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
TECHNICS INTRODUCES CD PLAYERS FOR DISC JOCKEYS, RADIO STATIONS AND JUST PLAIN MUSIC FREAKS.

Created with Class AA circuitry, precision search cueing and anti-vibration construction.

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Innovative Class AA circuitry provides you with silky highs, spectacular mid-range and chest-thumping bass. Precision 2-speed search dial cueing—a Technics exclusive—enables you to move precisely to any point on any track on the disc. Both forward and backward. And anti-vibration construction minimizes the effects of external shock and vibration.

These new CD players offer a high-resolution digital filter for the cleanest possible sound. For programming ease, you can access any track in under a second. There’s even 20-selection random access programming and wireless remote.

So if you’re a disc jockey, a radio station owner or a music freak, you’ll be crazy about the new Technics CD players.

Technics
The science of sound
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 remotely 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 RSR-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 intro-duce 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 SD (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.
STEREO DEMANDS
THE REAL SOUND
OF AMERICA'S
BEST-SELLING SPEAKERS

Realistic® brand speakers from Radio Shack are the choice of music lovers who know uncompromised sound when they hear it... and solid-value craftsmanship when they see it. From the mighty Mach Two® system to our widely acclaimed Minimus® series, each and every Realistic speaker system is engineered and manufactured to demanding standards. And 13 models, including two of our lowest priced extension speakers, feature a genuine walnut veneer finish, not vinyl. For the real sound of stereo, millions choose Realistic.
## EQUIPMENT

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- EPI T/E 320 Series II Speaker, page 31
- Harman Kardon Citation Twenty-Two Amplifier, page 37
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### JAPANESE AUDIO

- A special report
  
  **by Bryan Harrell**

### TWO DAT DECKS

- First U.S. tests of digital audio tape decks from Sony and Victor (JVC)
  
  **by Julian Hirsch**

### TAPE DECK BUYING GUIDE

- Features, specifications, and prices of cassette decks available in the U.S.
  
  **by William Burton, Wendy Schaub, and John Weinberg**

## MUSIC

### MOZART ON CD

- An annotated discography of Mozart's basic orchestral works on compact disc
  
  **by Richard Freed**

### BEST RECORDINGS OF THE MONTH

- Bach's *St. John Passion*, Crowded House, Liszt Songs, Fleetwood Mac

### RECORD MAKERS

- The latest from Buster Poindexter, Vladimir Feltzman, Chris Hillman, Ronnie Spector, Stewart Copeland, and more

Cover: The Yamaha CDX-1100 CD Player; see page 25.

Design by Sue Llewellyn, photo by Jook Leung.

### ATTENTION MAGAZINE RETAILER:

See important notice at the end of Classified ads, page 113.
Summer Reading

by Louise Boundas

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 Outslaughter 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.
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Travelling with the sound of Nakamichi mobile audio products can be a magical experience.

Our company's commitment to quality and leading-edge technology has produced some of the finest audio components known to man.

But it's not the technology that provides the magic; it's the musical experience it creates.

After all, we know that nothing can make the spirit soar like music.

For the name of your nearest authorized Nakamichi home audio or mobile sound dealer, please call or write:

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(800) 223-1521 (California)
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"The Genius of Matthew Polk Has Created Two Awesome Sounding Grand Prix Award Winning SDA SRSs"”

"Spectacular... it is quite an experience"

Stereo Review Magazine

No matter how you look at it; the SDA-SRS 2 incorporates 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 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 awe-inspiring sonic 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 cannot 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 Magazine*

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 True Stereo technology which reproduces music with a precise, lifelike three-dimensional soundstage which is unequalled and gives you, as Julian Hirsch of Stereo Review summed it up, "literally a new dimension in sound." Each beautifully styled and finished SRS 2 cabinet contains 4 Polk 6½" trilaminate 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, 2 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 monocoque 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 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.

Other superb sounding Polk speakers from $85 ea.

