

Stereo Review

JULY 1987 ● \$2.25

**SPECIAL REPORT:
JAPANESE AUDIO**

**FIRST U.S. TESTS!
TWO DAT DECKS FROM JAPAN**

CASSETTE DECK BUYING GUIDE

**LAB TESTS:
YAMAHA 18-BIT CD PLAYER
EPI SPEAKER SYSTEM
HARMAN KARDON CITATION AMP
SIGNET SPEAKER SYSTEM**



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*SL-P720 recommended for higher vibration applications

by *Christie Barter and William Burton*

BERLIN'S BIRTHDAY

The city of Berlin is celebrating its 750th anniversary this year. The West German record company Capriccio is honoring the occasion with the release of eight CD's (stickered with the Berlin bear) offering programs of "Berlin music" that ranges from popular band music to opera. Featured is a recording of Beethoven's Fifth Symphony by the Berlin Symphony Orchestra under Kurt Sanderling at a special suggested retail price of \$10.

COPY CODING UPDATE

CBS Records now has forty-five copy-prevention encoders for its own use and is supplying fifty-five to other record companies in June and July, although the companies might not use the units unless supporting legislation is enacted. The encoders filter out a band of frequencies centered near the B that is the second-highest note on the piano keyboard. Legislation now before Congress would require digital audio tape (DAT) recorders imported into the country to include a "spoiler" circuit that would prevent copying such encoded recordings. Some record companies in Europe and Japan have also expressed support for the CBS copy-code technology.

AROUND-THE-CLOCK ROCK

One World, a twenty-four-hour television spectacular conceived along the lines of Bob Geldof's Live Aid but considerably more wide-ranging, could be the year's most important rock benefit. A battery of TV cameras will again focus primarily on Wembley Stadium in England, and a host of British and American superstars will again troop across its stage. But this time they will be linked by satellite with top local and international artists performing on six continents. The goal is to promote world unity and to raise millions for the Save the Children Fund and other charities. In addition to remotes from Russia and China, One World will also be

beaming music and good will from both the U.S. and Nicaragua. Sting has reportedly been invited to play in Managua.

WIRELESS STEREO SPEAKERS

Signal-processing wizard Larry Schotz has developed a method of transmitting two channels of high-quality audio through house wiring. The technology will be used in new speakers from Recoton designed to receive stereo signals through AC power cords, but Recoton will also offer transmitters and receivers that can work with any powered speaker or with a separate amplifier and speakers. Recoton's RSR-1 speakers will be \$200 a pair, the RSRT-1 transmitter/receiver system \$150.

MUSIC NOTES

David Crosby, of Crosby, Stills & Nash, has signed on his own with A&M. His first solo album for the label will be released by the end of the year. . . . Pianist Emanuel Ax has signed a long-term multi-record contract with CBS Masterworks. . . . A specially edited twenty-fifth-anniversary edition of the Beach Boys' film biography, *An American Band*, is due from Vestron at the end of July. And the Boys' Brian Wilson has a solo LP coming up later this summer on Sire. . . . The Boston Symphony embarks on its fiftieth summer season at Tanglewood over the Fourth of July weekend. . . . Making his home-video debut this month is Billy Idol, in a Vestron compilation titled "Vital Idol." . . . Billy Joel is set to play the two largest indoor coliseums in Russia, one in Moscow and the other in Leningrad, in six dates scheduled for the end of July and the first week in August. . . . Among the native sons and daughters honored in the first Philadelphia Hall of Fame ceremonies were Chubby Checker, Bobby Rydell, Dizzy Gillespie, Pearl Bailey, and Marian Anderson.

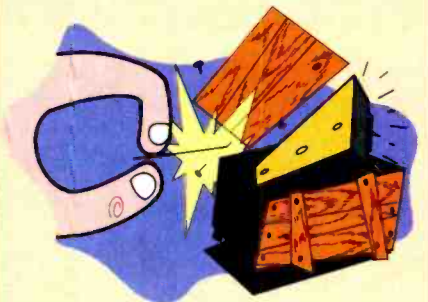
TECH NOTES

Look for home audio components from car audio manufacturers Soundstream and Rockford-Fosgate. Both are expected to in-

troduce home amplifiers, and Soundstream will also make a preamplifier, a tuner, and a remote-control system. . . . A Bose sound system is standard equipment in Honda's new Acura Legend Coupe. The system includes an AM/FM cassette tuner and four powered speakers with custom equalization. . . . A new AM/FM audio/video receiver from Carver, the AVR-100, has switching for eight video sources, Sonic Holography, stereo AM, and 150 watts each for the front channels and 50 watts each for the rear ones, all for \$1,199. . . . Look for CD-V players under both the Magnavox and Philips brand names. Pioneer and Yamaha will also be delivering CD-V players. . . . While JVC is already selling Super-VHS VCR's in Japan, RCA says that it will "try" to deliver four S-VHS products, two VCR's and two camcorders, to U.S. stores as early as August. . . . The picture quality of Beta-format video will be upgraded further when Sony's new ED (Extended Definition) Beta VCR's and metal-tape videocassettes go on sale in Japan this summer or fall. Sony is claiming that the use of metal tape and the separation of the chrominance and luminance signals in the record/playback process afford a horizontal resolution of 500 lines.

CARTRIDGE IN A CRATE

Ortofon's new top moving-coil cartridge, the MC 3000, comes packed in straw in a small wooden shipping crate. Price is \$1,000, including a 5-inch crowbar. Ortofon also announced that it has bought a 50 percent interest in Tandberg of America and will take over its inventory, warehousing, and administration.



TERRY ALLEN

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 Design by Sue Llewellyn, photo by Jook Leung.*

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SPEAKING MY PIECE

by Louise Boundas



Summer Reading

THERE was a kind of "unconscious arrogance" about them, one person says in David Halberstam's book *The Reckoning* (Morrow, \$19.95). "The Americans were proud and confident in those days [the early Sixties], and somehow innocent," Halberstam writes. So they cooperated with the Japanese productivity teams that were touring American factories to learn about American production methods. "The truth was, there was a certain condescension in all this; the Americans were open because they never took these odd little Asians seriously."

Halberstam's book is ostensibly about the automobile industry, specifically about the American giant Ford and the Japanese giant Nissan. But it is also about technological change—about invention and insularity, about imitation and initiative, and about power and getting it and losing it.

James Lardner started putting together an article on the "Betamax case" in 1982. "The low-comedy aspects of the story caught my eye immediately," he writes in his book *Fast Forward: Hollywood, the Japanese, and the Onslaught of the VCR* (Norton, \$18.95). "I was slower to see that [the home taping controversy] had a serious side after all."

Lardner follows the development

of the Japanese consumer electronics industry to its pre-eminence in the production of audio and video tape equipment. In 1976, as Sony's Betamax VCR was just beginning to be offered to the American public, an advertisement for it came to the attention of Sidney Sheinberg, the president of Universal Pictures. And thereby hangs the tale.

The serious side of *Fast Forward* has to do with "the constant struggle between pioneers and protectionists—between those who are trying to introduce new devices and those who are trying to guard and exploit existing ones." And in the course of Lardner's book it becomes clear that we do not know how to deal with that struggle, that our political and judicial institutions are inadequate to settle the disputes arising out of technological change.

Cars and consumer electronics are two conspicuous areas in which the Japanese have demonstrated that we had better take them seriously. But when it comes to judging fairly between the pioneers and the protectionists, and where consumer and national interests lie, we are still, somehow, innocents.

That should come as no surprise to anybody who has been trying to follow the current anticopying debate, the one revolving around digital audio tape, or DAT. At one point in the *Universal v. Sony* trial in early 1979, Lardner reports, Judge Warren Ferguson dismissed the relevance of a proposal for a VCR "jamming device." Ordering Sony to install such a device would not work, he said, because "as sure as you and I are sitting in this courtroom today, some bright young entrepreneur, unconnected with Sony, is going to come up with a device to unjam the jam. And then we have a device to jam the unjamming of the jam, and we all end up like jelly."

Halberstam and Lardner are consummate storytellers, and the stories they have to tell are fascinating. I started reading both of these books for information, but I continued reading them for pleasure. They are peopled with their own heroes and villains, movers and shakers—vivid, eloquent, sad, funny, human, *real*. I can't think of any better company for a long summer's day. □

Stereo Review

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"Spectacular... it is quite an experience"

Stereo Review Magazine

Now the genius of Matthew Polk brings you the awesome sonic performance of the SDA-SRS in a smaller, more moderately priced, but no less extraordinary loudspeaker, the SDA-SRS 2.

Matthew Polk's own dream speakers can now be yours!

Matthew Polk's ultimate dream loudspeaker, the SDA-SRS, won the prestigious Audio Video Grand Prix Speaker of the Year award last year. Stereo Review said "Spectacular... it is quite an experience" and also stated that the SRS was probably the most impressive new speaker at the 1985 Consumer Electronics Show. Thousands of man hours and hundreds of thousands of dollars were spent to produce this ultimate loudspeaker for discerning listeners who seek the absolute state-of-the-art in musical and sonic reproduction.

Matthew Polk has, during the last year, continued to push his creative genius to the limit in order to develop a smaller, more moderately priced Signature Edition SDA incorporating virtually all of the innovations and design features of the SRS without significantly compromising its awesome sonic performance. The extraordinary new SRS 2 is the spectacularly successful result. Music lovers who are privileged to own a pair of either model will share Matthew Polk's pride every time they sit down and enjoy the unparalleled experience of listening to their favorite music through these extraordinary loudspeakers, or when they demonstrate them to their admiring friends.

"Exceptional performance no matter how you look at it"

Stereo Review

Listening to any Polk True Stereo SDA* is a remarkable experience. Listening to either of the Signature Edition SDAs is an awesome revelation. Their extraordinarily lifelike three-dimensional imaging surrounds the listener in 360° panorama of sonic splendor. The awe inspiring bass performance and dynamic range will astound you. Their high definition clarity

*U.S. Patent No. 4,489, 432 and 4,497, 064. Other patents pending.

allows you to hear every detail of the original musical performance; while their exceptionally smooth, natural, low distortion reproduction encourages you to totally indulge and immerse yourself in your favorite recordings for hours on end.

Julian Hirsch of Stereo Review summed it up well in his rave review of the SDA-SRS: "The composite frequency response was exceptional... The SDA system works... The effect can be quite spectacular... We heard the sound to our sides, a full 90° away from the speakers... As good as the SDA feature is, we were even more impressed by the overall quality of the Polk SDA-SRS... The sound is superbly balanced and totally effortless... Exceptional low bass. We have never measured a low bass distortion level as low as that of the SDA-SRS... It is quite an experience! Furthermore, it is not necessary to play the music loud to enjoy the tactile qualities of deep bass... Exceptional performance no matter how you look at it."

The awe-inspiring sonic performance of the SDA-SRS 2 is remarkably similar to that of the SRS. Words alone can not express the experience of listening to these ultimate loudspeaker systems. You simply must hear them for yourself!

"Literally a new dimension in sound"

Stereo Review

Both the SDA-SRS and the SDA-SRS 2 are high efficiency systems of awesome dynamic range and bass capabilities. They both incorporate Polk's patented SDA True Stereo technology which reproduces music with a precise, life-like three dimensional soundstage which is unequalled and gives you, as Julian Hirsch of Stereo Review said, "literally a new dimension in sound". Each beautifully styled and finished SRS 2 cabinet contains 4 Polk 6½" trilaminare polymer drivers, a planar 15" sub-bass radiator, 2 Polk 1" silver-coil polyamide dome tweeters and a complex, sophisticated isophase crossover system. It is rated to handle 750 watts. The SRS utilizes 8-6½" drivers, a 15" sub-bass radiator, 4 Polk tweeters and an even more complex crossover. It is rated to handle 1000 watts.

Both the SDA-SRS and SRS 2 incorporate:
1.) time compensated, phase-coherent multiple

driver vertical line-source topology for greater clarity, increased coherency, lower distortion, higher power handling, increased dynamic range and more accurate imaging. 2.) a mono-coque cabinet with elaborate bracing and MDF baffle for lower cabinet read-out and lower coloration. 3.) progressive variation of the high frequency high-pass circuitry for point-source

"Literally a new dimension in the sound"

Stereo Review Magazine

operation and wide vertical dispersion. 4.) the use of small active drivers in a full complement sub-bass drive configuration coupled to a large 15" sub-bass radiator for extraordinarily tight, quick and three-dimensional mid and upper bass detail combined with low and sub-bass capabilities which are exceptional. The speakers are beautifully finished in oiled oak and walnut.

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"Our advice is not to buy speakers until you've heard the Polks"

Musician Magazine

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Where to buy Polk Speakers? For your nearest dealer, see page 107

LETTERS

Copy Prevention

I couldn't believe it: the copy-guard system being proposed for DAT's will affect the audio quality of CD's! It was almost like a bad joke: *remove part of the audio spectrum* from CD's and other prerecorded media so that DAT decks cannot copy them! And good old CBS Records says we don't have to worry, no one will ever miss that little 250-Hz notch. I guess we won't mind the distortion and phase shifts that will be caused by this complex multipole filter, right, CBS? Wrong!

DAVID J. WESTERMAN
San Jose, CA

If the recording industry is successful in prohibiting copying of their products, then it is reasonable to assume that according to the precedent thus established no one will be allowed to use a copying machine of any kind, except the original manufacturer. For instance, no copiers in public libraries for any reason, even for personal research. If certain books can't be checked out, that's just too bad. Buy the book, if it's still in print; if you can't afford it, you'll have to memorize it. No, you can't write it down either.

No copying of business forms, even for your own records, as this would deprive the industries producing them of the income they would have received if they had sold you extra ones to fill out in duplicate. Picture-processing equipment: only one print per negative allowed. If you want twelve prints of a photo, you'll have to take twelve shots of the same scene so that the company that makes the film gets its due.

DAVID MCNAMEE
Bakersfield, CA

Although I may be naïve about the mass-production tape-pirating operations going on, especially in countries with less than stringent laws, I think what really needs to be enforced are laws against *selling* illegal copies. After all, the "casual copier" is most often reproducing the music for his own needs. He wouldn't be purchasing another copy of the record, CD, or tape anyway, so the recording company loses no money by his reproducing it.

I am hoping that the problems with DAT will all be resolved. I have not yet purchased a CD player because I have been "holding out" for the release of a cassette form of digital technology.

D. BRAD PRICE
Souderton, PA

I hope that digital audio tape will see the light of day in the U.S., with CD-dubbing capability or not. Even without that capability, it will be great to be able

to dub all the black vinyl in my collection that will never be reissued on CD!

WILLIAM D. WRIGHT
Spokane, WA

If all prerecorded material will contain copy-guard encoding, DAT decks will be no more than overpriced analog recorders with digital playback capabilities. And who needs that? Better to wait for the day when add-on accessories like a copy-guard-encoding bypass and user-controlled sampling-frequency devices are available—then we will have DAT decks that are truly digital!

JOHN A. KEARNS
Woodbridge, VA

Copy-prevention legislation is still before Congress. If you feel strongly about it, write your congressmen. Call the Home Recording Rights Coalition at 800-282-TAPE for information.

Scoring Simels

Steve Simels deserves a pat on the back for his outstanding review of XTC's "Skylarking" in May ("Best Recordings of the Month"). At last someone other than myself has recognized a band with as much potential as a Lotus at a soap-box derby.

THOMAS SPAHR
Smithtown, NY

I trusted Steve Simels on Los Lobos's "By the Light of the Moon" (April "Best Recordings of the Month") and bought the CD unheard. How I wish I hadn't.

GREG MORGUS
Helena, MT

Crank 'Em Ups

I assume that Ralph Hodges's "High End" column in May was a bit of month-late April foolery. Right? I mean, except for the occasional immature and insecure teenager strutting his "coolness," people don't actually get together to assault the ears of a whole community, do they? Or do they?

R. A. RICKETTS
Terrebonne, OR

I thoroughly enjoyed Ralph Hodges on "Crank 'Em Ups." It's about time somebody addressed this new fascination with loud car audio. I'm becoming increasingly perturbed by cars that pull up next to mine at a stop light blaring with a sound level approaching that of a live concert. I don't enjoy listening to Mozart while being commanded to "bang my head" to the beat of Quiet Riot. How about a little courtesy?

DEAN STEWART
Redding, CA

Plain English

In the May editorial, Louise Boundas mentioned that she wishes to continue the magazine's "plain English" style of writing. This quality has been one of the many things that I have enjoyed about STEREO REVIEW. Julian Hirsch is due my thanks for his special kind of straightforward writing. Over the years, I have also enjoyed and been informed by the no-nonsense style of the music reviews, which contrast with the pompous, artificial, convoluted style in other audio magazines. My thanks to all of our writers for their "plain English" feature stories and articles.

HENRY W. ELLIS
Orlando, FL

Easy Listening

I was very pleased to see, from William Livingstone's May article, "Easy Listening on Compact Disc," that someone else recognizes this oft-ignored and looked-down-upon genre. But I was wondering why Bert Kaempfert was not included in the list of must-haves. I have three of his imported CD's, and there may be more on the way. Mantovani, Welk, Zamfir, and Acker Bilk certainly qualify for inclusion, but Kaempfert could show them a thing or two. And why no Mancini?

KEITH MCGUIGAN
Orlando, FL

"Easy Listening on Compact Disc"? Is that not like motor noise on half-speed-mastered LP? All one has to do is visit the dentist to enjoy the resounding entertainment value of "easy listening" music.

MICHAEL STENZ
Appleton, WI

Beastie Boys

In regard to Mark Peel's May review of the Beastie Boys' "Licensed to Ill": Rap is a form of music as viable as classical, jazz, rock, or whatever. The Beastie Boys don't claim to be the next guitar virtuosos or keyboard wizards. They're obviously in the music business for one reason, to have fun—or is that against your musical beliefs, Mr. Peel? Maybe STEREO REVIEW should put you on the Bon Jovi beat, you radical fellow, you!

CHRIS SMITH
Willmar, MN

Correction

The June test report on the TSW910 speaker from Acoustic Research mistakenly described its tweeter as $\frac{3}{4}$ inch in diameter. The size of the tweeter is 1 inch. We regret the error.

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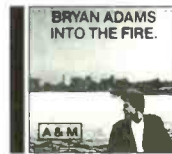
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350736. Rolling Stones—Rewind. (Rolling Stones Records)
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339044. Mozart: Symphony No. 40 & 41 (Jupiter)—Kubelik, Bavarian Symphony Orch. (Digital—CBS Masterworks)
349613. Original Soundtrack—Round Midnight. (Columbia)



353946

344622. Anita Baker—Rapture. (Elektra)
319996-399998. Motown's 25 #1 Hits From 25 Years. (Motown)
345777. Peter Gabriel—So. (Geffen)
334391. Whitney Houston. (Arista)
333286. Phil Collins—No Jacket Required. (Atlantic)
314443. Neil Diamond's 12 Greatest Hits, Vol. 2. (Columbia)
287003. Eagles—Their Greatest Hits 1971-1975. (Asylum)



346023

308049. Creedence Clearwater Revival Featuring John Fogerty/Chronicle. 20 greatest hits. (Fantasy)
343582. Van Halen—5150. (Warner Bros.)
345553. Branford Marsalis—Romances For Saxophone. (Digital—CBS Masterworks)
339226. Gershwin: Rhapsody In Blue; Second Rhapsody; etc.—M. Tilson Thomas, Los Angeles Phil. (Digital—CBS Masterworks)
326629. Bruce Springsteen—Born In The U.S.A. (Columbia)
343095. Philip Glass—Songs From Liquid Days. (CBS)
293597. Led Zeppelin—Houses Of The Holy. (Atlantic)

342097. Barbra Streisand—The Broadway Album. (Columbia)
336222. Dire Straits—Brothers In Arms. (Warner Bros.)
316604. Tchaikovsky: 1812 Overture; Marche Slave; Beethoven: Wellington's Victory—Maazel, Vienna Philharm. (Digital—CBS Masterworks)



354449

352948. Wynton Marsalis—Carnaval. Eastman Wind Ensemble, Donald Hunsberger. (Digital—CBS Masterworks)
348649. The Pachelbel Canon And Other Digital Delights. The Toronto Chamber Orchestra. (Digital—Fanfare)



351692

342073. Steely Dan—A Decade of Steely Dan. (MCA)
349373. Beethoven: Symphony No. 9 (Choral)—Bernstein. NY. Phil. (Digitally Remastered—CBS Masterworks)
314997-394999. Stevie Wonder's Original Multi-quarium I. (Tamlab)
348110. Buddy Holly—From The Original Master Tapes. (Digitally Remastered—MCA)
353771. Bolling/Rampol: Suite No. 2 for Flute & Jazz Piano Trio. (Digital—CBS)
352245. David Sarbom—A Change Of Heart. (Warner Bros.)

352799. Beethoven: Piano Concertos Nos. 1 & 2—Perahia; Haitink. Concertgebouw Orch. (Digital—CBS Masterworks)
351718. Georgia Satellites. (Elektra)
351122. Europe—The Final Countdown. (Epic)
348318. The Police—Every Breath You Take—The Singles. (A&M)
346312. Billy Joel—The Bridge. (Digital—Columbia)
344721. Lionel Richie—Dancing On The Ceiling. (Motown)
352633. Dolly Parton/Emmylou Harris/Linda Ronstadt—Trio. (Warner Bros.)
355156. Vladimir Horowitz Plays Favorite Chopin. (Digitally Remastered—CBS Masterworks)

COMPACT disc
DIGITAL AUDIO

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Here's the easy way to get the CDs you're looking for. As your introduction to the CBS Compact Disc Club, you can choose any 3 CDs listed in this ad for just \$1.00. Fill in and mail the application—we'll send your CDs and bill you for \$1.00. You simply agree to buy 2 more CDs (at regular Club prices) in the next year, and you may cancel membership anytime after doing so.

How the Club works. About every four weeks (13 times a year) you'll receive the Club's music magazine, which describes the Selection of the Month for your musical interest... plus many exciting alternates. In addition, up to six times a year, you may receive offers of Special Selections, usually at a discount off regular Club prices, for a total of up to 19 buying opportunities.

If you wish to receive the Selection of the Month, you need do nothing—it will be shipped automatically. If you prefer an alternate selection, or none at all, fill in the response card always provided and mail it by the date specified. You will always have at least 10 days in which to make your decision. If you ever receive any Selection without having 10 days to decide, you may return it at our expense.

The CDs you order during your membership will be billed at regular Club prices, which currently are \$14.98 to \$15.98—plus shipping and handling, and sales tax where applicable. (Multiple-unit sets may be higher.) There will be special sales throughout your membership. After completing your enrollment agreement you may cancel membership at any time.

Special Bonus Plan: After you buy 2 CDs at regular Club prices, you can build your collection quickly with our money-saving bonus plan. It lets you buy one CD at half price for each CD you buy at regular Club prices.

10-Day Free Trial: We'll send details of the Club's operation with your introductory shipment. If you are not satisfied for any reason whatsoever, just return everything within 10 days and you will have no further obligation. So why not choose 3 CDs for \$1 right now and mail the coupon today!

ADVANCE BONUS OFFER: As a special offer to new members, take one additional Compact Disc right now and pay only \$6.95. It's a chance to get a fourth selection at a super low price!

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Please accept my membership application under the terms outlined in this advertisement. Send me the 3 Compact Discs listed here and bill me \$1.00 for all three. I agree to buy two more selections at regular Club prices in the coming year—and may cancel my membership at any time after doing so.

SEND ME THESE 3 CDs FOR ONLY \$1.00

My main musical interest is (check one). (But I may always choose from either category.)
 ROCK/POP CLASSICAL

Mrs. _____
Miss _____
Print First Name Initial Last Name

Address _____ Apt. _____

City _____

State _____ Zip _____

Do you have a VCR? (Check one.) Yes No 421/87
Do you have a credit card? (Check one.) Yes No

ADVANCE BONUS OFFER: Also send me a fourth CD right now at the super low price of just \$6.95, which will be billed to me.

This offer is not available in APO, FPO, Alaska, Hawaii, Puerto Rico. Please write for details of alternative offer. Canadian residents will be serviced from Toronto. 6A7/C2

Note: We reserve the right to reject any application or cancel any membership. 6A8/C3

Selections with two numbers contain 2 CDs and count as 2—so write in both numbers. © 1987 Columbia House
CBS COMPACT DISC CLUB: Terre Haute, IN 47811

The one and only now offers you



the one-of-a-kind 10 disc changer



and the only carousel 5 disc changer.

Sony's two new DiscJockey CD changers give you twice as much to choose from.

There are no two ways about it. Only Sony offers the incredible sound of compact disc with the convenience of either a five or ten disc changer.

Consider the CDP-C10. It lets you sit back and listen for over ten hours. And since it's the only changer with a magazine compatible with the Sony Car DiscJockey, you can get even greater mileage from your CD music library.

Speaking of high performance, the CDP-C10 offers advanced programming, shuffle play and direct disc and track

selection. Then there's the affordable CDP-C5F. Its unique carousel design gives you over five hours of music, with 32-track programming, four repeat modes and the fastest access time of any changer anywhere.



Both changers feature remote control and renowned Sony technology like the Unilinear Converter/digital filter and aspheric lens laser optics for superior CD player performance.

So remember, only Sony offers a choice of changers that play for five or ten hours. But you'll hear how good they sound in seconds.

DiscJockey. SONY.

THE LEADER IN DIGITAL AUDIO.™



CIRCLE NO. 7 ON READER SERVICE CARD

NEW PRODUCTS



Koss

The Koss M/100 Plus audio/video loudspeaker is small in size, magnetically shielded, and self-powered so that it can be used as a primary or satellite speaker with a portable CD or tape player, a hi-fi VCR, or a stereo TV. A 20-watt amplifier drives the two 4 1/2-inch woofers and 1-inch dome tweeter. Frequency response is rated as 50 to 30,000 Hz. Audio input jacks, a 1/8-inch stereo phone jack, an adaptor cable for connection to the headphone outputs of portable players, and thermally reset circuit breakers are additional features. The cabinet is finished in a walnut-grain vinyl veneer, and it measures 6 inches wide, 15 inches high, and 12 inches deep. Price: \$249.95 a pair. Koss, Dept. SR, 4129 N. Port Washington Ave., Milwaukee, WI 53212.

Circle 120 on reader service card



Signet

Signet has added the H12a to its HiTec line of moving-magnet phono cartridges. Unlike the rest of the line, the H12a uses a standard half-inch mounting instead of a P-mount. The stylus is a .3 x .7-mil bonded elliptical diamond. Frequency response is given as 20 to 22,000 Hz. Recommended tracking force is 1.5 to 2.5 grams. Channel separation is 22 dB at 1,000 Hz. Price: \$900. Signet, Dept. SR, 4701 Hudson Dr., Stow, OH 44224.

Circle 121 on reader service card

Alphasonik

The MA-2035 is Alphasonik's most affordable Class A car stereo power amplifier. Class A operation is said to result in unparalleled sound clarity and stability. Rated to deliver 35 watts per channel into 4- or 2-ohm loads, the MA-2035 can be bridged for a mono output of 70 watts into 4- or 8-ohm loads. Total harmonic distortion is given as 0.01 percent at rated power. High- and low-level inputs with continuously variable sensitivity are included. Protection circuitry includes a power-on delay and Permatec, which protects the MA-2035 from speaker-wire shorts or overheating. Price: \$185. Alphasonik, Dept. SR, 701 Heinz Ave., Berkeley, CA 94710.

Circle 122 on reader service card



NEC

NEC's CD-610 compact disc player has a three-spot laser, separate analog and digital power supplies, and a linear-crystal oxygen-free-copper low-pass filter. The floating-suspension optical mechanism is said to insure accurate tracking and reduce the frequency of error compensation. Variable Intro Scan can be set to preview each track on a disc for 1 to 60 seconds. The wireless

remote control has a ten-digit keypad for direct track selection and easy programming. The fluorescent front-panel display has a twenty-track "play chart" that indicates the current track or, during programmed playback, the sequence of selected tracks. Frequency response is rated as 5 to 20,000 Hz \pm 1 dB, channel separation as 90 dB at 1,000 Hz. Price: \$459. NEC, Dept. SR, 1255 Michael Dr., Wood Dale, IL 60191-1094.

Circle 123 on reader service card

NEW PRODUCTS



JBL

JBL's compact ProIII two-way speaker is rated to handle up to 100 watts input, an exceptional capability for its size, and it is shielded for use in video and audio/video systems. Its 1-inch titanium-dome tweeter is only 25 microns thick (thinner than a strand of hair), for accurate transient response, yet it is said to be able to endure "crushing" force. The high-polymer laminate used in the 5-inch mid/low-frequency driver is said to limit rippling, cone fatigue, and strain and to reduce distortion to inaudible levels. Frequency response is rated as 65 to 27,000 Hz. The ProIII's diecast cabinet has black rubber moldings and measures 6¼ inches wide, 9¼ inches high, and 5½ inches deep. Price: \$240 per pair. JBL, Dept. SR, 240 Crossways Park West, Woodbury, NY 11797.

Circle 124 on reader service card

Magnavox

The CDB473 (shown) is one of three new front-loading compact disc players from Magnavox. The CDB473 has dual 16-bit digital-to-analog converters said to maintain accurate interchannel phase reproduction. It can be programmed to remember up to 785 favorite tracks. Its twenty-four-function remote control has a ten-digit keypad to simplify remote programming and a digital electronic volume control.

The CDB472 uses the same quadruple-

oversampling system, and its features include a six-function remote control, index access, a headphone jack, three-speed forward and reverse search, twenty-track programming, and fluorescent time and track displays. The CDB471 is identical except that it does not have a remote control, index access, or a headphone jack. Prices: CDB473, \$379; CDB472, \$329; CDB471, \$279. Magnavox, Dept. SR, I-40 and Straw Plains Pike, P.O. Box 14810, Knoxville, TN 37914-1810.

Circle 125 on reader service card



Sansui

Sansui's D-W11 double cassette deck offers simultaneous and relay play and record, double autoreverse, and high-speed dubbing. Up to 4 hours of music or other program material can be recorded or played back using two C-120 cassettes. Fifteen selections can be programmed for dubbing or playback. Other features include Automatic Music Program Search, Intro-Skip, Dolby B and Dolby C, and a microphone jack

with a mixing-level control. The D-W11 has two High-Bs hard permalloy record/playback heads, two double-gap High-Bs ferrite erase heads, and separate DC motors for the capstan and reel drives. Frequency response is rated as 20 to 18,000 Hz, signal-to-noise ratio as greater than 73 dB above 1,000 Hz with Dolby C (both specifications using metal tape). Price: \$700. Sansui, Dept. SR, 1250 Valley Brook Ave., Lyndhurst, NJ 07071.

Circle 126 on reader service card



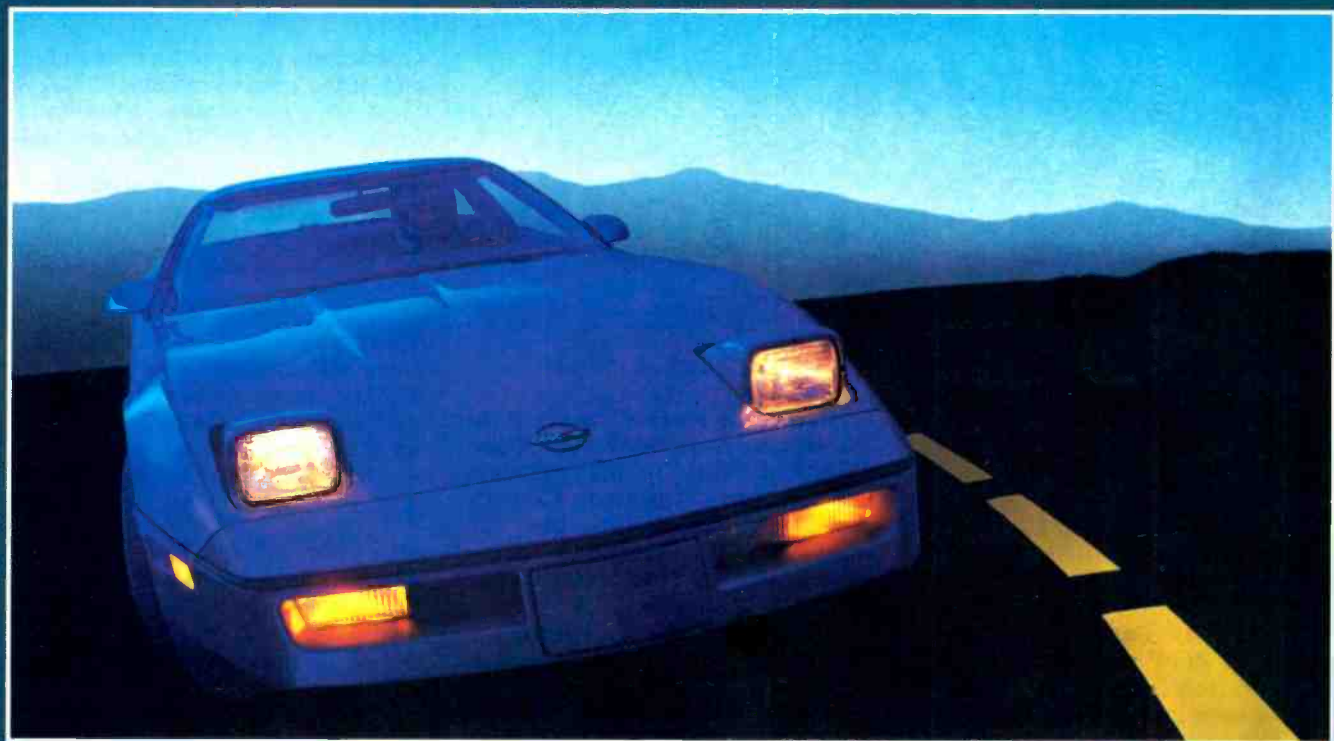
Altec Lansing

Altec Lansing's ALC10 active electronic filter and subwoofer crossover is adjustable for any model of car subwoofer and any type of listening situation or program material. The crossover frequency can be set at 50, 80, 100, or 150 Hz, and each point has a 24-dB-per-octave slope. The two-part Dynamic EQ control circuit can boost or cut any frequency from 30 to 200 Hz by up to 9 dB. Other features include a fixed high-pass output with a crossover at 100 Hz, a subwoofer output, and a direct output. Total harmonic distortion is rated as less than 0.1 percent. Price: \$65. Altec Lansing, Dept. SR, Milford, PA 18337.

Circle 127 on reader service card



BECAUSE TOO MUCH PERFORMANCE IS NEVER ENOUGH



Harman Kardon's drive for sonic excellence has elevated the standards of high fidelity for over 30 years. Our striving for the ideal is often considered "too much" by our competitors. Now the pleasure of "too much performance" is brought to the automotive environment.

Our competitors must feel that 20-20,000Hz ± 3 dB is "too much performance" to expect from an in-dash cassette/tuner, or they would offer it. We believe it the minimum necessary for true high fidelity reproduction. Even our least expensive model offers this and other "over design" distinctions: Dolby[®], dual gate MOSFET front ends, superior tuning sections, hand selected tape heads and heavy duty transports.



Shown: The new CH161 DYN-mount in-dash cassette/tuner, and CA260 automotive amplifier.



Our competitors must feel that High instantaneous Current Capability, Low Negative Feedback and discrete componentry constitute "too much performance" in automotive amplifiers. All of our mobile amps, from the 3.5 Watt/channel CA205 to the 60 Watt/channel CA260, are "over designed" to include these superior design criteria.

Automotive high fidelity performance from Harman Kardon. It's too much.

For more information and your nearest dealer call toll free 1-800-525-7000, Ext. 215 or write 240 Crossways Park West, Box 9215, Woodbury, New York 11797.

harman/kardon

A Harman International Company

High Performance Necessities for the Mobile Audiophile.

[®]Dolby is the registered trademark of Dolby Laboratories, Inc.

The Winner of
THE RODRIGUES CAPTION CONTEST



Of course, in the actual ad we'll use Madonna and a chain saw.

CONGRATULATIONS to Bruce E. Barstow, of Philadelphia, Pennsylvania! He is the winner of the third annual Rodrigues Cartoon Caption Contest, and his entry is the one now under the cartoon.

As we did in 1985 and 1986, in our January issue this year we printed a drawing by our cartoonist Charles Rodrigues and invited readers to submit proposed captions for it. The prize offered for the one the judges considered to be the funniest is \$100 and the original drawing.

As in previous years, the flood of entries came from all over North America and from such faraway places as New Zealand, Chile, Poland, and Saudi Arabia. The judges thank all the contestants for their entries. We also thank the 1985 and 1986 winners—Thomas Briggle, of Akron, Ohio, and Michael Binyon, of San Luis Obispo, California—who served on the panel of judges.

The most frequently duplicated caption was: "Is it live, or is it Aud-x?" In second place was: "Of course, we're professionals. We don't recommend that you try this at home." Particle board was mentioned in many captions, as were the cutting edge of technology, biamplification, stereo separation, and separation of high and low ends. There were some predictable jokes about wives and stereo, mothers-in-law, inflatable dolls, and sacrificial virgins.

Among the speaker brands mentioned were Bose, B&W, KEF, Polk, Pyle, and Thiel. To many readers the cartoon suggested Carver's Amazing Loudspeaker, but the model most frequently mentioned—for obvious reasons—was AR's Magic Speaker.

The person who figured in the largest number of captions was Madonna. In addition to Doug Henning, Julian Hirsch, and Harry Houdini, the celebrities mentioned included Bo Derek, Sonja Henie, Jack Klugman, the Labèque Sisters, Cyndi Lauper, Luciano Pavarotti, Brooke Shields, Kiri Te Kanawa, Anna Tomowa-Sintow, Vanna White, Fay Wray, and Pia Zadora.

Opposite the announcement of the contest in the January issue was an ad for KEF speakers which read: "Our testing may seem fanatical, but it's the only way to guarantee performance." We award honorable mention to the four readers who submitted that as their caption. They are David Barak (El Toro, California), Marty Hodgkinson (Olympia, Washington), Ronald Foster (Waynesburg, Ohio), and Fred Langer (Oviedo, Florida).

In the judges' opinion, this year's entries were the funniest yet. Some of the runners up are printed at right. If you think one of them is funnier than the one we gave the prize to, well, in the words of a famous authority on sex, that's normal. *William Livingstone*

Runners Up

No, sir. You plunge swords into the Model 6. This is the Model 5.

CHARLES BORN
 Wichita, KS

Gentlemen, I believe we've seen the end of the passive radiator.

JOSEPH STAFFORD
 Manchester, NH

Yes, sir. There *were* two of them. George tackled this one, the other got away.

WALTER M. SALEMAN
 Venice, FL

Don't you worry, Mr. Helmholtz! Your wife has been coated with Z-17, the same miracle compound used to prevent speaker cone break-up in all our new models.

RICHARD PELLICCIARO
 Concordville, PA

Don't know, sir. They sent her down to us this morning like this. George says he wants to see how they did it.

WALTER M. SALEMAN
 Venice, FL

Of course, we would want to A-B this with the guy on the inside and the gal working the saw.

ALVIN STEIN
 Brooklyn, NY

This is the third unit this month, and frankly we're worried.

DONALD BURNETT
 Alameda, CA

Forget all that high-tech stuff. Americans want to have fun with their stereo systems.

RANDY MATTHEWS
 Cross Lanes, WV

I know this is silly, but we can't keep slapping "Digital Ready" on the cartons and expect people to buy them.

GLENN D. PRESTON
 Manhattan Beach, CA

Who's whispering? You, there! Under the 'K' . . . care to share that with the *rest* of the class?

RONALD BALL
 San Antonio, TX



“How Can Everybody’s Speakers Be The Best?”

Read the various ads for speakers and you’ll find many of them loaded with claims about being the best.

You’d think that with so many “bests” out there, you wouldn’t have any problem finding the best speakers for your system. Unfortunately, that isn’t the case.

At KLIPSCH,[®] we’ll be the first to admit there are a lot of good speakers on the market. But we’d be the last to call any of them the “best.” Not even ours.

So what pitch will we give you about KLIPSCH?

Well, take note of the pictures in those ads. The drive components of all those speakers have a remarkable similarity in appearance.

That’s because they’re all about the same, and as a result, they all sound about the same.

KLIPSCH doesn’t use conventional drivers like the other guys. We use special *compression* drivers mated to horns. We’re about the only people that do. These KLIPSCH compression drivers give you higher output, more controlled imaging, greater clarity and wider dynamic range – characteristics so sought after in recording studios and other professional applications.

Do these characteristics make our speakers the “best”? Not necessarily. But KLIPSCH Loudspeakers certainly sound different from others. A *real* difference for your hard-earned money. A difference you can truly

appreciate the first time you listen, and every time thereafter. Uniqueness, if you will, for about the same price as common-place speakers.

You be the judge of what’s best. At your nearest KLIPSCH dealer. Look in the Yellow Pages. Or call toll free, 1-800-223-3527.



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A LEGEND IN SOUND.™

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CIRCLE NO. 2 ON READER SERVICE CARD

Consolidate Yo

How the world's most powerful receiver can provide the benefits of audiophile separates in a single, remote control component.

Never before has so much clean power, pure sound and unique technology been available at the touch of a remote control button.

The Carver Receiver 2000, at your service. In a single, exquisitely-styled component, we've engineered three of the most significant contributions ever made to audio technology.

A 200 watt RMS per channel Magnetic Field Power Amplifier.

A Sonic Hologram Generator for a three-dimensional sound experience.

An Asymmetrical Charge-Coupled FM Stereo Detector in the tuner section for the cleanest, most noise-free reception possible... plus AM STEREO.

Plus a low-noise high definition preamplifier and surround sound processor so you can create a true home theater experience.

Everything necessary for music enjoyment. Settle back in your chair and pick up the compact Receiver 2000 wireless remote control.

Touch the POWER button. Two hundred watts RMS per channel spring to life. More than any other receiver offered today. The kind of power needed to deliver Compact Discs' incredible dynamic range with the impact and clarity it deserves.

But you're in the mood for a record. Touch one of the four source buttons to select PHONO. As the record comes to life, you realize that it would be a superb candidate for Sonic Holography. Another touch of the



ur Power Base.

remote control and you're suddenly in the midst of the performers, a part of the musical experience.

Suddenly, the phone rings. You reduce the volume easily without leaving your chair and take the call. Later on, you select a favorite FM station from the twelve presets while you catch up on your reading. The sound is hiss-free, even when the station is far away. A great oldie comes on and you use the Receiver 2000's remote to turn it up and rattle the windows for a moment the way you always wished you could when that song first came out.

In the evening, it's movie time. The Receiver 2000 becomes your gateway to high impact surround sound that rivals any Dolby-equipped theater. Starships cruise through your living room. Aliens prowl behind the couch. Laser battles erupt over your coffee table.

All controlled from the comfort of your chair.

A wealth of useful features. From the silky feel of the large, easy-to-use knobs, to the switched and unswitched power sockets on the Receiver 2000's back, you'll find that no detail has been overlooked. Even if it didn't have three of Bob Carver's major innovations tucked inside it, the Receiver 2000 would be one of the finest receivers you could own.

