, if not quite on a par with the conductor's more spectacular Mahler productions. Certainly the disc makes a fine companion for Inbal's pioneering Teldec issues of the original versions of the Bruckner Third, Fourth, and Eighth Symphonies. *D.H.*

CHOPIN: *Preludes, Op. 28. Nocturnes: B-flat Minor, Op. 9, No. 1; E-flat Major, Op. 9, No. 2; C-sharp Minor, Op. posth.* Jean-Yves Thibaudet (piano). DENON © 33CO-1742 (59 min).

Performance: *Superb*
Recording: *Likewise*

Jean-Yves Thibaudet, now in his mid-twenties, must be his generation's most eloquent Chopin player. These performances of all the Op. 28 Preludes are on so exalted a level that one thinks in terms of inspiration rather than interpretation. The pianist's subtle control allows a great sense of freedom without a hint of waywardness, and the charac-

EXPLANATION OF SYMBOLS:

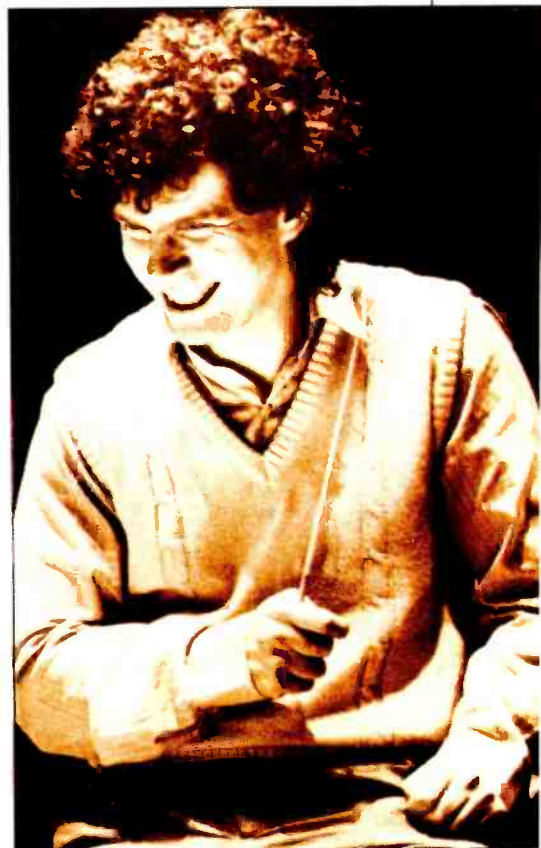
- ① = DIGITAL-MASTER LP
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CLASSICAL JAZZ

LAST year MusicMasters issued an album in which Maurice Peress conducted a reconstruction of Paul Whiteman's historic 1924 "Concert of New Music." It was a presentation as valuable for its documentation (which included all the original program notes as well as very comprehensive new material on the music and the event itself) as for the music. Now Angel has brought out "The Jazz Album," with Simon Rattle conducting the London Sinfonietta, a recording that might be regarded as a sort of supplement to the Peress set—the only duplication being the probably inevitable *Rhapsody in Blue*, which Gershwin introduced at the 1924 concert. Subtitled "A Tribute to the Jazz Age," the new set illustrates the influence of jazz on concert music, juxtaposing two of the earliest of such manifestations, a clutch of popular tunes of the Twenties in characteristic settings by Whiteman's top arrangers, and latter-day showpieces for clarinet and jazz combo by Stravinsky and Bernstein.

Milhaud's jazz-inflected ballet score *La Création du monde*, which preceded *Rhapsody in Blue* by a year or so, precedes it on this disc as well, setting the tone for the enterprise in a wonderfully idiomatic performance as remarkable for its subtle control as for its insinuating power. The *Rhapsody* (in the original jazz-band instrumentation) is a knockout—idiomatic, virtuosic, and affectionate but not the least bit sentimentalized; Peter Donohoe is surely one of the two or three most effective performers of the solo part since Gershwin himself. (Not only is the piece uncut, by the way, but there is one tiny passage that few of us will claim to have heard before.)