No matter what your budget is, there is a superb sounding Polk speaker perfect for you. Polk's incredible sounding/affordably priced Monitor Series loudspeakers start as low as $85 ea. The breathtaking sonic benefits of Polk's revolutionary True Stereo SDA technology are available in all Polk's SDA loudspeakers which begin as low as $395 each.

“Our advice is not to buy speakers until you've heard the Polks” *Musician Magazine*

The experts agree: Polk speakers sound better! Hear them for yourself. Use the reader service card for more information and visit your nearest Polk dealer today. Your ears will thank you.

Where to buy Polk Speakers? For your nearest dealer, see page 107
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, then who needs a copy of a music book? 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 the same scene so that the company that makes the film gets its due.

DAVID MCNAMEE
Bakersfield, CA

Although I may be naive about the mass-production tape-pirating operations going on, especially in countries with less stringent laws, I think what really needs to be enforced are laws against selling illegal copies. After all, the "casual copier" is most often a sick, insecure teenager strutting his music. "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

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.

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

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 your writers for their "plain English" feature stories and articles.

HENRY W. ELLIS
Orlando, FL

Easy Listening

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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 ½ inch in diameter. The size of the tweeter is 1 inch. We regret the error.
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320570, Mussorgsky: Pictures At An Exhibition; Ravel: La Voile—Menlo cond. (CBS Masterworks)
324822, Ravel: Bolero; La Voile; Rhapodie Espagnole—Maazel cond. (Digital—CBS Masterworks)
346984, Sean McCabe, K. Te Kanawa, J. Carreras, etc.—Digital—CBS
348458, DiVinci, Cello Concerto—Yo Yo Ma, Maazel, London Philharmonic—Digital—CBS Masterworks
347503, Cyndi Lauper—True Colors (Portrait)
346463, Andrews-Wilson—The Downs To The Moon (CBS)

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 alternatives. 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.

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City

State

Zip

Do you have a VCR? (Check one.)

[ ] Yes

[ ] No

Do you have a credit card? (Check one.)

[ ] Yes

[ ] No

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

Note: We reserve the right to reject any application or cancel any membership.

1987 Columbia House

Selections with two numbers contain 2 CDs and count as 2; so write matching numbers.

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434957

346478, Madonna—True Blue (Sire)

353458, Bruce Willis—The Return of Bruno (CBS)

353487, True Blue. (Sire)

351692, Vladimir Horowitz—Piano Concertos Nos. 1 & 2—Perlman, Hannik, Concertgebouw Orch—Digital—CBS Masterworks

351718, Georgia Satellites—Elektra

351622, Europe—The Final Countdown. (Epic)

343612, Billy Joel—The Bridge. (Digital—CBS)

344721, Lionel Richie—Dancing On The Ceiling. (Motown)

352633, Dolly Parton—Emymouhi Harris/Linda Ronstadt—Trio. (Warner Bros.)

351516, Vladimir Horowitz Plays Favorites Chopin, (Digital—CBS Masterworks)

347955, True Blue. (Sire)

343946, True Blue. (Sire)

349044, Johnny Mathis —Manauli—Hollywood Musicals (Columbia)

348979, True tuner—Break Every Rule (Capitol)

343339, Janet Jackson—Rush—Third Stage (MCA)

346472, Glenn Miller Orchestra—In The Digital Mood. (Digital—GPR)

348023, Greercedes—Clearwater Revival—Featuring John Fogerty—Chronicle. 20 greatest hits. (Fantasy)

351382, Van Halen—5150—Live at the Colosseum (CBS)

354553, Bradford Marsalis—Romances For Saxophone. (Digital—CBS Masterworks)

339226, Germaine—Rhapsody In Blue, Second Rhapsody, etc.—M. Tchaikovsky, Los Angeles Phil. (Digital—CBS Masterworks)

353777, Peter Gabriel—So. (A&M)

334391, Whitney Houston—In The Digital Mood. (Digital—GRP)

348979, True Blue. (Sire)

348202, Brian May—The Works. (Vertigo)

349613, Original Soundtrack—From The Master Of Kung Fu. (Digital—CBS Masterworks)