It has inputs for phono, Compact Disc player and even video sound sources. It allows 2-1 and 1-2 dubbing through dual tape deck inputs and outputs, and selection of two sets of speakers or a combination.

Precision, defeatable tone controls are provided for bass, treble and midrange, as well as a preset "loudness" equalization curve for acoustic compensation during low level listening.

The bright digital readout and signal strength LEDs are only a hint of the high quality quartz synthesized FM section and AM stereo circuitry within. Choose from six FM and six AM station presets, tune manually or use the Receiver 2000's automatic station search feature.

Ample Power for Digital. Even before Compact Disc players, clipping distortion caused by lack of amplifier power has been the critical listener's enemy. Speakers create music by generating magnetic fields inside their voice coils. A drum beat sounds on a record; energy flows to your speakers; the speakers push the air. In the case of low bass notes, this means having enough power to resonate the entire cubic volume of your listening room thirty times per second!

The sad fact is, few receivers have the technical capabilities to provide the amount of power needed to complete instantaneous music transient waveforms.

Before Bob Carver invented the Magnetic Field Power Amplifier, the only way to get enough power to completely eliminate clipping distortion was to give up owning a receiver and buy a traditional power amplifier and put up with its bulk, heat and expense. The Carver Receiver 2000 uses a better way. An affordable method of delivering the power speakers need without thermal waste, bulk and distortion. Our Magnetic Field Power Amplifier design is elegant, effective and fully described in the 32-page brochure we'll be glad to send you.

The finest receiver FM section. The Carver FM Stereo Receiver 2000 employs Asymmetrical Charge-Coupled Detector technology which makes FM sound as good as other stereo sound sources. Free of background hiss, click and pops, picket fencing and other multipath interference annoyances which disturb FM enjoyment.

Or, in the words of Audio Magazine's Len Feldman, "The significance of its design can only be fully appreciated by tuning the weakest, most unaccept-

able stereo signal you can find, then pushing those two magic buttons. Separation is still there; only the background noise has been diminished, and with it, much of the sibilance and hissy edginess so characteristic of multipath interference."

True realism with Sonic Holography.

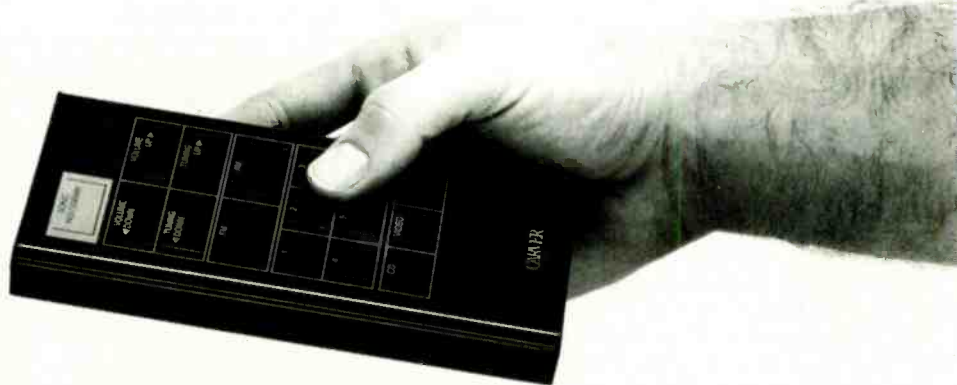
In a live setting, sound approaches from all sides, not just head on the way it does from stereo speakers. Sonic Holography uncovers critical timing and phase information that exists in your and CD's records, but has been inaudible with normal stereo components. Through the Carver 2000, this information emerges in three-dimensional space around you, pinpointing the precise location of instruments and vocals.

You don't need a trained ear to notice the difference. Suddenly the listening field extends wider, higher and deeper than your speakers, literally immersing you in the performance.

The best of everything in one compact component.

There has never been a more complete method of enjoying music than the Carver Receiver 2000. Occupying just over two square feet of shelf space, it gives you the power, the tuning ability and the miracle of Sonic Holography that can bring any music or video source to vibrant life. Audition it at your Carver dealer. And then shift the balance of power to your stereo system soon.

Power: 200 watts RMS per channel into 8 ohms. 20-20kHz with no more than 0.15% THD.



CARVER

P.O. Box 1237, Lynnwood, WA 98046

POWERFUL

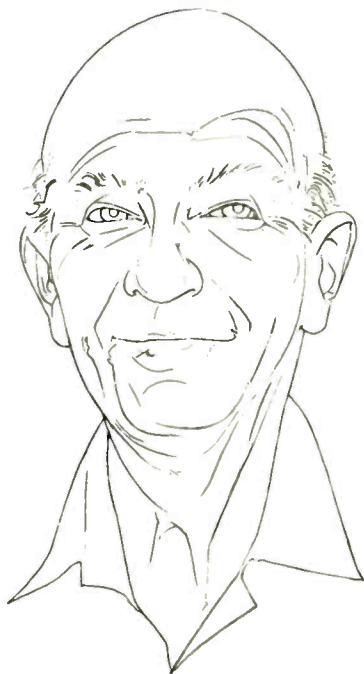
MUSICAL

ACCURATE

CIRCLE NO. 49 ON READER SERVICE CARD

Distributed in Canada by **evolution technology**

by Julian Hirsch



Detecting Distortion

THE performance of most of today's audio components is so refined that it can be measured only with state-of-the-art laboratory equipment, and then only with difficulty. Nevertheless, there is an ongoing effort by many manufacturers to reduce distortions of all kinds in their products, even when there is considerable doubt that any audible advantage will result.

It has been demonstrated many times that the human threshold of distortion perception is far higher than most people would suspect. While amplifier distortion levels even in inexpensive products are now routinely well below 0.1 percent at any usable listening level, even twenty or thirty times that much distortion probably could not be heard when listening to musical programs. Yet it is not uncommon to find new amplifiers with distortion ratings of 0.002 percent or less in which this feature is claimed, if only by implication, to produce audible benefits.

On the other hand, many audio-

philes maintain that they can hear differences between components even when no such differences can be measured or even explained by conventional theory. The conflict between "objectivists" and "subjectivists" shows no sign of abating, and it is difficult to find an acceptable middle ground between them.

First of all, we should establish some fundamental definitions. "Distortion" is most commonly used to refer to nonlinear amplitude distortion, the best-known forms of which are *harmonic distortion* and *intermodulation distortion*. There are other forms of distortion, such as *frequency distortion* (a departure from a "flat" frequency response), *phase distortion* and its relative, *time distortion* (when not all the frequency components of a signal reach the listener at the same instant), and various *transient distortions* (which occur only under certain conditions with rapidly changing signal waveforms and are not easily detected by conventional steady-state measurements).

Regardless of its category, the primary official definition of distortion (from the *IEEE Standard Dictionary of Electrical and Electronics Terms*) is "an undesired change in waveform," which covers all the above examples and many more. Although this definition is equally applicable to electrical or acoustical waveforms, it says nothing about the audible (subjective) effects of distortion. In fact, there is very little pertinent data on that subject despite all the psychoacoustic research that has been conducted.

Psychoacoustic research normally attempts to determine the audible effects of altering signals having

known and controlled characteristics such as single or multiple sine waves, noise spectra, impulses, etc. Unfortunately—actually, *fortunately* for the hi-fi industry—most of us don't listen to such nicely defined signals. People tend to prefer much more complex program material, most of it commonly lumped together in the category of "music."

Music is more enjoyable to listen to than test signals, but it does not lend itself well to quantitative measurements. One thing we do know, however, is that music programs are capable of masking enormous amounts of nonlinear distortion, literally hundreds of times more than would be detectable or tolerable with simple signals.

Nevertheless, people *do* hear differences between audio components, and do express preferences, even when conventional measurements do not show any basis for their judgments. This does not mean that the measurements are wrong, merely that we may be measuring the wrong things—although, unfortunately, no one knows what the "right" things are. In any event, an individual who claims to hear differences in a listening comparison, even if no preference is expressed, must be presumed to have detected *something*.

Certainly no argument is possible with the expression of a preference, although we should make allowance for the extreme fallibility of human judgment about what we hear. Personally, I find the usual statistical basis for establishing the detectability of differences to be unconvincing. In actual listening situations, a listener usually has little difficulty in deciding quickly whether the sound of something is good, bad, or simply ordinary (I am not concerned with detecting minute differences but with establishing a clear preference for one particular sound quality). If the decision-making process takes a long time, with many trials, I interpret that as *prima facie* evidence that any differences that may exist are not very significant.

What I would like to see is a measurement technique, which would probably have to consist of a number of rather complex measurements, that would correlate reason-

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115146

Richard Stoltzman: Begin Sweet World Amazing Grace, Air, Pie Jesu, others. RCA DIGITAL 150414

Robert Cray: Strong Persuader • Smoking Gun, others. Mercury/Hightone 104876

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Mozart, Symphonies Nos. 40 & 41 (Jupiter) Chicago Symphony Orchestra led by James Levine. RCA DIGITAL 104810

Bizet, Carmen (Film Highlights) • Julia Milgones-Johnson, Plácido Domingo; Lorin Maazel conducts. Erato DIGITAL 154105

The Judds: HeartLand • Don't Be Cruel, Cow Cow Boogie, etc. RCA 160363

Mozart, Requiem • Schreier leads the Leipzig Radio Choir & Dresden State Orchestra. Philips DIGITAL 115039



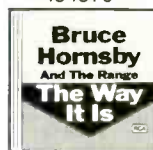
115306



154570



173406



163918



173924



173824



125224

John Cougar Mellencamp: Scarecrow Lonely Ol' Night, Small Town, Rain On The Scarecrow, more. Riva 144512

The Legendary Enrico Caruso • Vestì la giubba, Celeste Aida, Cleo e mar!, La donna è mobile, 17 more. RCA 134274

Kenny Rogers: They Don't Make Them Like They Used To • Title song, Twenty Years Ago, After All This Time, more. RCA 151174

Elvis Presley: Return Of The Rocker • King Of The Whole Wide World, Return To Sender, Stuck On You, etc. RCA 154071

Horowitz in London • Schumann, Kinder-scenen: more by Chopin & Scriabin. RCA DIGITAL 162507

Dire Straits: Brothers In Arms • Money For Nothing, etc. Warner Bros. DIGITAL 114734

Steve Winwood: Back In The High Life Higher Love, more. Island 153271



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Whitney Houston: Greatest Love Of All, You Give Good Love, etc. Arista 154381

Toscanini: Beethoven, Symphonies Nos. 1 & 3 (Eroica) • RCA 154201

Led Zeppelin I • Good Times Bad Times, Communication Breakdown, etc. Atlantic 134303

Steve Miller Band: Greatest Hits (1974-1978) • Fly Like An Eagle, The Joker, etc. Capitol 133199

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TECHNICAL TALK

ably well with the subjective judgments of a *large percentage* of experienced listeners. Perhaps, although I doubt this would ever prove to be practical, such an approach could even identify the sonic qualities that would appeal to a specific person. But since it is inconceivable to me that the results of such a procedure could ever apply to more than *one* individual, I am skeptical of the possibility of any solid correlation between measurements and the subjective response of *all* individuals. There is thus no substitute for doing your own listening, which clearly supports the subjectivist camp.

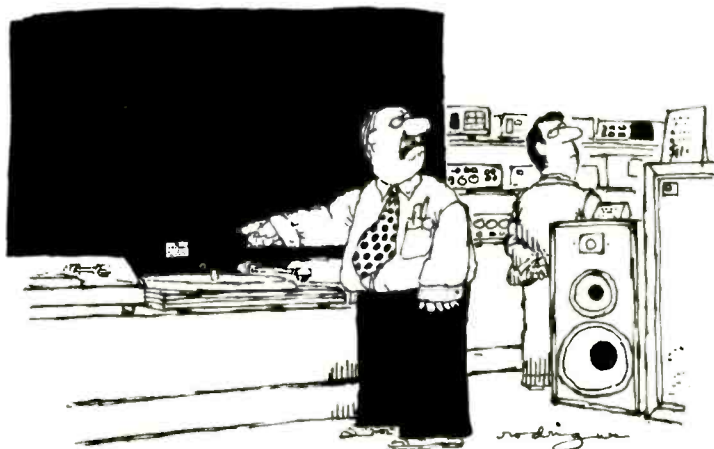
Unquestionably, large-scale statistical studies have given, and will continue to give, guidance to engineers and marketing departments in creating components that will appeal to a sufficiently large segment of the population to keep our industry alive and well. Although there will always be people who choose not to follow mass-market trends, we are fortunate in having a lively and innovative "high end" in the audio industry to meet their needs.

I have long considered myself an objectivist, because I prefer the (usually) clear-cut verdict of accurate measurements regarding the true performance of a product. For me, the nit-picking distinctions in sound that matter so much to many people are of little or no importance. I believe that the sound we finally hear is determined largely—say, about 95 percent—by the re-

coding process and the combination of the speakers and the listening room. The remaining 5 percent is contributed by the amplifier, record player, and other electronic components. My own subjective criteria for quality in such a component, therefore, principally involve ease of use, reliability, general suitability for its purpose, and the honesty of the claims made for it.

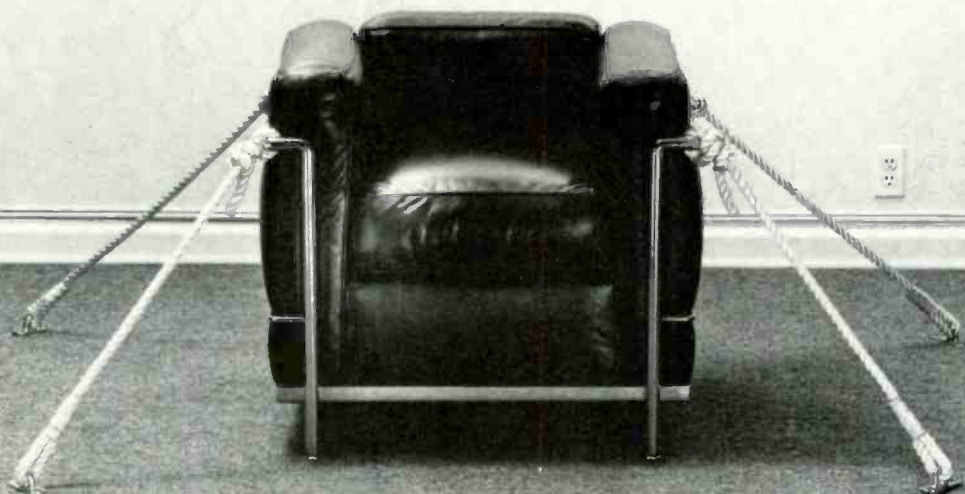
But since measurements are my primary tool for evaluating non-acoustic components, I am always looking for, and hoping that I will find, some technique or affordable instrumentation that will help me "get a handle" on the listening qualities of audio components. I will always trust my ears over my instruments, but I am too aware of the fallibility of human judgment to be unduly influenced by people who tell me what I *should* be hearing!

So there is no clear answer to the question of which is more sensitive, the ear or the meter. While instruments can *measure* qualities far below the detection threshold of any human ear, even an untrained ear can *detect* (not *measure*!) sound characteristics that cannot yet be measured. But despite the ear's sensitivity, human hearing is notoriously imprecise, easily influenced by other inputs to the brain, and almost totally qualitative in its determinations. Obviously, therefore, both approaches are needed for a full assessment of hi-fi components and systems. □



"Larry, did you have to make this sign that says this turntable will perform as well as any compact disc player so damned big?"

Most speaker designers haven't changed their position in 30 years.

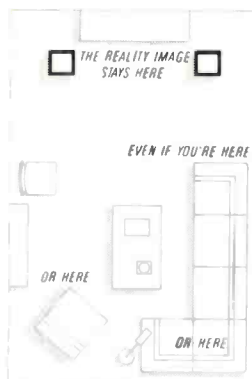


Presenting the dbx Soundfield series: Reality Imaging™ and the end of the stereo "sweet spot."

For 30 years, speaker designers have believed that the only way to achieve balanced stereo is to sit directly between and in front of both speakers. If you move out of this "sweet spot," the stereo image collapses and the frequency response is anything but flat.

At dbx, we took a revolutionary approach and developed a new speaker design that achieves stereo balance and frequency response so consistent from any listening position, so close to the real thing, we needed a new name to describe the experience: Reality Imaging.

Reality Imaging brings you right up to the stage. It's not only the sound, but the actual spatial reality—the feeling of being there. And it's an image that doesn't collapse if you move around.



Not only can you hear it, you can see it.

Ask your dbx dealer to demonstrate with a sound analyzer (such as the dbx 14110) how consistently the flat and smooth response—and Reality Imaging—are maintained by dbx Soundfield speakers at every point in the room. Then ask him to do the same with any other speaker at any price. You're in for a shock.

And we seriously suspect you'll be changing your position on stereo speakers for good.

dbx Soundfield 1A
\$3000 | pair*



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dbx Soundfield 1000
\$699 | pair*

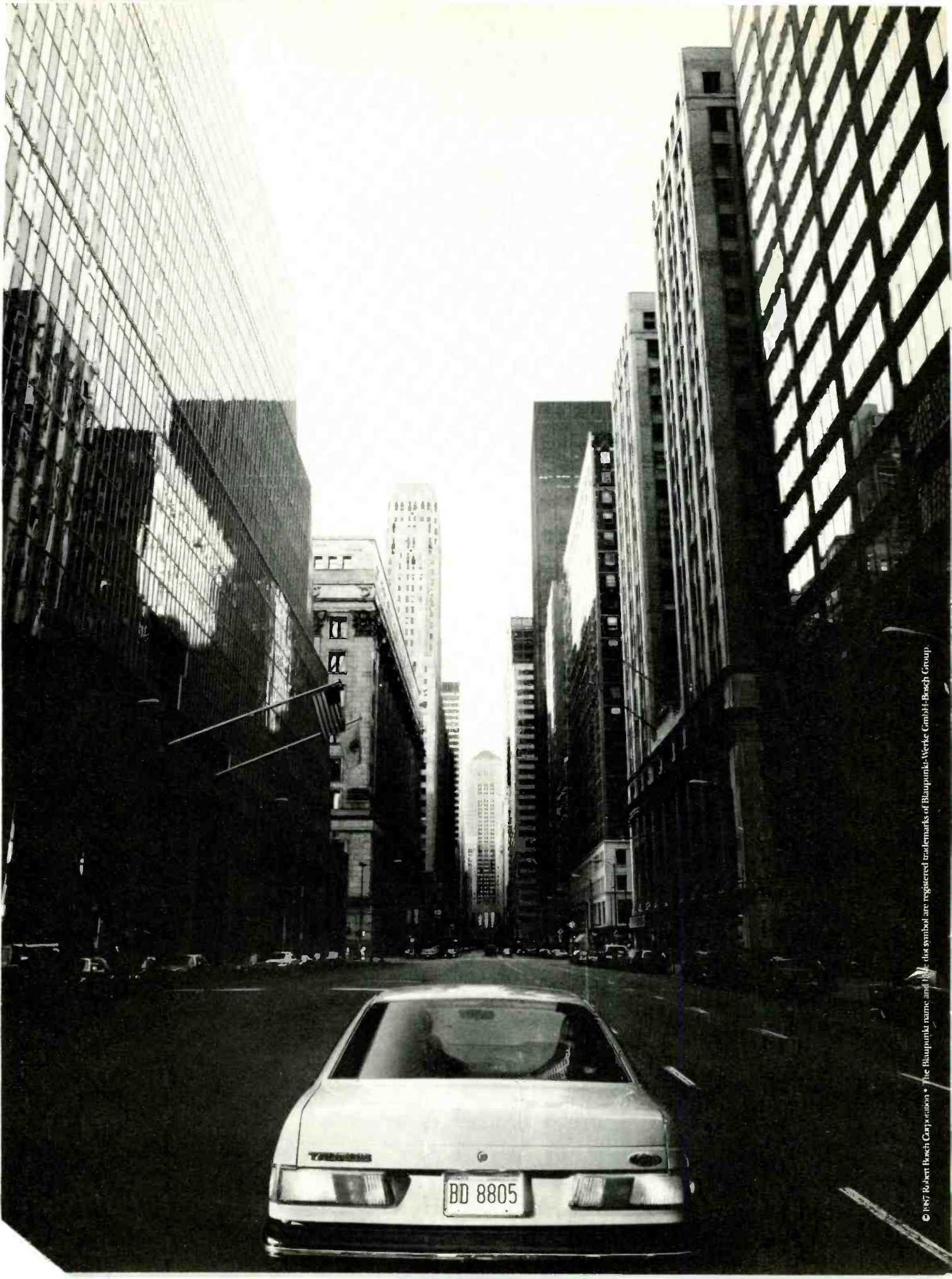


*Suggested retail prices.

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Beyond stereo

CIRCLE NO. 62 ON READER SERVICE CARD



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After the mountains of Europe, the canyons of North America pose no problem for a Blaupunkt.

For a Blaupunkt car stereo, the radio reception difficulties created by big city buildings are no big deal.

Because ever since the first



Blaupunkt was introduced in 1932, our tuners have had to overcome much bigger obstacles.

The Alps.

The Pyrenees.

The Apennines.

These European mountain ranges make even the towering headquarters of modern mega-corporations appear puny by contrast.

Yet thanks to the ingenuity of our 326 car audio engineers in Hildesheim, West Germany, Blaupunkt car stereos are superbly equipped to handle even the most extreme FM reception problems.

You see, a car stereo's ability to capture an FM radio signal is determined by five factors: FM sensitivity. Selectivity. Multi-path distortion. Signal attenuation. And RF intermodulation.

Most car stereo systems do a reasonably good job with two—perhaps three—of these factors.

But due to the persistence of our engineers—and the dozens of patents we've earned in this area alone—Blaupunkt's CODEM III and ORC II dynamic tuning systems do exceptionally well in all five areas.

Which helps explain why Blaupunkt has earned a reputation for engineering the world's finest tuners.

We even take the trouble to design our own antennas.

Something not one of our competitors bothers with.

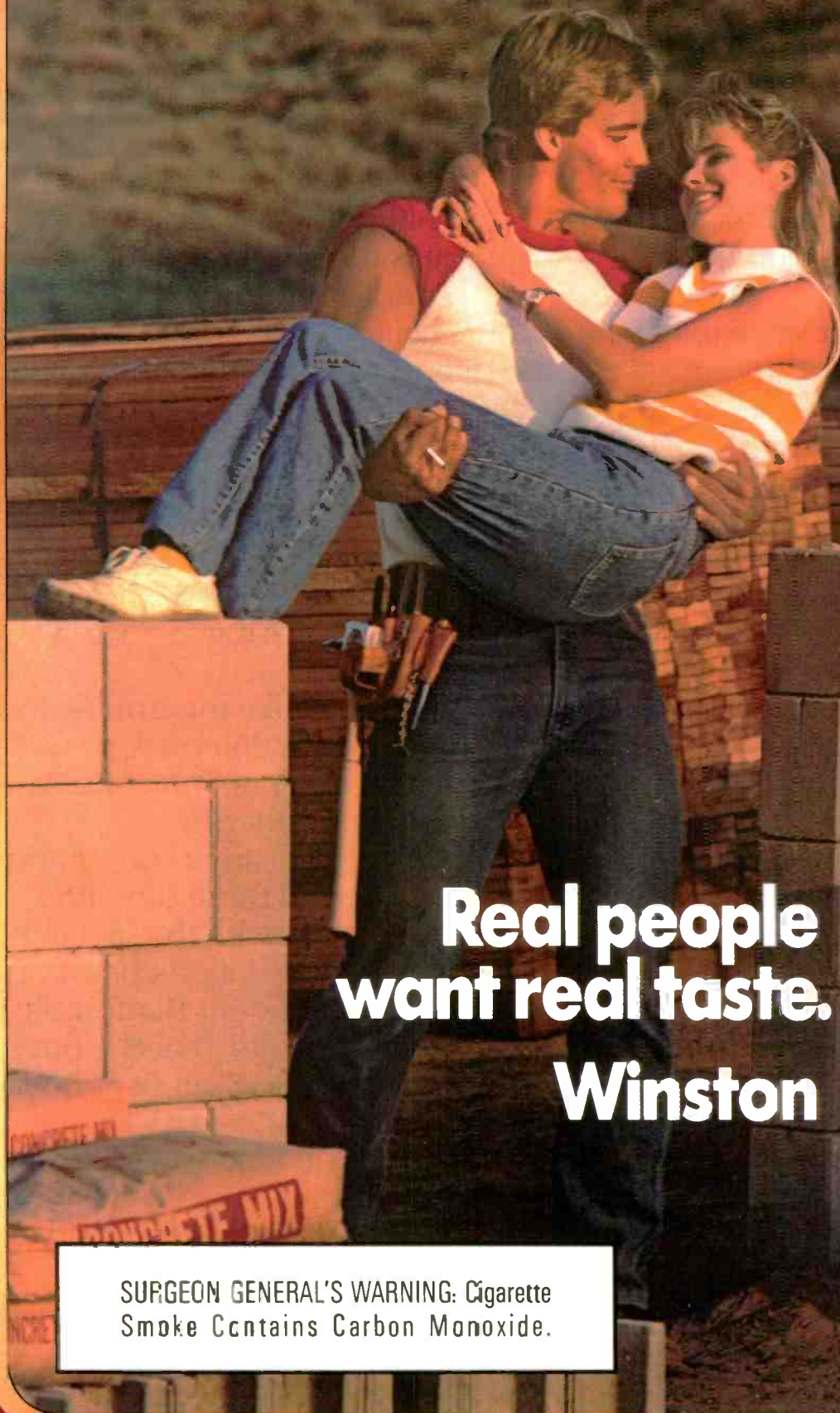
So if you're an urban motorist frustrated by all those buildings wreaking havoc with the signals of all your favorite stations, pay a visit to your independent Blaupunkt car stereo specialist. (For the one nearest you, please call us at 1-800-237-7999.)

What you hear will be music to your ears.

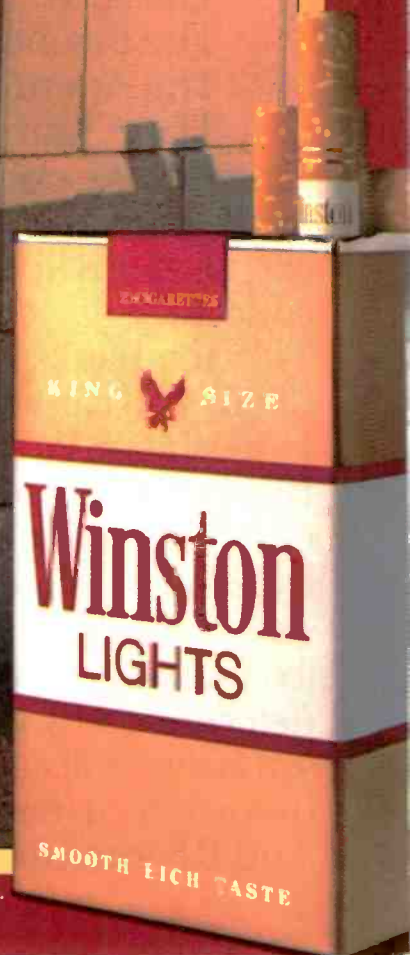
Without all the static you've been accustomed to.

● BLAUPUNKT
Designed for people with ears.
And something between them.

Real Dreams.



Real people want real taste. Winston



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



YAMAHA CDX-1100 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

THE Yamaha CDX-1100 is the first player to achieve the performance of 18-bit digital decoding from a 16-bit digital-to-analog (D/A) converter. In addition, it provides almost every operating convenience currently available in a CD player.

The CDX-1100 uses 18-bit quadruple-oversampling digital filters for each channel. The 176.4-kHz sampling rate of the filters greatly reduces noise in and just above the audio range compared with non-oversampling, 44.1-kHz filters. Since the spurious products and noise created by the digital sampling process are far above the 20-kHz upper frequency limit of the CD system, they can be removed by a digital filter, in conjunction with a fifth-order active analog filter, that

has a relatively gradual slope and a high cutoff frequency. These characteristics help preserve a flat response and produce less phase shift and ripple within the audio range. Compared with 44.1-kHz sampling, quadruple oversampling gives a fourfold improvement in time-axis resolution, although this is normally beneficial only at the higher program levels. Yamaha's 18-bit filters extend this improvement to the low-level portions of the program, where they also provide a fourfold improvement in amplitude resolution and correspondingly lower distortion.

The peak levels on a digital disc rarely reach the two highest, or most significant, bits of a 16-bit system, so the full capability even of 16-bit D/A conversion is needed relatively

infrequently. Many CD players, in fact, use 14-bit decoders without a significant loss of quality. Nevertheless, distortion increases rapidly as the program level decreases, and it is concentrated in the less significant bits of the digitally encoded signal. In fact, a pure sine-wave signal represented by the least significant bit is actually decoded into a square wave with a very high percentage of harmonic distortion, although it is not likely to be audible as such because of its very low level and masking by the other program material.

Yamaha's answer to such low-level distortion is the "Hi-Bit D/A Conversion System," a "floating" system that is designed to yield 18-bit performance with a conventional 16-bit D/A chip by shifting the entire signal going into the converter *upward* by 2 bits. The upward shift means that even the weakest portions of the signal are represented by a greater number of samples than in a conventional D/A converter. As a result, the usual square-wave output of a least-significant-

TEST REPORTS

bit conversion becomes a better approximation of a pure sine wave, with a consequent 12-dB reduction in its distortion content.

To deal with situations where the two most significant bits must be used, Yamaha's Hi-Bit system uses rapid switching devices that *drop* the digital signal by two bits when required. Most of the time, the Hi-Bit system gives the player the noise and distortion performance that could be expected from an 18-bit D/A converter; the occasional shifts to 16-bit operation take place only for brief intervals at high levels and are not audible. The use of separate D/A converters for the two channels also eliminates any phase shifting.

The CDX-1100's laser transport, made of a rigid molded-plastic material, is suspended on rubber bushings to isolate it from external vi-

bration and shock. The whole transport system is mounted on an aluminum-alloy chassis. Separate power supplies and transformers are used for the digital and analog sections of the player. The two sections, constructed on separate circuit boards, are optically coupled to reduce spurious signal noise to very low levels. The laser is driven by a high-speed linear motor that provides fast access to any desired part of the disc.

The analog circuits of the CDX-1100 are designed for compatibility with the very low noise levels and other refined characteristics of its digital portions. The electronic volume control is actually a digital attenuator with 20-bit resolution that is said to deliver a 120-dB dynamic range, with 0.2-dB steps from the 2-volt maximum down to zero out-

put. The frequency response of the player, measured through its direct-coupled analog audio amplifier, is rated as flat within 0.3 dB overall from 0 to 20,000 Hz.

In addition to all the usual operating and control functions, the CDX-1100 can access any track or indexed portion of a disc directly. The forty-four-key wireless remote control supplied with the player duplicates every one of its front-panel controls except the power switch, including the electronic volume control, and it can be used to program up to twenty-four tracks in any order. There is also a random-play mode.

The rear apron has gold-plated audio output jacks and a digital output jack that can be used with any amplifier having a built-in D/A converter. The program level at the stereo headphone jack on the front panel is controlled by the same electronic volume control that affects the line outputs.

The display window on the front panel is somewhat unusual in the amount and detail of the information it provides. It has the usual indication of the track and index numbers, program selection number, and elapsed time on the current track. It can be switched to show the total time and the remaining time on the disc. In addition, however, a row of numbers above a calibrated scale along the bottom of the window shows all the tracks on the disc up through No. 24, and a red triangle over each number is extinguished as the track finishes play. A red cursor travels along the scale to show the percentage of the disc that has been played—the full scale length represents 100 percent of a disc, no matter how long its playing time. A vertical scale, calibrated from 0 to -40 dB, shows the setting of the electronic volume control (attenuator). Illuminated words indicate the status of the various programming options.

The CDX-1100 is a large, heavy machine. Measuring 17 $\frac{1}{8}$ inches wide, 16 $\frac{3}{8}$ inches deep, and 4 $\frac{3}{4}$ inches high, it weighs about 31 pounds. It is supported on four vibration-isolating feet about 2 $\frac{1}{4}$ inches in diameter and $\frac{3}{4}$ inch high. Price: \$1,200. Yamaha, Dept. SR,

FEATURES

- Quadruple oversampling
- Separate 18-bit floating D/A converter for each channel
- Separate 18-bit digital filter with fifth-order active analog filter for each channel
- Digital volume control with 20-bit resolution
- Separate power supplies and transformers for analog and digital circuits
- Optical coupling between analog and digital circuits
- Playing mechanism floated on rubber isolators
- Linear-motor laser transport for fast cueing
- Heavy mounting feet on base for vibration isolation
- Programming for up to twenty-four tracks in any order
- Direct keypad access to any track or index location
- Track stepping and fast search (with audible sound) in either direction
- Random-play mode
- Repeat of single track, entire disc, or any selected portion of disc (phrase repeat)
- Space-insert mode adds 3 seconds of silence between tracks
- Front-panel headphone jack
- Display of current track and index numbers, total tracks on disc, remaining tracks, programming status, percentage of disc played, and time (elapsed time in current track or total and remaining time on disc)
- Wireless remote control for all front-panel functions except power on/off
- Gold-plated phono jacks on rear for analog and digital audio output
- Facility for operation by automatic timer

LABORATORY MEASUREMENTS

Maximum output level: 2.12 volts
Total harmonic distortion at 1,000 Hz: 0.0038% referred to 0 dB, 0.0032% referred to -10 dB, 0.005% referred to -20 dB
Signal-to-noise ratio (A-weighted): 117 dB
Channel separation: 110 dB at 1,000 Hz; 111.5 dB at 20,000 Hz
Frequency response: 0.01 dB overall from 50 to 20,000 Hz; -0.05 dB at 20 Hz

Dynamic range: 109 dB
Maximum phase shift (from 20 to 20,000 Hz): 2.9 degrees at 20,000 Hz
Cueing time: 1.5 seconds maximum
Cueing accuracy: A
Impact resistance: top, C; sides, B
Defect tracking: tracked maximum defect levels on Philips TS5 test disc



The concert continues with the Ford JBL Audio System.

Imagine the music of 12 speakers driven by 140 watts...

Just imagine a car audio system that could really deliver music as rich and powerful as a live concert.

Imagine music emanating from 12 JBL speakers—specifically equalized and adjusted to the surrounding environment and deftly capable of reproducing digitally accurate full-range, high fidelity sound.

- 12 JBL speakers including 2-6" x 9" woofers, 2-3½" midrange speakers and 2-7/8" tweeters located in the rear deck; 2-5¼" woofers mounted in the doors; and 2 tweeters and 2 midrange speakers in the instrument panel. Selective frequency fading so all woofers remain in operation at controlled levels when faded front/rear.

Imagine the sheer impact of 140 watts of total system power. Ample power to virtually eliminate distortion for the most comfortable listening—even at high volume for very long periods of time.

- 140 watts TSP—4 amplifiers, 35 watts per channel into 4 ohms at 1000 Hz with .07% THD. 105 dB SPL maximum acoustic output. Excursion control computer with continuously variable loudness compensation and automatic overload protection.

Then stop imagining and hear the real thing for yourself, exclusively at your Lincoln-Mercury dealer today.

JBL loudspeakers are featured in world renowned sound systems everywhere, including Tokyo's NHK Hall, Los Angeles Music Center, Tanglewood Music Shed, Frankfurt Opera House and now the Lincoln Continental and the Lincoln Town Car.



AUDIO SYSTEMS

TEST REPORTS

6600 Orangethorpe Ave., Buena Park, CA 90620.

Lab Tests

To the extent that we could measure them, our tests confirmed the exceptional performance qualities of the Yamaha CDX-1100. Even by the high standards of the compact disc, its frequency response was ruler-flat. Using the most expanded scale on our response plotter, we found that the left-channel response varied less than 0.01 dB overall from 50 to 20,000 Hz, falling to -0.05 dB at 20 Hz. The right channel, whose 1,000-Hz level was 0.3 dB higher than the left, "fell" to -0.05 dB between 15,000 and 20,000 Hz; below 15,000 Hz it was identical to the left. The left-channel output was 2.08 volts across a standard load of 10,000 ohms in parallel with a 1,000-picofarad capacitor.

The channel separation varied between 110 and 118 dB from 100 to 20,000 Hz. The 1,000-Hz total harmonic distortion (THD) was about 0.0032 to 0.0038 percent at levels of 0 and 10 dB, increasing to 0.005 percent at -20 dB. The A-weighted noise output was -117 dB, referred to a 0-dB signal level. The dynamic range, measured as the ratio of the THD + noise in the output from a

Even by the high standards of the compact disc, the response of the Yamaha CDX-1100 was ruler-flat, and its noise level approached our measurement limits.

-60-dB 1,000-Hz test signal to that in the output from a 0-dB signal, was 109 dB. In addition to several harmonics, the output contained many smaller spurious signals that appeared to be internal "beats." Since these were not harmonically related to the signal frequency, we did not include them in this measurement.

The interchannel phase shift was very small, a fraction of 1 degree over most of the audio range and just under 3 degrees at 20,000 Hz. The calibrated defects on the Phil-

ips TS5 test disc were played without difficulty. The cueing was excellent, and the laser slewed from Track 1 to Track 15 of the Philips TS4 disc in about 1.5 seconds. Slew-ing to an adjacent track took about 1 second or less; the exact time could not be measured reliably.

In only one respect did the Yamaha CDX-1100 disappoint us. Especially in view of its massive construction, we had expected it to be relatively resistant to physical shock, but it proved considerably more sensitive than many other CD players we have tested in the past year or so. Even a light to moderate tapping with the fingers on the top cover was sufficient to cause mis-tracking, and only a modest rap with the knuckles on the side produced the same result. It is unlikely, however, that anyone would experience operating difficulty from this sensitivity to shock in a normal installation. And since the CDX-1100 is a new product in an early phase of production, it is possible that its low shock resistance was a property of our test sample.

Comments

The Yamaha CDX-1100 is obviously a highly versatile machine with many features, yet we found it easy to use and flawless in operation. Its measured performance places it in the top rank of today's CD players, as well it should in view of the unusual design steps that were taken to achieve those results. One could hardly fail to be impressed.

It is more difficult to judge to what extent the CDX-1100's measurable qualities affect its sound. Frankly, given the variation in quality among recordings, as true of CD's as of LP's, it seems rather fruitless to try to isolate some sonic characteristic that can be assigned to the player and not the recording, speakers, or room. If we had heard any distinctive sound qualities, it would be logical to assume that they resulted from the exceptional electronics of the CDX-1100, whose flatness of response, dynamic range, noise level, and lack of phase shift place it right at the top of the field.

Alas, we heard no such distinctive properties with musical recordings,

but that did not surprise us. We can still say with some assurance that the CDX-1100 is an engineering tour de force, and if anything comes along that can beat its performance, we may have to update our test equipment once again! Certainly its noise level and flatness of response approach the limits of our measurement ability. For example, when we

The CDX-1100 is obviously a highly versatile machine with many features, yet we found it easy to use and flawless in operation. Its performance places it in the top rank of today's CD players.

tried to observe on an oscilloscope the waveform of a -90- or -100-dB tone to judge the effect of the 18-bit conversion on its distortion, the signal was lost in the noise.

When we tried to listen to the same tones through 600-ohm headphones, using the player's own jack, we found that the level was too low for serious listening. When we listened to the test signals through speakers, with the amplifier volume at maximum (and fingers crossed!), we *thought* we heard a smoother, more sinusoidal-sounding tone at those low levels from the CDX-1100 than we did when playing the same test disc on a much more conventional player. Even if the difference was real, however, it seems unlikely that it could have been heard listening to music at normal levels. A -90- or -100-dB tone was only faintly audible close to the speakers with the amplifier volume at maximum (and this with an amplifier that has power reserves of 150 to 600 watts or more).

At any rate, the CDX-1100 sounded superb given the right CD. The fact that much the same can be said about a number of other players does not detract from its standing. We can only hope that its sensitivity to shock was a flaw in our test sample. Otherwise, it is unquestionably the top-ranking CD player in our experience.

Circle 140 on reader service card

Behind this equipment is the best thing

Did you turn the page? If you didn't, go ahead. And then come back.

We've just shown you the other side of our new D Series Components to expose an extraordinary breakthrough in digital sound reproduction.

For the first time ever, our engineers have utilized fiber optics in an external link between the D Series Compact Disc Player and the D Series Integrated

Amplifier. In short, our fiber optic cable allows raw digital data to be transmitted to the amplifier in its purest possible form—light. And because light is totally impervious to outside interference, there's no line loss between the compact disc player and amplifier. None.

The result is pure CD sound as you've never heard it before.

Having discovered the missing link



...that's ever happened to digital sound.

to pure CD sound reproduction, our engineers could have quit while they were ahead. But that's not their style.

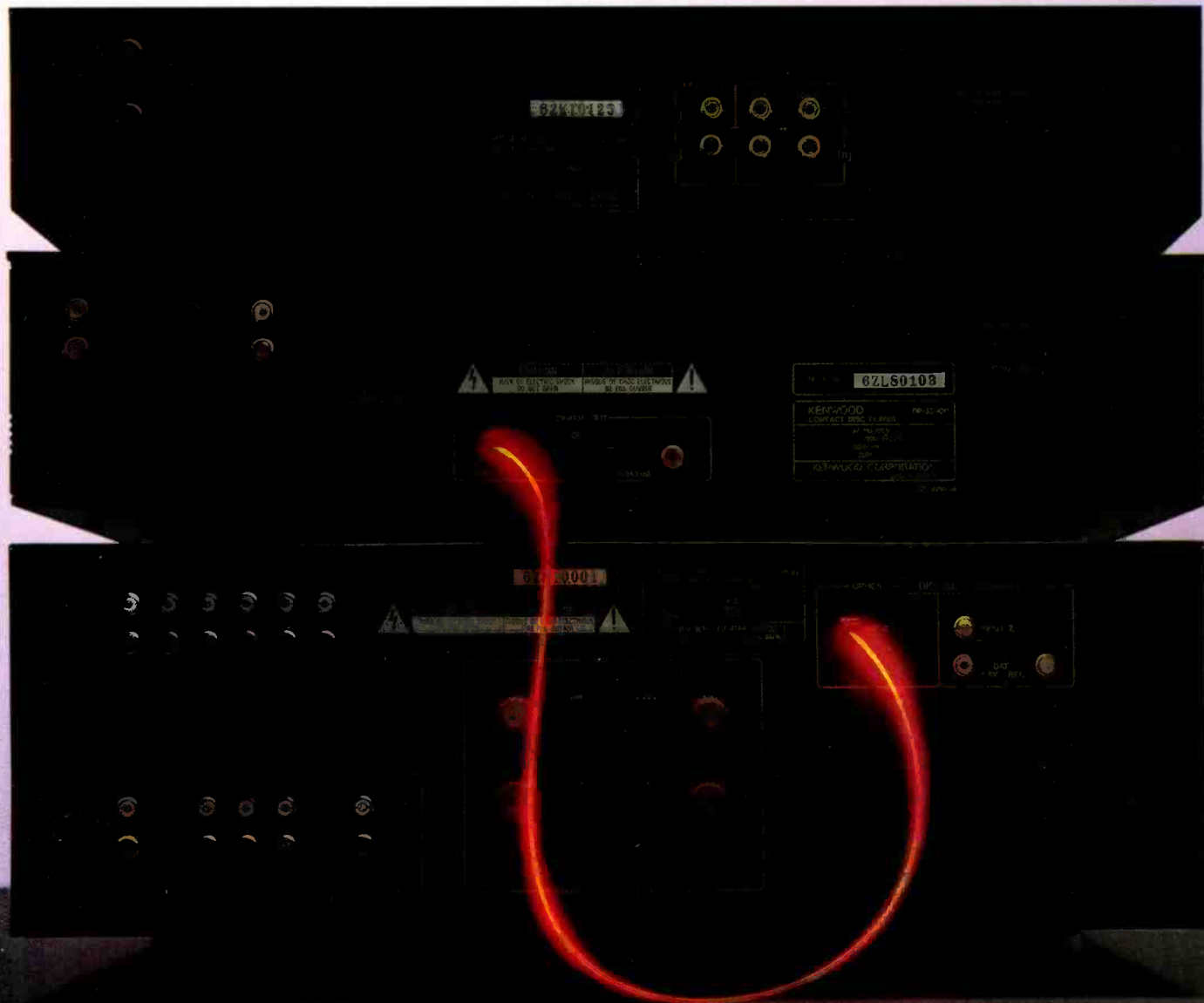
Instead, they set out to develop an equally remarkable tuner. And they succeeded. The D Series Tuner incorporates a unique Pentacle Power Supply and 4-D Circuit. Together, these innovative features add up to FM reception that literally

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CIRCLE NO. 26 ON READER SERVICE CARD



We removed the protective coating from the cable shown to clearly illustrate a fiber optic transmission.