The Stravinsky and Bernstein pieces come off far more effectively here than in the recordings conducted by the composers themselves, and the pop pieces simply couldn't be more fun. It's as if those old 78's stored away with Grandpa's wind-up Victrola had been put through some miraculous process to open them up sonically. All the flavor of the real thing is there, and it's irresistible. Jeremy Taylor, the lead singer of Harvey and the Wallbangers, reminds us in *After You've Gone* and *My Blue Heaven* that the art of the countertenor was alive and well in the pop world for decades before Alfred Deller revived it in the art song. The arrangements themselves remind us what a brilliant bunch Whiteman had around him. *After You've Gone* was arranged by William Grant Still, the composer of the *Afro-American Symphony*. Ferde Grofé, of



Conductor Simon Rattle

course, orchestrated *Rhapsody in Blue* as well as dozens of songs for Whiteman. And Lennie Hayton's very sophisticated setting of *Nobody's Sweetheart* is remarkable for its citation of the Russian Dance from *Petrushka*.

Overall, the high level of the performances, both in their own right and in terms of their fidelity to the period, is beyond question. Rattle and his players not only have the measure of this material, but they seem to be having the time of their lives. I look forward to the possibility of Gershwin's Concerto in F and his other concerted works from Donohoe and Rattle. *Richard Freed*

SIMON RATTLE: *The Jazz Album. Milhaud: La Création du monde. Gershwin: Rhapsody in Blue. Stravinsky: Ebony Concerto. Bernstein: Prelude, Fugue and Riffs.* Peter Donohoe (piano); Michael Collins (clarinet); John Harle (alto saxophone); London Sinfonietta, Simon Rattle cond. *After You've Gone; Nobody's Sweetheart; Sweet Sue; Dardanella; Makin' Whoopee; My Blue Heaven; San.* Jeremy Taylor, Harvey and the Wallbangers (vocals); London Sinfonietta, Simon Rattle cond. ANGEL ① DS-47991, © 4DS-47991, © CDC-47991 (74 min).



Philip Glass: a stirring operatic portrayal of the pharaoh Akhnaten

ter of each brief piece is delineated superbly with the same sense of effortless spontaneity.

What is there to say of such elegant, poetic, and touching realizations of thrice-familiar music? Here it is refreshed without eccentricity or indulgence, and with uncommon regard for tonal beauty. I might have wished for the inclusion of the Op. 45 Prelude, but the three nocturnes that fill out the recording are actually more welcome as they provide somewhat larger frames for Thibaudet's superbly attuned responsiveness. Denon's exceptionally well-focused sound, exemplary in its own right, captures the strength and the delicacy of the playing in exquisite balance. In short, a distinguished addition to the Chopin discography, and to that of the piano itself. R.F.

GERSHWIN: Overtures. *Girl Crazy; Of Thee I Sing; Oh, Kay!; Tip-Toes; Primrose. A Damsel in Distress, Suite/ Stiff Upper Lip Dance Sequence.* New Princess Theater Orchestra, John McGlinn cond. ANGEL ● DS-47977. © 4DS-47977. © CDC-47977 (43 min).

Performance: 'S wonderful
Recording: 'S marvelous

John McGlinn approaches Gershwin the way some classical conductors now approach early music, by going back to the original instrumentation, or as close to it as possible. In Gershwin's case, this means using the recently discovered original arrangements of his Broadway shows—by Robert Russell Bennett, Hilding Anderson, John Ansel, and

Gershwin himself—instead of the "big" symphonic treatments by André Kostelanetz and others.

Young McGlinn, still in his early thirties, has lately been making a career of seeking out and performing the original versions of scores by Gershwin, Kern, and Rodgers and Hart for the Library of Congress, the New Amsterdam Theatre Company, and the Houston Grand Opera. Cheers for that. In "Gershwin Overtures," he's come up with première recordings of the curtain-raisers to the virtually unknown *Primrose* of 1924 and the next year's *Tip-Toes*, which introduced to Broadway *That Certain Feeling, Sweet and Low-down*, and *Looking for the Boy*. Best of all, he has recorded nearly fifteen minutes of music from Gershwin's last completed film score, 1937's *A Damsel in Distress*, in Bennett's original orchestrations for the soundtrack, which McGlinn found in the RKO Radio archives. I've long felt that *Damsel*, with songs like *A Foggy Day* and *Nice Work If You Can Get It*, is one of Fred Astaire's most underappreciated film vehicles (mostly because his new co-star at the time, Joan Fontaine, couldn't overcome unfair comparisons with her predecessor, Ginger Rogers).