348110, Buddy Holly—Storyteller—(Digital—CBS Masterworks)

353946, True Blue. (Sire)

346462, Anita Baker—Rapture—(Elektra)

340996, 900908—Motorwax—25 #1 Hits From 25 Years. (Motown)

343391, Whitney Houston—In The Digital Mood. (Digital—GRP)

347577, Peter Gabriel—So. (A&M)

354443, Neil Diamond—12 Greatest Hits, Vol. 2. (Columbia)

357003, Eagles—Their Greatest Hits, Vol. 2. (Atlantic)

336091, Philip Glass—Mormon—For Saxophone. (Digital—CBS Masterworks)

346023, Steve Winwood—Back In The High Life. (Elektra)

351692, Vladimir Horowitz—Piano Concertos Nos. 1 & 2—Perlman, Hannik, Concertgebouw Orch—Digital—CBS Masterworks

353771, Bolling/Rampal—Suites No. 2 for Flute & Jazz Piano Trios. (Digital—CBS)

354245, David Sanborn—A Change Of Heart. (Warner Bros.)

347948, Wynton Marsalis—Convoy—Eastman Wind Ensemble, Donald Huntziger—Digital—CBS Masterworks

346649, The Pachelbel Canon And Other Digital Delights. The Toronto Chamber Orchestra. (Digital—Fontana)

353957, Led Zeppelin—Houses Of The Holy. (Atlantic)

353445, True Blue. (Sire)
The one and only now offers you

the one-of-a-kind 10 disc changer

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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.

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Speaking of high performance, the CDP-C10 offers advanced programming, shuffle play and direct disc and track selection. Then there's the affordable CDP-C5E. 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.
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 4½-inch woofers and 1-inch dome tweeter. Frequency response is rated as 50 to 30,000 Hz. Audio input jacks, a ¼-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 Permatect, 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 ± 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

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, 1-40 and Straw Plains Pike, P.O. Box 14810, Knoxville, TN 37914-1810.

Circle 124 on reader service card

JBL

JBL's compact ProII 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 ProII's diecast cabinet has black rubber moldings and measures 6½ inches wide, 9¼ inches high, and 5⅜ inches deep. Price: $240 per pair. JBL, Dept. SR, 240 Crossways Park West, Woodbury, NY 11797.

Circle 125 on reader service card

Sansui

Sansui's D-W11 double cassette deck offers simultaneous or 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
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 ±3dB 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.

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.

*Dolby is the registered trademark of Dolby Laboratories, Inc.

Harman/Kardon
A Harman International Company
High Performance Necessities for the Mobile Audiophile.
The Winner of
THE RODRIGUES CARTOON 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.

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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. Helmholz! Your wife has been coated with Z-17, the same miracle compound used to prevent speaker cone breakup in all our new models.

RICHARD PELLICCIARIO
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
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 commonplace 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.

"How Can Everybody's Speakers Be The Best?"
How the world's most powerful receiver can provide the benefits of audiophile separates in a single, remote control component.
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 castle 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 phone, 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 Asymmetric Charge-Coupled Detector technology which makes FM sound as good as other stereo sound sources. Free of background hiss, click and pops, pickey tending and other multipath interference annoyances which disturb FM enjoyment.

The significance of its design can only be fully appreciated by tuning the weakest, most unacceptable 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 CDs 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.
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 audiophiles 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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Led Zeppelin • Good Times Bad Times, Communication Breakdown, etc. Atlantic  134303
Steve Miller Band: Gretaest Hits 1974-1979 • Fly Like An Eagle, The Joker, etc. Capitol  133199
Tomita's Greatest Hits • Also Sprach Zarathustra, Bolero, Pachelbel Canon, Clair De Lune, 10 more. RCA  253955