EPI T/E 320 SERIES II SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

THE EPI Time/Energy (T/E) series of loudspeakers was designed to provide an accurate transient response as free as possible of "ringing" and other time-domain distortions. To achieve this, EPI (which makes all its own drivers) developed a dual-cone construction that is used throughout the T/E series.

Each cone driver in T/E series systems, as well as the domes of the high-frequency drivers, is made of two layers, one rigid and the other compliant. The outer cone is formed of stiff, light clear-polycarbonate plastic. The inner cone, molded as an integral piece with the compliant edge-surround, is made of polyurethane foam and provides damping of cone resonances. The

two layers are bonded by a combination of adhesives, pressure, and heat to form a single part with excellent mechanical properties, and additional damping is applied to the cone edge and suspension.

The EPI T/E 320 Series II is a floor-standing three-way system whose 10-inch acoustic-suspension woofer crosses over to the midrange driver at 300 Hz. This low crossover frequency allows the woofer to be located near the bottom of the front panel for optimum bass performance with a minimum of influence from the room boundaries. The midrange and high-frequency drivers are closely spaced and vertically aligned near the top of the enclosure, close to the level of a seated listener's ears and slightly to the

right of the speaker's center line. The rear of the 4-inch midrange driver cone is isolated from the woofer by a dual-chamber housing. The crossover to the 1-inch dome tweeter takes place at 2,500 Hz.

The nominal impedance of the EPI T/E 320 Series II is 6 ohms, and its rated sensitivity is 88 dB sound-pressure level (SPL) at 1 meter with a 1-watt input. The suggested amplifier power range is 15 to 250 watts, and the rated frequency response is 38 to 20,000 Hz.

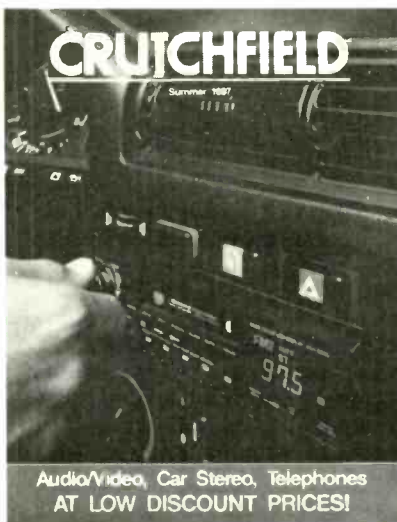
The speaker is housed in a handsome oak-grain, vinyl-clad cabinet measuring 34¼ inches high, 13 inches wide, and 10 inches deep. It weighs about 35 pounds. The dark-brown cloth grille unsnaps to reveal a fully finished speaker board. The spring-loaded connectors on the rear of the cabinet are designed to grip the stripped ends of speaker wires and will also accept twin banana plugs. Price: \$550 a pair. EPI, Dept. SR, 25 Hale St., Newburyport, MA 01950.

Lab Tests

The room response of the EPI T/E 320 Series II showed the usual bass and midrange irregularities caused by room-boundary effects, although its *average* level was quite uniform across the audio range. The close-miked response of the woofer peaked at 65 Hz, dropping at 12 dB per octave below that frequency and at 6 dB per octave above it. At the 300-Hz crossover frequency, the woofer's output was 10 dB below its maximum.

We also measured the midrange driver's output with close microphone spacing, and it varied about ± 2 dB from 300 to 2,000 Hz, falling off rapidly outside those limits. When the close-miked measurements were spliced to the room-response curves, the resulting composite frequency response was very close to EPI's rating, within ± 4.5 dB from 38 to 20,000 Hz.

Quasi-anechoic response measurements made with our FFT analyzer showed an output variation of only ± 3.5 dB from 300 to 23,000 Hz on the axis of the system. The response at 45 degrees off-axis began to fall off above 8,000 Hz and was down about 15 dB at 15,000



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Hz. The group delay varied only ± 0.2 millisecond from 2,000 to 23,000 Hz, indicating a highly linear phase response.

The system's sensitivity was 89 dB SPL, slightly higher than rated. Its impedance reached a minimum of 4 ohms at 1,000 Hz and a maximum of 20 ohms at the 45-Hz bass resonance; it varied between 4 and 10 ohms, with an average of close to 6 ohms, over most of the audio range. We measured the bass distortion with an input of 3.2 volts (equivalent to 90 dB SPL at 1 meter). From readings of under 0.5 percent above 75 Hz, the distortion increased smoothly to 6 percent at 50 Hz and 11 percent at 40 Hz.

The T/E 320 Series II acquitted itself very well in high-power toneburst tests. At 100 Hz, the woofer gave a slight rattle with an input of 580 watts into its 4.8-ohm impedance. At 1,000 Hz, where the system's impedance was 4 ohms, it had no difficulty handling the 1,580-watt output of our amplifier at its clipping point. At 10,000 Hz, amplifier clipping once again set the limit to our measurement, at 1,215 watts into 5.2 ohms.

Comments

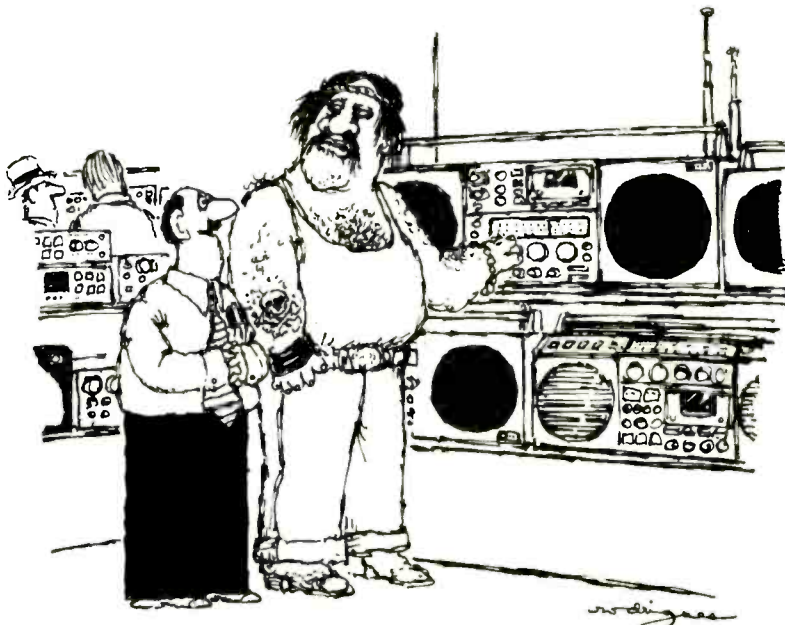
The sound from the EPI T/E 320 Series II was uncolored and very

neutral. It did not impart unnatural heaviness to voices, and its upper range was clean and extended. In fact, there was little one could criticize in its sound, which was always musical and listenable.

Obviously, the lowest bass is not this speaker's forte, although it does not give an impression of being bass-shy. This is understandable when you consider that its bass response, despite falling off below 65 Hz, was still present in useful amounts down to 40 Hz and lower. Even the rapidly rising bass distortion below 60 Hz or so was not as much of a drawback as it might seem, since it consisted almost entirely of third harmonics and did not sound irritating. In fact, it gives the listener an illusion of deeper bass than is really present.

The EPI T/E 320 Series II is not only easy to listen to, it is good to look at. It is one of the very few speakers we have seen that looks at least as good with its grille removed as with it in place. The shiny gray plastic cones and attractive wood-grain finish are certainly more interesting to look at than a featureless grille! Priced at little more than an ordinary bookshelf speaker, it strikes us as a genuine bargain in today's market.

Circle 141 on reader service card



"... You're right, sir, the kind of music you like to hear is none of my freakin' business."

“It is so clearly superior to past amplifiers in the low- to mid-priced range—not to mention most amplifiers two to three times its price—that I can unhesitatingly recommend it for even the most demanding high end system.”

Anthony Cordesman

Stereophile

vo. 8, no. 4



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- Preamp Level Amplification Crossover
- Fletcher-Munson Loudness Contour Circuit

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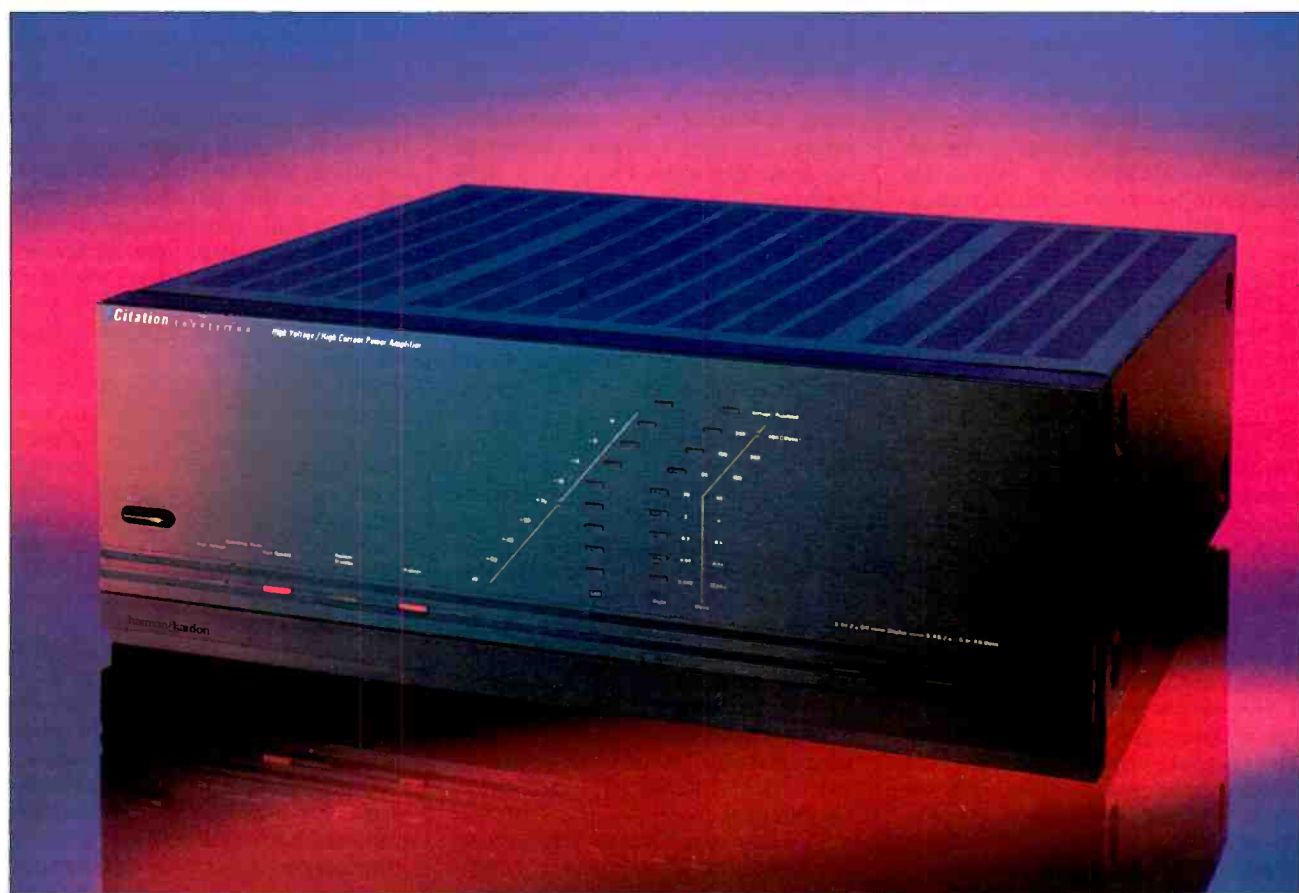
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JOCK LEUNG

HARMAN KARDON CITATION TWENTY-TWO POWER AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

SINCE the introduction of its first Citation Series audio components in 1963, Harman Kardon has reserved that name for products whose design and performance represent a clear departure from contemporary engineering practices. After an interval of about seven years without any Citation models in its line, the company has introduced a new Citation Series featuring a preamplifier, two power amplifiers, and a tuner. Rated at 200 watts per channel into 4 or 8 ohms, from 20 to 20,000 Hz, the Citation Twenty-Two is currently Harman Kardon's most powerful amplifier.

Much of the basic design philosophy of previous Citation amplifiers has been retained and its execution has been enhanced in the Model Twenty-Two. Among other things, that design philosophy calls for a wide bandwidth (far in excess of the audible frequency range), high instantaneous current-output capability, low overall negative feedback for reduction of transient intermodulation distortion (TIM), and use of discrete semiconductors (instead of IC's) in the signal path.

In designing the Citation Twenty-Two, the problem of dealing with widely varying speaker loads, and the very high instantaneous cur-

rents required to drive some speakers under actual listening conditions, was solved in a very simple and direct manner: selectable power-supply voltages.

There are two related but distinct limitations on the maximum instantaneous power output available from a given output-transistor configuration and load impedance. The maximum possible *voltage* output is determined by the amplifier's internal DC power-supply voltage, which must not be allowed to exceed the transistors' allowable maximum levels. There is also a limitation on the *peak current* that can be drawn by the load, which also must remain within the transistors' rated operating range. The continuous power output (the product of the voltage and current) and the heat dissipated by the transistors must also be considered, but these are related to long-term operating conditions and are normally much lower than the peak levels.

In conventional amplifier de-

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signs, a choice has to be made between the maximum current-output and maximum voltage-output capabilities of the amplifier, as they relate to the load impedance. In order to develop 200 watts into an 8-ohm load, say, the maximum voltage must be 40 volts rms combined with a current output of 5 amperes. For 200 watts into a 4-ohm load, only 28.3 volts is required, with a current of just over 7 amperes. If, however, a 40-volt maximum output is delivered into 4 ohms, the load will draw 10 amperes, corresponding to 400 watts—well beyond the amplifier's design limits and probably those of the speaker as well. On the other hand, if an amplifier designed to drive 4-ohm loads to 200 watts is terminated in an 8-ohm load, it will only be able to supply 100 watts output.

In order to deliver its rated power output into either 4- or 8-ohm loads, the Citation Twenty-Two has a rear-apron switch to select between two power-supply voltages. The higher voltage provides the rated output into 8 ohms, and the lower voltage provides the same power into 4 ohms without over-stressing the transistors or power-

supply components, so that the amplifier can operate under optimum conditions with either of the two most common speaker load impedances without compromising either safety or performance. Although some speakers are rated at 5 or 6 ohms, and the impedance of almost every speaker will vary widely throughout its frequency range, there is no need for a critical match. The worst penalty of operating the amplifier in its 4-ohm setting with an 8-ohm speaker will be a slight (and unnoticeable) reduction in maximum power output.

The problem of supplying large short-term peak currents was solved in the Citation Twenty-Two by conservatively designed output stages, each using eight 130-watt power transistors, and by eliminating the usual current-limiting circuits whose operation can cause distortion. The amplifier's maximum *steady-state* current is effectively limited by the available power-supply voltage, but, according to Harman Kardon, it can deliver *peak* currents of 100 amperes into either impedance.

The Citation Twenty-Two actually consists of two separate ampli-

fiers, one for each channel, sharing only the power cord and the chassis. The filter capacitors of each power supply are located close to their associated power transistors, so that the peak energy demands of the amplifier can be met with minimum loss through the connecting wiring. The speaker-output connectors are of a unique design intended to make a positive, long-lasting electrical contact between their gold-plated surfaces and the ends of the speaker wires.

The amplifier employs completely symmetrical circuitry from its input jacks to the speaker outputs. The open-loop bandwidth is very wide, to reduce phase shift within the audio band, and the inherent distortion of the circuits is kept very low. As a result, the overall negative feedback is only 12 dB, effectively eliminating transient distortions.

Besides being able to deliver 200 watts per channel into either 8- or 4-ohm loads, the Citation Twenty-Two can be bridged to form a mono amplifier rated at 400 watts into 8 ohms. The all-black chassis measures 17 $\frac{3}{8}$ inches wide, 14 $\frac{1}{4}$ inches deep, and 6 $\frac{1}{8}$ inches high, and the amplifier weighs about 37 pounds.

A lighted power switch is the only front-panel operating control. Narrow red lights indicate the selected impedance mode and tell when the protection circuitry is in operation. A display of eight pairs of green lights shows the amplifier's output level for each channel, in watts from 0.002 to 200 and in decibels relative to 200 watts (0 to -50). A button switches the display on and off, and another changes its sensitivity to match either 4- or 8-ohm loads. On the rear apron are the speaker-output connectors, the audio input jacks, and the switches to change the power-supply voltage and bridge the two channels for mono operation. Price: \$895. Harman Kardon, Dept. SR, 240 Crossways Park West, Woodbury, NY 11797.

Lab Tests

After an hour of preconditioning at one-third rated power, the top plate of the Citation Twenty-Two was quite warm, but it never became uncomfortable to the touch during our high-power testing. We

FEATURES

- Rated for 200 watts per channel into 4- or 8-ohm speakers
- Switchable dual-voltage power supplies to optimize performance for selected load
- Maximum 12 dB overall negative feedback for minimum TIM distortion
- High instantaneous current capability (100 amperes)
- Fully symmetrical circuitry
- Wide-band open-loop frequency response
- Dual-mono design with isolated left and right channels
- Bridgeable for mono operation rated at 400 watts into 8 ohms
- Instantaneous defeatable power-output indicators with 4- or 8-ohm sensitivity
- Accurate instantaneous overload indicators

LABORATORY MEASUREMENTS

1,000-Hz continuous output power at clipping: 4-ohm setting, 232 watts into 4 ohms, 312 watts into 2 ohms; 8-ohm setting, 231 watts into 8 ohms, 352 watts into 4 ohms

Clipping headroom (relative to rated output): 0.64 dB (8 or 4 ohms)

Dynamic power output: 4-ohm setting, 325 watts into 4 ohms, 552 watts into 2 ohms; 8-ohm setting, 315 watts into 8 ohms, 595 watts into 4 ohms

Dynamic headroom: 4-ohm setting, 2.1 dB; 8-ohm setting, 2.0 dB

Harmonic distortion (1,000 Hz): 4-ohm setting, 0.00385% at 1 watt, 0.015% at 200 watts; 8-ohm setting, 0.0032% at 1 watt, 0.0145% at 200 watts

Sensitivity (for a 1-watt output): 4-ohm setting, 54 millivolts; 8-ohm setting, 77 millivolts

A-weighted noise (referred to a 1-watt output): 4-ohm setting, -100 dB; 8-ohm setting, -98.7 dB



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made all our power and distortion measurements using both impedance settings.

As claimed, the amplifier's power output at clipping was almost exactly identical into 4- and 8-ohm loads (using the corresponding switch settings). The 1,000-Hz waveform clipped at 232 watts, corresponding to a clipping headroom of 0.64 dB. When we drove an 8-ohm load using the 4-ohm amplifier setting, the power at clipping was 145 watts, and into 2 ohms (for which the amplifier is *not* rated) it was 312 watts. With the switch set for 8-ohm operation, the 4-ohm clipping output was 352 watts (we did not try 2-ohm loads in this mode).

With the load matching the amplifier setting, the dynamic output during a 20-millisecond burst was 315 watts into 8 ohms and 325 watts into 4 ohms, corresponding to dynamic headrooms of 2 and 2.1 dB, respectively. We also made dynamic power measurements into 2 ohms, measuring 595 watts and 552 watts, respectively, for the 8- and 4-ohm settings. Although the dynamic headroom of the amplifier was considerable, its "power envelope" decayed fairly rapidly, reaching or nearing its continuous value in less than 100 milliseconds.

We measured the frequency response of the amplifier from 5 Hz to 500 kHz. It was down only 0.1 dB at the lower limit and 0.6 dB at the higher frequency. The slew factor, however, was lower than we usually measure on amplifiers whose frequency response is rolled off above the audio range: a factor of 8 with the 4-ohm setting and 6 with the 8-ohm setting. The amplifier was stable with reactive loads simulating "difficult" speakers, with some 60,000-Hz ringing appearing on a 10,000-Hz square-wave output. Its reactive-load factor was 0.64 dB at 63 Hz.

The amplifier's distortion characteristics were excellent and quite similar for its two impedance settings. Typically, the distortion at rated power was between 0.015 and 0.02 percent from 20 to 10,000 Hz, rising slightly to about 0.025 or 0.035 percent at 20,000 Hz. At half and one-tenth power, the distortion was between 0.006 and 0.01 percent

over the full frequency range. The 1,000-Hz distortion was about 0.005 percent at a 1-watt level regardless of the impedance settings and the actual load, and it increased smoothly to the range of 0.01 to 0.02 percent with outputs between 10 watts and the clipping point.

The input sensitivity for a 1-watt reference output was respectively 54 millivolts and 77 millivolts for the 4- and 8-ohm settings, and the A-weighted noise level was -99 to -100 dB referred to 1 watt.

Comments

The Harman Kardon Citation Twenty-Two conveys a visual impression of solid construction and thoughtful attention to detail, and its performance confirmed that impression. As our measurements show, its dual-voltage power supplies give the amplifier precisely the ability claimed for it—virtually identical performance into loads of either 4 or 8 ohms. It was also gratifyingly free of the minor annoyances that sometimes mar the total performance of powerful amplifiers. It was as silent acoustically as it was electrically (no humming or buzzing transformers, no fan noise or clicking relays).

The power-level display, informative without being gaudy (and it can be turned off if desired), appeared to be about as accurate as such an indicator can be. We also noted that the red overload lights were very accurate, lighting just as the waveform was *about* to clip rather than requiring actual audible clipping.

We were especially impressed with the Citation Twenty-Two's protection system. Designed to prevent damage to the amplifier, which it did to perfection, it showed no tendency to interfere with high-level program peaks. We found that inadvertent output short circuits silenced the amplifier (and lit the red indicator light) until a few seconds after the condition was corrected; then it returned to life as silently as it had turned off. At no time was there an audible click from a relay or a sound from the speakers other than instantaneous silence or the restoration of the program. Heartened by the amplifier's handling of accidental faults, we tried some de-

liberate misconnections that would have destroyed some otherwise good amplifiers we have used. The Citation Twenty-Two took them in stride.

As for sound—well, driving the amplifier directly from the outputs of a CD player having its own level control, we played a number of CD's noted for their wide dynamic range through several speakers in different power and price ranges. The results were all we could have hoped for, and they clearly demonstrated the benefits of using a powerful amplifier even for moderate listening levels. It was surprisingly easy for a program whose average level remained under 0.2 watt to light the red clipping indicators momentarily without sounding uncomfortably loud. With the CD player on pause, we could hear absolutely no sound from the speakers even with an ear pressed to the grille.

Much the same results could be accomplished with other 200-watt amplifiers. Few others, however, could match the overall silence and smoothness of the Citation Twenty-Two or its virtually bullet-proof design and construction. In spite of our strongly favorable reaction, we do have one criticism of the amplifier's mechanical design (which has nothing to do with its sound quality). Its speaker-output terminals are unlike any others we have ever seen, and we suspect that most people, like us, would be unable to discover how to make the connections without referring to the manual. The terminals will accept *only* the stripped ends of speaker wires. No lugs, banana plugs, or other common wire terminations can be used, and many special speaker cables cannot be adapted easily (if at all) to these unconventional binding posts. Fortunately, connection is a simple process once you read the manual!

In short, the Citation Twenty-Two looks to us like a winner. If more than 200 watts per channel, exceptional protection against damage, complete freedom from idiosyncracies, and overall top-quality performance are sufficient for your needs, this amplifier should be an ideal choice.

Circle 142 on reader service card

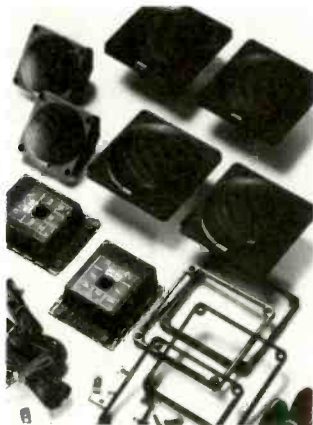


Built for the Long Haul

It's a mistake to assume that just because a car loudspeaker sounds and looks good when you buy it, it will sound and look good three or seven or twelve years from now.

The fact is that many car loudspeakers simply aren't built for a 150,000 mile haul punctuated by scorching heat, chilling cold, oppressive humidity, rough roads, damaging ultra-violet rays and kids' baseball bats.

But a Canton automotive speaker system—designed and built in West Germany for service anywhere in the world, including the tropics—will last and perform to spec as long as your car stays in one piece.



Pullman Set flush-mount speaker systems come in a wide variety of configurations, with highly adaptable mounting hardware.

Superior Sonic Performance

All eight Canton auto speaker systems are made of materials and components that are proven to stand up to the tough automotive environment.

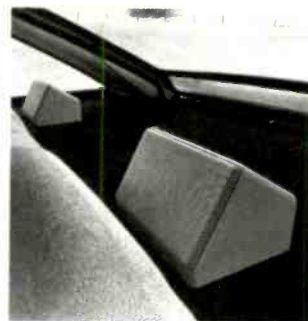
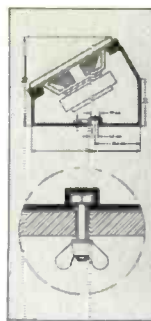


All Canton models, such as this new CX 160 coaxial, are built for the tough automotive environment—with die-cast frames, treated cellulose cones and built surrounds.

For instance, specially treated cellulose cones insure that moisture, heat and UV deterioration won't compromise performance. Built surrounds won't decompose, like foam will. Rugged, precision-die-cast frames allow for greater structural integrity. Perforated metal grills can take the punishment of bat, boot or any other blunt instrument.

That quality of construction actually translates into superior sonic performance.

For easy installation and optimum flexibility, nothing equals the Pullman and HC 100 surface-mount systems.



A detail like the die-cast frame can produce finer design tolerances, which result in better transient response, more potent low end and reduced midrange intermodulation distortion.

You can hear the difference, not just today but for as long as you own your car. When you upgrade to CD or DAT, your Canton speakers will be as ready as they were the day they were installed.



The HC 100 and other Canton systems aren't built only for the automotive long haul. They'll last every bit as long in your boat, your RV or your home.

Canton's flush-mount "Set" series turns doors and trunk into speaker enclosures, generating powerful bass and high performance sound.



Finest Fit and Finish

Beyond sonic performance, all eight systems—from the new flush-mount Set 600 and co-ax CX 160 to the surface-mount Pullman—share a fit and finish worthy of the finest cars in the world. If the basic black color isn't quite right, they can be painted with any high-quality automotive paint.

And their wide range of configurations makes them adaptable to virtually any

Don't like the idea of having holes cut in your car? But you want great sound? Canton's

Pullman and HC 100 surface-mount systems are the answer.

situation, from Honda CRX to Mercedes stretch limo.

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The interiors of Escort GT and EXP are designed with as much care as the mechanicals. The controls are where you expect them. The instrumentation is easy to read. For better grip, the four-spoke steering wheel is leather-wrapped. The driver's seat is anatomically contoured to offer support and comfort.

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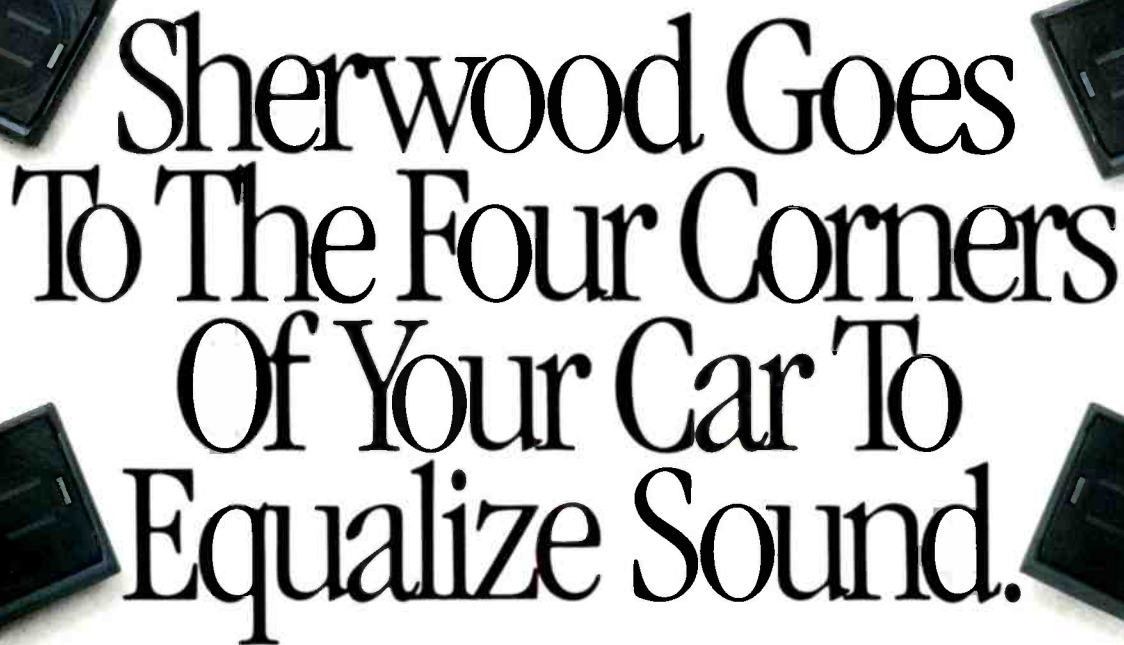
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Sherwood Goes To The Four Corners Of Your Car To Equalize Sound.

CIRCLE NO. 19 ON READER SERVICE CARD



SIGNET SL-100 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

ONE of the most fundamental problems in speaker design is obtaining a uniform dispersion of the sound across the operating frequency range of the system. As the wavelength of the sound becomes comparable to the dimensions of the radiating diaphragm or dome, the output becomes increasingly directional, "beaming" like a searchlight along the forward axis of the speak-

er and becoming weaker along other axes. In some cases, obtaining the desired stereo effect requires that the listener be on the forward axes of both speakers, which must be angled slightly inward.

Another solution is to use two or more high-frequency drivers (tweeters) angled outward from the speaker's forward axis. This can be effective, but such systems are prone to comb-filter effects, in which phase

interference between the drivers' outputs produces audible changes in the high-frequency sound as the listener's head is moved or turned slightly.

The new SL-100 "Definitive Image" speaker system from Signet features a novel acoustic-lens tweeter design that is said to provide wide horizontal coverage throughout the tweeter's operating range without comb-filter effects. Signet's Ferrallipse acoustic lens takes advantage of a special property of the ellipse, which is an oval containing two focal points. The sum of the distances from the foci to the ellipse boundary is a constant. As a result, a sound originating at one focus of an elliptical reflector, regardless of its directive properties, will appear at the other focus as a single phase-coherent point source.

The SL-100 has two rear-facing 1-inch soft-dome tweeters located 7 inches apart and facing individual elliptical reflectors. Each driver's dome is located at the outer focus of its reflector, nearest to the edge of the speaker enclosure, and the two reflectors have a common inner focus point located on a line midway between the drivers. In effect, all the high frequencies (from 5,000 Hz upward) radiate from a single point on the center axis of the speaker system and spread evenly across a horizontal angle of approximately 120 degrees.

The Signet SL-100 is a three-way floor-standing system measuring 36 inches high, 12¾ inches wide, and 16 inches deep. The tweeters and the Ferrallipse lens are located at the top of the front board, which slants slightly backward so that all the drivers radiate in phase. The midrange, from 500 to 5,000 Hz, is handled by a 3-inch soft-dome driver, and a 10-inch long-throw woofer operates in a vented enclosure whose two ports are in the rear of the cabinet. The frequency response of the SL-100 is rated as 40 to 20,000 Hz ± 2 dB, and its nominal impedance is 8 ohms. Suggested amplifier power ratings are from 25 to 250 watts per channel, and the rated sensitivity is 90 dB sound-pressure level (SPL) at 1 meter with an input of 1 watt.

The SL-100 is furnished with rub-

TEST REPORTS

ber feet and metal spikes, for use on carpeted or bare floors, respectively. Gold-plated five-way binding posts that accept banana plugs, spade lugs, or stripped wire ends are recessed into the rear panel. The walnut-grain cabinet has a removable black cloth grille, and each speaker weighs 66 pounds. Price: \$1,450 per pair. Signet, Dept. SR, 4701 Hudson Dr., Stow, OH 44224.

Lab Tests

The room response of the Signet SL-100 speakers, though quite flat overall, showed slight dips (3 to 5 dB) at 600 and 5,000 Hz. The high-frequency dispersion was excellent, with no significant difference between the response curves of the left and right speakers—respectively at angles of 0 and 30 degrees to the measuring microphone—all the way to our 20,000-Hz upper measurement limit.

When we combined the close-miked woofer response with the output from the port openings, the result was flat within 2.5 dB overall from 39 to 300 Hz, falling off to about -6 dB at 500 Hz, the nominal crossover frequency, and at 26 Hz, the low end of the woofer's range. We also measured the mid-range response with a close microphone placement; it was uniform within ± 1 dB from 800 to 5,000 Hz except for a peak of several decibels at 3,500 Hz. The effective crossover from the woofer was at 600 Hz, where the output of each driver was down 6 dB from the average level in the octaves above and below that frequency.

The composite response, combining the woofer and room measurements, was within ± 4 dB from 26 to 20,000 Hz. The middle and upper bass, from 60 to 200 Hz, was slightly elevated (by about 2 to 3 dB) compared with the higher frequencies, and a strong, clean bass output was maintained for more than an octave below that range.

The system's sensitivity measured 91 dB SPL, and its impedance averaged about 5 ohms. The minimum, 2.7 ohms, was measured at 6,100 Hz, and the impedance reached 16 ohms at the upper-bass resonance of 53 Hz. The lower-bass resonance was below our 20-Hz limit,

where the impedance was 30 ohms. The bass distortion was measured at a drive level of 2.5 volts, equivalent to a 90-dB SPL at 1 meter with a pink-noise input. Distortion was unusually low: less than 0.4 percent down to 65 Hz, under 2.4 percent to 24 Hz, and only 4.4 percent at 20 Hz.

Our quasi-anechoic response measurements, using the IQS FFT analyzer, revealed several interesting properties of the Signet SL-100. Most striking were periodic output variations through the middle and high-frequency range that were suggestive of comb-filtering resulting from interference between drivers. This is precisely the effect that the Ferralipse lens was designed to eliminate, but it showed up strongly in our dispersion measurements made at angles of 0 and 45 degrees.

The Signet SL-100 had a warm character, with impressively deep bass. Higher frequencies were seamlessly blended and well dispersed.

Aside from the cyclic response dips, however, these measurements confirmed the excellent dispersion that had been so evident in our room-response tests. The group-delay response (an indicator of phase linearity) showed some of the same variations, although it also indicated that the average output timing of all the drivers was matched very closely over the full measurement range from 180 to 22,000 Hz.

The SL-100 handled high-power tone bursts with exceptional ease. At 10,000 and 1,000 Hz, our amplifier clipped (at 1,510 and 1,290 watts, respectively) before any speaker limitations were apparent. At 100 Hz, where most 10-inch drivers would hit their stops at perhaps 200 or 300 watts, the SL-100 took a 610-watt single-cycle burst before emitting a slight rattle.

Comments

Compared with many other speakers, on first hearing the Signet SL-100 had a warm character, with

an impressively deep bass output. At higher frequencies the sound was seamlessly blended and well dispersed. We listened for any signs of beaming or comb-filtering effects as we walked past the front of the speakers, using both music and pink-noise signals, but we could find none. This suggests that our FFT measurements, which were made at a single microphone "listening" position, were showing effects that would not be apparent to a human listener using both ears.

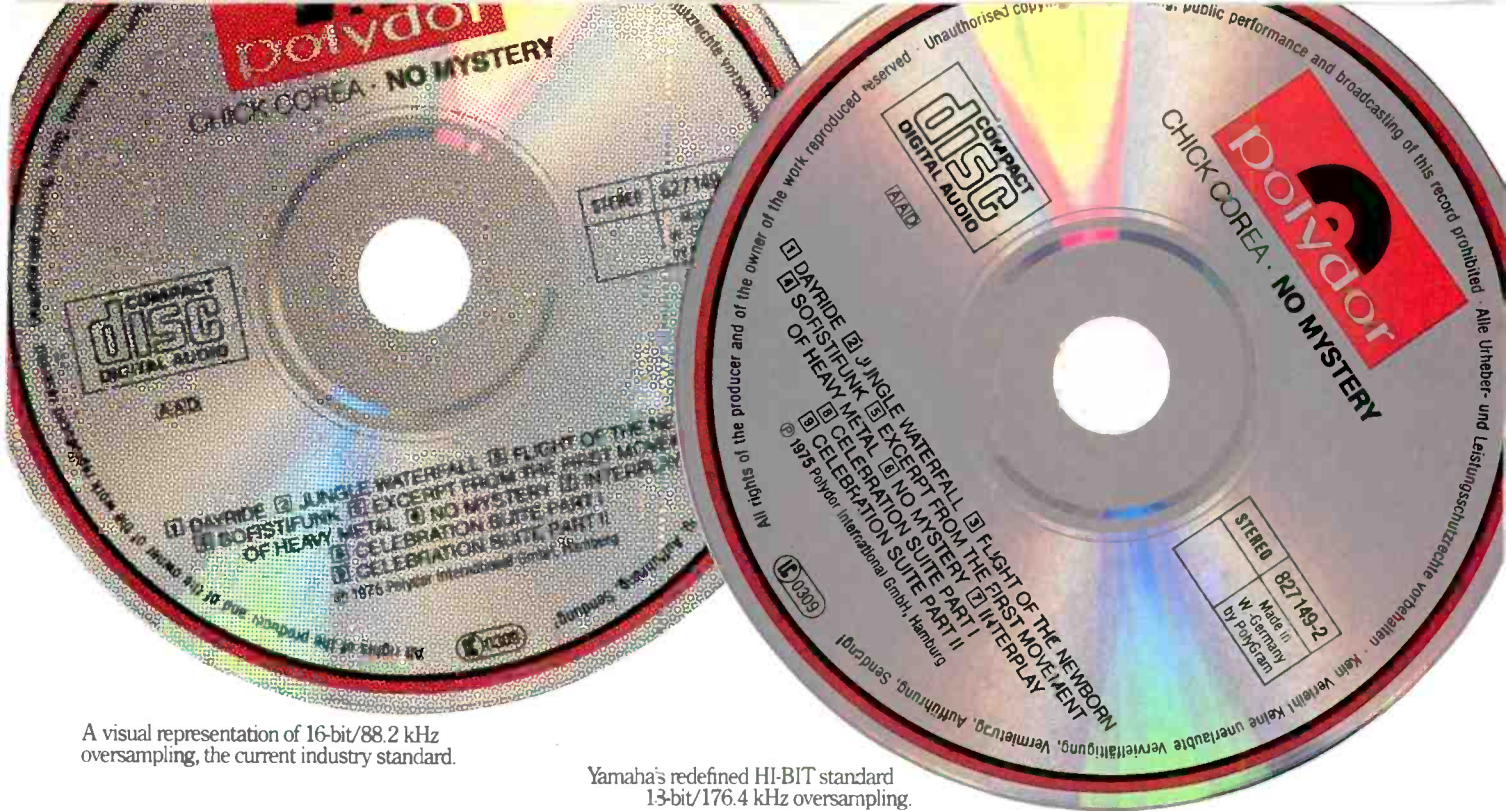
An excellent subjective test for speaker phase alignment is to listen through a spatial modifier such as the Carver Sonic Hologram, whose full effect requires that the speakers have close phase alignment in the horizontal plane. The SL-100 passed this test with flying colors, which tends to confirm that its two tweeters actually work like a single, centered, wide-dispersion tweeter.

The SL-100's were equally satisfactory with a variety of program material played through amplifiers of all power classes, from medium to very high. Since they are somewhat more sensitive than most speakers of similar size that we have tested, they can deliver a very high sound level when driven by a modestly rated receiver, yet they thrived on the full output of a super-power amplifier. They proved to have a full, flat response out to the highest audible frequencies in listening comparisons with other speakers on hand, most of which, though comparable in size to the Signet SL-100, did not have its extended bass performance.

Although the speaker's interchangeable rubber and spiked feet offer the user a choice in installation, the instructions warn that the spikes can damage carpets and advise that the final position of the speaker be determined before any feet are attached. We found that the speakers sounded just fine when the cabinets were placed directly on the floor without any feet.

Overall, the Signet SL-100 impressed us with its superb bass, especially for its size, and its ability to provide clean, well-dispersed sound at high volume levels. Altogether, a very nice job.

Circle 143 on reader service card



A visual representation of 16-bit/88.2 kHz oversampling, the current industry standard.

Yamaha's redefined HI-BIT standard
13-bit/176.4 kHz oversampling.

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The new Yamaha CDX-1100U brings a whole new definition to the term definition.

It does so by simply integrating the most innovative and advanced CD technologies ever. No doubt exactly what you expect from the leader in digital audio sound reproduction.

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Like quadrupling the sampling rate to 176.4 kHz, then combining it with our exclusive 18-bit



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And there's more than leading-edge technology to the CDX-1100U. There's also leading-edge convenience. By way of our 44-key wireless remote that has interactive control compatibilities, our 4-way repeat play, and our 24-track random programming that lets you play the music in the order you want it played.

If you'd like more details on Yamaha's latest advances in digital technology, write for a free technical white paper. But for the simplest and best explanation of our technological superiority, slip one of your compact discs into a CDX-1100U and push "Play."