McGlinn's versions of the overtures to *Oh, Kay!* (1926), *Girl Crazy* (1930), and *Of Thee I Sing* (1931) may be more authentic than the reconstructions Don Rose made in the mid-Seventies for Michael Tilson Thomas's "Gershwin on Broadway" album, but Thomas's performances still have more zip and Gershwin-esque flair. Roy Hemming

GLASS: Akhnaten. Paul Esswood (countertenor), Akhnaten; Milagro Vargas (alto), Nefertiti; Melinda Liebermann (soprano), Queen Tye; Tero Hanula (baritone), Horemhab; Helmut Holzapfel (tenor), Amon High Priest; Cornelius Hauptmann (bass), Aye; David Warrilow (narrator), Scribe; others. Stuttgart State Opera Chorus and Orchestra, Dennis Russell Davies cond. CBS ● M3 42457 three LP's, © M3T 42457 three cassettes, © M2K 42457 two CD's (129 min).

Performance: *Stirring*
Recording: *Superb*

Akhaten is Philip Glass's third opera. It is an intelligently and fully conceived work, richly orchestrated and emotionally stirring, and this Stuttgart Opera performance of it conducted by Dennis Russell Davies is a great achievement, brilliantly recorded. The composer's libretto traces the career of the Egyptian pharaoh Akhnaten (1375-1358 B.C.), who is believed to have been the first monotheist. He upset the old order by forbidding the worship of any god but Aten, traditionally identified with the sun but reconceived more abstractly by the pharaoh. Akhnaten was eventually overthrown and virtually all record of his reign destroyed, but some historians today trace the origins of Judaism to his beliefs.

Since there is evidence that Akhnaten was hermaphroditic, Glass wrote the title role for a countertenor, and to reduce the size of the orchestra as required by space constraints in the Stuttgart opera house where *Akhaten* had its première, he eliminated violins from the string choir, retaining only violas, cellos, and basses. The result is a deep, dark orchestral tone that accentuates the alienation of the high-voiced, feminine-sounding pharaoh. In addition, Akhnaten's wife, Nefertiti, is sung by an alto, which creates a sexual ambiguity in their Act II love duet.

Perhaps the most powerful passage is Akhnaten's "Hymn to Aten," in which he reveals his innermost thoughts about his god. Sung in English with an oboe accompaniment, it is a haunting, deeply moving, very operatic aria. Glass creates a stunning effect by following the hymn, based on an Egyptian inscription that may have been in Akhnaten's own words, with Psalm 104, sung in Hebrew by an offstage chorus, which mirrors to a remarkable degree the earlier text.

The language reverts to the reconstructed ancient Egyptian used for most of the opera in Act III, which climaxes with the cataclysmic destruction of the Temple of Aten. Then, in an ironic epilogue, Glass shocks us back into the present by portraying a tour through the ruins of Akhnaten's city, with a text from *Frommer's Guide to Egypt*. It's an unexpected twist from a composer who no doubt has many, many more surprises in store for us. Mark Peel

HARRIS: *Symphony No. 3*. SCHUMAN: *Symphony No. 3*. New York Philharmonic, Leonard Bernstein cond. DEUTSCHE GRAMMOPHON ① 419 780-1, ② 419 780-4, ③ 419 780-2 (51 min).

Performance: *Passionate*
Recording: *Splendid*

Leonard Bernstein has been the most powerful and persuasive advocate of these two symphonies since the death of Serge Koussevitzky, who introduced them as conductor of the Boston Symphony. Bernstein's recordings of them for Columbia in the Sixties, in fact, set the standard musically, and his new digital remakes are once again performances of passionate conviction. This time, moreover, the recordings have the state-of-the-art sound these works so richly deserve.

William Schuman's Third Symphony is in two parts, a Passacaglia and Fugue followed by a Chorale and Toccata. Everything grows out of a single melody that is elaborated along structural lines, culminating in a musical statement of overwhelming power and brilliance. The effect was shattering when I first heard the work under Koussevitzky, and Bernstein's new reading fully recreates that experience.