CD Club, 6550 E. 30 St. Indianapolis, IN 46219-1194

Bon Jovi: Slippery When Wet • You Give Love A Bad Name, etc. Mercury  104853
Vivaldi, Guitar Concertos • Los Romeros with the Academy of St. Martin-in-the-Fields. Philips DIGITAL  115265
Genesis: Invisible Touch • Land of Confusion, title song, etc. Atlantic  153740
Stevie Ray Vaughan & Double Trouble: Live Alive • RCA  150414
Robert Cray: Strong Persuader • Smoking Gun, others. Mercury/Hightone  104876
Boston: Third Stage • Amanda, We're Ready, others. RCA  173392
Mozart, Symphonies Nos. 40 & 41 (Jupiter) Chicago Symphony Orchestra led by James Levine. RCA DIGITAL  150414
Blitz, Carmen (Film Highlights) • Julia Migenes-Johnson, Placido Domingo, Leon 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  115029
John Cougar Mellencamp: Scarecrow • Lonely Night, Small Town, Rain On The Scarecrow, more. RCA  144512
The Legendary Enrico Caruso • Vest! Ta glubba, Celeste Ada, Cleo e marm, La torma s 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, Kinderscenen, 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  155271

CD653
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 recording 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.
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 14/10) 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
$13000 / pair

dbx Soundfield 10
$14599 / pair

dbx Soundfield 100
$1899 / pair

dbx Soundfield 1000
$1899 / pair

“Suggested retail prices.

For the location of the dbx speaker dealer nearest you, call us directly at (617) 964-3110. A division of BSR North America Ltd. © 1986 dbx, 71 Chapel Street, Newton, MA 02161.
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.

11 mg. "tar", 0.8 mg. nicotine av. per cigarette by FTC method.
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-
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 vibration 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 provide a 20-dB dynamic range, with 0.2-dB steps from the 2-volt maximum down to zero output. 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 17⅛ inches wide, 16¾ inches deep, and 4¾ inches high, it weighs about 31 pounds. It is supported on four vibration-isolating feet about 2⅛ inches in diameter and ¾ inch high. Price: $1,200. Yamaha, Dept. SR,
The concert continues with the Ford JBL Audio System.

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

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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.
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 Philips 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 mistracking, 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.

The 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.
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 gives new meaning to the word clear.

If you’re beginning to get the idea that our new D Series equipment is the best thing that’s ever happened to digital sound, we suggest that you call 1-800-4-KENWOOD for the location of your nearest authorized dealer. Just tell them you’ve seen the light. And now you’d like to hear it.

KENWOOD

CIRCLE NO. 26 ON READER SERVICE CARD

We removed the protective coating from the cable shown to clearly illustrate a fiber optic transmission.
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 34 1/4 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 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 tone-burst 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
“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
THE NEW CONCORD CX SERIES.
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Advanced Tape Noise Reduction Systems
Microprocessor Controlled Digital Tuner
FNR™ Noise Reduction for FM
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Low Distortion Preamp Level Fader
Bass and Treble EQ/Tone Controls
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Focus your attention now on our legendary amplifiers. Every CX series unit has a 4 way amplifier that supplies 35 or 50 watts total maximum power. Concord's low distortion preamp level fader and preamp outputs make adding more power easy. And because the amps in many CX series units can be "bridged" into 2 channels every watt they produce can still be used when you add a power amp. So you're really adding power, not just replacing it.

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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 currents 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-
TEST REPORTS

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 peres, corresponding to 400 watts—
The higher voltage provides the maximum output is delivered into 4 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 amplifiers, 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 17¾ inches wide, 14¼ inches deep, and 6¾ 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
The last thing I remember is the blonde at the tollbooth saying, "Turn up the stereo."

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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" de-

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 deliberate 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 idiosyncrasies, 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.

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 butyl surrounds.

For instance, specially treated cellulose cones insure that moisture, heat and UV deterioration won’t compromise performance. Butyl 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.

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 a “top high-quality automotive paint. And their wide range of configurations makes them adaptable to virtually any situation, from Honda CRX to Mercedes stretch limo.

Whichever Canton automobile loudspeaker system you choose, you can be sure it will be there for the long haul.