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YAMAHA 1887-1987

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CIRCLE NO. 14 ON READER SERVICE CARD

SPECIAL REPORT



JAPANESE AUDIO

By Bryan Harrell

NEWLY fallen cherry blossoms swirled in the silent breeze outside Tokyo's Vario Hall. Inside, Heitaro Nakajima of Aiwa was finishing a lecture presentation on the fine points of digital audio tape (DAT) technology. Sponsored by the private Avilac Delphi organization, the DAT forum was closed to the general public. Yet, despite the unusually pleasant weather, more than a hundred college students, male and female, managed to join the prominent audio industry and media figures in attendance.

As the students' interest suggests, DAT is *the* big news in Japanese audio this year. The industry is rightly proud of DAT, particularly because it is the first major audio product category or format to originate in Japan. Just as important, because DAT machines can record digitally, they are the next step in the much-heralded digital revolution in consumer audio. Tsutomu Imai, Sony's product manager responsible for its DTC-1000ES digital deck, says that "DAT's major appeal is the sound-recording function." Pioneer's senior managing director, Teruhiko Isobe, however, predicts that "The greatest possibilities will be in general audio—portables, car decks, and so forth."

Many people in the industry, though, are reluctant to give for-the-record opinions about DAT technology or marketing, and they choose the few words they do offer with extreme care. "We're all worried about provoking U.S. reaction right now," one source who asked not to be named confided, "because the U.S. has become very sensitive on this issue. DAT has become a symbol, a sore

ILLUSTRATION BY VICTORIA LOWE



日本聽覺技術





An optical transfer stage in Sony's top CD player, the CDP-705ESD, protects the audio circuits from noise generated in digital-to-analog conversion.



Nakamichi's remote-controlled CA-7A preamplifier isolates the control circuitry from the audio circuitry with extensive shielding and optical coupling.



Unlike other digital audio tape (DAT) recorders, the Technics SV-D1000 uses Class AA operation in the sample-and-hold stage to minimize distortion.



Sansui's AU-X901 integrated amplifier accepts balanced inputs from some Sansui CD players, using Cannon connectors, to eliminate even low levels of noise.

spot in the trade relationship." But while industry people were keeping mum, the members of Japan's lively audio press were more than willing to share their opinions on this year's biggest story (see box on page 53).

The Copyright Problem

The main problem with DAT may be a nontechnical one, what the Japanese call "*chossakken mondai*," or copyright problem. Denon's general manager of recording technology, Takeaki Anazawa, expressed this concern. "It's hard to say how, and when, the copyright issue can be solved," he said. "There's just no really good solution."

Anazawa regularly travels to Europe to supervise Denon's live digital recordings of prominent orchestras, and he explained that Denon's being both a hardware manufacturer and a major recording company puts it in "a most difficult position." Nevertheless, he says that Denon will probably release a DAT deck before the end of the year.

Pioneer's Isobe explained that his company, with its extensive LaserDisc catalog, faces a similar dilemma: "As a hardware maker, we naturally want to sell decks. But as a software supplier, we feel some kind of copy-prevention code must be agreed upon."

Isobe admitted that Pioneer has a DAT deck ready for the Japanese market only. Its rather high price tag of 250,000 yen (about \$1,790 at the press-time exchange rate of just under 140 yen to the dollar) reflects an extensive amount of engineering for higher sound quality, including a unique A/D converter and specially designed digital filters.

Is Prevention the Solution?

The impossibility of direct digital recording from CD's to DAT, because of the sampling-rate difference, is most often cited by audio industry people as the new format's major copy-prevention capability. This barrier, however, doesn't address the future problem of direct digital copying of prerecorded DAT releases using the same 48-kHz sampling rate.

Most suspect that the "notch" created by the copy-guard system proposed by CBS Records will affect sound quality to some extent. Denon's Anazawa says that he's "not sure if it really makes a difference in all software, but it can be



heard in some sources, particularly with Japanese traditional music that doesn't use the Western musical scale."

Audio critic Nobuyuki Foo, asked his opinion of the CBS system, joked that "with the annoyingly prominent midrange response in average Japanese speakers, the 3.8-kHz cut may be just about right to make them sound better." In a more serious tone, he said that the best way to solve the problem is to incorporate copy-prevention codes into CD and DAT subcodes, not into the music signal.

Yet most feel that direct digital recording is DAT's premier feature. Aiwa's Nakajima recognizes the need for copy prevention at 48 kHz, but he said that "digital dubbing performance is one of the key features of DAT." Yasuhiro Yamazaki, senior managing director of Nakamichi, agreed: "Direct digital recording has to be possible for the format to make any sense." He added that Nakamichi will release a DAT deck using its own, proprietary transport "by the end of this year, wherever it is permitted." In a U.S. press conference, Masaharu Matsushita, chairman of the parent company of Panasonic and Technics, said he does not consider it "appropriate" for a customer to be unable to record and that his company does not plan to take any "halfway approach" by introducing DAT players without a record function.

Nakajima feels that DAT will actually be "beneficial to the [music] industry in the long run by stimulating [overall sales of recordings]." He also noted that "We've always had the copyright problem with analog [tape] anyway." As an additional benefit of DAT, Nakajima cited its probable effect on the content of recorded music, recalling that in Japan the single dance tunes available on 78-rpm pressings gave way to more interpretive music when the LP came into existence.

What About Price?

With most DAT decks now selling for around 200,000 yen (about \$1,430), industry insiders admit that prices will come down, but not by much. "DAT decks will be down to around 150,000 yen [\$1,075] by the end of this year, with a more expensive category forming around the 250,000 to 300,000 yen level [\$1,790 to \$2,150]," speculated pub-



*D*igital picture processing in Toshiba's DX-900 VCR improves the quality of special effects, and a built-in PCM processor records and plays back digital sound.



DAVID KELLEY



*T*he Stax Professional 3 "ear-speakers" (middle photo) use electrostatic technology for a spacious and airy sound. The adapter at right steps up the output signal and provides the needed DC polarizing voltage.

*N*ine selections from any part of up to seven tapes in the left transport of Mitsubishi's DT-156 cassette changer (bottom photo) can be programmed for playback or for dubbing onto a single tape in the right transport.



Yamaha's CX-10000 control amplifier includes a digital parametric equalizer and all the functions of the innovative DSP-1 Digital Sound Field Processor.



Unique digital processing in NEC's DX-5000U VHS Hi-Fi VCR (middle photo) is said to reduce video noise levels, improving sharpness and color quality at all times, not just for special effects.



Combining the convenience of a compact music system with compact disc performance, Hitachi's NW-1 (bottom photo) includes an AM/FM receiver, a CD player, and a double cassette deck.

lisher Kohsei Wada of *Digital Sound*, who cautioned that there won't be the kind of dramatic price drops we've seen with CD players.

Critic Foo takes a somewhat more optimistic attitude, predicting that "DAT decks will be down to 100,000 yen [\$715] by Christmas because of the increasing use of new LSI's [large-scale integrated circuits], which are already off the drawing boards." Though he thinks that LSI-related miniaturization may result in portable decks for professional use, "DAT isn't likely to make it into headphone stereo."

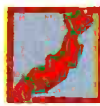
So What Else Is New?

In another area, there is a great deal of speculation about digital audio on a magneto-optical record/playback laser disc, which is now being developed at Sanyo. Hitachi, Sharp, Sony, and Toshiba are also rumored to be tinkering with the idea. "The technology to do this exists right now," said Foo, "but there's a catch. These blank discs would cost about 5,000 yen [\$36], 3,000 yen [\$21] at the lowest, and with the current technology they actually erase by themselves in ten or fifteen years. For consumers charmed by CD's 'forever' image, this won't go down well at all."

A technical essay on Sanyo's magneto-optical erasable digital audio disc (E-DAD) system appeared a few months back in the *JAS Journal* of the Japan Audio Society. Apparently a playing time of 45 minutes has been achieved on a 12-centimeter disc using the same signal format as the CD and with comparable sound quality. Interestingly enough, the prototype under development can also play CD's! Many variables are still undecided, however, the most important being format specifications.

Meanwhile, over at Pioneer, engineers have completed a prototype of a twelve-track digital audio recorder that uses 8mm videotapes and a rotary head drum. Of course, there's no word yet on when it will become a product.

Nakamichi is proud of its new line of receivers, which feature total separation of the tuner, preamplifier, and power-amplifier sections. "Maybe we have gone a bit overboard, technically speaking, and we're not sure this development is fully appreciated by the consumer on the lower end of the scale, but it



gives us satisfaction," said Yamazaki of Nakamichi, adding that his company has now "successfully transformed itself from a cassette-deck maker to a full-line audio manufacturer."

On a more basic level, new materials are continuing to be developed that enable marginal increases in sound-reproduction quality. Publisher Kohsei Wada noted that simple carbon in various forms, from graphite to amorphous diamond, is improving the sound quality of speakers and that optical coupling (fiber optics) has achieved improvements in electronic components.

Audio critic Saburo Egawa cited

the new OCC (Ohno Continuous Casting) variety of LC-OFC wire as offering audibly better fidelity, though there aren't any data available yet to back up his observations. Egawa is personally involved with another new material of audio import, though it will never make it inside an audio system. It's a new type of laminated flooring material made of spruce sandwiched between two layers of a variety of Japanese hardwood. "Spruce has good acoustic properties, but it's too soft for floors," observed Egawa, "and the floor is the fundamental factor in room acoustics, much more so than walls."

The Chips Are Down

Overshadowing DAT is the U.S.-Japan trade imbalance, highlighted by the controversy over semiconductors. In March, Japanese IC manufacturers agreed to an 11 percent cut in production. In an interesting coincidence, the Electronic Industries Association of Japan (EIAJ) reported that total electronic exports from Japan were down 11 percent in 1986. The biggest decline was in consumer electronics, with exports down 26 percent.

Indeed, audio will be affected by fluctuations in the semiconductor market, since semiconductors are



DAT JOURNALISM

SURE, DAT is the big news in audio technology," said Hiromitsu Nakazawa, chief editor of *Musen To Jikken* (Stereo Technic), one of Japan's leading technically oriented audio magazines, "but I don't think it's that remarkable a system [in terms of performance]. There are still professional analog reel-to-reel [devices] that can outperform it."

Nonetheless, Nakazawa feels that for the average consumer DAT is a good thing, particularly in light of the rapid improvements in digital-to-analog (D/A) and analog-to-digital (A/D) converter circuitry in the years since the CD was introduced. He noted, however, that DAT cassettes recorded on some manufacturers' decks do not play back properly on others, evidence that some manufacturers are "not yet following the official format specifications to the letter," though he feels that the situation should "stabilize in a year or so." And he added that people who protest full-capability DAT decks (those that are able to record digitally) are "like the people who protest NASA. You can't stop new technology."

Kohsei Wada, publisher of *Digital Sound* and several other major audio magazines, is certain that DAT will be "a much bigger product than the CD, if only a way can

be found to solve the copyright problem." He goes even further, claiming that "DAT sounds better than CD." Since DAT is a contact medium, he speculated, with the tape actually touching the heads, better depth of sound is possible compared with the "aerial photography" approach of CD playback.

Saburo Egawa, one of Japan's most famous audio critics, also believes that DAT sounds better, but for a different reason. "The 10 percent increase in sampling frequency [from the CD's 44.1 kHz to DAT's 48 kHz] makes a real difference in depth and sound resolution," Egawa observed, though he admits that DAT is far from perfect. "It's not what I would call a hi-fi system, because there isn't sufficient sound resolution at low signal levels, causing a shallow depth of sound field." To evaluate the performance of DAT with respect to such sonic parameters, Egawa has been recording live bird calls in a park near his suburban Tokyo home.

Similar observations were made by another prominent audio critic, Nobuyuki Foo, who said that "DAT's lack of depth reminds me of the sound of certain CD players, which incorporate ceramic capacitors in the power supply to meet regulations regarding RF signal generation required by several Eu-

ropean countries." Like Nakazawa, Foo has experienced variations in decks from different makers, adding that he's heard tremendous burst errors from a very small percentage of them. "DAT's going to take at least three years to be perfected enough to be taken seriously by the audiophile market," he predicted. Foo says that releasing DAT this year is sort of like "mik-kiri hassha," a colorful Japanese expression for a train that pulls away while passengers are still running to get on.

Performance aside, Foo feels strongly that DAT shouldn't have been released until the copyright issue was solved. "I think [the Japanese industry's lower sensitivity to copyright issues] reflects the fact that Asian people have difficulty paying for something they can't see and hold," said Foo, whose father is Chinese. "That's why gold is so highly prized." Several of his own written works have been translated into Chinese and published without his permission, increasing his awareness of the problem.

"It's going to have to be a tax on tape and recorders," Foo concluded. "I know people say that not everyone tapes at home, but let's be honest—not more than one [recorder owner] in a thousand makes live recordings."



Pioneer's LD-S1 LaserVision player has a digital memory for high-quality still pictures, frame advance, and multiple speeds, even with long-play CLV videodiscs.



Aiwa's A70 cassette changer can play or record up to fifteen selections from five tapes in any order, with a choice of Dolby B or Dolby C noise reduction.



Digital inputs from CD players, DAT decks, and PCM processors are converted to analog outputs by special circuits in Luxman's LV-109 integrated amplifier.

primary components of today's products. Though companies like Sony and Yamaha are well known for their original IC's and LSI's, the fact remains that nearly all audio manufacturers rely on other suppliers for semiconductors, particularly for standard circuits.

The Yen Also Rises

Though the semiconductor battles cloud the future for Japanese audio manufacturers, the current preoccupation is with "endaka," a buzzword that literally translates as "high yen." Endaka has already had a devastating effect on audio producers. Many are slashing profit margins to maintain U.S. market share, and some are shifting production to other Asian countries with lower labor costs. Aiwa has constructed a second factory in Singapore while upping production in its Gwent, U.K., factory, and Sansui is rumored to have moved entire production lines to Taiwan.

Particularly vulnerable to the yen's increase was Nakamichi, which exports 85 percent of its production. "We are willing to take a lower volume," said senior managing director Yamazaki, noting that his company responded to the yen's rise with three price increases last year. Still, Nakamichi enjoyed its best year ever in the U.S. in 1986. "We are grateful for the support of consumers in light of our price increase," Yamazaki said, pointing out that Nakamichi faces the same problems as all the other companies. He does not expect further price increases in 1987, however.

Pioneer also had to raise its U.S. prices three times last year because of the dollar's fall against the yen, observed Kohji Hatakeyama of the company's international division. Pioneer's senior managing director Isobe added that, "When the yen hit 150 [to the dollar], it resulted in stronger competition from other Asian producers. Pioneer's response was to stay ahead by better quality and more unique design concepts." He gave the six-CD changer as an example. "But when we get to 140 [yen to the dollar], we're not sure what will happen," he continued, citing the possibility of moving to overseas production.

"At 150 [yen to the dollar], there are definite and unavoidable structural changes in the audio industry," agreed publisher Kohsei



Wada, "which means that we're going to see much more local production [in the target country]." Along the same lines, Nakamichi's Yamazaki feels that "brands will begin to lose their national identity as far as production goes."

But by the end of April, the yen's value had risen even more, with a conversion rate below 140 to the dollar. Masaharu Matsushita told U.S. electronics journalists that "The economic situation today is the worst in our lives." Pointing out that Japanese manufacturers could no longer expect rising profits, he said, "We have to accept today's profitability as tomorrow's profitability." He predicted that prices of Japanese consumer electronics in the U.S. would continue to rise, saying that consumers were starting to choose products more carefully as a result.

Producing products with more features and better performance while reducing manufacturing costs are the strategies needed to maintain profitability in today's economic environment, Matsushita noted. Panasonic, Technics, and other Matsushita companies would follow these strategies in all product areas, he said, adding that better after-sales service was also needed to keep consumers satisfied.

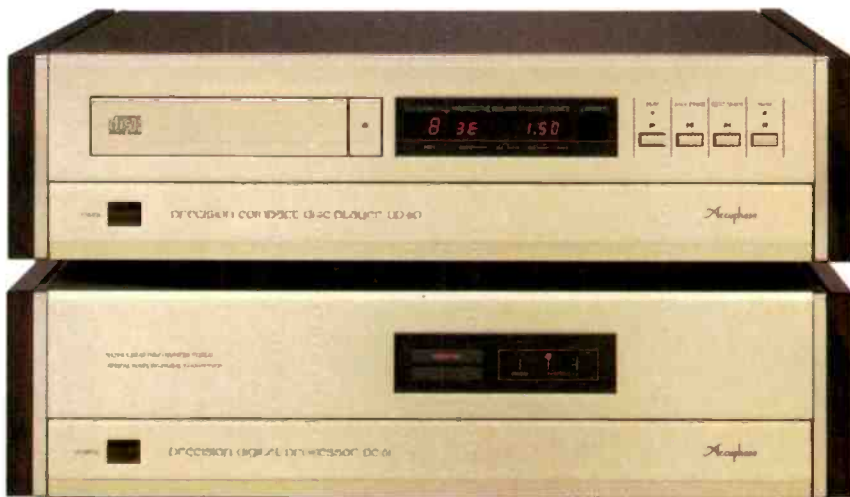
Back in Japan, another prominent audio executive, who wished to remain anonymous, complained that "It's the Japanese companies that are at fault for the difficulties. They're either not raising U.S. prices fairly to reflect the higher yen, or they're dishing out kickbacks to the power retailers. If this keeps up, it may result in some stiff antitrust reaction from the U.S. government."

Selling Audio to Japan

Americans might think it's like taking sand to the beach, but there's no reason why foreign audio products can't be sold in Japan, particularly in light of the yen's greater purchasing power. Until recently, there had always been a market in Japan for exotic high-end equipment from North America and Europe. Prices have often been set unbearably high by importers in order to keep volume low and maintain a product's exclusivity and mystique, factors that appeal strongly to traditional Japanese sentiments toward things foreign.



Clarion is the first car stereo manufacturer to begin production of a DAT player for automotive use. The model above was shown to car manufacturers this spring.



The two-part platter and floating tonearm base of Denon's DP-100M turntable (middle photo) use silicon damping to reduce the effects of external vibrations. The heavy-duty spring suspension also reduces acoustic feedback.

The Accuphase compact disc player (bottom photo) has two separate parts. The DP-80 playback unit (above) sends the digital signals through fiber-optic cables to the DC-81 processor (below) for digital-to-analog conversion.



For extended listening, Sanyo's CP M1000 changer allows you to load up to ten compact discs into a magazine. It also has a separate magazine for single discs.



Akai's three-motor, three-head GX-8 cassette deck uses a quartz-referenced phase-locked-loop circuit to control the speed of the capstan motor.



Kenwood's DP-3300D CD player sends digital signals through fiber-optic cables to the KA-3300D integrated amplifier for analog conversion.

The Society of Consumer Audio Distributors (SOCAD) is the English name for the Yunyu Audio Kyogikai (Imported Audio Conference), a group of sixteen companies that import audio products into Japan. Concurrent with the Japan Audio Fair in October, SOCAD sponsors the Imported Audio Fair, which is one of the most important displays of imported audio products in Japan. Participation is open only to SOCAD members, creating what some charge is a nontariff barrier to market access.

One SOCAD member, who preferred to remain anonymous, said there are no exact data available on sales trends of imported audio products, but he admitted that the number of units is quite small. He indicated that transducer-related products—speakers and cartridges—have been most popular, adding that the imported cartridge market has dropped considerably since the advent of CD players. When asked why imported audio products in Japan often carry price tags three or four times higher than retail in their home country, he explained that many importers are forced to go through wholesalers to get their products into the stores, adding an extra markup. He pointed out that many importers are very small companies that have to make their profits on high prices rather than volume sales.

"I was shocked at how high the prices are—three or four times what they should be," said Robert Kelly, "and I was angry that it was [such] a closed market." Kelly is a hardware design and development engineer from Sussex, England, who worked at Decca before coming to Japan. Now working for Griffin Electronics in Tokyo, Kelly is general manager for a select line of British audio goods Griffin imports at prices that are in line with ordinary Japanese products.

Asked why Japanese would want to buy British, Kelly explained that "The Japanese have always respected traditional British prestige products, and I feel the ones we offer give good value." Griffin imports Ariston, A & R Cambridge (Arcam), and Heybrook, and he promises "no gimmicks, just honest hi-fi products which have a good sound."

Asked about SOCAD, Kelly indicated that Griffin was granted a pro-



visional membership, recalling the inquisition-like atmosphere at his company's initial meeting with the SOCAD board, where "lots of eyebrows went up when we explained the level of our products and the prices we would charge." Nonetheless, SOCAD membership will enable Griffin to participate in the next Imported Audio Fair. "Most shops can't give a proper demonstration, so the show is quite important," he explained.

Regarding Japan's notoriously complex distribution system, Kelly said he's found that it's "a lot harder than it should be. A lot of importers are using wholesalers, and Yamagiwa [a large retailer] strongly suggested we use one of their established wholesalers. They'd take a percentage, and I'm afraid we would lose control over the product [marketing]."

An Import Success Story

Bose speakers have been imported into Japan for fifteen years now, but it wasn't until Bose established a Japanese subsidiary nearly ten years ago that sales started to take off. Sumiyoshi Sakura of Bose Japan explained that to Japanese consumers Bose symbolizes high technology thanks to the company's strong links with MIT. "Bose speakers also have a natural sound, which appeals to the Japanese consumer," he added. Apparently the Japanese also like the Bose Japan prices, which are in line with the U.S. prices. Sakura proudly notes that seven years ago Bose overtook JBL as the largest-selling speaker in Japan and has maintained the lead ever since.

When asked about difficulties in entering the Japanese market, Sakura pointed the finger at Japanese speakers, which he claimed were pretty stiff competition. "They're beautifully finished," he said, "and they were quite big for the price, giving good performance for the money." Eventually, however, Japanese consumers were won over to Bose's "light, small, good-sounding" products.

Another potential success is Polk Audio, whose Stereo Dimension Array line of speakers is being imported by TES Corporation. Hitoshi Takahashi, sales manager for the Polk Audio line, admits that good sound isn't enough: "The brand image is quite important. We feel

that Polk's appeal will be its serious approach to sound creation." Polk speakers work well in surround-sound applications, he added. Takahashi also noted that appearance and finish are very important to Japanese audiophiles. "Polk speakers are walnut, but the Japanese like black. Also, rounded cabinets and grilles are definitely in."

Conflict and Symbiosis

Let's go back to that balmy spring evening as Heitaro Nakajima wraps up his DAT lecture. Here's an example of a man who worked his way up the corporate ladder, not as an MBA but as an accomplished engineer. Obviously Nakajima is a man deeply involved with the fruits of his labors. In a sense, he symbolizes technological advance and expanding production, virtually the only corporate values the Japanese recognize. The Japanese are rightfully proud of their achievements, including those in audio. Many feel they're being punished unfairly by the United States for doing their job too well.

But as the college students and audio industry figures file out of Vario Hall, let's cut over to a few of Tokyo's live music houses for a different look at the Japanese. At the Carnival in rowdy Shinjuku, a female vocalist is bleating out the final strains of a tired jazz standard, trying her very best to sound like

Onkyo's RC-AV1M universal remote control, the "Unifier," can be programmed to operate any component that has an infrared sensor, remembering more than one hundred functions. It learns codes from other remote controls when the two are pointed at each other and corresponding function buttons are pressed at the same time.



Linda Ronstadt. Over at Body & Soul in Roppongi, a stocky guy in shades is hustling his saxophone through a ripoff of Coltrane. At Crocodile in Harajuku, a bunch of self-styled rockers have just hoofed up the last steps of the Stairway to Heaven. And over at Aspen Glow up in the college-kid hangout of Shibuya, a skinny guy in cowboy getup is honking through Hank Williams, straight from the record, no chaser.

More than anything else, such scenes drive home the reality that the U.S. is the largest exporter of recorded music, something very few Japanese truly realize. The DAT copyright controversy is really a problem only because of how the Americans may react. In the much-heralded post-industrial Age of Information, the Japanese are still behind in not fully recognizing the value of nonmaterial creativity.

Americans prize highly their own creative energy and spirit. Yet Americans also prize individual rights, including home taping, for themselves and their friends. And it's just this right that the Japanese hope to serve with their latest electronic products. □

Bryan Harrell, STEREO REVIEW's Tokyo Correspondent, is an American journalist who has lived in Tokyo since 1977. He is a member of the Japan Audio Society and writes a weekly music column for the Japan Times.

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CIRCLE NO. 52 ON READER SERVICE CARD

TWO DAT DECKS

Japan's first-generation Sony and Victor (JVC) DAT decks signal a bright future for tape recording.

BY JULIAN HIRSCH

EVEN though digital audio tape (DAT) recorders are not yet available in the U.S., their advent has been well documented in audiophile publications and the general press. Speculation is widespread concerning the capabilities of this new medium and its potential impact on both the rapidly growing compact disc market and the well-established audio cassette.

The DAT standard allows the use of three sampling frequencies: 48 kHz, 16 bit, for recording and playback; 32 kHz, 16 or 12 bit, for extended-time recording and playback; and 44.1 kHz, 16 bit (the CD standard), for playback only. Restricting the 44.1-kHz mode to playback only prevents the use of DAT decks for digital-to-digital copying of CD's.

Prototype models of DAT decks have been shown, and occasionally demonstrated, by several well-known Japanese manufacturers, and a few months ago a number of the decks were introduced for sale in Japan. The arrival of DAT decks in the United States, however, has been delayed by a bitter struggle between the recording industry and audio equipment manufacturers.

While the outcome of that battle has yet to be decided, STEREO REVIEW has obtained two new DAT decks, a Sony and a Victor (JVC), by simply purchasing them in Japan. We cannot assume that these are the *same* machines that *may*

become available in this country, but being able to use and test them has given us some clear initial impressions of the special capabilities and limitations of this intriguing new recording medium.

We were able to test the Sony machine somewhat more thoroughly than the Victor XD-Z1100, thanks to a draft copy of an English translation of its Japanese manual we got from Sony. Since both machines were intended for the Japanese market, they were designed to be operated from a 100-volt power line, so we had to reduce our 120-volt line to that level for our tests.

Sony DTC-1000ES

Externally, the Sony DTC-1000ES closely resembles a CD player. Its dimensions, styling, and front-panel layout are also very reminiscent of other Sony audio components. As in a CD player, a motorized tape drawer slides out horizontally when the open/close button is pressed. The transport controls follow accepted conventions for markings and functions. Anyone who has ever used a cassette deck or a CD player should have no difficulty making and playing recordings with the DTC-1000ES. It has several functions not previously available to the home recordist, however, and using some of them requires careful study of the manual and considerable hands-on practice.

After some days of experiment-

ing, we were able to use most of the special features of this machine, but we never did feel quite comfortable with all of them, mainly because of some less-than-clear wording of the manual translation. We have no doubt that the final English version will be much improved.

The DTC-1000ES has such familiar CD player features as AMS (automatic music search) and fast scan in either direction with audible sound. Its bright luminous display panel initially shows elapsed minutes and seconds of operation, and it can be switched to show the elapsed time in the current program or the time remaining on the tape. Unlike CD players, however, the Sony DAT deck did not keep precise and accurate track of time; the readings were close to correct, but errors of several seconds occurred, especially when a tape had been rewound or otherwise shuttled back and forth.

Other displays include the sampling frequency in use (32, 44.1, or 48 kHz), the program number, and the AMS number—the number of program segments the machine has been set to skip in forward or reverse search. The words SKIP ID or START ID appear in the display during search or skip operations.

Across the full width of the horizontal window are two parallel rows of signal-level indicators with a peak-hold feature. They are calibrated from 0 to -50 dB, with a red OVER indication beyond the zero mark. The recording level is set by



two concentric knobs. The front-panel headphone jack has its own volume control. As with most CD players, the line-output (playback) level of the DTC-1000ES is fixed at a nominal 2 volts.

A START ID subcode signal is recorded automatically whenever the signal level drops below an internally set threshold for more than 3 seconds, which will usually happen at the end of every band when recording from an LP or between tracks on most CD's (which can only be recorded through the deck's analog inputs). Any musical pause or very soft passage that falls below the threshold level for a few seconds will also trigger the subcode recording, but this action can be defeated after the fact with the ERASE button, which can remove any START ID signal. Conversely, a START ID can be added at any point with the MANUAL button.

The program numbers are not normally recorded on the tape, but they can also be added to correspond with the START ID positions. Other buttons are used to write and erase SKIP ID codes to omit selected portions of the tape. A single press of the RENUMBER button automatically numbers the program segments in sequence. A ten-digit keypad on the panel provides direct access to any numbered selection.

The rear panel of the Sony DTC-1000ES contains the gold-plated analog and digital input and output jacks. The digital output can be connected to an external digital-to-analog (D/A) converter unit such as the Sony DAS-703ES. Also extending from the rear of the DTC-1000ES are two power transformers, one for the analog circuits and the other for the digital circuits.

The Sony DTC-1000ES measures 17 inches wide, 13½ inches deep (plus 2½ inches for the power transformers), and 3¾ inches high. Our test unit was fitted with wood-grain vinyl-finished side panels that added another 1½ inches to its width, and it weighed 26½ pounds. The wireless remote control duplicates most of the deck's front-panel control functions.

Victor (JVC) XD-Z1100

The second machine we evaluated was the Victor XD-Z1100 (it would carry the JVC brand name in this country). In its size and general appearance, the Victor deck is very similar to the Sony. Its cassette



The first prerecorded DAT's, from GRP, include this Chick Corea album.

loading system is somewhat different, however. Touching the open/close button causes the door over the tape well to move out slightly and drop down in front of the panel. The cassette is inserted in the slot and pushed in part way (like loading a cassette into a car tape deck); then it is drawn in fully by a motor, and the door swings up to cover the opening.

The display window has a level indicator consisting of parallel rows of luminous blue-white rectangles calibrated from 0 to -40 dB in steps of 3 or 4 dB. From 0 to -6 dB, the display color changes to bright red. To the right of the level display is a large MARGIN indicator that constantly displays the reserve margin—the difference between peak signal level and the 0-dB overload point—for values between -19 and 0 dB. The level and margin readouts both have a peak-hold feature, and the margin numbers can easily be read at a distance. A bright red OVERLOAD bar appears above the margin numeral when 0 dB is exceeded. A third scale in the main level display shows the number of the highest significant bit of the digitally encoded signal, corresponding to the instantaneous level.

Whenever the machine is running, the tape counter shows location numbers in arbitrary units, but during recording it can be switched

to show elapsed time on the current program (cryptically identified as A. TIME) and the time remaining on the tape (more logically called TAPE REMAIN). Other indications include the program number and the sampling rate, the latter being indirectly shown as STANDARD PLAY (48 kHz) or LONG PLAY (32 kHz) mode.

Like the Sony DAT deck, the Victor machine has conventional transport control buttons that presented no problems in operation. Its REC button also provides a REC MUTE function if it is pressed while recording, muting the recorded signal for a few seconds and automatically recording a START ID subcode before stopping the tape in the pause mode. Horizontal sliders across the bottom of the panel control recording level, channel balance, and output level.

The other controls are a number of small, thin black buttons that are barely visible against the black panel. Their markings are not always too helpful—B. SEARCH, RESERVE, and CALL/MONITOR were three we never figured out. Another puzzle was DIGITAL PEAK, which produced a flashing zero and an overload indication on the MARGIN display while it was held in but had no other function that we could find. Two small pushbuttons select either analog or digital signal inputs and either STANDARD PLAY or LONG PLAY operation.

The rear panel of the Victor XD-Z1100 contains gold-plated phono jacks for the analog inputs and outputs and two sets of digital inputs and outputs. One set of digital connections carries conventional electrical signals; the other carries optical signals transmitted through fiber-optic cables. (The deck's optical output is intended to be sent to an external D/A conversion unit equipped with optical inputs, but we do not know when such equipment will be available for the consumer market.) Another pair of small jacks on the rear apron, with an adjacent slide switch, are identified as SYNCHRO and COMPU-LINK. From the connection diagrams in the manual, we judge that these are meant for synchronized dubbing using two XD-Z1100 recorders or one recorder with a CD player.

Attached to the bottom plate of the Victor recorder is a wooden sub-base, identified as a "solid wood base for higher stability and low resonance." The machine is supported

on four large feet designed to isolate it from its surroundings. The Victor XD-Z1100 measures 17 inches wide, 12¼ inches deep, and 4¼ inches high, and it weighs 20¼ pounds. It is furnished with a wireless remote control that duplicates most of its operating controls and also has a ten-key numerical pad for direct access to any selection.

Lab Tests

We tested both machines with 30- and 60-minute DAT cassettes. In general, the tests followed our standard CD-player format except that we had to record our own test signals. For plotting the record-playback frequency response, we recorded a sweeping sine-wave signal from a Philips TS3 test CD played on a Sony CDP-55, one of the flat-test players we have ever tested (its response variation is appreciably less than ± 0.05 dB from 20 to 20,000 Hz). All other measurements were made by recording test signals from a low-distortion generator.

The results of our electrical measurements are shown in the box at right. Both decks yielded very similar frequency-response, distortion, noise, and dynamic-range measurements. The most striking differences between them were their input sensitivities (the level required to reach a 0-dB recording indication with maximum gain setting) and channel separation. While the Victor machine required 720 millivolts input to reach 0 dB, the Sony reached that level with only about 25 millivolts. Either machine, however, should be able to record with full effectiveness from any likely program source. Since the level control of the Sony is located at its input, its amplifiers cannot be overloaded by any input signal as long as the recording indicators remain below 0 dB.

The channel-separation difference is more difficult to understand. In other digital components (specifically, CD players), channel separation is almost always better than 85 or 90 dB at 1,000 Hz, and it often decreases somewhat at very high frequencies as a result of stray capacitive coupling between channels through the wiring or from circuit components in the analog section.

The channel separation of the Sony machine was roughly comparable to that of a portable CD player (not quite up to the standard of most home players), but even at

FEATURES

SONY DTC-1000ES

- Records and plays back with 48-kHz sampling frequency
- Playback-only option with 44.1-kHz or 32-kHz sampling frequencies
- Automatic selection of sampling frequency in playback
- 16-bit digital encoding and decoding
- Four direct-drive motors for transport and head drum
- Motor-driven tape drawer
- Analog and digital recording inputs and playback outputs
- Separate A/D and D/A converters for left and right channels
- Quadruple-oversampling digital filters
- Separate power transformers for analog and digital sections
- Automatic music search
- Automatic skip of undesired segments
- Direct access to any selection
- Subcode 1D's for start of selections, segments to skip, program numbers
- Music review at increased speed with audible program
- Music scan (first 10 seconds of each selection)
- Headphone output with volume control
- Wireless remote control

VICTOR XD-Z1100

- Records and plays back with 48-kHz or 32-kHz sampling frequency (twice the recording time at lower rate)
- Playback-only option with 44.1-kHz sampling frequency (16-bit decoding)
- Automatic selection of sampling frequency in playback
- 16-bit digital encoding and decoding at 48-kHz sampling rate; 12-bit encoding and decoding at 32 kHz
- Motor-driven tape drawer
- Analog inputs and outputs; selectable electrical or optical digital inputs and outputs
- Automatic music search
- Subcode 1D's for start of selections, segments to skip, and program number
- Music review at increased speed with audible program
- Direct access to any selection (through remote control only)
- Intro scan (first few seconds of each selection)
- Synchro (Compu-Link) jacks for interface with other components
- Headphone jack
- Level control for line and headphone outputs
- Wireless remote control

LABORATORY MEASUREMENTS

SONY DTC-1000ES

- Record-playback frequency response** (referred to 1,000-Hz level): 20 to 20,000 Hz $+0.15$, -0.1 dB
- Total harmonic distortion** (at 1,000 Hz: 0.0045% at 0 dB, 0.004% at -10 dB, 0.01% at -20 dB)
- Signal-to-noise ratio** (A-weighted, referred to 0-dB signal level): 91.5 dB
- Record-playback flutter:** less than 0.0005% (residual of test instrument)
- Channel separation:** 84 dB at 1,000 Hz, 63 dB at 10,000 Hz, 60.5 dB at 20,000 Hz
- Interchannel phase shift:** 1,000 Hz, 0 degrees; 10,000 Hz, 0 degrees; 20,000 Hz, 1.4 degrees
- Input level for 0-dB recording:** 25 mV
- Playback level from 0-dB recording:** 1.95 volts
- Fast-forward time** (60-minute cassette): 30 seconds

VICTOR XD-Z1100

- Record-playback frequency response** (referred to 1,000-Hz level): Standard Play, 20 to 20,000 Hz $+0.05$, -0.35 dB; Long Play, 20 to 14,000 Hz $+0$, -0.75 dB
- Total harmonic distortion** at 1,000 Hz: Standard Play, 0.003% at 0 dB, 0.003% at -10 dB, 0.0125% at -20 dB; Long Play, 0.05% at 0 dB, 0.07% at -10 dB, 0.07% at -20 dB
- Signal-to-noise ratio** (A-weighted, referred to 0-dB signal level): Standard Play, 90.5 dB; Long Play, 87.5 dB
- Record-playback flutter:** less than 0.0005% (residual of test instrument)
- Channel separation** (Standard Play): 54 dB at 1,000 Hz, 35 dB at 10,000 Hz, 31.5 dB at 20,000 Hz
- Interchannel phase shift** (Standard Play): 1,000 Hz, 2 degrees; 10,000 Hz, 20 degrees; 20,000 Hz, 40 degrees
- Input level for 0-dB recording:** 0.72 volt
- Playback level from 0-dB recording:** variable, 2.93 volts maximum
- Fast-forward time** (60-minute cassette): 40 seconds

20,000 Hz it was at least 60 dB. The separation measurements of the Victor, on the other hand, were not much better than those of a good phono cartridge or FM tuner. They were not poor enough to degrade the audible separation of a stereo program, but we were nonetheless surprised to obtain readings between 30 and 40 dB at the upper audio frequencies.

The decks' interchannel phase-shift readings were also very different, but this was because of the differences between them in circuit design. Sony's use of separate A/D converters at the inputs to the digital circuits and separate D/A converters at their outputs, along with quadruple oversampling and digital filtering, essentially reduces interchannel phase shift to zero, meaning that the two channels have *no* differential time error. Evidently the Victor machine uses a single multiplexed D/A output converter (we would judge that double oversampling is also used), resulting in a small time error, about 5 microseconds, between the left and right channels. It is quite inaudible, and we mention it only to point out one of the few identifiable differences in electrical performance between the decks.

Since the Victor XD-Z1100 is also able to record with a 32-kHz sampling rate, we made the relevant measurements at that rate as well as the standard 48 kHz. As expected, the lower sampling rate restricted the upper frequency limit to about 14,000 Hz, compared with a response to 22,000 Hz, beyond our measurement limit, at the higher rate. At the lower rate, the response fell about 0.7 dB from 1,000 to 14,000 Hz and dropped precipitously above that frequency. In contrast, the 48-kHz response of both machines varied over a total range of about 0.2 to 0.3 dB from 20 to 20,000 Hz. At the lower sampling rate, the Victor's dynamic range was reduced from about 91 dB to 87.5 dB, and its total harmonic distortion increased markedly, from 0.003 percent with 48-kHz sampling, to a still negligible 0.05 to 0.07 percent at 0 and -10 dB.

We took advantage of having two DAT machines available to establish the degree of compatibility that existed between their tapes. A tape recorded with a 48-kHz sampling rate on either machine played back perfectly on the other. At the 32-kHz sampling rate, however, a re-

ording made on the Victor deck would not play back properly on the Sony deck. The Sony machine recognized the 32-kHz frequency, but the program was noisy, distorted, and unlistenable. We could not establish the reason for this effect.

After dubbing a CD onto a DAT cassette, we also made direct digital-to-digital transfers between the two machines in both directions. The results were flawless—the recorders gave no signs of “knowing” whether they were dealing with digital or analog signals. No doubt we could have repeated the dubbing process indefinitely without finding any audible deterioration in quality.

We tested the search features of the Sony DTC-1000ES by taping from CD's with a large number of tracks (such as the Philips TS5 test disc) and checking how accurately and quickly the deck was able to access individual program segments. The AMS system worked well. After a momentary hesitation, the tape transport went into a fast mode (in which it could traverse the full 30-minute tape in about 16 seconds and the 60-minute tape in 29 seconds). It stopped after a slight overshoot of the target START ID signal, then reversed, overshoot again (by a smaller amount), and repeated this process a couple of times. After each overshoot, the tape moved at a slower speed, finally reaching the correct position at approximately normal playing speed and resuming play from exactly the right point. The entire process usually took from 3 to 7 seconds, slightly more time than a CD player takes to cue a track.

In its response to physical shock, the DTC-1000ES was not at all like most CD players. Although we certainly did not try to demolish the unit, the hardest blows we could deliver with a fist had absolutely no effect on its playing. The Victor deck was also quite immune to pounding on its cabinet, though the practical significance of its isolating feet was not clear.

Comments

It is not easy to make a clear choice between these two machines, especially in view of our incomplete knowledge of their features and overall capabilities. In fact, we would not wish to make such a choice in the absence of definite quality differences between them.

We were more comfortable using

the Sony machine, but that reaction was certainly prompted by our having the English-language manual. We also found the Sony's front-panel controls and their markings more to our liking (the Victor's buttons and their markings are simply too small for easy use). On the other hand, the availability of a 32-kHz sampling mode makes the Victor XD-Z1100 an attractive choice for anyone who expects to make a large number of DAT recordings, since it converts a DT-120 (2-hour) tape to a 4-hour tape.

We made a surprising and informative discovery while using these DAT recorders. Having read for years about the dire consequences of exceeding a 0-dB level in a digital system, even momentarily, we were pleasantly surprised to find that doing so merely clipped the signal peaks cleanly and symmetrically, without any other discernible effects. This is in sharp contrast to what happens when most power amplifiers (and even some preamplifiers) are driven slightly into clipping—there is usually a burst of power-supply ripple accompanying the flat-topped waveform and sometimes a delayed recovery from the overload.

It seems highly probable that an occasional, brief overload of a DAT recorder will be much less audible than a comparable overload of an amplifier or even of a cassette deck. Also, within the 0-dB maximum limit, the frequency response and distortion of the DAT recording are essentially unaffected by level variations, no matter how large.