Bernstein's new Roy Harris Third, however, has a couple of problems. In his earlier recording, the opening, single-line melodic narrative goes at exactly the right pace; here Bernstein slows down and loses the line. Also, even in the 1960 recording Bernstein had a tendency to lean rather hard on the fugue subject, and he does so even more in the new version, again breaking the line. For me the Harris Third should be a seamless whole.

These strictures notwithstanding, the stunningly recorded new version still makes a moving listening experience. The final pages of the score, which Harris added in the two weeks between the Boston première and the first New York performance, carry a tragic import that may be even more appropriate today than it was in the hopeful post-Depression, pre-war milieu from which the music sprang. *D.H.*

ROUSSEL: *Symphony No. 2, in B-flat Major, Op. 23; Symphony No. 4, in A Major, Op. 53.* Orchestre National de France, Charles Dutoit cond. ERATO ① NUM 75284, ② MCE 75284, ③ ECD 88226 (60 min).

ROUSSEL: *Petite Suite, Op. 39; Concertino for Cello and Orchestra, Op. 57; Concerto for Small Orchestra, Op. 34; Sinfonietta, Op. 52; Le Testament de la Tante Caroline, Overture.* Philippe Bary (cello); Ensemble Instrumental de Flandre Wallonne, Bruno Membrey cond. CYBELIA/QUALITON IMPORTS ③ CY 817 (52 min).

ROUSSEL: *Évocations, Op. 15.* Nathalie Stutzmann (contralto); Nicolai

Gedda (tenor); José van Dam (baritone); Orféon Donostiarra; Orchestre du Capitole de Toulouse, Michel Plascon cond. *Résurrection, Symphonic Prelude After Tolstoy, Op. 4.* Orchestre du Capitole de Toulouse, Michel Plascon cond. ANGEL ③ CDC-47887 (58 min).

ROUSSEL: *Des Heures passent, Op. 1; Rustiques, Op. 5; Suite in F-sharp Minor, Op. 14; Sonatine, Op. 16; Prelude and Fugue, Op. 46; Trois pièces, Op. 49.*

Alain Raës (piano). SOLSTICE/HARMONIA MUNDI USA ③ SOCD 08 (72 min).

Performances: *Persuasive*
Recordings: *Fair to excellent*

It was Albert Roussel's compounded bad luck, in a sense, to be born between the births of Debussy and Ravel, to be a sort of late bloomer whose music was overshadowed by that of his more celebrated contemporaries throughout his life, and, finally, to die in the same year

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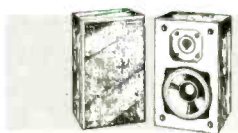
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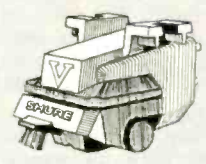


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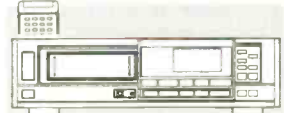
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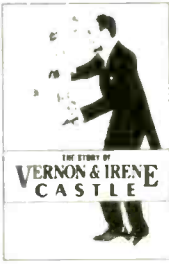


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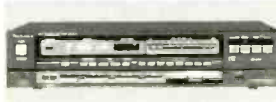
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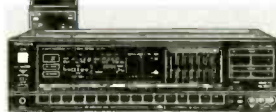
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as Ravel, so that even in death he was upstaged. Four recent recordings, each from a different source, combine to present a worthwhile survey of some of Roussel's familiar works and some that are less familiar, involving a broad range of musical forms and performing media.

At the head of this short list is the ERA release that wraps up Charles Dutoit's coverage of the symphonies with the Orchestre National de France. In contrast with the succinct and incisive later symphonies, No. 2, completed in 1921, is as expansive as its predecessor, though it is the only one of Roussel's four symphonies cast in three movements instead of four, suggesting a certain link with the French tradition established in the symphonies of Franck, Chausson, and Dukas. Dutoit brings off both the Second and Fourth Symphonies as persuasively as he did the two on his earlier recording. We simply could not hope for much finer realizations of any of these symphonies.

Several of the shorter works that had not been available for some time in any form have been gathered on a Cybelia CD in performances by a recently formed chamber orchestra based in and subsidized by the city of Roussel's birth, Tourcoing. The Ensemble Instrumental de Flandre Wallonne, under its founder, Bruno Membrey, performs a lovely program, including the piquant little overture to *Le Testament de la Tante Caroline*, which appears not to have been recorded before. What the performances may lack in the way of polish they make up in style and charm. The sound, however, has the deadened quality, extremely dry and dullish, that seems to be the norm for this otherwise enterprising label.