It is to be hoped that DAT decks will be allowed to enter this country before too long and without any crippling copy-inhibiting circuits that will affect their analog inputs (it is a forgone conclusion that the direct digital copying of CD's will *not* be allowed). Initially, prices will be high—these machines would have to cost \$1,200 to \$1,500 at current exchange rates—but they *should* fall rapidly as the products become widely available. Casual users of audio cassette recorders may not find DAT worth its cost, but anyone who is at all serious about home taping will want to have a DAT deck. In spite of its apparent complexity, it makes recording and playback easier than ever before. And the sound quality of a DAT recording is limited only by that of the source material. □

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Digital Audio & Compact Disc Review
February 1987



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Anthony H. Cordesman
Audio Magazine
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Audio Magazine
November 1983

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ADS

C4 Dolby B/C/HX Pro Cassette Deck

Single-capstan cassette deck with Dolby B, Dolby C, and Dolby HX Pro. Features external-processor loop (usable for compander); cast transport; record balance set electronically in 1-dB increments; mic/line mixing; bias/EQ set by user and stored in memory; real-time (elapsed and remaining) and standard counters; music search. S/N 93 dB with compander . . . \$1,200

Atelier C3 Two-Speed Cassette Deck

Two-speed stereo cassette deck provides for recording and playback at 1.88 ips (standard speed) and 3.75 ips (double speed). Features quartz-PLL direct-drive capstan; multiple-pole outer-rotor motor; repeat; mic/line mixing; 3 heads; 2 motors; Dolby B; Dolby C; music search; memory stop/play; LED meters; headphone jack. W&F standard speed 0.04% wrms, high speed 0.035%; FR (with all tape types) standard speed 20-20,000 Hz ± 2 dB, high speed 25-22,000 Hz ± 2 dB; S/N (A-wtd, all tape types) standard speed: >58 dBA no NR, >66 dBA Dolby B, >74 dBA Dolby C, high speed: >60 dBA no NR, >68 dBA Dolby B, >76 dBA Dolby C; line-input sens for 0-dB reading 100 mV; line output level with 0-dB indication 700 mV; mike input sens 0.56 mV. 17.5" W x 2.75" H x 14.8" D; 19.6 lb . . . \$900

Atelier C2 Dolby B & C Cassette Deck

Stereo cassette deck with single-capstan design and DC-frequency-generator servomotor drive. Features speed accuracy of $\pm 1\%$ or better, 80 sec winding time for C-60 cassettes; 12-segment, 2-color LED's. W&F 0.06% DIN; FR normal and chrome, 20-18,000 Hz ± 2 dB, ferrichrome and metal 20-20,000 Hz ± 2 dB; S/N (ref to level producing 3% THD at 315 Hz) >74 dBA with Dolby C, >66 with Dolby B, >58 dBA without Dolby; headphone output 320 mV into 200 ohms (0.5 mW); 17.52" W x 2.76" H x 14.84" D; 18.3 lb . . . \$600

AIWA

AD-F990UB Dolby B & C Cassette Deck

Features 3 heads; 2 motors; auto bias/EQ; Dolby HX Pro; dual capstans; bias fine tuning; remaining-time counter; music search; output level control; memory stop/play; mic inputs; headphone jack; rec mute; IC logic controls; fluorescent meters with peak hold; MPX filter switch; timer rec/play standby; auto Dolby NR detector; intro-play; Auto-De-Magnetizing System (A.D.M.S.). W&F 0.025% wrms; FR ferric 20-18,000 Hz ± 3 dB, high bias 20-19,000 Hz ± 3 dB, metal 20-20,000 Hz ± 3 dB; S/N (A-wtd) metal: 68 dB Dolby B, 80 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output level with 0-dB indication 400 mV; mic input sens 1 mV. 16.56" W x 4.38" H x 11.31" D; 12.1 lb . . . \$650

AD-A70U Auto-Sorting Cassette Deck

Autoreverse cassette deck holds up to 5 cassettes for quick-reverse 15-selection random-programmed playback and sequential-timed recording. Features 4 motors; Dolby B & C; blank skip; music search; rec mute; headphone jack; LED meters; electronic tape counter; auto tape selector. W&F 0.06% wrms; FR metal 30-15,000 Hz ± 3 dB; S/N metal 78 dB Dolby C. 13" W x 4.25" H x 13.62" D; 13.2 lb . . . \$650

AD-F770UB Dolby B & C Cassette Deck

Features 3 heads; 2 motors; auto bias/EQ; Dolby HX Pro; dual capstans; bias fine tuning; remaining-time counter; music search; output level control; memory stop/play; mic inputs;



**T A P E
D E C K S
BUYING GUIDE**

LISTENING and listening to every one of the tape decks in the stores would give you a good idea of their performance, but that would be pretty hard to do. It is easier to use this guide to find decks with the features and performance you want at a price you can afford. Then you can hit the stores to push the buttons and listen to the decks.

The information in this guide was supplied by the manufacturers. The prices are *suggested*; actual prices are set by each dealer. Like any such list, this one cannot be complete, and the fact that something is not listed should not be interpreted as a reflection on its quality.

headphone jack; rec mute; digital automatic tape adaptation; IC logic controls; fluorescent meters with peak hold; auto Dolby NR detector; intro play; A.D.M.S. W&F 0.025% wrms; FR ferric 20-17,000 Hz ± 3 dB, high bias 20-18,000 Hz ± 3 dB, metal 20-19,000 Hz ± 3 dB; S/N (A-wtd) metal: 68 dB Dolby B, 80 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output level with 0-dB indication 400 mV; mic input sens 1 mV . . . \$550

AD-WX220U Dolby B & C Cassette Deck

Features 2 heads; 2 motors; auto bias/EQ; bias fine tuning; music search; output level control; LED meters; mic inputs; headphone jack; rec mute; quarter-time dubbing; Dolby B & C; 1-touch synchro dubbing. W&F 0.038% wrms; FR ferric 20-13,000 Hz ± 3 dB, high bias 20-15,000 Hz ± 3 dB, metal 20-16,000 Hz ± 3 dB; S/N (A-wtd) metal: 66 dB Dolby B, 78 dB Dolby C . . . \$550

AD-W20U Double Cassette Deck

Double cassette deck with quick-reverse record/playback in both decks. Features 2+2 heads; 2 motors; continuous record/playback; programmable 18-selection edit dubbing; auto bias/EQ; Dolby B; Dolby C; music search; blank skip; LED meters; headphone jack; rec mute; one-touch high-speed dubbing. W&F 0.6% wrms; S/N metal 78 dB Dolby C; line-input sens 50 mV; line output sens 0.38 mV. 16.63" W x 4.38" H x 12.75" D; 12.3 lb . . . \$550

AD-S40U Dolby B & C Cassette Deck

Features 3 heads; 2 motors; auto bias/EQ; Dolby HX Pro; dual capstans; bias fine tuning; headphone jack; rec mute; computer designed keyboard front control panel; A.D.M.S.; electronic digital tape counter; feather-touch IC logic controls; cue & review; fluorescent peak meters. W&F 0.028% wrms; FR ferric 20-16,000 Hz ± 3 dB, high bias 20-17,000 Hz ± 3 dB, metal 20-18,000 Hz ± 3 dB; S/N (A-wtd) metal: 78 dB Dolby C . . . \$350

AD-R550U Autoreverse Cassette Deck

Features 2 heads; 2 motors; auto bias/EQ; Dolby B; Dolby C; Dolby HX Pro; bias fine tuning; music search; blank skip; output level control; mic inputs; headphone jack; rec mute; 0.2 sec autoreverse; micro-grain capstans; timer standby; fluorescent peak meter; edit assist; IC logic controls. W&F 0.04% wrms; FR ferric 25-13,000 Hz ± 3 dB, high bias 25-15,000 Hz ± 3 dB, metal 25-16,000 Hz ± 3 dB; S/N (A-wtd) metal: 65 dB Dolby B, 78 dB Dolby C; line-input sens for 0-dB reading 50 mV. 16.38" W x 4.38" H x 11.81" D; 11.4 lb . . . \$250

AD-R30 Autoreverse Cassette Deck

Cassette deck with 0.3-second autoreverse. Features feather-touch IC-logic controls; DC servomotor; Dolby B; Dolby C; auto or manual record mute; auto tape-type selector; timer standby; fine bias adjustment for normal and high-bias tape . . . \$180

AD-S15 Dolby B & C Cassette Deck

Two-motor cassette deck with Dolby B; Dolby C; auto tape-type selector; feather-touch IC-logic controls; fine bias adjustment for normal and high-bias tape; auto rec mute; timer standby . . . \$150

AD-S10 Dolby B & C Cassette Deck

Cassette deck with Dolby B; Dolby C; auto tape-type selector; fine bias adjustment for normal and high-bias tape; rec mute; soft-touch controls; 7-part level display; timer standby . . . \$120

AKAI

GX-R99-B 3-Head Cassette Deck

Autoreverse cassette deck with computer record-level processing system to set and maintain optimum record level, Teflon-bonded head housing of beryllium-alloy die-cast zinc to maintain accurate azimuth, super GX (glass and crystal) head, high-tuned DC amp with Foldback Electrode Transistors (FBET) for increased midrange resolution and widened dynamic range. Features 3 heads; 5 motors; auto bias/EQ; Dolby B; Dolby C; dual capstans; bias fine tuning; direct drive; elapsed-time counter; remaining-time counter; music search; output level control; memory stop/play; rec mute; headphone jack; peak/VU/peak-spectrum meters; auto fader; FLD display; record cancel; gold RCA jacks; auto tape monitor; timer start; feather-touch full-logic controls; direct lead-in; power eject. Wireless remote control optional. W&F 0.028% wrms; FR ferric 20-18,000 Hz ± 3

ILLUSTRATION BY TERRY ALLEN

TAPE DECKS

dB, high bias 20-19,000 Hz \pm 3 dB, metal 20-21,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 60 dB no NR. 17.3" W x 4.1" H x 14.6" D; 19.1 lb \$649

GX-8-B 3-Head Cassette Deck

Cassette deck with quartz-PLL direct-drive motor for low W&F, super GX (glass and crystal) head, manual bias trim; extended-range peak meter. Features 3 heads; 3 motors; Dolby B; Dolby C; dbx; dual capstans; bias fine tuning; elapsed-time counter; remaining-time counter; music search; output level control; rec mute; headphone jack; auto mute; record cancel; gold-plated RCA and headphone jacks; FLD display; feather-touch full-logic controls; direct lead-in; power eject. W&F 0.04% wrms; FR ferric 20-19,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, metal 20-21,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 115 dB dbx, 60 dB no NR. 17.3" W x 4.4" H x 13.9" D; 14.3 lb \$609

GX-6-B Dolby B & C Cassette Deck

3-head cassette deck with Super GX (glass and crystal) heads for increased dynamic range and greater sound purity. Features extended-range peak meter for music with high dynamic range; manual bias trim; auto mute; feather-touch full-logic controls; record cancel; gold-plated RCA and headphone jacks; FL display; direct lead-in; power eject; 3 motors; dual capstans; bias fine tuning; direct drive; elapsed- and remaining-time counter; music search; output level control; rec mute. W&F 0.04% wrms; FR ferric 20-19,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, metal 20-21,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 60 dB no NR. 17.3" W x 4.4" H x 13.9" D \$530

GX-R70EX Autoreverse Cassette Deck

Cassette deck with Computer Record Level Processing system (CRLP) to set and monitor optimum recording levels. Features twin-field Super GX head with separate gaps for recording and playback; twin active power supply for stable amplification and lower IMD; auto fader and mute; direct lead-in; power eject; record balance; 2 heads; 3 motors; auto bias/EQ; Dolby B & C; dbx; dual capstans; elapsed-time counter; music search; output level control; rec mute; headphone jack. Wireless remote control optional. W&F 0.05% wrms; FR ferric 20-17,000 Hz \pm 3 dB, high bias 20-18,000 Hz \pm 3 dB, metal 20-19,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 110 dB dbx; 60 dB no NR. 17.3" W x 4.1" H x 11" D \$549

HX-A451W Double Cassette Deck

High-speed dubbing cassette deck with random programmable dubbing and playback for both transports. Master driver mechanism uses 3rd motor for tape synchronization. Features feather-touch full-logic controls; auto mute; record pause; timer start; Blank Skip Playback System (BSPS); 3 heads; 3 motors; Dolby B & C; music search; elapsed-time counter; LED meters; mic inputs; rec mute; headphone jack. Wireless remote control optional. W&F 0.09% wrms; FR ferric 30-15,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal: 67 dB Dolby B, 77 dB Dolby C, 57 dB no NR. 17.3" W x 4.3" H x 11.5" D; 9.7 lb \$379

GX-R60EX Autoreverse Cassette Deck

Cassette deck with twin-field Super GX head with separate gaps for recording and playback and twin active power supply for stable amplification and lower IMD. Features feather-touch

full-logic controls; FLD display; reverse selector; direct lead-in; power eject; record balance; 2 heads; 2 motors; Dolby B & C; dbx; dual capstans; elapsed-time counter; music search; output level control; rec mute; headphone jack. Wireless remote control optional. W&F 0.05% wrms; FR ferric 20-17,000 Hz \pm 3 dB, high bias 20-18,000 Hz \pm 3 dB, metal 20-19,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 110 dB dbx; 60 dB no NR. 17.3" W x 4.1" H x 11" D; 11 lb \$429

GX-A5X-B Dolby B/C/dbx Cassette Deck

Cassette deck with twin-field Super GX head with separate gaps for recording and playback and selected repeat for repetition of user-selected songs. Features feather-touch full-logic controls; FLD display; auto mute; timer start; auto tape selector; 2 heads; 1 motor; elapsed-time counter; mic inputs; rec mute; headphone jack. Wireless remote control optional. W&F 0.05% wrms; FR ferric 20-17,000 Hz \pm 3 dB, high bias 20-18,000 Hz \pm 3 dB, metal 20-19,000 Hz \pm 3 dB; S/N (A-wtd) metal: 70 dB Dolby B, 80 dB Dolby C, 115 dB dbx; 60 dB no NR. 17.3" W x 4.1" H x 11.2" D; 9 lb \$259

HX-A351W Double Cassette Deck

High-speed one-touch dubbing cassette deck with continuous play, timer start, power and record LED indicators. Features 3 heads; 2 motors; Dolby B; elapsed-time counter; soft-touch controls; headphone jack. W&F 0.09% wrms; FR ferric 30-15,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal: 66 dB Dolby B \$229

AUDIO-TECHNICA

AT-RMX64 4-Track Cassette Deck

4-track deck with integral 6-in, 4-out mixer. Features 3 heads; 3 motors; Dolby B & C; 6 switchable mic/line outputs; 6 mic inputs; 2-band parametric equalizer; master output-level control; soft-touch controls; phantom power; LED output display; 60-dB total attenuation; 2 send/return loops; channel return and sub solos; headphone jack. FR, high bias 20-18,000 Hz \pm 3 dB; S/N (all A-wtd), high bias 55 dB no NR, 64 dB Dolby B, 68 dB Dolby C. \$1,695

BANG & OLUFSEN

Beocord 5500 Stereo Cassette Deck

Stereo cassette deck with automatic track search. Features automatic reverse; Dolby B; Dolby C; automatic record level. \$999

Beocord 3300 Interactive Cassette Deck

Cassette deck integrates with Beosystem 3300 system for remote-controlled operation. Features Dolby B; Dolby HX Pro headroom extension; soft-touch controls; auto search; level meter that adjusts for tape sensitivity; sendust head; auto demagnetization \$499

DENON

DR-M44HX Cassette Deck

Features 3 heads; 3 motors; auto bias/EQ; Dolby B; Dolby C; Dolby HX Pro; dual capstans; bias fine tuning; manual azimuth adjust; direct drive; elapsed- and remaining-time counter; music search; blank skip; output level control; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; rec mute; MPX filter; nonslip reel drive. W&F 0.035% wrms; FR metal 25-20,000 Hz \pm 3 dB; S/N (A-wtd) high bias: 75 dB no NR \$650

DR-M30HX Dolby B & C Cassette Deck

3-head cassette deck with Dolby HX Pro, dual

capstans, auto tape selector, real-time counter, music search, fluorescent meter, MPX filter \$475

DR-M14HX Dolby B/C/HX Pro Cassette Deck

Two-head remote-controlled cassette deck with Dolby HX Pro; Dolby B; Dolby C; Silent Mechanism; MPX filter; pause/mute; punch-in recording; music sensor; headphone jack; timer standby. W&F 0.045% wrms \$375

DR-M12HX. Similar to DR-M14HX except lacks remote control \$325



Denon DR-M44HX

DR-M20 Dolby B & C Cassette Deck

3-head cassette deck with closed-loop dual capstans, nonslip reel drive, pure DC construction, manual bias, multi-function fluorescent meters with peak level \$375

DR-M10 Dolby B & C Cassette Deck

Features 2 heads; auto tape selector; tape counter; 8-segment LED meter; manual fine bias adjust \$250

DR-M07 Dolby B & C Cassette Deck

Cassette deck with Dolby B; Dolby C; full-logic transport; bias adjust; bias/EQ for normal, high-bias, metal tape; headphone jack. W&F 0.057% wrms; S/N >73 dB with Dolby C \$200

FISHER

CR-W95 Double Cassette Deck

High-speed-dubbing cassette deck with autoreverse for both transports. Features synchronized one-touch dubbing; sequential play function; Dolby B & C; metal-tape capability for both transports; soft-touch controls. Silver finish \$300
CR-W95B. As above in black \$300

CR-W85 Double Cassette Deck

High-speed-dubbing cassette deck with autoreverse for deck 1. Features synchronized one-touch dubbing; sequential play function; Dolby NR; metal-tape capability for both transports; soft-touch controls. Silver finish \$250
CR-W85B. As above in black \$250

CR-W55 Double Cassette Deck

High-speed-dubbing cassette deck. Features synchronized one-touch dubbing; sequential play function; Dolby NR; metal-tape capability for both transports; soft-touch controls. Silver finish \$150
CR-W55B. As above in black \$150

HARMAN KARDON

CD491 Dolby B/C/HX Pro Cassette Deck

Ultrawideband cassette deck with direct-drive dual-capstan transport. Features 3 heads; 2 motors; Dolby B; Dolby C; Dolby HX Pro; bias fine trim with record and bias calibration test-tone oscillators; music search; output level control; memory stop/play; logic control; weighted peak-hold LED meters; mic inputs; mic/line mixing; headphone jack; rec mute. Timer controllable. W&F 0.025% wrms; FR with all tape types 20-24,000 Hz \pm 3 dB; S/N (A-wtd, with high bias tape) 58 dB no NR, 66 dB Dolby B, 75 dB Dolby C; line-input sens for 0-dB reading 40 mV; line output level with 0-dB indication 420 mV; mic input sens 0.65 mV. 17.36" W x 4.88" H x 13.5" D; 18 lb \$900

TAPE DECKS

TD392 Dolby B/C/HX Pro Cassette Deck

Cassette deck with 3 heads for monitoring during recording. Sendust record head, narrow-gap high-density ferrite play head. Features 1 motor; Dolby B; Dolby C; Dolby HX Pro; solenoid logic transport; bias fine trim with test-tone oscillator; output level control; weighted LED meters; headphone jack; rec mute. W&F 0.05% wrms; FR with all tape types 20-22,000 Hz \pm 3 dB; S/N (A-wtd, with high bias tape) 58 dB no NR, 66 dB Dolby B, 75 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output level with 0-dB indication 500 mV. 17.36" W x 4.88" H x 13.5" D; 16 lb \$645

CD302 Cassette Deck

Cassette deck with sendust record/playback head and logic controlled solenoid transport. Features Dolby B; Dolby C; Dolby HX Pro; bias fine tuning; output level control; rec mute; headphone jack; defeatable multiplex filter. W&F 0.05% wrms; record-playback FR, ferric 20-21,000 Hz \pm 3 dB, high bias 20-21,000 Hz \pm 3 dB, metal 20-21,000 Hz \pm 3 dB; S/N (A-wtd), high bias 65 dB with Dolby B, 73 with Dolby C \$435

CD202 Cassette Deck

Cassette deck with narrow gap record/playback permalloy head and Dolby B & C NR. Features logic transport with solenoid controls; bias fine tuning; 2 heads; LED meters. W&F 0.05% wrms; record-playback FR, metal 20-20,000 Hz \pm 3 dB; S/N (A-wtd) high bias 65 dB with Dolby B, 73 with Dolby C \$315



Harman Kardon CD491

CD102 Cassette Deck

Cassette deck with narrow gap record/play hard permalloy head and Dolby B NR. Features full-logic transport with solenoid controls; 2 heads; 1 motor; LED meters. W&F 0.05% wrms; record-playback FR, metal 20-20,000 Hz \pm 3 dB; S/N (A-wtd), high bias 65 dB \$275

HITACHI

D-W99 Double Cassette Deck

Front-loading logic-controlled double autoreverse cassette deck. Features high-speed one-touch dubbing; 20-segment FL peak meter with peak-hold selector; time rec/play; 4-digit FL counter; music scan; random memory program search; 2 heads; 3 motors; autoreverse; two transports; Dolby B; Dolby C; blank skip; memory stop/play; unified remote control compatibility. W&F 0.04% wrms; FR, ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N metal 66 dB Dolby B, 72 dB Dolby C \$700

D-W77 Double Cassette Deck

Logic-controlled autoreverse cassette deck. Features high-speed dubbing; Dolby B and Dolby C; music scan; relay play; random memory program search; 2 heads; 4 motors; 2 transports; auto tape selector; timer rec/play; blank skip; rec mute; headphone jack; unified remote control compatibility. FR ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N 66 dB Dolby B, 72 dB Dolby C. 14.5" W x 5.12" H x 11" D \$500

D-W33 Double Cassette Deck

Soft-touch autoreverse high-speed dubbing cassette deck with auto tape selector, timer rec/play; continuous playback, and synchronized dubbing start. Features 2 heads; 2 motors; autoreverse; two transports; Dolby B; blank skip; LED meters; headphone jack. W&F 0.08% wrms; FR, ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB; S/N metal 65 dB Dolby B \$300

JVC

DD-VR77 Autoreverse Cassette Deck

Hi-fi U-turn quick autoreverse cassette deck with direct drive. Features 3 heads; 3 motors; Dolby B; Dolby C; elapsed-time counter; remaining-time counter; music search; blank skip; output level control; memory stop/play; soft-touch controls; headphone jack; rec mute. W&F 0.035% wrms; FR ferric 20-16,000 Hz \pm 3 dB, high bias 20-17,000 Hz \pm 3 dB, metal 20-17,000 Hz \pm 3 dB; S/N (A-wtd) metal: 58 dB no NR; line-input sens for 0-dB reading 80 mV; line output level with 0-dB indication 300 mV. 17.125" W x 4.375" H x 11.125" D \$450

TD-V66BK 3-Head Cassette Deck

Discrete cassette deck with SA head, digital peak display, DC-configured amps, gold-plated terminals, shunt-regulated power supply, OFC wiring and plating. Remote controllable with selected JVC Compu-Link Components. Features 3 motors; auto bias/EQ; Dolby B & C; elapsed time counter; music search; output level control; memory stop/play; soft-touch controls; rec mute; headphone jack. W&F 0.038% wrms; record/playback FR (\pm 3 dB) ferric 20-19,000 Hz, high bias 20-19,000 Hz, metal 20-21,000 Hz; S/N (A-wtd) metal 58 dB no NR. 17.19" W x 4.36" H x 11.12" D; 10.6 lb \$450

TD-W660 Double Cassette Deck

Double cassette deck with quick autoreverse on both transports; Dolby B; Dolby C; full-logic controls; double-speed copying with synchro start; auto bias/EQ; continuous play; timer start; music scan (transport A) \$385
TD-W550. Similar to TD-W660 except lacks quick autoreverse system \$305

TD-W60BK Autoreverse Cassette Deck

Hi-fi U-turn quick-reverse double-mechanism cassette deck with double-speed dubbing and one-touch synchro start. Remote controllable with selected JVC Compu-Link Components. Features 3 heads; 3 motors; auto bias/EQ; Dolby B & C; music search; LED meters; soft-touch controls; headphone jack. W&F 0.08% wrms; record/playback FR (\pm 3 dB) ferric 30-15,000 Hz, high bias 30-16,000 Hz, metal 30-16,000 Hz; S/N (all A-wtd) metal 58 dB no NR. 17.19" W x 4.36" H x 9.06" D; 10.8 lb \$385

TD-W330 Double Cassette Deck

Double cassette deck with Dolby B; Dolby C; full-logic controls; double-speed copying with synchro start; continuous play; auto bias/EQ; 6-part level meters; timer start \$265

TD-W220. Similar to TD-W330 except has mic inputs and lacks auto bias/EQ on transport B \$235

TD-W110. Similar to TD-W220 except lacks Dolby C and has ANRS NR \$165

TD-X301BK Dolby B & C Cassette Deck

Autoreverse cassette deck with computer-controlled 2-motor full-logic mechanism. Remote controllable with selected JVC Compu-Link Components. Features 2 heads; 3 motors; LED meters; soft-touch controls; mic inputs; rec

mute. W&F 0.08% wrms; record/playback FR (\pm 3 dB) ferric 30-14,000 Hz, high bias 30-15,000 Hz, metal 30-15,000 Hz; S/N (A-wtd) metal 58 dB no NR. 17.19" W x 4.31" H x 9.06" D; 8.4 lb \$240

TD-X201BK Dolby B & C Cassette Deck

Full-logic-control cassette deck with computer-controlled 2-motor full-logic mechanism. Remote controllable with selected JVC Compu-Link Components. Features 2 heads; 2 motors; LED meters; soft-touch controls; mic inputs; rec mute. W&F 0.08% wrms; record/playback FR (\pm 3 dB) ferric 40-14,000 Hz, high bias 40-15,000 Hz, metal 40-15,000 Hz; S/N (A-wtd) metal 58 dB no NR. 7 lb \$185

KENWOOD

KX-95W(B) Double Cassette Deck

Autoreverse double cassette deck with Dolby B and C NR. Features elapsed-time counter; mic inputs; full electronic logic control; continuous relay play; 16-selection direct program search system; synchronized recording with KD-74F(B)/KD-64F(B); index scan; re-recording standby; auto tape selector. W&F 0.06% wrms; FR metal 20-18,000 Hz \pm 3 dB; S/N (A-wtd) metal: 73 dB Dolby C; 16.22" W x 4.22" H x 10.62" D; 13 lb \$365

KX-96W Double Cassette Deck

Double autoreverse cassette deck with Dolby B and Dolby C; remote control; simultaneous and sequential recording; relay play; high-speed dubbing; full-logic controls; music search; auto rec mute; recording standby; index scan; blank skip \$365

KX-660HX Dolby B/C/HX Pro Cassette Deck

Two-head cassette deck with Dolby B and Dolby C; Dolby HX Pro headroom extension; auto and manual bias setting; full-logic controls; 2 DC servomotors; blank skip; index scan; track or side repeat; recording standby \$295

KX-75R(B) Autoreverse Cassette Deck

Features Dolby B and C NR; elapsed-time counter; mic inputs; rec mute; full electronic logic control; photo-sensor autoreverse; rotary head system; direct program search; index scan; auto record mute; 2-motor drive; W&F 0.06% wrms; FR metal 20-18,000 Hz \pm 3 dB; S/N (A-wtd) metal: 73 dB Dolby C \$245



Kenwood KX-75R(B)

KX-780(B) Basic Series Cassette Deck

3-head cassette deck with Dolby B and C noise reduction; full-logic controls; bias fine-tune; 16-LED peak level meters; electronic tape controls; independent L and R record-level controls; headphone jack with output level control. W&F 0.05% wrms; FR 22-20,000 Hz \pm 3 dB with metal tape; 13 lb \$320

KX-45C(B) Dolby B Cassette Deck

Cassette deck with Dolby B NR. Features elapsed-time counter; output level control; soft-touch mechanical logic; mic inputs; headphone jack; single-selection direct-program search; 1-touch recording; 6-LED peak indicators; metal, chrome, and normal tape selector. W&F 0.09%

TAPE DECKS

wrms; FR metal 20-16,000 Hz \pm 3 dB; S/N (A-wtd) metal: 64 dB Dolby B. 16.22" W x 4.22" H x 10.62" D; 10 lb \$170

KYOCERA

D-811 Dolby HX Pro Cassette Deck

Features 2 heads; 3 motors; 3 bias/EQ presets; Dolby B; Dolby C; dual capstans; bias fine tuning; direct drive; elapsed-time counter; remaining-time counter; digital electronic counter; output level control; memory repeat stop/play; LED peak hold meters; soft-touch controls; mic inputs; headphone jack and control; rec mute; wireless remote. W&F 0.02% wrms; metal 20-22,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, normal 20-20,000 Hz \pm 3 dB; S/N (A-wtd) metal: 58 dB no NR, 10 dB Dolby B, 20 dB Dolby C; line-input sens for 0-dB reading 70 mV; line output level with 0-dB indication 580 mV; mic input sens 0.5 mV \$625

D-611 Dolby B & C Cassette Deck

Features 2 heads; 3 motors; 3 bias/EQ presets; bias fine tuning; direct drive; output level control; memory repeat stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; rec mute; wireless remote. W&F 0.035% wrms; metal 20-22,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, normal 20-20,000 Hz \pm 3 dB; S/N (A-wtd) metal: 58 dB no NR. 10 dB Dolby B, 20 dB Dolby C; line-input sens for 0-dB reading 70 mV; line output level with 0-dB indication 580 mV; mic input sens 0.5 mV. 18.12" W x 4" H x 12.12" D; 16 lb \$485

LUXMAN

K-03 Direct-Drive Cassette Deck

3-head cassette deck. Features 3 motors; Dolby B; Dolby C; dual capstans; bias fine tuning; direct drive; remaining-time counter; output level control; memory stop/play; headphone jack; rec mute; logic control; Duo-Beta circuitry. W&F 0.002% wrms; FR ferric 20-20,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, metal 20-20,000 Hz \pm 3 dB; S/N (A-wtd); ferric: 56 dB no NR, 64 dB Dolby B, 71 dB Dolby C, high bias: 58 dB no NR, 66 dB Dolby B, 73 dB Dolby C, metal: 60 dB no NR, 67 dB Dolby B, 73 dB Dolby C; line-input sens for 0-dB reading 150 mV. 17.81" W x 6.36" H x 14.36" D \$1,200

K-106 Autoreverse Cassette Deck

Remote-capable cassette deck with timer function. blank search, rec mute/auto space, auto tape selector, programmable search, auto record pause, auto scan, intro scan. Features 2 heads; 3 motors; Dolby B; Dolby C; dbx; Dolby HX Pro; dual capstans; bias fine tuning; blank skip; elapsed-time counter; music search; memory stop/play; LED meters; soft-touch controls; rec mute; headphone jack. W&F 0.05% wrms; FR (-3 dB) ferric 20-17,000 Hz, high bias 20-19,000 Hz, metal 20-19,000 Hz; S/N (A-wtd) ferric: 66 dB Dolby B, 70 dB Dolby C, 89 dB dbx; high bias: 67 dB Dolby B, 71 dB Dolby C, 90 dB dbx; metal: 67 dB Dolby B, 71 dB Dolby C, 90 dB dbx. 9.9 lbs; 17.25" W x 4.5" H x 12.06" D \$580

K-460. As above in gold \$580

K-105 Autoreverse Cassette Deck

Remote-capable cassette deck with blank search, rec mute/auto space, auto record pause, auto scan, intro scan. Features 2 heads; 3 motors; Dolby B; Dolby C; dbx; dual capstans; blank skip; elapsed-time counter; music search; LED meters; soft-touch controls; rec mute; headphone jack. W&F 0.05% wrms; FR (-3 dB) ferric 30-16,000 Hz, high bias 30-18,000 Hz, metal 30-18,000 Hz; S/N (A-wtd) ferric: 65 dB



Luxman K-03

Dolby B, 69 dB Dolby C, 90 dB dbx; high bias: 67 dB Dolby B, 71 dB Dolby C, 90 dB dbx; metal: 67 dB Dolby B, 71 dB Dolby C, 90 dB dbx. 9.9 lbs; 17.25" W x 4.5" H x 12.06" D \$480

K-100 Dolby B & C Cassette Deck

Remote-capable cassette deck with full-logic-control capability. Features 2 heads; 2 motors; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.06% wrms; FR (-3 dB) ferric 30-15,000 Hz, high bias 30-17,000 Hz, metal 30-17,000 Hz; S/N (A-wtd) high bias: >65 dB Dolby B, >70 dB Dolby C; metal: >65 dB Dolby B, >70 dB Dolby C. 7.7 lbs; 17.25" W x 4.31" H x 10.5" D \$250

MARANTZ

Double Cassette Decks

SD565 Autoreverse Double Cassette Deck

Dual cassette deck with autoreverse, record, and playback for both transports. Features 15-song quick music search; auto tape selector; high-speed dubbing; mic/line mixing; auto rec mute; Dolby B & C; 2 heads; 2 motors; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.05% wrms; record/playback FR (\pm 3 dB) ferric 35-15,500 Hz, high bias 35-16,500 Hz, metal 35-17,500 Hz; S/N (all A-wtd) metal 65 dB Dolby B, 72 dB Dolby C. 16.5" W x 4" H x 10.25" D; 11.9 lb \$450

SD255 Double Cassette Deck

Features 2 heads; Dolby B; Dolby C; LED meters; soft-touch controls; mic inputs; headphone jack; auto tape selector. W&F 0.18% wrms; FR ferric 40-12,500 Hz \pm 3 dB, high bias 40-12,500 Hz \pm 3 dB, metal 40-12,500 Hz \pm 3 dB; S/N (A-wtd) ferric: 51 dB no NR, 57 dB Dolby B, 65 dB Dolby C; 10.4 lb \$250

SD155 Double Cassette Deck

Features 2 heads; Dolby B; LED meters; soft-touch controls; mic inputs; headphone jack; auto tape selector. W&F 0.18% wrms; FR ferric 40-12,500 Hz \pm 3 dB, high bias 40-12,500 Hz \pm 3 dB, metal 40-12,500 Hz \pm 3 dB; S/N (A-wtd) ferric: 51 dB no NR, 57 dB Dolby B, 16.5" W x 4.44" H x 10.25" D; 10.5 lb \$230

Portable Cassette Decks

PMD 430 dbx Portable Cassette Deck

3-head AC/DC cassette deck with Dolby B. Features fine-bias control; headphone jack with adjustable volume; dual recording level controls; 2 mic inputs; switchable mic attenuation (0, -15, -30 dB); compatible with normal/high-bias/metal tape; auto replay; pitch control; 3.5 lbs; 2" x 9" x 6.5" \$550

PMD 420 Dolby B Portable Cassette Deck

Features 2 heads; bias fine tuning; mic inputs; headphone jack; built-in speaker; pitch control; 3-position tape selector; switchable limiter; 3-way power. W&F 0.12% wrms; FR ferric 40-14,000 Hz \pm 3 dB, high bias 40-15,000 Hz \pm 3 dB, metal 40-16,000 Hz \pm 3 dB; S/N (A-wtd) ferric: 51 dB no NR, 59 dB Dolby B; line-input

sens for 0-dB reading 70 mV; line output level with 0-dB indication 400 mV; mic input sens 0.3 mV. 9" W x 2" H x 6.5" D; 2.9 lb \$450

PMD 221 Portable Cassette Deck

Features 2 speeds (1.88 and 0.94 ips); 3 heads; mic inputs; headphone jack; built-in speaker; built-in mic; pitch control; 3-position tape selector; ext mic and speaker jacks; manual or auto level control; switchable limiter; 3-way power. W&F 0.12% wrms; FR ferric 40-12,500 Hz \pm 3 dB. S/N (A-wtd) ferric: 48 dB no NR; line-input sens for 0-dB reading 70 mV; line output level with 0-dB indication 400 mV; mic input sens 0.3 mV. 9" W x 2" H x 6.5" D; 2.9 lb \$330

PMD 201 Portable Cassette Deck

Features 2 speeds (1.88 and 0.94 ips); 2 heads; mic inputs; headphone jack; built-in speaker; built-in mic; pitch control; 3-position tape selector; ext mic and speaker jacks; manual or auto level control; switchable limiter; 3-way power. W&F 0.12% wrms; FR ferric 40-12,500 Hz \pm 3 dB. S/N (A-wtd) ferric: 48 dB no NR; line-input sens for 0-dB reading 70 mV; line output level with 0-dB indication 400 mV; mic input sens 0.3 mV. 9" W x 2" H x 6.5" D; 2.9 lb \$280

MITSUBISHI

DT-156 Autoreverse Cassette Deck

Dual cassette deck with 7 cassette auto-changer. Features 3 heads; 6 motors; Dolby B; music search; blank skip; memory stop/play; soft-touch controls; Programmable playback (up to 9 selections from side A or B of 7 cassettes); programmable record; double-speed dubbing; blank skip; repeat playback. W&F 0.12% wrms; FR ferric 30-16,000 Hz \pm 3 dB, high bias 30-17,000 Hz \pm 3 dB, S/N (A-wtd) high bias: 58 dB no NR, 68 dB Dolby B. 16.69" W x 6.63" H x 11.81" D; 20 lb \$330

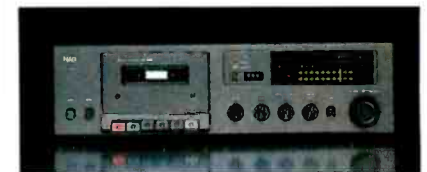
DT-46 Cassette Deck

Cassette deck with Dolby B and C. Features feather-touch logic controls; peak-record level meters; auto bias/EQ selection \$170

NAD

6300 Remote-Controlled Cassette Deck

Remote-controlled 3-head cassette deck with dual capstans; Dolby B; Dolby C; CAR dynamic-range compression; amorphous dual-gal head; Dolby HX Pro and Dyneq headroom extension; Play Trim; real-time counter. W&F 0.018% wrms; S/N 77.4 dB with metal tape and Dolby C \$798



NAD 6155

6155 Dolby B/C/HX Pro Cassette Deck

Cassette deck with Play Trim circuit to adjust playback EQ to compensate for differences in cassettes made on other decks and for overall high-frequency compensation. Features Dolby B; Dolby C; Dolby HX Pro \$448

6240 Dyneq Cassette Deck

Cassette deck with Dyneq headroom extension; bias fine-tuning; Play Trim; Dolby B; Dolby C; peak-reading meters. W&F <0.06% wrms; S/N 77 dB with 3% THD at 333 Hz \$298

TAPE DECKS

NAKAMICHI

Dragon Autoreverse Stereo Cassette Deck

Microprocessor-controlled 3-head cassette deck with Dolby B and C. Features Auto Azimuth Correction system; asymmetrical diffused-resonance transport; Super Linear Torque direct-drive motors; auto retracting slot guides; tape-pad lifter; auto tape slack take-up; 2-speed cueing; 2-speed master fader; auto rec pause; rec level and bias calibration controls with 2-tone oscillator; dual-gap ferrite/sendust erase head; separate tape and EQ switches for ZX, SX, and EX cassettes; direct-coupled recording and playback amplifiers; left, right, master input levels; output level control; rec mute; high-output headphone jack; defeatable infrasonic filter; 4-digit LED electronic counter with memory stop and repeat. W&F 0.019% wtd rms; FR 20-22,000 Hz \pm 3 dB with ZX tape; S/N Dolby B/C on 66/72 dB at 400 Hz with 3% THD (A-wtd with ZX tape at 400 Hz, 0 dB); sep/crosstalk 37/60 dB at 1,000 Hz, 0 dB; input sens/imp 50 mV/50 kilohms line; output level/imp 1 V/2.2 kilohms line, 45 mW/8 ohms for headphones; 17.75" W x 5.31" H x 11.81" D; 21 lb .. \$1,995



Nakamichi CR-5A

CR-7A 3-Head Cassette Deck

Discrete cassette deck with asymmetrical diffused-resonance dual-capstan transport. Features 3 motors; auto bias/EQ; Dolby B; Dolby C; manual azimuth adjust; elapsed-time counter; remaining-time counter; output level control; memory stop/play; LED meters; soft-touch controls; headphone jack; rec mute; wireless remote; auto & manual tape/equalizer selection; auto fade; auto repeat. W&F 0.027% (wrms); FR, ferric 18-21,000 Hz \pm 3 dB; S/N (A-wtd), metal 66 dB Dolby B, 72 dB; line-input sens for 0-dB reading 50 mV; line-output level with 0-dB indication 1,000 mV \$1,495

RX-505 3-Head Cassette Deck

Discrete stereo cassette deck with unidirectional autoreverse to eliminate bidirectional azimuth error. Mechanism turns cassette over at end of side during record or playback. Features asymmetrical dual-capstan closed-loop transport; auto fade (20 secs before end of tape); Dolby B and C; DC servomotors; auto record pause; LED peak level meters reading from -40 to +10 dB; dual-speed master fader; punch-in recording; memory stop/play; soft-touch controls. W&F <0.04% wtd rms; FR 20-20,000 Hz \pm 3 dB all tape types; S/N >70 dB with Dolby C and metal tape; THD <0.9% with ZX tape; line-input sens for 0-dB reading 50 mV; line-output level with 0-dB indication 1,000 mV; 17.75" W x 5.69" H x 11.81" D; 22 lb .. \$1,295
RX-202. Similar to above with 2 heads. 19 lbs, 13 oz \$695

MR-1 Discrete 3-Head Pro Cassette Deck

Cassette deck with asymmetrical dual-capstan diffused-resonance transport. Features Dolby B and C; 3 motors; memory stop; rec mute; external NR loop accessed via standard phono jacks; dual 16-segment peak-reading electronic level meters; Crystallog recording and play heads; subsonic filter; MPX filter; \pm 6% pitch control;

front-panel 0.25" balanced line-input jacks; rear balanced XLR input and output jacks; unbalanced 0.25" rear jacks. Balanced inputs: imp 600 ohms; rated input level +4 dBm; headroom 16 dB to max input level (+20 dBm); min input level -6 dBm. Unbalanced inputs: imp 100 kohm; nominal recording level with input of -20 dBV (0.1 V); nominal input level 0.316 V. Comes with EIA standard rack-mount adaptor. Optional remote control. W&F 0.027% wrms, \pm 0.048% wtd peak; FR 20-20,000 Hz \pm 3 dB at -20 dB \$945

CR-5A 3-Head Dolby B & C Cassette Deck

Discrete cassette deck with asymmetrical diffused-resonance dual-capstan transport. Features 3 motors; Dolby B; Dolby C; bias fine tuning; output level control; memory stop/play; LED meters; soft-touch controls; headphone jack; rec mute; auto repeat; dual-speed master fader control; independent L/R. W&F 0.027% (wrms); FR, ferric 18-21,000 Hz \pm 3 dB; S/N (all A-wtd), metal 66 dB Dolby B, 72 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output at 0 dB 1,000 mV \$995

BX-300 3-Head Dolby B & C Cassette Deck

Discrete 3-head cassette deck with asymmetrical dual-capstan transport driven by direct-drive capstan motor. Features 3 motors; dual capstans; bias fine tuning; direct drive; output level control; memory stop/play; LED meters; soft-touch controls; headphone jack; rec mute; pitch control; wired remote control; 2-speed master fader; defeatable MPX filter; 2-position EQ switch; 3-position tape selector; separate L + R output level. W&F 0.027% wrms; FR ferric 20-20,000 Hz \pm 3 dB, high bias 20-20,000 Hz \pm 3 dB, metal 20-20,000 Hz \pm 3 dB; S/N (A-wtd) metal: 64 dB Dolby B, 70 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output level with 0-dB indication 1,000 mV \$750

MR-2 2-Head Dolby B & C Cassette Deck

Rack-mountable cassette deck with balanced line inputs. Features 3 motors; Dolby B; Dolby C; bias fine tuning; output level control; memory stop; LED meters; mic inputs; headphone jack; pitch control; auto repeat; hyperbolic-contour laminated sendust rec/playback head. W&F 0.06% wrms; FR, ferric 20-20,000 Hz \pm 3 dB; S/N (all A-wtd), ferric 62 dB Dolby B, 68 dB Dolby C \$559

BX-125 2-Head Dolby B & C Cassette Deck

Microprocessor-controlled silent-mechanism 2-head cassette deck. Features 2 heads; 3 motors; output level control; memory stop/play; LED meters; soft-touch controls; headphone jack; 2-speed master fader; defeatable MPX filter; 2-position EQ switch; 3-position tape selector; separate L + R output level. W&F 0.06% wrms; FR ferric 20-20,000 Hz, high bias 20-20,000 Hz, metal 20-20,000 Hz; S/N (A-wtd) metal: 62 dB Dolby B, 68 dB Dolby C; line-input sens for 0-dB reading 50 mV; line output level with 0-dB indication 500 mV \$475

BX-100 2-Head Cassette Deck

Features 3-digit mechanical tape counter; LED meters; Dolby B; DC servomotor; headphone jack. W&F 0.05% wrms; FR 20-20,000 Hz with all tape types; THD <1.0%; S/N metal 62 dB no NR; line-input sens for 0-dB reading 50 mV; line-output level with 0-dB indication 500 mV; 16.94" W x 4.31" H x 9.88" D; 12 lb \$349

NEC

K-700E Double Cassette Deck

High- and normal-speed dubbing cassette deck

can be remote controllable when used in conjunction with NEC's A-1300E integrated amp. Features 2 heads; 2 motors; 15-program random memory for recording and playback; Dolby B; Dolby C; music search; LED meters; soft-touch controls; mic inputs; rec mute. W&F <0.06% wrms; FR (\pm 3 dB) ferric 20-16,000 Hz, high bias 20-17,000 Hz, metal 20-17,000 Hz; S/N (A-wtd) metal 65 dB Dolby B, 72 dB Dolby C. 17" W \times 4.33" H \times 12.5" D; 11 lb \$329

ONKYO

Integra TA-2090 Dolby B/C/dbx Cassette Deck

Computer-controlled cassette deck with Dolby HX Pro. Features 3 heads; 3 motors; auto bias/EQ; dual capstans; bias fine tuning; direct drive; elapsed-time counter; remaining-time counter; music search; output level control; memory stop/play; mic input; headphone jack; rec mute; remote control optional; record calibration controls; side panels optional; sendust heads; MPX filter; fluorescent meters; 2-color peak hold. W&F 0.02% wrms; FR ferric 25-17,000 Hz \pm 3 dB, high bias 25-19,000 Hz \pm 3 dB, metal 25-21,000 Hz \pm 3 dB; S/N (A-wtd) metal: 60 dB no NR, 70 dB Dolby B, 80 dB Dolby C, 87 dB dbx; line-input sens for 0-dB reading 60 mV; line output level with 0-dB indication 750 mV; mic input sens 0.6 mV; mic input overload 165 mV. 17.69" W x 3.93" H x 15.44" D; 20 lb \$900

Integra TA-2058 Dolby B & C Cassette Deck

Dolby HX Pro cassette deck with computer-controlled 3-motor transport and remote-control capability compatible with Onkyo remote-controlled A/V receivers. Features auto bias-adjusting system to optimize FR within 5 sec; 3 heads; auto bias/EQ; bias fine tuning; elapsed-time counter; remaining-time counter; music search; memory stop/play; LED meters; mic inputs; rec mute; headphone jack; MPX filter; 3 repeat modes; master left/right level fader with balance fine tuning. W&F 0.045% wrms; record/playback FR high bias 30-17,000 Hz \pm 3 dB, metal 30-18,000 Hz \pm 3 dB; S/N (A-wtd) metal 70 dB Dolby B, 80 dB Dolby C. 17.12" W x 4.36" H x 14.12" D; 14 lb \$500

TA-RW99 Dual Autoreverse Cassette Deck

Features 2 heads; 4 motors; auto bias/EQ; Dolby B; Dolby C; autoreverse; high-speed or real-time dubbing; music search; LED meters; mono mic input; headphone jack; rec mute; search dubbing function. W&F 0.05% wrms; FR 30-14,000 Hz \pm 3 dB ferric, 30-15,000 Hz \pm 3 dB high bias, 30-16,000 Hz \pm 3 dB metal; S/N (A-wtd) metal 58 dB no NR, 68 dB Dolby B, 78 dB Dolby C; line-input sens 60 mV; line output level 500 mV; mic-input sens 1 mV. \$480

Integra TA-2048 Dolby B & C Cassette Deck

Cassette deck with computer-controlled 3-motor transport and remote-control capability compatible with Onkyo remote-controlled A/V receivers. Features 3 heads; auto bias/EQ; bias fine tuning; music search; memory stop/play; LED meters; mic inputs; rec mute; headphone jack; master left/right level fader with balance fine tuning. W&F 0.045% wrms; record/playback FR high bias 30-17,000 Hz \pm 3 dB, metal 30-18,000 Hz \pm 3 dB; S/N (A-wtd) metal 70 dB Dolby B, 80 dB Dolby C. 17.12" W x 4.36" H x 14.12" D; 14 lb \$380

Integra TA-2047B Dolby B & C Cassette Deck

Computer-controlled cassette deck with 2 heads and 3 motors. Features bias fine tuning; elapsed-time counter; remaining-time counter; music search; memory stop/play; LED meters;

TAPE DECKS

mic inputs; headphone jack; rec mute; MPX filter; subsonic filter; preset levels with master fader; auto tape select; remote control optional. W&F 0.045% wrms; FR ferric 30-15,000 Hz \pm 3 dB, high bias 30-16,000 Hz \pm 3 dB, metal 30-17,000 Hz \pm 3 dB; S/N (A-wtd) metal: 60 dB no NR, 70 dB Dolby B, 80 dB Dolby C; line-input sens for 0-dB reading 60 mV; line output level with 0-dB indication 500 mV; mic input sens 1 mV; mic input overload 150 mV. 17.13" W x 4.38" H x 14.63" D; 13 lbs. Available in black finish only \$350

TA-RW66 Double Cassette Deck

Combination dubbing cassette deck with autoreverse playback capability. Deck 1 has unidirectional record and playback; Deck 2 has autoreverse playback. Features 4 heads; 4 motors; auto bias/EQ; music search; built-in MPX filter; LED meters; soft-touch controls; 1 mic input; rec mute; headphone jack; timer record and play; 2-times high-speed dubbing. W&F 0.07% wrms; record/playback FR metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal 66 dB Dolby B, 76 dB Dolby C \$350

TA-R22B Autoreverse Cassette Deck

Computer-controlled cassette deck with Dolby B and Dolby C. Features 2 heads; 2 motors; music search; blank skip; LED meters; mic inputs; headphone jack; rec mute; infrared end-of-the-tape-to-leader detector; MPX filter. FR ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; line-input sens for 0-dB reading 60 mV; line output level with 0-dB indication 500 mV; mic input sens 1 mV; mic input overload 100 mV. 7.13" W x 4.5" H x 10.5" D; 10 lbs. Black finish \$280

TA-W55 High-Speed Dubbing Cassette Deck

Features 4 heads; 2 motors; Dolby B; music search; LED meters; soft-touch controls; mic inputs; rec mute; timer rec/play; continuous play; simultaneous play of 2 cassettes; 5-track mixing; auto tape selector; DC servo-controlled motors. W&F 0.07% wrms; FR ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal: 56 dB no NR, 66 dB Dolby B; line-input sens for 0-dB reading 60 mV; line output level with 0-dB indication 500 mV; mic input sens 1 mV; mic input overload 100 mV. 17.13" W x 4.81" H x 10.18" D; 12 lb \$260

TA-2028 Dolby B & C Cassette Deck

2-head cassette deck with computer-controlled 2-motor tape transport and remote-control capability compatible with Onkyo remote-controlled A/V receivers. Features 2 repeat modes; built-in MPX filter; auto bias/EQ; bias fine tuning; music search; memory stop/play; LED meters; mic inputs; rec mute; headphone jack. W&F 0.06% wrms; record/playback FR metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal 68 dB Dolby B, 78 dB Dolby C. 17.12" W x 4.36" H x 10.12" D; 9 lb \$240

TA-2017B Dolby B & C Cassette Deck

Features 2 heads; 1 motor; bias fine tuning; LED meters; soft-touch controls; mic inputs; direct-function transport; peak level meters; MPX filter. W&F 0.07% wrms; FR ferric 30-14,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) metal: 56 dB no NR, 66 dB Dolby B, 76 dB Dolby C; line-input sens for 0-dB reading 60 mV; line output level with 0-dB indication 500 mV; mic input sens 1 mV; mic input overload 100 mV. 17.13" W x 4.44" H x 10.63" D; 10 lbs. Black finish only \$160

PARASOUND

CD-400 Dolby B & C Cassette Deck

Features 2 heads; 1 motor; music search; LED meters; soft-touch controls; mic inputs; headphone jack; stabilized DC-servo drive; removable cassette door. W&F 0.07% wrms; FR ferric 30-15,000 Hz \pm 3 dB, high bias 30-15,000 Hz \pm 3 dB, metal 30-16,000 Hz \pm 3 dB; S/N (A-wtd) ferric: 55 dB no NR, 64 dB Dolby B, 72 dB Dolby C; high bias: 56 dB no NR, 65 dB Dolby B, 72 dB Dolby C; metal: 58 dB no NR, 66 dB Dolby B, 73 dB Dolby C \$230

PIONEER

CT-A9X Dolby B & C Cassette Deck

3-head cassette deck with Reference Master Mechanism. Features Dolby B; Dolby C; dual capstans; automatic bias/level/equalization tuning system; direct drive; remaining-time counter; music search; output level control; memory stop; soft-touch controls; headphone jack; auto rec mute; auto tape select; timer standby; ribbon sendust heads. W&F 0.018% wrms; FR ferric 30-19,000 Hz \pm 3 dB \$900



Pioneer CT-A9X

CT-1370WR(BK) Double Cassette Deck

Features autoreverse; two-transport recording and playback; Dolby B; Dolby C; high-speed and continuous dubbing; relay rec/play; auto tape selector; random-access programming; music search and repeat; skip search; rec mute; synchro start; timer rec/play; remote control \$500

CT-1380WR Double Autoreverse Cassette Deck

Cassette deck has autoreverse for recording and playback for both transports, with high-speed continuous dubbing of both sides of a tape. Features Dolby B and Dolby C; parallel recording to make two copies simultaneously; relay recording and play; auto bias/EQ; programming of up to ten selections per side; music search; repeat; skip search; rec mute; timer record and play; gold-plated headphone jack. W&F 0.06% wrms; FR with metal tape 20-18,000 Hz $-$ 20 dB; S/N 57 dB without NR \$500

CT-1280WR Double Cassette Deck

Double cassette deck with autoreverse recording on Transport 1 and autoreverse playback on Transport 2. Features Dolby B; Dolby C; high-speed dubbing; relay play; music/skip search for up to 15 tracks; auto bias/EQ; rec mute; 1-touch recording; full-logic controls; black finish. FR with metal tape 25-16,000 Hz $-$ 20 dB; S/N 56 dB without NR; W&F <0.075% wrms \$300

CT-2070R Autoreverse Cassette Deck

Autoreverse cassette deck with Dolby B, Dolby C, and dbx noise reduction. Features full-logic controls; music search; one-touch recording; 6-segment LED level meters; black finish. W&F 0.08% wrms; S/N 57 dB without NR \$290

CT-980W Double Cassette Deck

Double cassette deck records and plays on Transport 1 and plays on Transport 2. Features Dolby B and Dolby C; high-speed dubbing; relay play. FR with metal tape 35-16,000 Hz $-$ 20 dB; S/N 56 dB without NR; W&F 0.13% wrms \$180



Proton 740

PROTON

740 Autoreverse Cassette Deck

Full-logic-controlled cassette deck with Dolby B, Dolby C, and dbx NR. Features 2 heads; 1 motor; auto bias/EQ; elapsed-time counter; music search; output level control; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; rec mute; sleep timer function; 9 program memory selection; adaptable to a timer for playback or record. W&F 0.05% wrms; FR ferric 25-16,000 Hz \pm 3 dB, metal 25-19,000 Hz \pm 3 dB \$329

AD-300 Autoreverse Cassette Deck

Full-logic autoreverse cassette deck with Dolby B and Dolby C; continuous play; elapsed-time counter; auto tape-type select; memory; optional remote control; MPX filter. S/N 72 dB with metal tape and Dolby C; FR 30-17,000 Hz \pm 3 dB with metal tape \$299

720B Dolby B and C Cassette Deck

Stereo cassette deck with Dolby B and Dolby C. Features soft-touch controls, one-touch record; bias circuit to reduce crosstalk between stereo channels; defeatable MPX filter; LED record indicators; balance control; mic inputs; headphone jack; mic/line mixing capability. W&F 0.08%; FR ferric. 30-17,000 Hz \pm 3 dB \$199

REALISTIC

SCT-1000 Dolby B & C Double Cassette Deck

Features 2 transports; fade out; elapsed-time counter; mic inputs; headphone jack. FR (\pm 3 dB) ferric 40-12,500 Hz, high bias 40-13,000 Hz, metal 40-14,000 Hz; S/N (A-wtd) ferric 61 dB Dolby B, 69 dB Dolby C. 16.94" W x 4.75" H x 9.89" D; 9 lb \$230

SCT-100 Double Cassette Deck

Double cassette deck with Dolby B; Dolby C; high-speed dubbing; copies both sides of source tape at once; relay play; soft-touch controls; bias/EQ for normal, high-bias, metal tape; headphone and mic jacks. W&F 0.08% wrms; S/N 73 dB with Dolby C, 61 dB with Dolby B \$230
SCT-74. Similar to SCT-100 except lacks autoreverse and relay play. W&F 0.12% wrms; S/N 70 dB with Dolby C, 60 dB with Dolby B \$180

SCT-43 Dolby B & C Cassette Deck

Features 2 heads; auto music search; 2-color 5-LED peak level meters; soft-touch controls; separate record level controls; tape counter; 0.25" mic and headphone jacks. FR 40-14,000 Hz \pm 3 dB metal \$140

SCT-45 Double Cassette Deck

Features 4 heads; 2 motors; two transports; Dolby B; manual azimuth adjust; elapsed-time counter; mic inputs; headphone jack. W&F 0.1% wrms; FR (\pm 3 dB) ferric 40-12,500 Hz; S/N (A-wtd) ferric 60 dB Dolby B \$130

SCP-25 Autoreverse Cassette Player

Cassette player automatically plays both side of tape. Features Dolby B; fast forward; rewind; EQ selector for ferric, high-bias, and metal tape \$100

TAPE DECKS

SCT-35 Dolby B Cassette Deck

Features 2 heads; L/R record level controls; dual-color peak level meters; auto-stop; tape counter; pause; soft-eject door; bias selector; 0.25" mic and headphone jacks. FR 40-14,000 Hz \pm 3 dB metal and high bias \$80

REVOX

B215 3-Head Cassette Deck

Cassette deck with 3 microprocessors for control of bias, level, EQ, transport, and real-time counter. Features 3 heads; 4 motors; digital storage of bias, level, EQ settings for 6 tape formulations; manual or auto record-level setting; die-cast transport chassis; azimuth-stable pivoting headblock; 2 programmable locate buttons; loop mode; auto start-of-record locate. Counter computes elapsed time. W&F 0.1% wrms; FR ferric 30-18,000 Hz \pm 3 dB \$1,880

ROTEL

RD870 Dolby B/C/HX Pro Cassette Deck

Features sendust rec/play head; precision transport mechanism; 2 heads; 2 motors; bias fine tuning; direct drive; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.05%; FR metal 30-20,000 Hz \pm 3 dB \$499

RD850 Dolby B & C Cassette Deck

Cassette deck with sendust rec/play head, ferrite core erase head. Features soft-touch controls; LED meters; mic inputs; DC servo motors; headphone jack. W&F 0.08% wrms; FR ferric 30-17,000 Hz \pm 3 dB \$219

SAE

C101 Three-Head Cassette Deck

Full-logic microprocessor cassette deck with Dolby calibration adjustments. Features 3 heads; 2 motors; LED meters; Dolby B; Dolby C; bias fine tuning; manual azimuth adjust; elapsed-time counter; remaining-time counter; output level controls; memory stop/play; LED meters; soft-touch controls; sendust heads; remote control optional. W&F 0.06% wrms; FR 20-20,000 Hz \pm 3 dB for all tape types. 19" W x 5.25" H x 12.5" D; 17 lb \$650

C102 Cassette Deck

Full-logic microprocessor cassette deck. Features tape transport encased in electronic sliding drawer; 2 heads; 2 motors; Dolby B; Dolby C; manual azimuth adjust; elapsed-time counter; remaining-time counter; music search; blank skip; memory stop/play; LED meters; rec mute; sendust heads. W&F 0.06% wrms; FR 20-20,000 Hz for all tape types \$429

SANSUI

D-W11 Double Cassette Deck

Double autoreverse cassette deck records on both transports simultaneously. Features Dolby B; Dolby C; relay play; high-speed dubbing; 15-selection programming; separate capstan and reel motors; music search; intro skip; mic/line mixing. S/N > 73 dB over 1,000 Hz with Dolby C and metal tape \$700

D-W10 Double Cassette Deck

Autoreverse high-speed dubbing cassette deck. Features 2 heads and 2 motors for each transport; Compu-Edit; 16-track RMPS; auto fader; rec cancel; intro skip; timer record/play; manual and auto level controls; auto bias/EQ; Dolby B; Dolby C; dual capstans; auto azimuth adjust; elapsed-time counter; music search; blank skip; memory stop/play; LED meters; mic inputs; headphone jack; rec mute; black or silver. W&F

0.05% wrms; FR metal 30-17,000 Hz \pm 3 dB; S/N (A-wid) metal: 73 dB Dolby C \$600

D-95WR Double Cassette Deck

Autoreverse high-speed dubbing cassette deck. Features 2 heads and 2 motors in each transport; normal or double-speed dubbing; Compu-Edit; relay play; 15-track RMPS; rec cancel; program skip; intro skip; auto fader; auto level control; auto Dolby B; Dolby C; auto azimuth adjust; time counter; music search; blank skip; headphone jack; rec mute; black or silver. W&F 0.06% wrms; FR metal 20-17,000 Hz \pm 3 dB; S/N 78 dB Dolby C \$500

D-E750 Double Cassette Deck

Double-speed dubbing cassette deck with Compu-Edit, timer record/play. Operates with Sansui system remote control. Features 2 heads; 2 motors; autoreverse; two transports; auto bias/EQ; Dolby B; Dolby C; dual capstans; blank skip; auto azimuth adjust; music search; memory stop/play. W&F 0.06% wrms; FR metal 20-17,000 Hz \pm 3 dB; S/N (A-wid) metal: 72 dB Dolby C \$500

D-E350. Similar to D-E750 except no autoreverse, Dolby C, and music search. \$240

D-705 Dolby B & C Cassette Deck

Cassette with timer record/play and real-time auto tape monitor. Features 3 heads; 2 motors; bias/EQ; dual capstans; bias fine tuning; blank skip; music search; output level control; LED meters; rec mute. W&F 0.035% wrms; FR metal 20-21,000 Hz \pm 3 dB; S/N (A-wid) metal: 68 dB Dolby B. \$500



Sansui D-W10

D-505R Autoreverse Cassette Deck

Features timer record/play; real-time tape counter; 2 heads; 2 motors; auto bias/EQ; Dolby B; Dolby C; dual capstans; bias fine tuning; blank skip; auto azimuth adjust; music search; output level control; memory stop/play; LED meters; rec mute; headphone jack. W&F 0.45% wrms; FR metal 20-19,000 Hz \pm 3 dB \$425

D-100W Double Cassette Deck

High-speed double cassette deck with full-logic transports; Dolby B; Dolby C; manual level controls; music search. W&F 0.09% wrms; S/N 74 dB with metal tape and Dolby C \$350

D-70CW Double Cassette Deck

High-speed-dubbing cassette deck with timer record/play and relay play. Features 4 heads; 2 motors; two transports; auto bias/EQ; Dolby B; Dolby C; soft-touch controls; rec mute. Can be operated with Sansui Super Compo remote-control system. W&F 0.6% wrms; FR metal 20-17,000 Hz \pm 3 dB; S/N (A-wid) metal: 54 dB Dolby B. \$300

SANYO

RDW89 Double Cassette Deck

Double cassette deck with 3-way programmable quick autoreverse; high-speed synchro dubbing; Dolby B; bias/EQ for normal, high-bias, mic input; dual 5-part LED meters; soft-touch con-

trols; headphone jack; DC servomotor. W&F 0.1% wrms; S/N 57 dB (no NR), 65 dB (Dolby B), both with metal tape \$190

RDW59. Similar to RDW89 but lacks programmable quick autoreverse \$90

RDW41. Similar to RDW59 but has 5-part LED meter for sum of left and right channels \$80

RDW49 Double Cassette Deck

Features Dolby NR; continuous playback; high-speed dubbing; synchro dubbing; metal-tape capability; dual level meters; auto stop; soft-touch transport controls; 3-digit tape counter; headphone jack \$90

RDS29 Cassette Deck

Features soft-touch controls; Dolby NR; permalloy heads; metal-tape capability; 5-segment VU meters; headphone jack; input level controls; 3-digit tape counter \$60

SCOTT

DT686 Double Cassette Deck

High-speed dubbing cassette deck with Dolby B & C. Features 2 heads; 2 motors; 2 transports; music search; LED meters; soft-touch controls; headphone jack; continuous-play function. W&F 0.08% wrms; FR (\pm 3 dB) ferric 30-13,000 Hz high bias 30-14,000 Hz, metal 30-15,000 Hz. S/N (A-wid) ferric 62 dB Dolby B, 70 dB Dolby C \$200

DD656 Double Cassette Deck

High-speed dubbing cassette deck with Dolby B. Features 2 heads; 2 motors; 2 transports; LED meters; soft-touch controls; headphone jack; continuous-play function. W&F 0.15% wrms; FR (\pm 3 dB) ferric 40-13,000 Hz; S/N (A-wid) ferric 61 dB Dolby B \$150

SHARP

RT-6W800(BK) Double Cassette Deck

Autoreverse, high-speed-dubbing cassette with Dolby B NR. Features soft-touch controls; auto program search; LED peak level meters; metal-tape capability; 2 heads; 1 motor; music search; output level control; mic inputs; headphone jack. W&F 0.08% wrms; record/playback FR ferric 40-13,000 Hz \pm 3 dB \$220

RT-W500(BK) Double Cassette Deck

Cassette deck with high-speed synchronous dubbing and continuous playback capability. Features 2 heads, 1 motor; Dolby B; LED peak level meters; headphone jack; mic inputs; metal-tape capability; auto stop. W&F 0.12% wrms; record/playback FR ferric 50-11,000 Hz \pm 3 dB, high bias 50-12,000 Hz \pm 3 dB \$120

RT-115(BK) Dolby B Cassette Deck

Features metal-tape capability; 2 heads; 1 motor; headphone jack; LED peak level meters; auto stop. W&F 0.1% wrms; record/playback FR ferric 50-11,000 Hz \pm 3 dB \$80

SHERWOOD

S-260R Autoreverse Cassette Deck

Cassette deck with 3-mode autoreverse. Features 2 heads; Dolby B; Dolby C; bias fine tuning; music search; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; rec mute; auto music search; permalloy head; function indicators; damped cassette door. W&F 0.08% wrms; FR ferric 25-16,000 Hz \pm 3 dB \$250

S-270 DD Double Cassette Deck

Metal-capable cassette deck with Dolby NR. Features 2 heads; bias fine tuning; 3-digit

TAPE DECKS

counter; LED meters; permalloy head; soft-touch controls; mic inputs; headphone jack; high-speed dubbing; continuous playback; mic mixing; one-touch dubbing; function indicators; damped cassette doors; separate L/R input level controls. W&F 0.10% wrms; FR ferric 30-15,500 Hz \pm 3 dB; S/N (A-wtd.) high bias: 56 dB no NR, 65 dB Dolby B \$230

S-160 Dolby B & C Cassette Deck

Cassette deck with auto music search. Features 2 heads; bias fine tuning; elapsed-tape counter; music search; LED meters; permalloy head; soft-touch controls; mic inputs; headphone jack; rec mute; audio muting; metal tape capable; function indicators; damped cassette door; separate L/R level controls. W&F 0.08% wrms; FR ferric 30-15,500 Hz \pm 3 dB \$200

S-95 Dolby B & C Cassette Deck

Metal-capable cassette deck with 2 heads. Features bias fine tuning; elapsed-tape counter; LED meters; permalloy head; soft-touch controls; mic inputs; headphone jack; function indicators; damped cassette door; separate L/R level controls. W&F 0.08% wrms; FR ferric 30-15,500 Hz \pm 3 dB \$160

SONY

TC-WR950 Double Cassette Deck

Remote-controlled cassette deck with high-speed dubbing; quick autoreverse; Dolby B and Dolby C for both transports; continuous play; rec mute. W&F 0.05% wrms; S/N 72 dB with Dolby C and metal tape \$700

TC-R503 Double Cassette Deck

Double cassette deck with Dolby B; Dolby C; quick autoreverse; Dolby HX Pro headroom extension; auto tape-type selector; music scan; feather-touch controls; headphone jack. W&F 0.05% wrms; S/N 72 dB with Dolby C and metal tape \$500

TC-WR750 Double Cassette Deck

Double autoreverse cassette deck with Dolby B; Dolby C; music search; blank skip; 2 heads; high-speed dubbing; continuous play; optional remote control. W&F 0.07% wrms; S/N 71 dB with Dolby C and metal tape \$400

TC-W550 Double Cassette Deck

Double cassette deck with Dolby B; Dolby C; high-speed dubbing; rec mute; optional remote control; feather-touch controls; auto music sensor. W&F 0.07% wrms; S/N 71 dB with Dolby C and metal tape \$300

TC-R303 Autoreverse Cassette Deck

Autoreverse 2-head cassette deck with Dolby B; Dolby C; feather-touch controls; optional remote control; mic input; headphone jack. W&F 0.07% wrms; S/N 71 dB with Dolby C and metal tape \$240

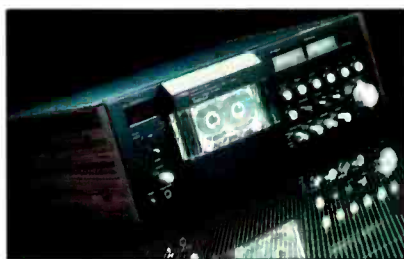
TC-W250 Double Cassette Deck

Double cassette deck with high-speed dubbing; Dolby B; Dolby C; auto tape-type selector on Transport A; soft-touch controls. W&F 0.012% wrms; S/N 70 dB with Dolby C and metal tape \$210

TANDBERG

TCD 3014A Cassette Deck

8-bit, 32K, E-PROM microprocessor-controlled stereo cassette deck with 4 servo-controlled tape-transport motors. Has scan to play, scan to stop, auto rewind, auto replay, timer record/



Tandberg TCD 3014A

play functions. Features 3 heads; Dolby B; Dolby C; azimuth alignment; bias adjustment; rec-current adjustment utilizing built-in test system; linear motor to position heads and pinch-rollers to tape; instant "flying start" record/play; Dyneq record equalization; Actilinear II headroom-extension system; peak-reading meters; cue and review at half speed; real time/real revolution counter; LED indication of all transport functions. Wireless infrared remote control with built-in receiver included. Rosewood side panels or rack mounts \$1,995

TEAC

AD-7 CD Player/Cassette Deck

Combination compact disc player and cassette deck with synchronized recording and remote control. CD section has 15-track programming; 3-beam laser; index search; separate output. Cassette section has autoreverse; Dolby B; Dolby C, and dbx NR; bias fine tuning. \$949 AD-5. Similar to AD-7 but lacks remote control and dbx \$799



Teac V-850X

W-880RX Autoreverse Cassette Deck

Double quick-autoreverse cassette deck with dual-record rotary head system and full IC-logic transport control. Features 2 heads; 2 motors; two transports; auto bias/EQ; Dolby B; Dolby C; blank skip; music search; memory stop/play; LED meters; rec mute; headphone jack; Random Memory Program Dubbing (RMPD); intro check; continuous record/play; parallel recording; 5-band graphic EQ; Automatic Frequency Shift (AFS); decode copy; Intro Check Memory Dubbing (ICMD). W&F 0.05% wrms; FR ferric 25-19,000 Hz \pm 3 dB \$749

R-888X Autoreverse Cassette Deck

Features 4 heads; 3 motors; memory bias/EQ; Dolby B; Dolby C; dbx; dual capstans; bias fine tuning; full IC-logic control; MPX filter; elapsed-time counter; remaining-time counter; music search; blank skip; output level control; memory stop/play; LED meters; headphone jack; rec mute; monitor in both directions; auto tape selector. Remote control optional. W&F 0.029% wrms; FR ferric 25-17,000 Hz \pm 3 dB, high bias 25-19,000 Hz \pm 3 dB, metal 25-20,000 Hz \pm 3 dB \$699

V-850X Dolby B/C/dbx Cassette Deck

Features 3 heads; 3 motors; auto bias/EQ; bias

fine tuning; elapsed-time counter; remaining-time counter; music search; blank skip; output level control; memory stop/play; LED meters; full IC-logic controls; mic inputs; headphone jack; rec mute; remote; auto tape selector; block repeat; auto tape/source switching. W&F 0.03% wrms; FR ferric 25-17,000 Hz \pm 3 dB \$599

W660R Double Autoreverse Cassette Deck

Double quick-autoreverse cassette deck with full IC-logic transport control. Features 2 heads; 3 motors; two transports; RMPD; cobalt amorphous head in deck II; continuous playback; auto bias/EQ; Dolby B; Dolby C; blank skip; music search; LED meters; rec mute; headphone jack. W&F 0.05% wrms; FR ferric 25-18,000 Hz \pm 3 dB \$499

W460-C. Similar to W660R without autoreverse and cobalt amorphous head \$429

D-525C. Similar to W460-C without blank scan and RMPD \$259

R-606X Autoreverse Cassette Deck

Quick-autoreverse cassette deck with rotary head system, full IC-logic transport system, random memory play, intro check, MPX filter, headphone-level control. Features 2 heads; 2 motors; auto bias/EQ; Dolby B; Dolby C; dbx; bias fine tuning; blank skip; elapsed-time counter; music search; memory stop/play; LED meters; mic inputs; rec mute; headphone jack. W&F 0.05% wrms; FR ferric 25-17,000 Hz \pm 3 dB, metal 25-20,000 Hz \pm 3 dB. 17.12" W x 4.75" H x 10.44" D \$479

R-505. Similar to R-606X without dbx, MPX filter, bias fine tuning, random play, headphone level, intro check, and blank skip \$379

V-770 3-Head Cassette Deck

Features full IC-logic tape transport; 2 motors; auto bias/EQ; Dolby B & C; Dolby HX Pro; bias fine tuning; elapsed-time counter; music search; output level control; memory stop/play; LED meters; rec mute; headphone jack; intro check; gold-plated jacks; MPX filter; Compu-matic Program Search (CPS). W&F 0.05% wrms; FR ferric 25-18,000 Hz \pm 3 dB \$469

W-440CGL Dubbing Cassette Deck

Dual transport high-speed dubbing cassette deck with auto tape select. Features 2 heads; 2 motors; Dolby B; Dolby C; LED meters; soft-touch controls; rec mute. W&F 0.06% wrms; FR ferric 25-16,000 Hz \pm 3 dB \$468

V-550X Dolby B/C/dbx Cassette Deck

Full-IC-logic cassette deck with cobalt amorphous head. Features 2 heads; 2 motors; auto bias/EQ; elapsed-time counter; music search; memory stop/play; LED meters; mic inputs; rec mute; headphone jack; MPX filter; intro check; one-touch recording. W&F 0.05% wrms; FR ferric 25-18,000 Hz \pm 3 dB \$429

R-435X Autoreverse Cassette Deck

Cassette deck with rotary head system. Features 2 heads; 1 motor; Dolby B; Dolby C; dbx; output level control; LED meters; soft-touch controls; mic inputs; rec mute; headphone jack. W&F 0.06% wrms; FR ferric 30-16,000 Hz \pm 3 dB. 17.12" W x 4.89" H x 10.75" D \$299

R-425. Similar to above without dbx \$199

V-538X Dolby B/C/dbx Cassette Deck

Features 2 heads; 1 motor; bias fine tuning; output level control; LED meters; soft-touch controls; mic inputs; rec mute; headphone jack. W&F 0.06% wrms; FR ferric 30-15,000 Hz \pm 3 dB. 17.12" W x 4.75" H x 9.16" D \$199

V-437C. As above without dbx \$159

TAPE DECKS

TECHNICS

RS-T80R Double Cassette Deck

Autoreverse double cassette deck records on both transports. Features Dolby B, Dolby C, and dbx NR (can remove dbx encoding when copying encoded tape); auto recording on both sides of both tapes; parallel recording to record on both tapes simultaneously; blank search; mute; auto bias/EQ; sequential playback; blank skip. W&F 0.08% wrms \$600

RS-T55R Double Cassette Deck

Double cassette deck with quick autoreverse for both transports; Dolby B, Dolby C, and dbx NR; high-speed dubbing; auto bias/EQ; synchro start, stop, and rec mute; auto space; anti-resonant metallic feet; edit search on Transport A; soft-touch controls; 28-step digital peak readout \$420

RS-T33R. Similar to RS-T55R except lacks dbx and autoreverse on Transport B \$350

RS-T22. Similar to RS-T33R except lacks synchro stop and rec mute \$225

RS-T11. Similar to RS-T22 except lacks Dolby C and digital peak readout \$195

RS-B29R Autoreverse Cassette Deck

Remote-controlled autoreverse cassette deck with rotary head to minimize azimuth variance between sides; azimuth adjusting screws to set head angle. Features Dolby B; Dolby C; bias and EQ for normal, high-bias, and metal tape; feather-touch controls; music search; auto rec mute; 2-color LED meters; sliding input-level and balance controls; inputs. Black finish. W&F 0.08% wrms \$270

RS-B207 Dolby B/C/dbx Cassette Deck

Cassette deck with Dolby B, Dolby C, dbx NR. Features 12-segment 2-color level meters; electronic tape counter; 1 DC servomotor; headphone jack. W&F 0.08% wrms \$225

RS-B107 Dolby B & C Cassette Deck

Cassette deck with Dolby B; Dolby C; 12-segment 2-color level meters; headphone jack; electronic tape counter. W&F 0.08% wrms \$190

RS-B105 Dolby B Cassette Deck

Slim cassette deck with bias/EQ for normal, high-bias, metal tape; Dolby B; 6-segment meters; mic jacks; soft-touch full-logic controls; headphone jack; timer standby. W&F 0.08% wrms \$145

UHER OF AMERICA

CR 1601 Portable Cassette Deck

Compact front-loading portable cassette recorder with monitor facility featuring 8 hours record time and built-in voice actuating system. Features 3 heads; 2 motors; dual capstans; bias fine tuning; manual azimuth adjust; direct drive; elapsed-time counter; output level control; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; rec mute; 3 tape speeds: 1.88, .94 and .16 ips with ALC. W&F \pm 2% wrms; FR ferric 20-19,000 Hz \pm 3 dB; 9.3" W x 2.3" H x 7.3" D; 5 lb \$1,649

CR-260AV Autoreverse Cassette Deck

Features 3 heads; 1 motor; dual capstans; manual azimuth adjust; elapsed time counter; mic inputs; headphone jack; DIN accessory facility for film dubbing; built-in monitor speaker; built-in mic; switchable auto level control. Operates on dry cells, 12 volt car battery or 120 V AC. W&F 0.24% DIN; FR ferric 30-15,000 Hz \pm 3 dB, high bias 30-16,000 Hz \pm 3 dB; S/N ferric: 63 dB no NR; high bias: 58 dB no NR; line-

input sens for 0-dB reading 600 mV; line output level with 0-dB indication 775 mV; mic input sens 0.2 mV. 23.5" W x 5.9" H x 18.5" D; 6 lb \$1,285

CR-160AV Portable Cassette Deck

Stereo cassette deck with Dolby B and C. Features 2 heads; 1 motor; manual azimuth adjust; mic inputs; headphone jack; ALC with two time constants; sep channel record level control; 3 built-in monitor speakers. Operates on dry cells, 12-V car battery or 120 V AC. W&F 0.2% DIN; FR ferric 30-16,000 Hz \pm 3 dB \$899

VECTOR RESEARCH

VCX-450 Autoreverse Cassette Deck

Cassette deck with multi-skip music search. Features dual capstans; LED meters; Dolby B and C NR; mic inputs; DC servomotor; rec mute; headphone jack; memory stop/play. W&F 0.07%; FR ferric, 20-16,000 Hz \pm 3 dB; high bias, 20-17,000 Hz \pm 3 dB; metal, 20-18,000 Hz \pm 3 dB; S/N metal 55 dB no NR, 65 dB Dolby B, 75 dB Dolby C \$330

VCX-345 Double Cassette Deck

Double cassette deck with high-speed synchro-start dubbing; Dolby B; Dolby C; continuous play; mic inputs; manual level control; bias/EQ for normal, high-bias, and metal tape; headphone jack. W&F 0.08% wrms; S/N 73 dB with Dolby C; FR 40-17,000 Hz \pm 3 dB at -20 dB with metal tape \$250

VCX-325. Similar to VCX-345 except lacks Dolby C and headphone jack. W&F 0.08% wrms; S/N 63 dB with Dolby B; FR 40-15,000 Hz \pm 3 dB at -20 dB with metal tape \$150

VCX-250 Dolby B & C Cassette Deck

Power-assisted 1-motor cassette deck with music search. Features mic inputs; DC servomotor; rec mute; headphone jack. W&F 0.06%; FR ferric, 30-15,000 Hz \pm 3 dB; high bias, 30-16,000 Hz \pm 3 dB; metal, 30-17,000 Hz \pm 3 dB; S/N metal 55 dB no NR, 65 dB Dolby B, 75 dB Dolby C \$200

YAMAHA

KX-1200U 3-Head Cassette Deck

3-head cassette deck with closed-loop dual-capstan transport; 28-key remote control; nonmagnetic amorphous heads; FET input; Dolby B, Dolby C, dbx; auto bias/EQ, with individual bias setting for each tape; Dolby HX Pro; 2-speed fast wind; fader; repeat; remaining-time counter; output-level control; 20-segment level meter; full-logic controls; auto rec mute; return; music search; intro scan; memory stop and scan; timer standby. W&F <0.03%; S/N 61 dB no NR, 69 dB Dolby B, 77 dB Dolby C, 95 dbx; FR (with metal tape at -20 dB), 20-24,000 Hz \pm 3 dB; THD <0.8% \$699



Yamaha K-720B

K-720B Autoreverse Cassette Deck

Features 2 + 1 motor transport with independent capstan drive and independent head-rotation motor; dbx, Dolby B, Dolby C NR; Dolby HX Pro; wide-range multi-function fluorescent level meters with optimum record level indication; rec return; auto rec mute; auto tape selector; remaining-time display with auto fade

out/fade in; 15-selection programmable recording/random-access playback; 2-way repeat; memory stop; intro scan; music search; blank skip; auto source change; timer rec/play; output level control. RS-15 remote control optional. W&F 0.04% wrms; FR 30-20,000 Hz \pm 3 dB metal; S/N 90 dB dbx. 11.4 lb \$499

K-740 Dolby B/C/HX Pro Cassette Deck

Full-logic cassette deck with Dolby HX Pro, Dolby B, and Dolby C; amorphous heads; car EQ; rec return; auto rec mute; remote controlled through Yamaha RS amps or with optional RS-KW5; 2 motors; auto bias/EQ; auto fader; blank skip; timer standby. W&F <0.08% wrms; S/N >59 dB no NR, >67 with Dolby B, >75 db with Dolby C; FR at 20-20,000 Hz \pm 3 dB at -20 dB \$419

KX-W500U Double Cassette Deck

Double autoreverse cassette deck with Dolby B and Dolby C; remote controlled through Yamaha RS amps or with optional RS-KW5 remote control; permalloy heads; auto tape selector; rec return; auto rec mute; 24-hour play; 2-color, 6-segment level meters; timer standby; music search. W&F <0.08%; S/N 72 db with Dolby C \$389

KX-400U. Similar to KX-W500U except single transport; Dolby HX Pro; intro scan; blank skip; auto fader. W&F <0.06% \$299

KX-200U. Similar to KX-400U except lacks autoreverse and Dolby HX Pro. Same specs at KX-W500U \$209

K-540B Dolby B & C Cassette Deck

Features full-logic operation; low-imp sendust rec/play heads; Dolby HX Pro; bidirectional intro scan; LED peak level meter; 4-digit linear counter; 2 DC servo, 1 DC motor; dual-speed FF/rew; master fader; MPX filter switch; rec return; auto rec mute; auto tape selector; full/0-M repeat; memory stop; music search; headphone level control; auto source change. W&F 0.05% wrms; FR 25-20,000 Hz \pm 3 dB metal; S/N 74 dB Dolby C. 17.12" W x 4.62" H x 10.75" D; 9.7 lb \$339

K-222B High-Speed Dubbing Cassette Deck

Features full-logic operation; high-/normal-speed one-touch dubbing; Dolby B & C; LED peak level meter; relay play; music search; rec return; auto rec; auto tape selector; timer rec/play. W&F 0.008% wrms; FR 30-16,000 Hz \pm 3 dB metal; S/N 74 dB Dolby C. 17.12" W x 4.36" H x 10.75" D; 10.6 lb \$319

K-340B Dolby B & C Cassette Deck

Features full-logic operation; low-imp sendust rec/play heads; Dolby HX Pro; intro scan; LED peak level meter; 2-motor transport; music search; full A/B repeat; rec return; auto rec mute; auto tape selector; timer rec/play; auto source change. W&F 0.05% wrms; FR 30-20,000 Hz \pm 3 dB metal; S/N 74 dB Dolby C. 17.12" W x 4.36" H x 10.75" D; 9.2 lb \$259

K-142B Dolby B Double Cassette Deck

Features relay play; permalloy rec/play heads; LED peak level meter; cue/review; auto tape selector; timer rec/play. W&F 0.08% wrms; FR 30-16,000 Hz \pm 3 dB metal; S/N 66 dB. 17.12" W x 5" H x 8.8" D; 8.8 lb \$239

K-140B Dolby B Cassette Deck

Features hard-permalloy rec/play head; LED peak level meter; 2-motor transport; cue/review; timer rec/play. W&F 0.08% wrms; FR 30-15,000 Hz \pm 3 dB metal; S/N 65 dB. 17.12" W x 5" H x 8.88" D; 7.7 lb \$179

MOZART

THE BASIC REPERTOIRE ON COMPACT DISC

BY RICHARD FREED



PHILIPS CLASSICS

Neville Marriner provides eloquent accompaniment for Alfred Brendel in Mozart's piano concertos.

THE basic Mozart—that is, the basic orchestral works—are surely some of the basic basics. They are among the works most frequently played in the concert hall and the most frequently recorded. They have also been best-sellers during the LP years and, entering the catalog now on compact discs either as revivals of earlier recordings or as new recordings altogether, they are bound to be best-sellers on CD too.