Both the enterprise and the dullish sound quality were reflected in Cybelia's pioneering recording of Roussel's very early little tone poem based on Tolstoy's *Resurrection*. That work has now been given a much more winning presentation, particularly in respect to sonics, by Michel Plasson and his Toulouse orchestra on an Angel CD where it is coupled with one of Roussel's most ambitious early works, *Évocations*. This fascinating symphonic triptych, composed in 1910-1911, reflects the oriental influences that made themselves felt so forcefully in several of Roussel's major works after his extended honeymoon in India and Indo-China. The central panel, a recollection of a crowd scene in Jaipur, rivals Ravel in its exploitation of color, and the final one, as long as the preceding two combined, is a setting involving three solo singers and chorus of a poem composed for the work by M. D. Calvocoressi, "On the Banks of the Sacred River." The contralto, Nathalie Stutzmann, is new to me in both name and voice, but she holds her own even in the distinguished company of Nicolai Gedda and José van Dam.

Finally, on a generously filled Solstice



Kiri Te Kanawa: admirable *Arabella*

CD, Alain Raës plays all six of Roussel's major works for piano solo, ranging chronologically from the surprisingly substantial little suite called *Des Heures passent* (Roussel's Op. 1) to the familiar *Trois pièces*, Op. 49, composed for Robert Casadesus in 1933. Along the way are the enchanting *Rustiques*, the masterly Suite in F-sharp Minor (deservedly the best-known of all Roussel's piano works), the Sonatine, and the Op. 46 Prelude and Fugue. Not a word of information is offered on Raës, but he plays all this music with the same sort of sympathy, assurance, and conviction Dutoit brings to the symphonies, and the exceptionally well-focused 1979 analog recording comes up beautifully in the CD transfer. R.F.

SCHOENBERG: *Five Pieces for Orchestra, Op. 16* (see Best of the Month, page 89)

SCHUMAN: *Symphony No. 3* (see HARRIS)

R. STRAUSS: *Arabella*. Kiri Te Kanawa (soprano), Arabella; Franz Grundheber (baritone), Mandryka; Gabriele Fontana (soprano), Zdenka; Ernst Gutstein (baritone), Waldner; Helga Dernesch (mezzo-soprano), Adelaide; Peter Seiffert (tenor), Matteo; Gwendolyn Bradley (soprano), Fiakermilli; others. Chorus and Orchestra of the Royal Opera House, Covent Garden, Jeffrey Tate cond. LONDON 417 623-1 three LP's, 417 623-4 three cassettes, 417 623-2 three CD's (158 min).

Performance: *Satisfactory*
Recording: *Satisfactory*

Arabella, along with *Desdemona*, may well be one of Kiri Te Kanawa's best

roles. It requires a pure, limpid tone, which she is eminently equipped to offer, and on stage it requires physical beauty and grace, likewise among her many endowments. Winsomeness and girlish daydreaming of romance are Arabella's chief traits prior to the Act II duet with Mandryka, when she begins to evolve into the woman she actually becomes in Act III. Te Kanawa admirably projects this character development with a vocal delivery notable for its silvery sheen.

As Mandryka, Franz Grundheber sings well and shows a good sense of character, though he does not convey the rugged animal magnetism that informed George London's interpretation or achieve the finesse of Dietrich Fischer-Dieskau's much subtler delineation. As Zdenka, Gabriele Fontana creates an appealing younger sister and blends her voice enchantingly with Dame Kiri's in their Act I duet.

Helga Dernesch's Adelaide is unhappily marred by a certain tonal muddiness, but Gwendolyn Bradley copes easily with Fiakermilli's high-register caperings in what is surely one of Strauss's most ungrateful roles. The rest of the cast members accomplish their assignments competently.

If my tone is one of guarded enthusiasm for this new recording of *Arabella*—which, indeed, appears to be the only one available now in any format in the U.S.—it is not because it offers less than an adequate account of Strauss's work. Rather, it is because the performance seems to lack the artistic commitment on the part of the singers needed for a complete realization of their characters, the sustained level of singing needed to project the full impact of the score, and the masterful presence of a conductor sufficiently steeped in the living tradition to give full meaning to this most Viennese of operas. All these qualities figure abundantly in the older recordings of *Arabella* conducted by Georg Solti (London) and Joseph Keilberth (Deutsche Grammophon). R.A.

TCHAIKOVSKY: *1812 Overture, Op. 49; Romeo and Juliet, Fantasy Overture; Francesca da Rimini, Op. 32*. Oslo Philharmonic Orchestra, Mariss Jansons cond. ANGEL 417 DS-49141, 417 DS-49141, 417 CDC-49141 (56 min).

Performance: *Fiery*
Recording: *Brilliant*

This Angel package of Tchaikovsky warhorses comes as a kind of pendant to the much-praised cycle of the symphonies that Mariss Jansons and the Oslo Philharmonic recorded for Chandos. Under Jansons's direction the Oslo Philharmonic has developed from a competent provincial orchestra to a highly flexible ensemble of hair-trigger responsiveness. A further asset is the acoustic excellence of the new Oslo Konserthus.

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here. Jansons makes a really exciting experience of it by virtue of carefully gauged dynamics, brilliance of attack, and varied coloration. I don't ever remember hearing the opening pages ("Abandon all hope...") sound quite so baleful—fire and brimstone with a vengeance!

The pacing of *Romeo and Juliet* recalls the famous old Mengelberg/Concertgebouw recording. The opening is less sepulchral than usual, the conflict passages are fierce and feverish, the famous love music gets its full due, and the tragic denouement gets a bonus in the form of a tam-tam stroke not indicated in the score.

The opening hymn of the *1812 Overture* is beautifully nuanced and given unusually subtle coloration, but the allegro passages are hard-driven and the realization of the final pages, with bells and cannon, has been equaled or surpassed in a number of other recordings. From a purely musical standpoint, I would still give the palm to Muti and the Philadelphia Orchestra, also on Angel, for the *1812* and would recommend this Jansons recording primarily for the *Francesca da Rimini*. D.H.

WEBERN: *Six Pieces, Op. 6* (see Best of the Month, page 89)

COLLECTION

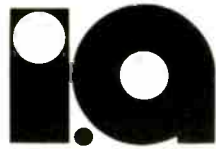
BARRY TUCKWELL: Baroque Horn Concertos. Knechtl: *Concerto in D Major*. Reinhardt: *Concerto in E-flat Major*. Quantz: *Concerto No. 3, in E-flat Major*; *Concerto No. 9, in E-flat Major*. Graun: *Concerto in D Major*. Röllig: *Concerto No. 14, in E-flat Major*; *Concerto No. 15, in D Major*. Barry Tuckwell (horn); Academy of St. Martin-in-the-Fields, Iona Brown cond. LONDON 417 406-1, 417 406-4, 417 406-2 (61 min).

Performance: *Splendid*
Recording: *Good*

The French horn made its first appearance during the seventeenth century and emerged as a virtuoso instrument early in the eighteenth. The major source of early horn concertos in this collection is a manuscript, held by the University of Lund in Sweden, that contains eighteen concertos associated with the court at Dresden. Barry Tuckwell offers an intriguing sample of these splendid works.

Tuckwell's performances are masterly, despite a few blurred passages. The Academy of St. Martin-in-the-Fields provides firm support, although a balance problem arises from the use of modern instruments that early instruments might have avoided. But if Tuckwell, a true virtuoso, has minor difficulties negotiating some passages, who today could play them on a hand-stopped horn? We are fortunate to have recordings of these concertos on any horn at all, no matter what kind. S.L.