My recommendations of the CD versions of these basic works are based on both musical and sonic considerations. Secondary considerations include adequacy in labeling, the convenience of accessing subsections of the longer works, and value in terms of playing time. Maximum capacity being a bit more than seventy-four minutes, CD's offering less than forty-five or fifty minutes are not good value—though some, of course, may be of outstanding musical value.

◆ **MOZART: Clarinet Concerto in A Major.** Antony Pay, playing a basset clarinet specially made for him, with Christopher Hogwood conducting the Academy of Ancient Music, is the clear choice here. The companion work is

Mozart's Oboe Concerto, with Michel Piguet playing a 1783 instrument (L'Oiseau-Lyre 414 339-2).

◆ **MOZART: Piano Concerto No. 20, in D Minor.** Rudolf Serkin, with Claudio Abbado conducting, is remarkably persuasive (DG 400 068-2). Clara Haskil, with Igor Markevitch conducting, is perhaps even more eloquent, but the sound of her oldish recording is a bit cramped (Philips 412 254-2). Alfred Brendel, with Neville Marriner and the Academy of St. Martin-in-the-Fields, is excellent, but so far his recording of No. 20 comes only in his specially priced set of all the concertos on ten CD's (Philips 412 856-2).

◆ **MOZART: Piano Concerto No. 21, in C Major.** Brendel, with Marriner conducting, is all-surpassing in this work, giving us a landmark entry for the Mozart concerto discography, coupled with the Concerto No. 15 in B-flat (Philips 400 018-2) or in the big box.

◆ **MOZART: Piano Concerto No. 23, in A Major.** Vladimir Ashkenazy, in the dual role of soloist and conductor, is at his best in this work, and the coupling is a convenient one, No. 27 (London 400 087-2).

◆ **MOZART: Piano Concerto No. 24, in C Minor.** Haskil and Markevitch are as eloquent in this work as in the other minor-key concerto with which it shares

a CD (see No. 20 above). Of the later recordings, both Ashkenazy's (London 414 433-2) and Brendel's (in the big box) are eminently satisfying.

◆ **MOZART: Piano Concerto No. 27, in B-flat Major.** Ashkenazy's affectionate, communicative performance is coupled with his fine one of No. 23 (see above). Brendel's version, another strong argument for the box, is also available in a mid-price coupling with No. 23 (Philips 420 487-2).

◆ **MOZART: Violin Concerto No. 5, in A Major.** The late Arthur Grumiaux's matchless elegance, with Colin Davis conducting, has been beautifully preserved in a very successful CD transfer (Philips 412 250-2). Anne-Sophie Mutter's debut recording, with Herbert von Karajan, is perhaps the most appealing runner-up (DG 415 327-2). Among newer recordings, I can recommend the one by Itzhak Perlman and James Levine, with the same coupling as Grumiaux's and Mutter's, the Violin Concerto No. 3, in G Major (DG 410 020-2), or as part of their three-disc set of all the Mozart concertos (DG 419 184-2).

◆ **MOZART: Serenade in G Major ("Eine kleine Nachtmusik").** Among all-Mozart packages, the Orpheus Chamber Orchestra's straightforward, vigorous approach wears well in this piece and two seldom-heard charmers (DG 419 192-2), Raymond Leppard is

more expansive in a more substantial program (Erato ECD-88014), and Christopher Hogwood conducts an enlivening original-instruments version, with a replacement for the lost minuet and the delightful Serenades Nos. 6 and 8 (L'Oiseau-Lyre 411 720-2). Karajan's big-orchestra version is surprisingly warmhearted, with works by Grieg and Prokofiev (DG 400 034-2). Among the recordings by small ensembles, the one by the Philharmonia Quartet of Berlin is most appealing, both in its own right and for the companion works, the Horn Quintet and the *Musical Joke* (Denon C37-7229).

◆ **MOZART: *Sinfonia Concertante in E-flat Major for Violin and Viola*.** Yet another of those happy instances where all available versions are good enough to allow a choice to be made on the basis of the preferred coupling or performers. The best *sounding*, surely, is the recording by violinist Jean-Jacques Kantorow, violist Vladimir Mendelssohn, and the Netherlands Chamber Orchestra under Leopold Hager (Denon C37-7507). I like the one by Pierre Amoyal (violin) and Gérard Caussé (viola) with the Lausanne Chamber Orchestra under Armin Jordan because it is coupled with a very bright-sounding performance of the *Sinfonia Concertante* for wind quartet (Erato ECD 88113). Itzhak Perlman and Pinchas Zukerman, though, with Mehta and the Israel Philharmonic (DG 415 486-2), bring a greater sense of individuality to the E-flat *Sinfonia*, as do Stern and Zukerman with Mehta and the New York Philharmonic (CBS MK 36692).



Colin Davis is at his best in the *Symphonies Nos. 39 and 41*.



CHRISTINA BURTON/ANGEL RECORDS

Jeffrey Tate's appealing *Haffner Symphony* is handsomely recorded and is joined on a well-filled CD by the *Symphonies Nos. 32 and 39*.

◆ **MOZART: *Symphony No. 35, in D Major ("Haffner")*.** Leonard Bernstein (DG 415 305-2) and Bruno Walter (CBS MK 42026) give large-scaled, warmhearted, endearing performances in the same general style, yet each with an individual stamp. Jeffrey Tate's is also especially appealing, and there are two additional Mozart symphonies, Nos. 32 and 39, on his handsomely recorded disc (Angel CDC-47327).

◆ **MOZART: *Symphony No. 36, in C Major ("Linz")*.** Bernstein and the Vienna Philharmonic have something special going in their recording of this work, the clear choice at present (DG 415 962-2).

◆ **MOZART: *Symphony No. 38, in D Major ("Prague")*.** Bernstein's *Prague* is almost as special as the *Linz* with which it is paired (see above). Herbert Blomstedt and the Dresden State Orchestra give a noble, poised performance that's splendidly recorded and paired with *Symphony No. 39* (Denon C37-7146). Karl Böhm and the Vienna Philharmonic are strong here too (DG 413 735-2), and Hogwood brings a great deal of freshness to his original-instruments version with the Academy of Ancient Music (L'Oiseau-Lyre 410 233-2).

MOZART: *Symphony No. 39, in E-flat Major*. Blomstedt is as satisfying here as in No. 38. Sir Colin Davis, with the same Dresden orchestra, gives perhaps the finest Mozart performance he has yet recorded, paired with a strong *Jupiter* (Philips 410 046-2), and Böhm is still in the running with his majestic, traditional version (with No. 38, as above).

MOZART: *Symphony No. 40, in G Minor*. Both Sir Charles Mackerras and Christopher Hogwood favor the original version (without clarinets) and take *all* repeats. Mackerras's performances of this work and the *Jupiter*, with the Prague Chamber Orchestra, are exceptionally inspiring, with really zippy minuets (Telarc CD-80139). Hogwood, with original instruments, is a bit more expansive but similarly crisp and dramatic, with the *Paris Symphony*, No. 31, filling out his disc (L'Oiseau-Lyre 410 197-2). Among the large-orchestra versions, Blomstedt's offers exemplary clarity and balance (Denon C37-7022), but Bernstein's is more dramatic (DG 413 776-2).

◆ **MOZART: *Symphony No. 41, in C Major ("Jupiter")*.** Bernstein's powerful, heroically scaled *Jupiter* comes with his endearing *Haffner* (DG 415 305-2). Böhm always showed special authority in this work, and his final recording of it is one of the best (DG 413 547-2). Blomstedt (Denon C37-7022) and Davis (Philips 410 046-2) share a leaner, more Classical approach and benefit from outstanding sound, as do Mackerras (see No. 40) and Hogwood, who again offers an ingratiating earlier symphony as coupling, No. 34 (L'Oiseau-Lyre 411 658-2). □

Richard Freed's "*The Basic Repertoire on Compact Disc*" for 1987 has recently been updated. To order the complete pamphlet, send a stamped (39¢), self-addressed business-sized (No. 10) envelope and a check for \$1.50 (payable to Stereo Review) to *Basic Repertoire*, Stereo Review, 1515 Broadway, New York, NY 10036.

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BEST RECORDINGS OF THE MONTH

Stereo Review's critics choose the outstanding current releases

GARDINER'S MAGNIFICENT BACH PASSION

RIGHT from the start of John Eliot Gardiner's new Archiv recording of Bach's *St. John Passion*, particularly in the instrumental build-up to the first choral entrance, you know that you are in for a magnificent performance. Having mastered the dramatic requirements of Handelian opera, in which relatively contemplative recitatives lead up to the emotional outbursts of the arias, Gardiner here shows his equal mastery of the very different pacing needed for the Bach Passions.

The weight of this drama of Christ's Passion as told by St. John rests, as it should, on the recitatives themselves. The arias, sung by different soloists, are withdrawn from the emotions of the recitatives, seeming to contemplate rather than to express them. The choral passages are conceived the same way, and the Monteverdi Choir makes a nice distinction between its emotionally charged, mob-like outbursts in the recitatives and the utter simplicity and directness of the chorales.

Tenor Anthony Rolfe Johnson, as the Evangelist, shapes his narration exceedingly well. Beginning quietly, as if he were just reading from the Biblical text, he gradually becomes more and more involved in the story. He draws us into his grief over the betrayal of Jesus as well as his outrage when Barabbas is freed and Pilate orders Jesus to be scourged. After the brutality of the crucifixion and death of Jesus, Johnson recaptures the quietness of the opening in recounting the burial and conveys the degree of the Evangelist's involvement by the seeming fatigue in his delivery of the final passages.

Basses Stephen Varcoe and Cornelius Hauptmann, as Jesus and Pi-

late, respectively, perfectly dramatize the conflict between those contrasting personalities. And the chorus's razor-sharp cries convey the vacillation of the angry mob while menacing swirls of sound produced by the period winds and strings reinforce its brute reactions.

One of the most revealing aspects of this performance is the interplay between the period instruments of Gardiner's English Baroque Soloists and the vocalists. In the arias, singer and instrumental obbligato often achieve a near-perfect blend, most tellingly in the alto aria "*Es ist vollbracht!*," in which Michael Chance, a superb countertenor with a beautiful voice and brilliant technique, exactly matches the timbre of the viola da gamba. They perform the aria as though they were one.

In other arias, two violas d'amore and a lute weave their haunting sonorities against first a bass and then a tenor voice, or two breathy flutes join an equally breathy soprano, or flute and oboe da caccia accompany a sharper, more focused soprano. Bach carefully chose the instruments to accompany each aria, and

Gardiner has chosen the soloists that best match them. The arias in this performance enter the most eloquent plea ever made on records for the use of period instruments and Baroque vocal styles, and thanks to the careful engineering, every musical subtlety has been faithfully captured. Spare no effort in adding this recording to your collection.

Stoddard Lincoln

BACH: *St. John Passion*. Anthony Rolfe Johnson (tenor), Evangelist; Stephen Varcoe (bass), Jesus; Cornelius Hauptmann (bass), Pilate; Nancy Argenta, Ruth Holton (soprano); Michael Chance (countertenor); Neill Archer, Rufus Müller (tenor). Monteverdi Choir; English Baroque Soloists, John Eliot Gardiner cond. ARCHIV/DEUTSCHE GRAMMOPHON ● 419 324-1 two LP's \$19.96, © 419 324-4 two cassettes \$19.96, © 419 324-2 two CD's no list price.

CROWDED HOUSE: CONFRONTATION AS SPORT

TEN years from now, Casey Kasem will be playing *Don't Dream It's Over* on the weekend oldies countdown. We'll hum along with Neil Finn's memorable chorus, and the Split Enz will be the answer to the show's trivia question. Crowded House, Finn's new band, has two things that Split Enz, Finn's old band, didn't have: luck, and Mitchell Froom as a producer. The luck came in the form of *Don't Dream's* chart success; after all, Finn must have written a hundred other equally worthy songs over the years, all of which disappeared upon release.

You can't buy luck, but you can buy a sympathetic producer, which is exactly what Crowded House did. Froom took Finn's bright, slightly eccentric pop sound, which some call New Zealand's answer to the Beatles, mixed in a little chaos—the sliding calliope organ of *Mean to Me*, the screeching guitar and howling vocal of *Love You 'Til the Day I Die*—and turned the band from nice, "Rubber Soul" pop to edgy, "White Album" hysterics.



Conductor John Eliot Gardiner

BEST RECORDINGS OF THE MONTH



MICHELE NATZ/RETINA LTD.

Nicholas Seymour, Neil Finn, and Paul Hester of Crowded House

Finn's songs are still energetic and tuneful. But there's a twist: beneath that cheery surface lurks an angst-ridden, somewhat sinister mind. The "Crowded House" album, in fact, is about confrontation—confrontation as the easiest way to get out of a confining relationship and confrontation as good, plain sport. Most people go out of their way to avoid conflict. Not Finn. When he and his lover realize their relationship has gone stale, Finn sings of the ensuing battle and heartache, "Now we're getting somewhere." *Don't Dream It's Over* is deliberately ambiguous—does Finn mean "We'll always be together" or "Take a hike"? In *Mean to Me*, a harmless question over dinner gets an oddly hostile reply: "You asked me what I was thinking/I was thinking of a padded cell/With a black-and-white TV/To stop us from getting lonely." Sorry I asked.

Finn can't even write a song with a title like *Love You 'Til the Day I Die* without getting weird: "There are closets in my head where dirty things are kept . . . I want to drag them out, just to see the look on your face." And in the oddest definition of the month, Finn sings, "Feeling devastated, tired and deflated, that's what I call love." To make matters worse, it all makes perfect sense. Recommended.

Mark Peel

CROWDED HOUSE. Neil Finn (guitar, piano, lead vocals); Nicholas Seymour (bass); Paul Hester (drums,

backing vocals). *World Where You Live; Now We're Getting Somewhere; Don't Dream It's Over; Mean to Me; Love You 'Til the Day I Die; Something So Strong; Hole in the River; I Walk Away; Tombstone; That's What I Call Love.* CAPITOL ST-12485 \$8.98, © 4XT-12485 \$8.98, © CDP-46693 no list price.

MARGARET PRICE SINGS LISZT GEMS

RECORDED consequences of last year's Liszt centennial observances continue to show up—mostly, as expected, in the realm of piano music, but with a good deal of orchestral material and some of the major choral works as well. The category most conspicuously neglected has been Liszt's songs. This neglect is now redressed in part by a bewitching recital recorded for Teldec by the exquisite soprano Margaret Price, with no less a Lisztian than Cyprien Katsaris as her splendid keyboard associate.

It is hard to resist superlatives in speaking of Price in any context. At seventy-two minutes plus, her generously filled CD is the equivalent of a full recital program, and there is no hyperbole in saying that every one of the seventeen items is a gem. First of all, there is the program itself, a remarkably rich selection of

Liszt's finest works in this category. Among them are the three settings of Petrarch sonnets, actually the original versions of what became the *Sonetti di Petrarca* for piano solo; the expansive setting of Mignon's "*Kennst du das Land*," from Goethe's *Wilhelm Meister*; all three intriguingly contrasting versions of "*Freudvoll und leidvoll*"; and another original version of one of Liszt's best-known piano pieces, the setting of Freiligrath's "*O lieb, so lang du lieben kannst*," which was later transformed into the *Liebestraum* No. 3.

Price makes each of the songs in turn seem more remarkable than the last, and each in turn sounds as if it must be the most cherished single piece in her repertoire. She is able to lose herself in the songs, and anyone with working ears, I would think, will respond in kind—not so much filled with admiration for the singer or the pianist or the fine team they make, but simply enthralled by the wonderful music that remains even now so little known to the vast majority of even "serious" listeners. The recording itself is just fine, and full texts and translations are included.

Richard Freed

LISZT: Songs. *Mignons Lied; Hohe Liebe; Gestorben war ich; O lieb; Die stille Wasserrose; Wie singt die Lerche schön; Kling leise, mein Lied; Es muss ein Wunderbares sein; Die Loreley; Über allen Gipfeln ist Ruh; Freudvoll und leidvoll (three versions); La Tombe et la rose; Drei Petrarca-Sonette.* Margaret Price (soprano); Cyprien Katsaris (piano). TELDEC © 8.43342 no list price.



Cyprien Katsaris, Margaret Price

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BEST RECORDINGS OF THE MONTH

GREG GORMAN/WARNER BROS.



Fleetwood Mac: after half a decade of silence, a triumphant return

“TANGO IN THE NIGHT” WITH FLEETWOOD MAC

THEY'RE back! No, not the malevolent ghosts of *Pottergeist II* but Fleetwood Mac, the thinking person's multi-Platinum rock band. With the brand-new “Tango in the Night,” Fleetwood Mac has returned to the pop wars after an absence of five years. The question before the court is, What do they sound like after almost half a decade of silence?

Answer: the way they always sounded—like no one else in pop music at the moment. And the lion's share of the credit for it must go to Lindsey Buckingham, who wrote most of the album's best material and co-produced all of it. Buckingham is that rarest of rare birds in rock, an accessible eccentric, and while his work on “Tango” does not come near his almost dangerously off-the-wall solo albums, he remains as unpredictable as ever. Frankly, there are enough toy pianos and synthesized zithers decorating the tunes in “Tango” to confound just about anybody.

True, there are some clinkers here, emanating, to no one's surprise, from the direction of the band's one-woman airhead contingent, Stevie Nicks. In the past, Buckingham has been able to dress up Nicks's undergraduate mewlings enough to make them likable sonic wallpaper, but for “Tango” he seems to have been unable, or per-

haps just unwilling, to provide a similar service.

Fortunately, and perhaps by way of compensation, Buckingham seems to bring out the best in the Mac's other principal writer, Christine McVie. McVie's voice, of course, remains one of the most haunting of the age, but Buckingham has loosened up her songcraft. *Everywhere*, for example, might have been merely another of her sublime little love songs, but Buckingham has dressed it up to be almost cinematic in its grandeur. Their closing collaboration, *You and I, Part II*, is a little triumph, an unlikely bit of silliness that actually suggests a cross between Brian Wilson's “Pet Sounds” and Leroy Anderson's *The Syncopated Clock*.

Add to all this some genuinely spooky stuff that verges on actual rock-and-roll—the insidiously tribal *Big Love*, in which Nicks partially redeems herself with some of the most convincing heavy breathing I've heard in years, or the title song, with an instrumental break that achieves an almost Led-Zep-like impact—and what you have is, if hardly a masterpiece, at least some of the most elegant and sonically seductive fluff of 1987. Welcome back, Mac. *Steve Simels*

FLEETWOOD MAC: *Tango in the Night*. Fleetwood Mac (vocals and instrumentals). *Big Love*; *Seven Wonders*; *Everywhere*; *Caroline*; *Tango in the Night*; *Mystified*; *Little Lies*; *Family Man*; *Welcome to the Room* . . . Sara; *Isn't It Midnight*; *When I See You Again*; *You and I, Part II*. WARNER BROS. 25471-1 \$9.98, © 25471-4 \$9.98, © 25471-2 no list price.

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- DWIGHT YOAKAM:** *Guitars, Cadillacs, Etc., Etc.* REPRISE 25372-2. “Rising star” (July 1986).

CLASSICAL

- BRITTEN:** *Spring Symphony*; *Peter Grimes*; *Four Sea Interludes*. Previn. ANGEL CDC-47667. “Superb” (Best of Month, September 1979).
- GLUCK:** *Alceste*. Norman, Gedda; Baudo. ORFEO C 027823 (three CD's). “Dignified and well prepared” (August 1983).
- LISZT:** *Piano Sonata in B Minor*; *Ballade in B Minor*; *Consolation No. 3*; *Mephisto Waltz No. 1*. Horowitz. RCA 5935-2-RC. Tops for “simple, poetic fantasy and depth of feeling” (May 1978).
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- PUCCINI:** *Madama Butterfly*. Scotto, Domingo; Maazel. CBS M2K 35181 (two CD's). “An absolute triumph” (December 1978).
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*Discs and tapes reviewed by
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GREGORY ABBOTT: *Shake You Down.* Gregory Abbott (vocals, keyboards); vocal and instrumental accompaniment. *I Got the Feelin' (It's Over); Say You Will; Shake You Down; You're My Angel;* and four others. COLUMBIA BFC 40437, © BCT 40437, © CK 40437, no list price.

Performance: *Sweetly romantic*
Recording: *Excellent*

As the latest arrival among the pretty boys of pop, Gregory Abbott might be dismissed as a sort of Philip Michael Thomas with brains—he has degrees from more than one university and formerly taught at Berkeley—but close listening to his hit album, "Shake You Down," reveals an attractive musical personality. This is his set all the way, since he wrote all the songs and arrangements, served as producer, and played keyboards while doing the lead vocals. It's a very impressive achievement, indicating depth as well as polish.

Basically, Abbott is a romantic singer who delivers his lyrics with fine articulation and gives Smokey Robinson a run for his money in the ultra-high range. Most of the songs here have a light, airy quality and moderate pacing suited to both listening and close dancing. Abbott deviates from this pattern on *Rhyme and Reason*, which is laced with Caribbean cadences, hinting at a broader scope to his talents. But for the time being, his sweet balladry is perfectly fine. *P.G.*

LOU ANN BARTON: *Forbidden Tones.* Lou Ann Barton (vocals); Jerry Marotta (drums); Jimmie Vaughan (guitar); other musicians. *Tear Me Apart; Speechless; Camero Girls; Every Little Thing; Pink Bedroom;* and three others. SPINDLETOP/ROUNDER SPT 107 \$8.98.

Performance: *Impressive*
Recording: *Good*

Lou Ann Barton is one of those whiskey-voiced blues belters that a certain generation of musicians gets all moony over from time to time. Back in 1982, a couple of Big Names—legendary producer Jerry Wexler, ex-Eagle Glenn

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DWIGHT YOAKAM

AFTER all the praise honky-tonk man Dwight Yoakam got for his debut in "Guitars, Cadillac, Etc., Etc.," he had his work cut out for him with his second album. Hailed as a messiah for true hillbilly music—as well as a Pied Piper for the punk audience that reveres country-fusion bands like Lone Justice and the Beat Farmers—Yoakam had to prove the seriousness of his intent and the progress of his vision.

In addition, when that first album was released, the twenty-nine-year-old Yoakam had arrived with a carefully choreographed image and a bodacious ad campaign that almost overshadowed his desire to reach the heart of root country music. To complicate things, his vocal breaks and flourishes occasionally seemed too mannered, too posed, and too self-consciously derivative of Hank Williams.

With his new "Hillbilly Deluxe," however, Yoakam should manage both to thrill his following and to calm the nerves of those who liked what they originally heard but feared Yoakam was just a trendy Rhinestone Cowboy—more concerned with flash and *faux* Nudie suits than substance. Certainly the carefully orchestrated strokes are still here—the tributes to Buck Owens (especially in Yoakam's own *Little Ways*), the inclusion of a bankable classic (Lefty Frizzell's *Always Late with Your Kisses*), and a reworking of Elvis Presley's *Little Sister* that puts a shiny edge (and a radio-ready sheen) on his more traditional material. But, overall, "Hillbilly Deluxe" proves that accompanying Yoakam's pretty face is a heart that's country bred and country pure.

Ironically, Yoakam accomplishes this with fewer autobiographical songs than he had on his first album, leaning instead on dedication to the structure of the traditional sound and on his innate

sense of clear country code and sensibility. A native of Pikeville, Kentucky, Yoakam combines all of those strengths on *Readin', Rightin', Rt. 23*, a song based on a saying, which Yoakam says circulates in his adopted Columbus, Ohio, that makes fun of Kentucky hillbillies who find their way north. It captures the sad oppression of some rural people far better than the sentimentalized portraits in Yoakam's debut.

Happily, however, a couple of the strong suits of that first album reappear here—Pete Anderson's sparkling but spare production and the precise, confident musicianship of Yoakam's four-piece band, the Babylonian Cowboys. Led by Anderson's snappy, virtuoso guitar and sweetened by Brantley Kearns's fluid fiddle, this is the type of band that singers dream of—and, to be sure, it accounts for a large part of Yoakam's appeal and authenticity.

Aside from being simply a solid album, however, "Hillbilly Deluxe" is one of a handful of albums that signal the gathering strength of country's "New Traditionalism" and a way out of the post-"Urban Cowboy" slump. The last time Nashville got news this good, Andrew Jackson was thinking of going into politics. *Alanna Nash*

DWIGHT YOAKAM: *Hillbilly Deluxe.* Dwight Yoakam (vocals, acoustic guitar); Pete Anderson (electric guitar, six-string bass); J. D. Foster (electric bass); Jeff Donovan (drums); Brantley Kearns (fiddle, background vocals); Herb Pedersen (background vocals); vocal and instrumental accompaniment. *Little Ways; Smoke Along the Track; Johnson's Love; Please, Please Baby; Readin', Rightin', Rt. 23; Always Late with Your Kisses; 1,000 Miles; Throughout All Time; Little Sister; This Drinkin' Will Kill Me.* REPRIS 25567-1 \$8.98. © 25567-4 \$8.98, © 25567-2 no list price.



Chris Isaak: compelling, beautifully crafted performances

Frey—had a hand in her debut album on Asylum. Hype-guns a-blazing, they tried to do a "Dusty in Memphis," White Girl at Muscle Shoals, all-purpose r-&-b hat trick. Unfortunately, all they produced was some lackluster bar-band blues, and a chastened Barton returned to her native Texas.

In "Forbidden Tones," however, Barton was her own producer, and she's done it right. Backed by a crack bunch of sympathetic musicians (Fabulous Thunderbird Jimmie Vaughan, for example), she's come up with a first-rate, slightly bluesier version of Marti Jones's recent, similarly excellent "Match Game." Barton sings the very pants off a nicely chosen set of top-drawer pop and soul tunes, including one of the better Beatles covers in memory (*Every Little Thing*) and extremely strong versions of John Hiatt's *Pink Bedroom* and Mink DeVille's *One Good Reason*. A nice job, and an album worth looking for. S.S.

CROWDED HOUSE (see Best of the Month, page 81)

FLEETWOOD MAC: *Tango in the Night* (see Best of the Month, page 84)

THE JIMI HENDRIX EXPERIENCE: *Live at Winterland*. Jimi Hendrix (guitar, vocals); Mitch Mitchell

(drums); Noel Redding, Jack Casady (bass). *Prologue; Fire; Manic Depression; Sunshine of Your Love; Spanish Castle Magic*; and eight others. RYKO © RCD 20038 no list price.

Performance: *Brash*
Recording: *Surprisingly good*

Unlike most of the posthumous Jimi Hendrix albums produced by Alan Douglas, "Live at Winterland" is actually worth owning. A forgotten 1968 concert recording that had been moldering in the vaults, the set features the Experience just before boredom, personality clashes, and drug abuse snuffed out the collective fire. The music really sounds like they meant it.

In retrospect, you can't help but notice that Mitch Mitchell was a pretty slovenly drummer, but Hendrix himself was in exceptional form (his work on *Killing Floor* will doubtless leave most of today's guitarists scratching their heads in amazement), and the digitally refurbished recording is wonderfully vivid. As a document of the band in concert, I'd still give a slight edge to the "Live at Monterey" set—it was their American debut, when they really had something to prove—but if you're looking for live Hendrix on CD, you can't go wrong with this one. S.S.

CHRIS ISAAK. Chris Isaak (guitar, vocals); James Calvin Wilsey (guitar);

Kenny Dale Johnson (drums); Rowland Salley (bass). *You Owe Me Some Kind of Love; Heart Full of Soul; Blue Hotel; Lie to Me; Fade Away; Wild Love; This Love Will Last*; and four others. WARNER BROS. 25536-1 \$8.98, © 25536-4 \$8.98, © 25536-2 no list price.

Performance: *Intense*
Recording: *Excellent*

Chris Isaak, whose 1985 debut, "Silver-tone," is rumored to be among the worst-selling albums in Warner Bros.' history, is an artsy-looking guy with a Fifties complex and, as it turns out, quite a lot of talent. I was one of the many who missed "Silver-tone," but his new album certainly suggests why Warners gave him another shot: the guy's a remarkably compelling performer. A collection of edgy love songs that suggest the emotional universe encountered on old Roy Orbison records, it's a beautifully crafted re-creation of the emotional paranoia underlying a lot of genuine rockabilly.

Isaak sings his way through it all with a choked intensity that never once lapses into the theatrical—kind of like Bryan Ferry if he'd ever had a genuine feeling. Add in the sensational stripped-down-yet-powerful production by Erik Jacobsen (the Sixties veteran who used to do the Lovin' Spoonful) and the understated and eloquent playing by Isaak's band, and what you get is one of the more interesting left-field albums of 1987. Picks to click: a very smart neo-country remake of the Yardbirds' *Heart Full of Soul* and Isaak's own swirling and hypnotic *Fade Away*. Recommended. S.S.




JASON AND THE SCORCHERS: *Still Standing*. Jason and the Scorchers (vocals and instrumentals); Jai Winding (organ); other musicians. *Golden Ball and Chain; Crashin' Down; Shotgun Blues; Good Things Come to Those Who Wait*; and five others. EMI AMERICA ST-17219 \$8.98, © 4XT-17219 \$8.98.

Performance: *Partial knockout*
Recording: *Terrific*

The Scorchers' debut EP, with its near-miraculous blend of Gram Parsons country soul and Who-style dynamics, was one of the major mind-bogglers of the early Eighties, but many of us who became instant fans were disappointed by the band's follow-up, a fairly anonymous piece of blustery arena-rock. "Still Standing" is, by and large, a return to something approaching their original form. Not that there haven't been some changes. The more overt Southern gothicisms are gone, and lead singer Jason Ringenberg—known for his inimitable yowling-cat vocals—seems to be running out of things to write about. The otherwise quite rousing *Golden Ball and Chain*, for example, is a thinly veiled diatribe on the record business, a sure sign of declining inspiration. Most of

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THE BREAKFAST CLUB

YOU'D think a band must either be arrogant or plain stupid to call itself the Breakfast Club, but before you gag on your Cream of Wheat, let me say that these guys had the name *before* the movie. More to the point, the savvy dance arrangements and clever updating of Philly and Motown soul in their first album will soon make you forget about Hollywood's obnoxious, pouty teen starlets—in itself a public service.

The Breakfast Club blends two musical strains: Stephen Bray's Detroit funk and Dan Gilroy's New York art-school rock. Bray, whose success in co-producing Madonna's "True Blue" and "Like a Virgin" albums put the Breakfast Club on hold for two years, contributes prodigiously layered funk arrangements of synth, horns, and sonic-boom percussion in the classic dance-club mix that causes woofers to hyperventilate. Although Art is not what the Breakfast Club is about, Gilroy's art-rock background makes for lyrics that are considerably smarter than your average dance music's.

To appreciate the originals, though, it helps to start with the album's lone cover—Gamble and Huff's *Expressway to Your Heart*, a gem of soul metaphor.

It's that kind of songwriting over-achievement that the Breakfast Club goes after every time as they zigzag between coy romance and frank hormonal frenzy. In *Right on Track*, for instance, Gilroy tries to dance his way back into his girl's heart by putting on his best moves; he slides to the left and shimmies to the right, but "every time, [she's] looking the other way." In *Kiss and Tell*, Gilroy admits a universal but generally suppressed truth: men are incapable of keeping a confidence when they've "scored." *Specialty* would have been a great vehicle for Marvin Gaye—told in his youth that the only way to make it in the world was to specialize, Gilroy decided to specialize in love-making: "If you're talking love, talk to me." Nice work if you can get it. I hope Madonna gives Bray time off to make another album soon. *Mark Peel*

THE BREAKFAST CLUB. Steve Bray, Dan Gilroy, Eddie Gilroy, Gary Burke (vocals and instrumentals); vocal and instrumental accompaniment. *Never Be the Same*; *Right on Track*; *Kiss and Tell*; *Always Be Like This*; *Rico Mambo*; *Expressway to Your Heart*; *Specialty*; *Standout*; *Tongue Tied*. MCA MCA-5821 \$8.98, © MCAC-5821 \$8.98.

the album works, though, and the credit belongs to guitarist Warner Hodges, who more or less steals the show.

Hodges not only has his Keith Richards/Pete Townshend moves down cold, he's also an extraordinarily careful craftsman with an unerring feel for when to keep things simple and when to pile the guitars on in glorious metallic or acoustic layers. He's also turning into an interesting soloist, as in his Richard Thompson-style musings in the quite lovely *Good Things Come to Those Who Wait*. Some of the tracks verge on the mundane (mostly when the band's trying too hard, as in *Shotgun Blues*), and the remake of the Stones' *19th Nervous Breakdown*, while enjoyable in the abstract, does not compare to the way these guys previously inhabited a Bob Dylan tune. Still, when everything clicks and Ringenberg is fighting to be heard over Hodges's symphonic blues riffing, these guys are one of the most impressive American bands around. Worth a listen. *S.S.*

GRACE JONES: *Inside Story*. Grace Jones (vocals); vocal and instrumental accompaniment. *I'm Not Perfect (But I'm Perfect for You)*; *Hollywood Liar*; *Chan Hitchhikes to Shanghai*; *Victor Should Have Been a Jazz Musician*; *Crush*; and five others. MANHATTAN ◉ ST-53038 \$8.98, ©4XT-53038 \$8.98, © CDP-46340 no list price.

Performance: *In fine form*
Recording: *Excellent*

In recent years, Grace Jones has moved assuredly from mere novelty to musical solidity. Her voice even sounds better than it did in the days when her reputation was based primarily on the boldness of her live performances. Now each set is an adventure, usually promising something new. For "Inside Story," Jones worked closely with Bruce Woolley, a percussionist and synthesizer artist with whom she wrote all of the songs. Also playing a major role was Nile Rodgers, who co-produced the album with Jones.

There is a broad range of material here, with an outstandingly imaginative use of rhythm, which reaches its peak in the driving *Crush*. There's a bit of social commentary in *White Collar Crime*, with its oddly shaped melody, and a dash of surrealism in *Victor Should Have Been a Jazz Musician*. Indeed, there is something odd about most of these melodies, but they are beautifully arranged and meticulously delivered. I'm still not certain what "Inside Story" is about, but with Grace Jones it's often better not to question what's happening. Just enjoy it. *P.G.*

DOLLY PARTON, LINDA RONSTADT, EMMYLOU HARRIS: *Trio*. Dolly Parton, Linda Ronstadt, Emmylou Harris (vocals); Albert Lee (guitar); Mark O'Connor (viola, fiddle, mandolin, guitar); other musicians. *The Pain*

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Trio: Dolly Parton, Linda Ronstadt, and Emmylou Harris

of *Loving You*; *Making Plans*; *To Know Him Is to Love Him*; *Hobo's Meditation*; *Wildflowers*; *Telling Me Lies*; *My Dear Companion*; *Those Memories of You*; *I've Had Enough*; *Rosewood Casket*; *Farther Along*. WARNER BROS. 25491-1 \$8.98, © 25491-4 \$8.98, © 25491-2 no list price.

Performance: *Restrained*
Recording: *Good*

After a decade of tease and promise, Dolly Parton, Linda Ronstadt, and Emmylou Harris—affectionately dubbed the "Queenston Trio" in Nashville music circles—have finally delivered their historic harmony album, which had become legend while various incarnations were started, then scrapped, as the women's schedules and label conflicts conspired for delay. Whenever a lone track from those sessions surfaced on a solo LP, such as their 1981 version of *Mr. Sandman*, it promised a trio album of eccentric brilliance, breathtaking vocals, and inspired instrumental backing. In short, a masterpiece. Now that "Trio" has been released, the question, of course, is whether the long-awaited project lives up to the expectations.

Ten years ago, when the singers' ages hovered around thirty, they chose a stylistic approach that incorporated country, folk, bluegrass, and a little rock-and-roll bolstered with electric instruments and red-hot picking. Since then, however, Harris divorced the original producer, Brian Ahern, Ronstadt took

up with Nelson Riddle, and Parton went to Hollywood.

Now, as they've hit forty, they've mellowed somewhat, and, flying in the face of contemporary country fashion, they've opted for a traditional, acoustic, and old-fashioned sort of album—one that would, in Ronstadt's words, "sound like we lived from 1907 to 1987, and we sang the whole time." That, at least, explains why the composers here range from Jimmie Rodgers to Kate McGarrigle and Phil Spector.

Perhaps, too, there lies the reason for the album's funereal pacing, something most apparent in the songs in which Ronstadt takes the lead—Rodgers's *Hobo Meditation*, which sounds ridiculous coming out of the mouths of three well-heeled women, Linda Thompson and Betsy Cook's *Telling Me Lies*, and McGarrigle's *I've Had Enough*, reduced to something of a set piece here. But even the trio's rendering of the Teddy Bears' 1958 hit, *To Know Him Is to Love Him*, with Harris doing the honors, seems lifeless and weighted down.

Even though the album employed Ronstadt's producer, George Massenburg, and Harris's musical consultant, John Starling (as well as Harris's usual ace studio players), the most vibrant contributions are undoubtedly Parton's. Not only do her two original songs—*The Pain of Loving You*, which she wrote with Porter Wagoner years ago, and *Wildflowers*—pick up the pace, but it is Parton who finally breaks the

album's arch restraint with Alan O'Bryant's *Those Memories of You*, a strong and mournful bluegrass tune in the best Bill Monroe tradition. If the other offerings shimmer with the beauty of these angelic harmony vocals—and there are moments, particularly in *Farther Along* and *The Pain of Loving You*, that will bring you to your knees—*Those Memories of You* is the only track that bothers to address the soul.

"Trio," then, is not the masterpiece we expected. It is, however, a gorgeous sampler of female harmony singing and thrilling instrumental solos—particularly those by guitarist Albert Lee and fiddler Mark O'Connor—as well as a monument to perseverance and a celebration of enduring friendship. In today's world, perhaps that is rarer than a masterpiece after all. A.N.

PATTY SMYTH: *Never Enough*. Patty Smyth (vocals); Eric Bazilian (guitar); Neil Jason (bass); Anton Fig (drums); other musicians. *Never Enough*; *Downtown Train*; *Give It Time*; *Call to Heaven*; and five others. COLUMBIA FC 40182, © FCT 40182, © CK 40182 no list price.

Performance: *Too much*
Recording: *Very good*

A few months before Patty Smyth's debut recording, as a member of Scandal, became the fastest-selling EP in the history of Columbia Records, I used to see her fairly regularly in a little club in New York's Greenwich Village. Instantly, you knew she was going to be a star. She had a wonderful, winsome voice, her band played smart, melodic power pop, and she was cute as a button—a vulnerable, waiflike little figure brimming with girlish innocence and enthusiasm.

Naturally, when the Scandal EP came out and Smyth became ubiquitous on MTV, I was somewhat nonplused. Suddenly she was cavorting in black leather like a cut-rate Pat Benatar. She had turned into a basic, generic, tough-gal rocker—indeed, into a *cartoon* of a basic, generic, tough-gal rocker. Her new music was similarly uninspiring, and, later, I was hardly surprised when she fired her band and started doing kung fu moves for the cameras. Overnight, she had become a paradigm of everything that's wrong with do-it-by-the-book corporate rock-and-roll.

"Never Enough," her latest, is the final nail in the coffin. Not a note rings true, not an emotion is expressed that isn't thoroughly canned, not a cliché is overlooked. And several good songs are quite thoroughly mangled, especially Tom Waits's ineffably poignant *Downtown Train*, rendered here by Smyth with all the subtlety of a Visigoth. As thoroughly repellent as it is, the record *does* have value as a warning to other aspiring female rockers: What, after all, does it profit a woman to go multi-Platinum and lose her soul? S.S.



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COURTNEY PINE

SAXOPHONIST Courtney Pine is a British jazz musician of Jamaican descent. He is in his very early twenties, he dresses in a suit when performing, and he has been getting raves from the British press. The annotator of Pine's latest album, "Journey to the Urge Within," refers to the "Wynton Marsalis Factor." The truth is that Wynton Marsalis has quite a way to go before he will become the jazz player Courtney Pine already is.

Pine cites Sonny Rollins and John Coltrane as early influences, men who blazed trails that eventually led him back to Lester Young and Sidney Bechet. It is evident from his playing that he has done a great deal of listening and that he has developed a wonderful grasp of the jazz idiom. Even at this early stage, Pine is a remarkably skilled and mature improviser who knows the boundaries of good taste and stays within them. That does not mean he plays it safe, for there is an abundance of exploratory creativity in his work here.

Pine's intention in "Journey" was to display his talents as both improviser and composer, but what we hear goes considerably beyond that. We hear Pine as composer, as wit, as virtuoso, and as poet. In short, this is a set full of vivid colors and pleasant surprises, all of which bode well for the future of the Great Black Hope of British jazz.

Four of the ten tracks feature vocals,

one by Susaye Greene and three by Cleveland Watkiss. Greene's clear, well-tuned voice delivers the message of *Children of the Ghetto* with compelling urgency, finally becoming an instrument in duet with Pine. Watkiss seems locked in a Bobby McFerrin groove. I don't mean that as a criticism, however, for Watkiss's wordless vocals are smartly shaped and every bit as effective as McFerrin's are.

Pine has surrounded himself with excellent musicians, and while everybody gets a chance to shine, his is clearly the brightest light. A creative force as powerful as Courtney Pine is bound to be called to strut his stuff here in the homeland of jazz. but in the meantime, he seems to have found plenty of inspiration on the other side of the pond.

Chris Albertson

COURTNEY PINE: *Journey to the Urge Within*. Courtney Pine (bass clarinet, soprano and tenor saxophones); Ray Carliss (baritone saxophone); Susaye Greene, Cleveland Watkiss (vocals); Julian Joseph (piano); Gary Crosby (bass); Mark Mondesir (drums); other musicians: *Miss-Interpret; I Believe; Peace; Delores; As We Would Say; Children of the Ghetto; When, Where, How and Why; C.G.C.; Seen; Sunday Song.* ANTILLES/ISLAND AND 8700 \$8.98, © ZCAND 8700 \$8.98, © CCD 8700 no list price.

ROSEMARY CLOONEY: *The Music of Jimmy Van Heusen*. Rosemary Clooney (vocals); John Oddo (piano); instrumental accompaniment. *Love Won't Let You Get Away; Imagination; Like Someone in Love; Call Me Irresponsible; The Second Time Around;* and five others. CONCORD JAZZ CJ-308 \$8.98, © CJ-308-C \$8.98, © CCD-4226 no list price.

Performance: *Beautiful*
Recording: *Excellent*

Jimmy Van Heusen has copped more Oscar nominations for Best Song (fourteen to date, including four wins) than any other composer. Yet there have been relatively few all-Van Heusen albums over the years (one of the best, Lena Horne's on RCA, has long been out of print). So Rosemary Clooney's wonderful new album is cause for cheering—not just because it fills an inexplicable gap but also for filling it with such a great choice of songs.