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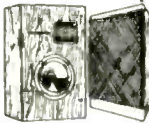
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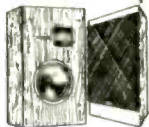
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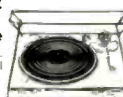


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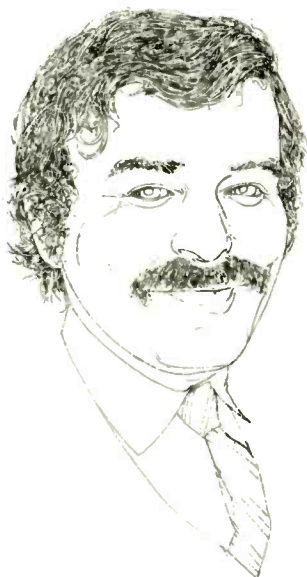
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by *Ralph Hodges*



Subwoofers and Woofersnappers

HIGH fidelity is associated with the reproduction of music, and the perfect high-fidelity sound system would be able to go anywhere music can go. Music, in its turn, is associated with pitch, and when a system fails to reproduce a pitch accurately—at extremely high and low audio frequencies—music disappears. Or so goes the theory, anyway.

Subwoofers (and, every now and then, supertweeters) ostensibly exist to make sure music is not short-changed in any possible way. But everyone who has ever used a subwoofer as a true *subwoofer*, that is, active only below 50 Hz or so, knows that it usually doesn't have much to do. Yes, the fundamentals of large pipe organs may dig down below 20 Hz, but it would seem that the big pipes are valued more for the overtone structures they develop than for the infrasonic hoot and shudder. The sensation of an organ's wind chest being filled and depleted is often enough to convey the gravity of certain musical passages. Many orchestral bass drums are pitched well below 40 Hz, but

they are not tuned—apparently an admission that there is no real music down there, but merely visceral effects. Other instruments that probe as deeply tend to have very weak fundamentals, and a well-assembled record player does not—and should not—respond to frequencies much below 20 Hz.

Am I saying that subwoofers are frivolous? By no means. Here's a short list of what I think subwoofers (or "detached" woofers, which is what most of the commercial products really are) are good for:

- Flexibility of placement. Even in acoustically asymmetrical rooms, the logical stereo sound stage can be set with the higher-frequency reproducers while the bass section is installed wherever it will most advantageously couple its highly room-affected output with the environment.
- Structural isolation. The woofer can be wadded in damping materials that will help keep peace with the neighbors and then be hidden away inconspicuously.
- Reproducing recording circumstances. A woofer that is really a *subwoofer* may be able to convey such subtleties as the chug of organ wind-chest activity, and even the quiet opening and closing of doors in the back of the auditorium, with a true "you are there" reality.
- Reproducing what is present in CD's and similar sources that have no low-frequency limits.

Have we lost track of music in the last few points? Perhaps, but it should be kept in mind that music is pitch-related and that somebody is going to take it wherever a sense of pitch can be exploited. Where is the true low-frequency limit of that? Unsurprisingly, there have been few investigations.

Not long ago, Marshall Buck did some notable work suggesting that a sense of pitch may persist down to 12 Hz. Many people, including myself, found it easy to neglect such findings, especially since Buck is the engineering chief for Cerwin-Vega, a company that likes to scare us a bit. More recently, Louis Fielder, of Dolby Labs, and Eric Benjamin, an electrical engineer not directly in-

involved with audio but certainly passionate about it, took Buck more literally and came up with a current crop of "woofersnappers"—recordings that mean serious business below 30 Hz, and which will not be denied unless their bass content is filtered out by the playback chain.

Fielder and Benjamin, working with their own wits plus every piece of information they could lay hands on, determined that 20 Hz was not likely to be significant in the listening experience unless reproduced at a relative level of about 80 dB, and that 2 Hz would not make much difference unless it emerged at 120 dB. These findings opened lots of middle ground, however, and the CD's they collected in their partial survey left no doubt that there is plenty of life below 20 Hz, and not just from Jack Renner's cannon in the Telarc *1812 Overture*.

Most of the energy below 20 Hz came from organ recordings, but the researchers did find a few pop recordings that made it down as low as 12 Hz, and even the well-worn *Star Wars* theme (on another Telarc recording) got down to 25 Hz. These frequencies were recorded deliberately, and they are inextricably a part of what the producer meant to deliver. They can be filtered out, of course, or they can be served by some very expensive attempts to reproduce them, as very good subwoofers are intended to do. But they cannot be ignored. They are woofersnappers, and they can kill listening pleasure and even audio systems with astonishing ease unless they are anticipated and brought under control.

If you're with me so far, you will want to read more about the efforts of Fielder and Benjamin, and your recourse is AES preprint No. 2537 (G-4), available for \$5 from the Audio Engineering Society, 60 East 42nd Street, New York, NY 10165. In this well-conceived work, titled "Subwoofer Performance for Accurate Reproduction of Music," the authors thoughtfully and exhaustively deal with many of the matters I *haven't* brought up concerning subwoofers, and woofers in general. There is no product being sold, just information. But that is really what we need now.

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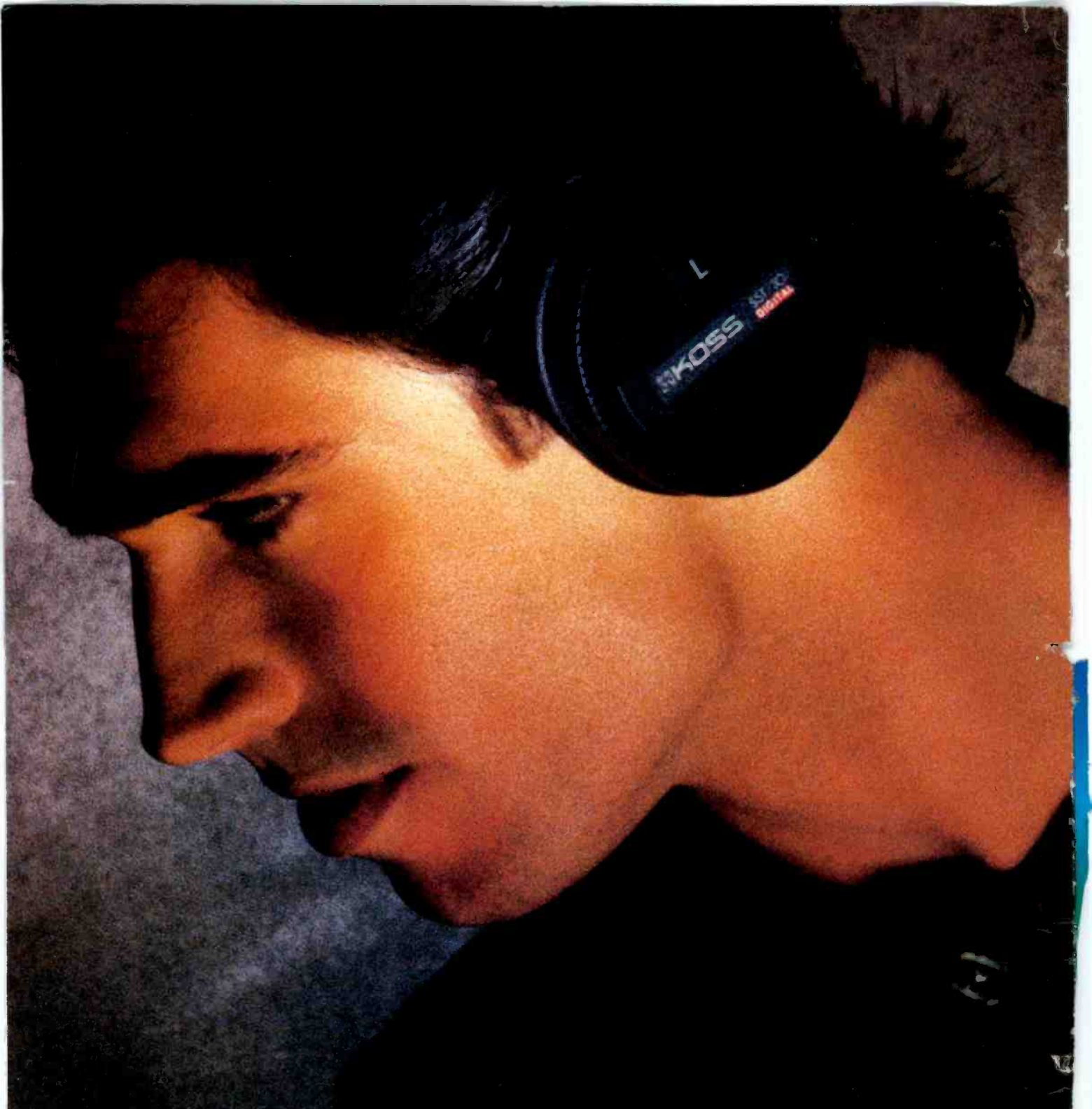
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