Clooney keeps the emphasis on Van Heusen's ballads (has anyone since Kern written better ones?), bringing just the right warmth and intimacy to *The Last Dance, The Second Time Around,* and *Imagination*, in particular. Her voice is also perfect for a couple of the sunnier, uplifting tunes Van Heusen has specialized in, such as *Walking Happy* and *My Heart Is a Hobo*. A small combo (piano, guitar, tenor saxophone, cornet, bass, drums) provides the perfectly matched backing. Roy Hemming

BENNY GOODMAN: *The RCA Victor Years*. Benny Goodman (clarinet), with His Orchestra, Quartet, and Trio; Metronome All-Stars. *Jingle Bells; After You've Gone; Body and Soul; Madhouse; Who; Someday Sweetheart; Sandman; No Other One; Santa Claus Came in the Spring; Yankee Doodle Never Went to Town; Life Goes to a Party;* and two hundred and forty-one others. BLUEBIRD/RCA ● 5704-1 sixteen LP's \$95.98, © 5704-4 sixteen cassettes \$95.98.

Performance: *Historic*
Recording: *Good mono transfers*

Strictly speaking, Benny Goodman's "King of Swing" title was little more than a successful publicity gimmick, but no one can deny the fact that the late clarinetist and band leader was one of the most popular and visible figures of the Swing Era. It is also a fact that he was responsible for generating some of the most exciting music of any epoch. If you doubt that, just listen to the sparks generated by the likes of Gene Krupa, Ziggy Elman, Teddy Wilson, Harry James, Bunny Brigan, Lionel Hampton, and maestro Goodman himself on some of the 252 sides recently rere-

leased by RCA in its reactivated Bluebird series. "Benny Goodman: The RCA Victor Years" is an impressive boxed set containing everything the famous bandleader recorded for the company between 1935 and 1939.

The annotation consists of the same informative notes Mort Goode wrote for a previous issue (though he should have been asked to update them) and a brief, self-serving remembrance by Leonard Feather. The recordings are entered in chronological order (with occasional alternate takes), all digitally remastered. I ran some A/B comparisons of the old and new reissues and found that, if there was any audible difference at all, the non-digital versions sounded better, particularly on the early vocals.

The music, as one might expect from a collection of this scope, is of mixed quality, ranging from slightly-above-average pop fare of the Thirties to certified jazz masterpieces. Most of it, however, is wonderful, and the sides that lack jazz value clearly have nostalgia value. The best of these Victor/Bluebird sides, along with the Columbia sextet/septet recordings with Charlie Christian, Cootie Williams, and Count Basie that followed, are the cream of the Goodman crop—essential for any serious study of American music. *C.A.*

STANLEY JORDAN: *Standards, Volume I.* Stanley Jordan (guitar). *Georgia on My Mind; Moon River; The Sound of Silence; Silent Night; Because;* and five others. BLUE NOTE • BT-85130 \$9.98, © 4BT-85130 \$9.98 © CDP-46333 no list price.

Performance: *Alone together*
Recording: *Very good*

Stanley Jordan is a young guitarist whose unorthodox way of drumming on his instrument produces a sound like two players at once. "Standards," his second Blue Note release, is a solo album, which I have been hoping Jordan would make ever since I first heard sidemen get in the way of his extraordinary guitar work on his first album. Don't get me wrong—I am not suggesting that Jordan should always work alone, just that he should devote an occasional album entirely to solo performances. I have to admit that I was a bit baffled by the inclusion of *Silent Night*, a tune I prefer to hear toward the end of December, but the old Christmas war horse almost becomes a blues in Jordan's creative hands. The rest of the program ranges from Paul Simon's *The Sound of Silence* and Stevie Wonder's *Send One Your Love* to such older standards as *Georgia on My Mind* and *My*

Favorite Things. The best news? This is volume one. *C.A.*

MAL WALDRON: *You and the Night and the Music.* Mal Waldron (piano); Reggie Workman (bass); Ed Blackwell (drums). *The Way You Look Tonight; Bag's Groove; Billie's Bounce; Georgia on My Mind;* and three others. PRO-JAZZ © CDJ 617 no list price.

Performance: *Engaging*
Recording: *Very good*

Pianist Mal Waldron's reputation is, in good measure, based on his past work with Charles Mingus, Eric Dolphy, and Billie Holiday, but the American public largely continues to ignore the qualities that brought about those associations in the first place. To be sure, Waldron works regularly and even records now and then, but his most fertile ground is away from his homeland, in Europe and Japan, where this CD was recorded.

Although Waldron is as fine a composer as he is a pianist, only one tune in "You and the Night and the Music" is his, a lovely slow *Waltz for My Mother*, which features a probing bowed solo by Reggie Workman. The rest of the program is a mixture of classics from bop to Tin Pan Alley, all played within a few notes of the peak of perfection. *C.A.*

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

BACH: *St. John Passion* (see Best of the Month, page 81)

BLOCH: *Schelomo* (see SHOSTAKOVICH)

DEBUSSY: *La Mer; Nocturnes; Prélude à l'après-midi d'un faune*. Cleveland Orchestra and Women's Chorus, Vladimir Ashkenazy cond. LONDON ④ 417 488-1 \$10.98, © 417 488-4 \$10.98, © 417 488-2 no list price.

Performance: *Sensuous*
Recording: *Gorgeous*

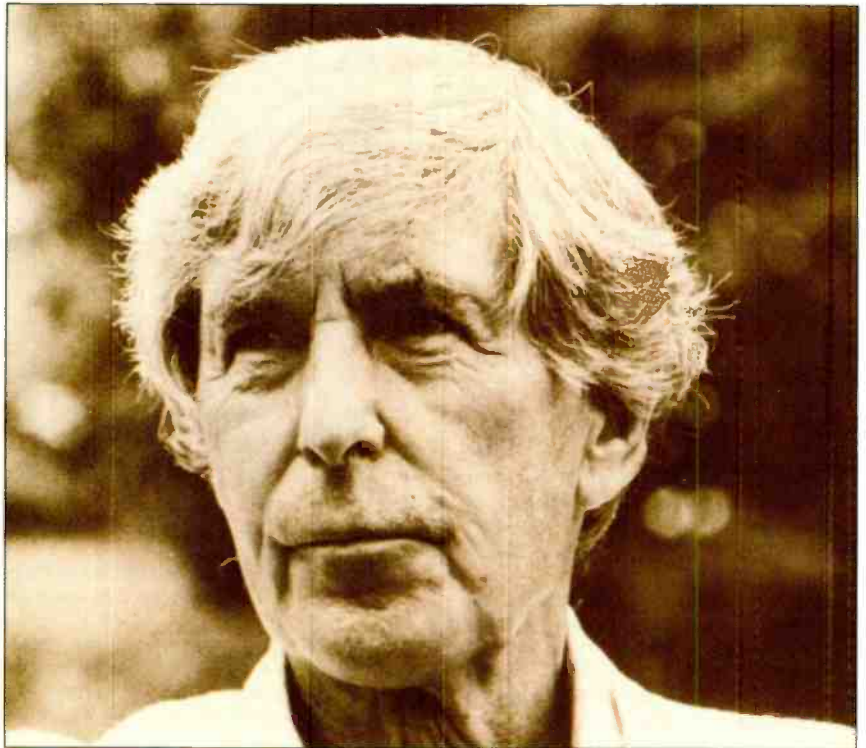
Vladimir Ashkenazy's first recording of orchestral works by Debussy finds him responding more to their coloristic and sensual aspects than to the linear and structural ones. Given a near-perfect microphone setup in the superb acoustic surround of Cleveland's Masonic Auditorium, the result is wholly beguiling as sheer sound, but even the languors of the *Faune* and the apparently static but inexorable progress of the clouds in *Nuages* should have an undercurrent of strength that I find missing here. *Sirènes*, with the wordless women's chorus beautifully balanced, comes off best of the three Nocturnes. *Fêtes* is rather lacking in panache, and the cymbal crashes at the climactic moments of its central procession are rather subdued. And the performance of *La Mer* has similar shortcomings and virtues, the stormy final pages providing most of the virtues.

There is formidable competition on CD for all of the works here, notably from Previn on Angel. If sound is your main concern, however, this recording is a perfect demonstration of compact disc technology, capturing the fullest possible range of orchestral color and the widest extremes of dynamics in virtually perfect balance. *D.H.*

HANDEL: *Tamerlano*. Derek Ragin (countertenor), Tamerlano; Nigel Robson (tenor), Bajazete; Nancy Argenta (soprano), Asteria; Michael Chance (countertenor), Andronicus; Jane Findlay (mezzo-soprano), Irene; René Schirrer (baritone) Leone. English Baroque Soloists, John Eliot Gardiner cond. ERATO/RCA ④ NUM 75278 three LP's \$32.94, © MCE 75278 three cassettes

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Sir Michael Tippett

A CHILD OF OUR TIME

UNIL I heard André Previn's new recording of Michael Tippett's oratorio *A Child of Our Time*, the work had always been, for me, one of those things more impressive to read about than actually to hear. Tippett's response to a seventeen-year-old Polish Jew's desperate act of shooting a German diplomat in Paris in November 1938, and the monstrous pogroms mounted by the Nazis in reprisal, was most compassionate and heartfelt: his "protest against the conditions that make persecution possible" was conveyed by a work one wanted so much to like and admire *because of* what motivated it—and out of admiration for the inspiration that led Tippett to make use of American Negro spirituals, which he invested with a truly universal significance.

The several live performances I have heard seemed to present the music as a sort of document of itself—as if every listener should be expected to share Tippett's compassion and his philosophic-moral vision just because the music is on the stands and it is being played and sung. Even on records, the conductor regarded as Tippett's most authoritative and committed advocate, Colin Davis, seems to aim, in his Philips recording, for a grandiosity that is surely the antithesis of what this piece is

all about—and to take his willing soloists with him. An earlier Argo recording, made some thirty years ago with John Pritchard conducting, was far less dramatic, and perhaps even a little slow, but it glowed with a more credible intensity.

The new Previn version, handsomely recorded on the Royal Philharmonic Orchestra's own label, distributed here by MCA Classics, is closer to Pritchard's than to Davis's. If it seems less urgent than one might ideally wish, it is surely to be preferred to the inflated scale of Davis's reading. There is a subtle poignancy in Previn's low-key, seemingly cool approach that promises to wear well: his view of the work might be described as an observation, or commentary, rather than a demonstration. The sound on LP is quite good, and I would imagine that the CD, which I have yet to hear, is even more impressive. *Richard Freed*

TIPPETT: *A Child of Our Time*. Sheila Armstrong (soprano); Felicity Palmer (mezzo-soprano); Philip Langridge (tenor); John Shirley-Quirk (baritone); Brighton Festival Chorus; Royal Philharmonic Orchestra, André Previn cond. RPO/MCA CLASSICS ④ MCA-6202 \$9.98, © MCAC-6202 \$9.98, © MCAD-6202 no list price.

TONY NUTLEY-TV SOUTH/JAY K. HOFFMAN & ASSOC

\$32.94, © ECD 88220 three CD's no list price.

Performance: *Fabulous*
Recording: *Splendid*

Recorded more than any other Handel opera, *Tamerlano* is certainly one of the master's most dramatic and musically intriguing works. Dealing with the universally popular Baroque theme of the conflict between love and honor, the powerful plot involves one Bajazete, Emperor of the Turks, who has been captured by Tamerlano (Tamerlane), Emperor of the Tartars.

The opera really belongs to Bajazete, one of Handel's few tenor roles. Nigel Robson sings it to the hilt, ranging from tenderness towards his daughter, Asteria, to fierce pride toward Tamerlano and his ally Andronicus, and brings the opera to its climax in his final suicide. Nancy Argenta as Asteria and Michael Chance as Andronicus are a perfect team. They, too, range from love to hate and back to love. Both are gifted singers, skilled in Handel's florid coloratura; they ably project the drama of their situations.

Although the title of the opera suggests that Tamerlano is the lead, his part is comparatively small, and it consists mostly of recitatives. Derek Ragin, however, is one of the most promising countertenors on the scene today. His voice is rich and powerful and filled with dramatic urgency. He is thoroughly masculine and convincing as both a singer and actor. Jane Findlay, as Irene, sounds rather too much like a countertenor, and René Schirrer makes a gruff Leone.

John Eliot Gardiner is, without doubt, our finest conductor of early-instrument ensembles. He evokes a splendid sound from his English Baroque Soloists and paces the drama with a drive that never flags for a moment. This recording is a must for fans of opera and early music. *S.L.*

LISZT: *Songs* (see *Best of the Month*, page 82)

LUTOSLAWSKI: *Symphony No. 3; Les Espaces du sommeil*. Dietrich Fischer-Dieskau (baritone, in *Les Espaces*); Berlin Philharmonic Orchestra, Witold Lutoslawski cond. PHILIPS ① 416 387-1 \$10.98, © 416 387-4 \$10.98, © 416 387-2 no list price.

Performance: *Authoritative*
Recording: *Good enough*

Witold Lutoslawski's superb Third Symphony, introduced by Georg Solti and the Chicago Symphony less than four years ago, has already been recorded twice, first by Esa-Pekka Salonen and the Los Angeles Philharmonic and now by the composer himself. As in the previous recording, on CBS, the coupling here is Lutoslawski's setting of Robert Desnos's poem *Les Espaces du sommeil*, this time sung by Dietrich



Orpheus Chamber Orchestra: Mozart with verve

CHRISTIAN STEINER/DEUTSCHE GRAMMOPHON

Fischer-Dieskau, for whom the work was composed. Philips does not bother to give us the work's date or to mention that its première was given by the same soloist, conductor, and orchestra in April 1978.

Both performances, in fact, carry more than just authority. Lutoslawski—who is a very effective conductor of his own music—exhibits a flair and a freedom in his reading of the Third Symphony that perhaps go beyond what any other conductor could bring to it, and he draws a stunning response from the Berlin Philharmonic. As a historical document, this issue can claim a special place, and it augurs well for the further composer-conducted Lutoslawski recordings Philips is planning, but it is by no means a clear choice in every respect. The sound is good enough but does not compare with the CBS recording in terms of clarity and definition or, for that matter, all-round vividness. And Fischer-Dieskau, for all the commitment and authority he brings to the work, tends to overdo the dramatic emphasis at more than a few points. I suspect that the somewhat less intense but very tasteful singing of Salonen's John Shirley-Quirk may wear better.

On LP the new issue surely merits recommendation for the symphony alone, which not only receives a more highly charged performance than Salonen's but has the advantage of being contained in full on a single side, while Salonen's performance on CBS begins at the end of side one and breaks for turnover. On CD, however, the choice really has to be CBS, for Salonen's more brilliantly recorded Lutoslawski is not only uninterrupted but is packaged together with his downright irresistible

account of Messiaen's *Turangalila-symphonie* with the Philharmonia Orchestra on two generously filled CD's. The Salonen set, in fact, must stand very near the top of anybody's short list of outstanding contemporary recordings available in the new medium. *R.F.*

MOZART: *Eine kleine Nachtmusik* (K. 525); *Divertimento in E-flat Major* (K. 252); *Divertimento in D Major* (K. 131). Orpheus Chamber Orchestra. DEUTSCHE GRAMMOPHON ① 419 192-1 \$10.98, © 419 192-4 \$10.98, © 419 192-2 no list price.

Performance: *Sparkling*
Recording: *Sparkling*

Continuing the tradition established by its earlier disc of Mozart divertimenti, the Orpheus Chamber Orchestra here offers first a work for strings alone, then one for winds, and finally one for the combined forces. As before, each group performs to perfection on its own, and together they produce a clean, well-balanced ensemble. Even without the services of a conductor, the orchestra brings sparkle and verve to this group of elegant works spanning a period in Mozart's life when he was never at a loss for charm. Highly recommended. *S.L.*

PROKOFIEV: *Symphony No. 5, in B-flat Major, Op. 100; Dreams, Op. 6*. Concertgebouw Orchestra, Vladimir Ashkenazy cond. LONDON ① 417 314-1 \$10.98, © 417 314-4 \$10.98, © 417 314-2 no list price.

Performance: *Lyrical*
Recording: *Richly resonant*

Vladimir Ashkenazy knows his way around this lyric-heroic Russian mas-

terpiece as though it were second nature to him. His treatment of the opening movement may not have the dramatic impact of Leonard Slatkin's justly acclaimed Saint Louis Symphony recording for RCA, but the lyric emphasis of Ashkenazy's reading, combined with the luscious tone produced by the Concertgebouw Orchestra, gives this recording its own special validity.

The tension tightens, as it should, in the scherzo, though Slatkin still has the edge when it comes to rhythmic urgency and biting attacks, particularly in the final section. Ashkenazy's lyric manner stands him in good stead throughout the slow movement, but I wish the desperate dissonant outcry at the climax had been endowed with more of that very quality. It is in the finale that Ashkenazy and the Concertgebouw truly come into their own, with execution of surpassing brilliance and a communication of internal detail that I have seldom heard surpassed.

The sonics, while richly resonant, remain clear and unclouded. Certainly they enhance the unashamedly sensuous color and texture of *Dreams*, a work from Prokofiev's student years, which is the unusual and welcome filler. *D.H.*

SCHUBERT: Piano Sonata in A Major (D. 959); Drei Klavierstücke (D. 946).
Michel Dalberto (piano). ERATO/RCA
© ECD 88116 no list price.

Performance: *Loving*
Recording: *Warm and limpid*

Michel Dalberto's first recordings of Schubert sonatas, the eminently lovable D Major (D. 850) and the unfinished C Minor (D. 840), appeared on Erato (and on Musical Heritage Society under license from Erato) a half-dozen years ago. Dalberto, then about twenty-five, was so thoroughly "inside" the music that he must have created an eager audience for his further explorations of the Schubert sonatas, and this second installment lives up to every expectation that earlier issue might have aroused. Here he delivers loving, communicative, and possibly even more deeply involved performances of the most endearing of the three great sonatas of Schubert's final year and the three impromptus he wrote that same year, which Brahms eventually published under the title *Klavierstücke*. Alfred Brendel's recording of the A Major Sonata is already on a Philips CD, and no one who has it need think about replacing it. But Dalberto's way with the sonata is every bit as absorbing, and his less overtly dramatic reading may appeal to listeners who regard this work as basically lyrical and reflective. He is similarly persuasive in the *Klavierstücke*, and the whole sequence is given a warm, limpid sonic frame. *R.F.*

SHOSTAKOVICH: Cello Concerto No. 1, Op. 107. BLOCH: Schelomo.
Lynn Harrell (cello); Concertgebouw

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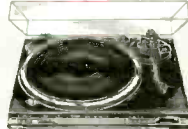
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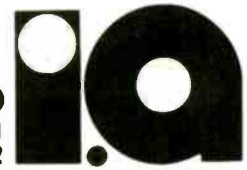
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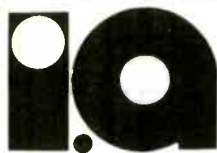
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Orchestra, Bernard Haitink cond. LONDON 414 162-1 \$10.98, 414 162-4 \$10.98, 414 162-2 no list price.

Performance: *Very good*
Recording: *Sumptuous*

The first all-digital recording of Ernest Bloch's Hebraic rhapsody, *Schelomo*, in absolutely gorgeous sound, is the chief attraction of this release. Lynn Harrell's solo cello has never sounded more lush, while Bernard Haitink conjures up kaleidoscopic tonal glories from the Concertgebouw redolent of the Philadelphia Orchestra in the unforgettable 1940 recording by Feuermann and Stokowski. The initial solo entry sounds a bit more lachrymose, however, than in some other versions I have heard—Starker's or Rostropovich's, for example.

In the Shostakovich Cello Concerto No. 1, Harrell and Haitink face a highly competitive field. Not only is the 1960 composer-supervised recording by Rostropovich, the work's dedicatee, and the Philadelphia Orchestra under Ormandy, still available on LP, but there are two fine all-digital versions: one by Yo-Yo Ma with Ormandy and the Philadelphia, coupled with the Kabelevsky Cello Concerto No. 1, and another by Heinrich Schiff with the Bavarian Radio Symphony under Maxim Shostakovich with his father's Second Cello Concerto, which is by far the most appropriate pairing.

Harrell need defer to none of his rivals when it comes to setting forth the mercurial moods of the First Concerto, and he gets splendid backing from Haitink. Whereas the reverberant qualities of the recording location enhance the Bloch, they tend at times to muddy the texture in the Shostakovich, but that is a minor cavil about what is a generally fine achievement on the part of all concerned.

D.H.

SIBELIUS: *Violin Concerto in D Minor, Op. 47* (see TCHAIKOVSKY)

STRAVINSKY: *The Firebird, Complete Ballet; Song of the Nightingale*. Seattle Symphony Orchestra, Gerard Schwarz cond. DELOS © D/CD 3051 no list price.

Performance: *Excellent*
Recording: *Very good*

This Stravinsky recording was made at the Seattle Opera House some six months after what I felt was a less than happy Wagner collection, and there is notable improvement in the quality of both the performance and the sound. A new recording of the complete *Firebird* faces some stiff competition on CD, however. The digital recordings by Antal Dorati and the Detroit Symphony and by Charles Dutoit with his fine Montreal contingent, both on London, offer spectacular sound. Dorati's has more kinetic impact, Dutoit's more of the poetic essence of the score, but Schwarz and the Seattle Symphony,

aided by a fine production and engineering team, also give a fine account of themselves. Stravinsky's array of dazzling orchestral colors emerges with both warmth and brilliance, and the percussion climaxes during the Kashchei episodes are everything that one could ask.

The selling point of this CD for me, however, is the coupler, *Song of the Nightingale*, a scintillating work that Stravinsky drew from his opera based on the Hans Christian Andersen tale of the Emperor and the Nightingale. Uniting the tender and the wildly fantastic side of the youthful Stravinsky, *Song of the Nightingale* is quite special. I know of few things in music more deliciously outlandish than its Chinese March or more curiously haunting than the Fisherman's Song on solo trumpet. Schwarz and his players give their all in this music, and even at twenty-one minutes it's worth the price of the entire CD all by itself. Dorati offers no companion work, while Dutoit gives us Stravinsky's early *Scherzo fantastique* and *Fireworks*.

D.H.

TCHAIKOVSKY: *Violin Concerto in D Major, Op. 35*. SIBELIUS: *Violin Concerto in D Minor, Op. 47*. Viktoria Mullova (violin); Boston Symphony Orchestra, Seiji Ozawa cond. PHILIPS 416 821-1 \$10.98, 416 821-4 \$10.98, 416 821-2 no list price.

Performance: *Formidable*
Recording: *Good, but . . .*

For her recording debut in the West, Viktoria Mullova—who carried off the 1982 Tchaikovsky Competition Gold Medal and in the previous year won the Sibelius Competition in Helsinki—has chosen her two prize-winning vehicles. To my ears and memory, she seems to be a violinist of formidable musical and technical gifts somewhat in the mold of the legendary Ginette Neveu, whose career was tragically cut short in a 1949 plane crash.

Mullova's Tchaikovsky is immensely strong but also lacking somewhat in the tenderness demanded by the more sentiment-laden episodes. The final movement is a real dazzler, however, and the cadenzas come off with blazing virtuosity. The Sibelius concerto is the real prize here. Like Neveu in 1946, Mullova invests the music with true grandeur and passion, moving it beyond the orbit of such less substantial concertos as the Bruch G Minor, if not quite to the level of the great Brahms concerto. The many hurdles for the soloist in the outer movements hold no terrors whatever for her.

Seiji Ozawa and the Boston Symphony back Mullova to the hilt, but the over-prominence of the timpani is something of a trial. It seems to me not so much a matter of dynamics as of unfortunate microphone placement. Listeners who have suitably flexible equalizer controls may be able to tame

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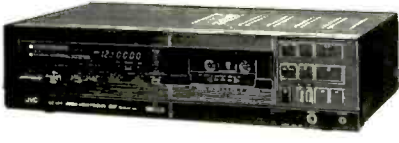
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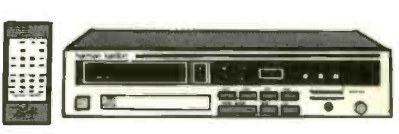
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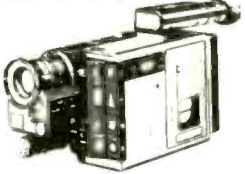


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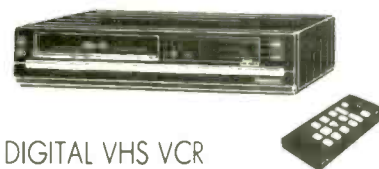
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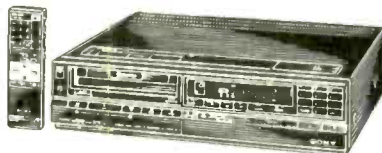
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the timpani without compromising other significant elements in this remarkable disc debut. *D.H.*

COLLECTIONS

ELLY AMELING: *Soirée française.* Songs by Debussy, Fauré, Gounod, Poulenc, Roussel, Chausson, Bizet, others. Elly Ameling (soprano); Rudolf Jansen (piano). PHILIPS ● 412 628-1 \$10.98, © 412 628-4 \$10.98, © 412 628-2 no list price.

Performance: *Very appealing*
Recording: *Excellent*

Surely, Elly Ameling has one of today's most mellifluous voices. It is never forced; it soars or floats or caresses. To hear her is always a special pleasure, as this collection of French songs attests. The material, of contrasting mood and musical texture, is well arranged, with familiar selections, such as Debussy's *Mandoline* and Fauré's *Après un rêve*, as well as lesser-known pieces such as Messiaen's *La Fiancée perdue*. It is hard to choose a favorite among them. The *Bailé* of Canteloube is exquisitely spun out, and Caplet's *Le Corbeau et le renard* is delivered with infectious humor. Ameling's French is so clearly articulated that virtually every word is understandable; still, I regret there are no translations, merely brief notes on the fourteen composers represented. All twenty-four songs are given exemplary accompaniment by pianist Rudolf Jansen, and the sound is fine. *R.A.*

SYLVIA SASS: *Great Soprano Arias.* Donizetti: *Lucia di Lammermoor: Mad Scene.* Verdi: *Un ballo in maschera: Ecco l'orrido campo; Morrò, ma prima in grazia. La forza del destino: Pace, pace.* Otello: *Willow Song; Ave Maria.* Sylvia Sass (soprano); Hungarian State Opera Orchestra, Ervin Lukács cond. HUNGAROTON ● SLPX 12405-1 \$10.98, © MK-12405-4 \$10.98, © HCD 12405-2 no list price.

Performance: *Uneven but winning*
Recording: *Fine*

One rarely hears the *Lucia* Mad Scene sung by so warm a voice as that of Sylvia Sass. Strictly speaking, she is not a coloratura soprano, and she eschews the flute-accompanied cadenza at the end of the first half of the scene, as well as many of the notes *in alt* throughout. There is no chorus of wedding guests. In all, it is a rather unsatisfactory effort despite the smoothness of her middle-voice singing. Sass is on surer ground with Amelia's big scenes from Verdi's *Ballo in maschera*, in which she spins some lovely tone and, in the absence of roulades, is able to give attention to the text. "*Pace, pace*" from *La forza del destino* is delivered with passion, and Desdemona's final scenes from *Otello* are musically molded and sung with refinement. The Hungarian State Opera Orchestra performs nicely under Ervin Lukács. *R.A.*

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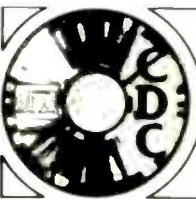
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- CT Danbury: Carlton Stereo • New Haven: Take 5 Audio
- DE Wilmington: HiFi House
- FL Boca Raton: Captain Video • Ft. Lauderdale: Hialeah: Captain Video • Jacksonville: Hoyt HiFi/Video Center • Lake Park: Lake Worth: Audio Advisors • Lauderdale: Miami: Captain Video • N. Miami: Burton's Camera • St. Augustine: Audio Design • Stuart: Fox Audio
- HA Honolulu: Honolulu Audio Video Co. • The Stereo Station
- ID Boise: The Stereo Shoppe • Ketchum: Infinite Audio & Video • Pocatello: Sound Waves • Twin Falls: The Sound Company
- IL Algonquin: Team Electronics • Bloomington: Audio Visions Inc. • Burbank: Digital Audio Video TV • Champaign: Glenn Poor's Audio Video • Charleston: Uptown Audio • Chicago: United Audio, Victor's Stereo • Deerfield: United Audio • DeKalb: AudioQuest Inc. • Jacksonville: Front Row Records • Kankakee: Barratt Entertainment Co. • Lansing: United Electronics • Morton Grove: Hiles: United Audio • Normal: Glenn Poor's Audio Video • Rockford: Absolute Audio • Schaumburg: United Audio • Springfield: The King's Stereo • Vernon Hills: United Audio • Waukegan: Hear/Here
- IA Burlington: Vintage Audio • Corvallis: Spencer Sound Systems • Fairfield: Golden Ears • Iowa City: Spencer Sound Systems
- KS Emporia: Audio-Video Connection • Lawrence: University Audio • Manhattan: Rolling Thunder Ltd. • Overland Park: Brands Mart • Topeka: Nelson's
- ME Falmouth: Hi-Fi Exchange
- MD College Park: Backview: Audio Kraters • Towson: Discaring Ear
- MA Amherst: Greenfield: Adronax Music • Boston: Braintree, Hanover, Hyannis, Peabody, Saugus: Central Sound • Waltham: Waltham Camera Inc.
- MH Ann Arbor: Sound Associates Inc. • Lansing: Stereo Types Audio • Marquette: American TV & Appliances • Minnetonka: In Concert • Plymouth: Central Entertainment • St. Paul: The Right Stuff
- MO Bahrar: Crestwood: Flip's Stereo • Columbia: D & M Sound, Stereo Buff • Creve Coeur: Audio Visions Inc. • Jefferson City: The Stereo Buff • Joplin: Stereo Buff • Kansas City: Brands Mart • Rolla: End of the Rainbow • Springfield: The Stereo Buff
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- OK Tulsa: The Phonograph
- OR Hermiston: Quicksilver Audio
- PA Allentown: Bryn Mawr, Feasterville, Jenkintown, Bensalemville, Philadelphia: Sassafras • Camp Hill: HiFi House • Erie: House of Record • Harrisburg: HiFi House • Throop: Shenadi Sound
- PR RI Piedra: On Top Audio
- RI North Providence: Eastern Discount
- SC Columbia: Audio Alternative • Greenville: Stereo Video Inc. • Hilton Head Island: Video Plus Inc
- SD Sioux Falls: Western Stereo
- TN Johnson City: The Sound Room • Memphis: Opus III • Sevierville: Sound Concepts
- TX Austin: Audio Concepts • Dallas: Ed Kellum & Son
- UT Provo: Custom Acoustics • Ogden: HiFi Shop • St. George: Upper Audio • Woods Cross: Trax Audio & Video
- VA Alexandria: Excalibur Audio • Charlottesville: Sound Machine • Richmond: The Audio Exchange • Virginia Beach: Digital Sound
- WA Friday Harbor: Sea Acoustics • Longview: Lines & Designs • Pullman: Optimum Sound • Redmond: Home Entertainment by Design • Richland: Quicksilver Audio • Tacoma: The Stereo Shoppe
- WV Charleston: Hi-Fi Clinic • Morgantown: The Sound Source
- WI Appleton: Oak Creek, Waukegan: American TV & Appliance • La Crosse: Audio One • Madison: American TV & Appliance, Specialized Sound

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JULY



by Christie Barter
& Steve Simels



Johansen/Poindexter: respect

THE IMPORTANCE OF BEING BUSTER: Appearing in small clubs and on TV as singer and lounge lizard **Buster Poindexter**, New York favorite **David Johansen** seems finally to be getting the critical respect and public acclaim that eluded him in the early Seventies when he fronted for the proto-punk **New York Dolls**. Buster has been a regular on this season's *Saturday*

discovered bluesman **Johnny Winters**, and members of the *Saturday Night Live* band are said to be playing back-up. □

BYRDS DO IT! Well, ex-Byrds, that is, and what they do is tour. You've probably heard that one alumnus, a cleaned-up **David Crosby**, is hitting the road right now with his former quartet colleagues **Steven Sills**, **Graham Nash**, and **Neil Young**. What you might not have heard is that the Byrds' erstwhile secret weapon, multi-instrumentalist and songwriter **Chris Hillman**, is also out on the road, shooting for yet another comeback.

Hillman is now getting top billing with the **Desert Rose Band**, an outfit featuring steel-guitar wizard **Jay Dee Maness**, who figured prominently in 1968's "Sweetheart of the Rodeo," the record in which the Byrds more or less invented country-rock. Look for the Desert Rose Band in your town real soon. Also look for their MCA/Curb album, which features a remake



Ex-Byrd Hillman (left) with 1986 tour group

Night Live—a high point was his steamy duet with guest host **Sigourney Weaver** in *Baby, It's Cold Outside*—and he recently shared Best Cabaret Act honors with **Cissy Houston** (mother of **Whitney**) at the second annual New York Music Awards.

Buster's long-awaited solo album is being recorded at this writing. No word on a label yet, but the executive producer is **Steve Paul**, who

of the Byrds' twenty-one-year-old classic *Time Between*. □

THE greeting is brief and to the point: "G'day viewers. I'd loik you all to sid-down quiet and listen ca'fully. Oi've taken it upon meself in the interest of Austrlyian culture to narrate a story to youse all. It's not just a story with words, though. It's a story with music as well. . ."



Hogan and friends: a new accent for Peter and the Wolf

It's the story of Peter and the Wolf as narrated for Angel Records by **Paul Hogan**, TV personality, promoter of Australian tourism and brew, and, of course, star of the phenomenally successful movie *Crocodile Dundee*.

The new album was originally prepared for the Australian market by the EMI affiliate in Sydney, which came up with the idea of dubbing narration by Hogan over an existing recording of Prokofiev's *Peter and the Wolf*. And Angel, viewing Hogan's sudden popularity in this country, had the great good sense to release it here.

The Prokofiev is coupled with Britten's *The Young Person's Guide to the Orchestra*, also narrated by Hogan. Both works are performed by the Orchestre de Paris under the late **Igor Markevitch**. □

has been described as "sort of *Aida* without the elephants." It will have its world premiere performances in Cleveland late next year.

According to the Cleveland Opera, *Holy Blood* is "a real opera," highly melodic and in no sense rock-and-roll, although "it relates to rock in something of the way that *Porgy and Bess* reflects Gershwin's knowledge of jazz." No word yet about recording plans, but we'll keep you posted. □

YOUNG keyboard artists in the news include **Michel Dalberto**, who records for Erato in Paris and makes his American debut July 15 at the Newport (Rhode Island) Music Festival. Winner of the

Copeland: no elephants

ALL right, the guy's versatile, but this is getting ridiculous. **Stewart Copeland**, best known as the innovative drummer for the **Police**, has already done TV scores (the moody music for *The Equalizer*) and dabbled in films (Francis Coppola's *Rumble Fish*) and dance (a *King Lear* for the San Francisco Ballet). But now he's writing grand opera!

An epic of the Crusades tentatively titled *Holy Blood and Crescent Moon*, the opera



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prestigious Clara Haskil Prize in 1975, when he was twenty, Dalberto went on to take first prize in the even more prestigious Leeds International Piano Competition three years later, and his growing discography is even studded with a Grand Prix du Disque

Though for some reason it's not listed in Schwann, Feltsman's earlier recording of Chopin preludes, which was smuggled out of Russia and released here by CBS, is still available on both LP and cassette (the catalog number is 39966). □

duced seventeen of the MJQ albums released on Atlantic in the Fifties and Sixties, many of them still in the catalog. □

FANS of Sixties chanteuse **Ronnie Spector**, whose voice has broken more hearts than any other in recording history, got a genuine thrill this year when the legendary former Ronette turned up in **Eddie Money's** hit single *Take Me Home Tonight*—as well as in the video, where she still looked better in a tight skirt than anybody else in rock.

Now get set for an even bigger thrill: Ronnie's back with her first solo album since 1980's overlooked (and underdistributed) "Siren." Titled "Unfinished Business" (Columbia), the record features contributions by hit-makers **Gregory Abbott** and the **Bangles' busy Susanna Hoffs**, who chimes in on backing vocals. And Eddie Money returns Spector's duet favor in *Who Can Sleep*, the album's first single. Keep your fingers crossed for what deserves to be the biggest comeback since Tina Turner ditched Ike. □



Money, Spector: looking good

ting the road again this summer in a cross-country tour. Accept no imitations. . . . **Burton Cummings** and **Randy Bachman**, the creative mainstays of the original **Guess Who**, are recording again, this time as a duo. Longtime fans may recall that they ran one of the more entertaining public feuds of the Seventies. . . . Get set for the First Annual Celebrity Rock-and-Roll Golf Tournament, a sports landmark featuring members of **Bon Jovi**, **Mötley Crüe**, **Cheap Trick**, **Night Ranger**, **Journey**, and the **Rod Stewart Band**. A TV documentary of the tourney, to be held this summer, will air in September, with a home-video version due by the end of the year. . . . Look for a collaboration between two all-time-great rock harmony bands, the **Beach Boys** and the **Everly Brothers**, on the Everlys' forthcoming third album for PolyGram. □



Prize-winning pianist Dalberto: getting around

for an album of Schubert sonatas he recorded in 1979. His second Schubert album, with the A Major Sonata, is reviewed in this issue.

Last year we reported on two young Russian pianists worth watching. One was **Vladimir Feltsman**, who had been living in Moscow under a sort of professional house arrest since 1979. The other was **Sergei Edelmann**, who had managed to emigrate to the West and had, in fact, just made his recording debut on RCA. Well, Edelmann's career seems to be flourishing, and RCA recently released his second album, a Chopin recital.

The news on Feltsman is good too. He was not only allowed to perform publicly in Moscow a couple of months ago—for the first time in eight years—but he has also been granted an exit visa. Feltsman is expected to settle in the U.S., and it's said that "dozens" of recording and concert offers await him.

TOGETHER again after a long hiatus, the redoubtable **Modern Jazz Quartet** has just signed with WEA International. Founded in the early Fifties and remaining intact, with only one personnel change, for over two decades, the MJQ recorded almost exclusively for Atlantic until disbanding in 1974. Renewing that connection, WEA will release the MJQ's new albums on the Atlantic label in this country.

The first of those albums is "Three Windows," which takes its title from one of the four new pieces the quartet performs with the New York Chamber Symphony. Some of the music was played in public for the first time last month at the JVC Jazz Festival in New York.

"Three Windows" was produced by **Neshui Ertegun**, WEA's president, back in the recording studio for the first time in fifteen years, during which he built WEA into an industry giant. Ertegun pro-

GRACENOTES. A syndicated sit-com called *The New Monkees*, surely one of the most unnecessary commercial offerings since New Coke, is set for its debut on TV this fall in most major markets around the country. The ailing/fledgling Fox Network will be a principal outlet. Meanwhile, undaunted, the old Monkees will be hit-

The Modern Jazz Quartet: getting together



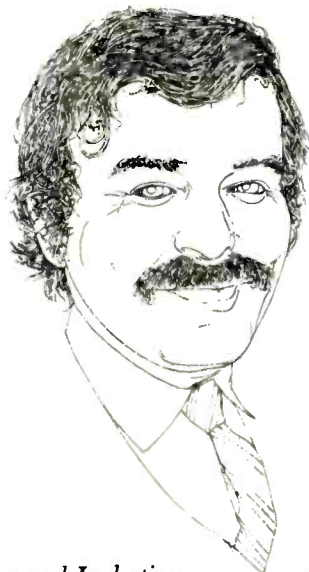
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ATLANTIC RECORDS

THE HIGH END

by Ralph Hodges



Sound Isolation

THE saddest aspect of being interested in high-fidelity sound reproduction is living within earshot of those who are not. During hi-fi's early days, enthusiasts tended to be moderately affluent. They were starved for watts by present standards and listened to music that was not relentlessly intrusive to everyone on the block. Progress, however, has exacted its price, and now anyone with a few hundred dollars to spend can rapidly become a persistent public nuisance. You may have found yourself in that role once or twice. I know I have, as I am in the business of evaluating audio equipment and unable to afford a test lab on the moon.

What can we, as civilized beings who suffer when we know others around us are suffering, do about this situation—short of using headphones? I discussed the problem recently with Roy Allison of Allison Acoustics, whose loudspeaker designs take more than the usual account of room interactions. As I had glumly anticipated, Allison had not unearthed any sparkling new solutions, but the old ones are certainly worth checking out before trying something that is almost certain *not* to work.

Prominent among ineffective approaches is acoustical-absorption treatment. First of all, you can't absorb the very low frequencies with any sort of material practical for home use; you have to use material specifically designed for sound absorption or the low frequencies will be ignored. And those frequencies that are absorbed are going to be attenuated both outside and *inside* the listening environment. Once you turn up the volume to restore the loss at your listening position, you're right back where you started.

There *is* one place, however, where an acoustic-absorption treatment can be helpful—windows. Improvised or custom-made interior shutters that fit the window area well can appreciably reduce the transmission of sound outward, and they'll also prevent a good deal of street noise from getting in. Shutters of thick, dense particle board are most effective. If you decide to install shutters, make sure that you can still use the window for ventilation if necessary.

The way a room's walls, floors, and ceilings are constructed is the greatest determinant of sound transmission. Allison finds that double-wall construction with alternating studs provides a fine mix of practicality and potency. As an extra measure, the air space between the two walls can be filled with absorptive material, but neither of us is sure it is worth the additional expense.

Alas, true double-wall construction voraciously consumes living space. Generally, landlords—unless they're going to live in the buildings themselves—don't even consider it during construction, and they will rarely permit a tenant to remodel in this fashion. Therefore, instead of acoustical isolation of your listening room, it may be necessary to experiment with physical isolation of your loudspeakers from building structures that would efficiently transmit the sound and vibration of your music to neighboring apartments.

I have achieved excellent results by isolating my speakers on a large, homemade wooden platform occupying almost a third of my listen-

ing room (besides the speakers, it holds a desk and bookshelves). All possible contacts between the platform and the walls and floor are buffered by large rubber dampers wedged, *not* nailed or screwed, into the junction points. Noise from the tiny TV set in the next room has occasionally aroused neighborly comment, but the results of some 1,200 watts into large loudspeakers have gone unnoticed—or at least unlocated—for five years.

For those interested in physical buffering with resilient materials, Allison offers a straightforward formula,

$$f = \sqrt{10/d}$$

where f is the lowest frequency (in hertz) at which the setup provides good vibrational isolation and d is the deflection (in inches) that occurs when the material is burdened with something like a speaker cabinet. Be aware that the formula works only when the material is within a linear range of compression; if the weight of the speaker crushes it entirely flat, there will be no isolation. There will also be no isolation if the weight doesn't deflect the material at all. Also note that small speaker supports with ideal deflection tend to be wobbly affairs, risky to the toes and shins of anyone in the vicinity, hence my choice of a large platform instead.

Spiked feet of the sort provided with high-end speaker stands, and also available separately, are currently being hailed as good isolation mechanisms. Allison cannot understand why this should be so, and neither can I. Although spikes reduce the surface-contact area with the floor, the contact pressure and coupling are commensurately increased. You'll have to invest in such products at your own risk.

Finally, with the proliferation of good hi-fi systems—or at least high-power hi-fi systems—there may be times when you won't want to shield your neighbors from your noise but to send them a direct message concerning their own excesses. I highly recommend Liszt's *Transcendental Etudes*. Virtuoso piano music reproduced with authority and at length will bring even heavy-metal freaks to their knees. □



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