Find out more about the entire Canton product line by visiting an Authorized Canton Dealer and picking up Canton’s 1986/1987 40-page Loudspeaker Journal.

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If you want a car that raises your pulse without ruining your credit rating, Ford offers two suggestions. Escort GT and Escort EXP. The moving force in both cars: a multi-port electronically fuel-injected 1.9 liter High Output engine that delivers 115 horsepower through a smooth-shifting 5-speed manual gearbox. The performance-tuned suspension and sticky 15-inch tires connect the power—and you—to the road.

When it's time to slow down, the power-assisted front disc/rear drum brakes are ready for work.

Human engineering. The interiors of Escort GT and EXP are designed with as much care as the mechanics. 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.

Your move. The choice: excitement for four in the GT, or the sporty two-seater EXP.

Escort GT
Either way, you can count on one thing. You're going to have a seriously good time.

**New 6-Year/60,000-Mile Powertrain Warranty.**

Ford now covers all new 1987 cars with a 6-year/60,000-mile warranty on major powertrain components. Restrictions and deductible apply. New, longer corrosion warranty coverage for body panel rust-through is 6 years/100,000 miles. Also, participating Ford Dealers stand behind their customer paid work with a free Lifetime Service Guarantee. It's good for as long as you own your Ford car. Ask to see the limited warranty and the service guarantee when you visit your Ford Dealer.

Ford. Best-built American cars... six years running.

For the past six consecutive years, Ford quality has led all other American car companies. This is based on an average of owner-reported problems in the first three months of service on '86 models, and in a six-month period on '81-'85 models designed and built in North America.

**FORD ESCORT GT**  
**FORD ESCORT EXP**

Have you driven a Ford... lately?

Buckle up—Together we can save lives.
Until now, car stereo systems let you equalize sound through two speakers, at best. Which is hardly best, if you have four speakers. The highs and lows you control in only two speakers are virtually cancelled out by the levels you can't control in the other speakers.

But listen to Sherwood. Listen to the CRD-350 stereo cassette receiver combined with the EQA-280 equalizer/amplifier. Listen to full equalizer control of all four speakers at 20 watts per channel. A total of 80 watts.

The experts did at this past summer's Consumer Electronics Show. And they voted the CRD-350/EQA-280 combo "Among the most innovative consumer electronics products of the year." The EQA-280's line output loops through the CRD-350's preamp sending fully equalized sound to the four corners of your car.

And the EQA-280 gives you seven EQ bands. Five LEDs to indicate power levels. A selectable EQ defeat switch. A high/low gain switch. An automatic remote on/off.

What about the CRD-350? What about everything you ever wanted in car stereo. You get FM stereo, of course. But also C-QUAM* AM stereo. Dolby** B/C noise reduction for its full logic, auto-reverse cassette deck.


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Want more for your money? You'll never get it. Ask the experts. Like any of the dealers listed below. Sherwood's got the market cornered in four-corner sound.

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

Southern California — Crystal Sonics, 1 (800) 545-730, Wisconsin — American TV, (608) 271-1000, Minnesota, North Dakota, Iowa — Best Buy Co., (612) 896-2300
New England — Manufacturer's Marketplace, (617) 327-7000, Richmond — Auto Sound of Virginia, (804) 282-3152, Indiana — Hifi Buys, (317) 243-2940

CIRCLE NO. 19 ON READER SERVICE CARD
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 speaker 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, 12 3/4 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-
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 center of the listening position. This is precisely the effect that the Ferrellipse lens was designed to eliminate, but it showed up strongly in our dispersion measurements made at angles of 0 and 45 degrees.

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.

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’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.

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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
Yamaha has just redefined the compact disc.

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.

But if you think that's all we did to improve our new CD player, listen carefully. Because the CDX-1100U also employs HI-BIT technology no other manufacturer has even thought of.

Like quadrupling the sampling rate to 176.4 kHz, then combining it with our exclusive 18-bit digital filter and 18-bit dual digital-to-analog converters. This unique combination produces waveform resolution accuracy four times greater than any other CD player on the market today.

What does all this accuracy mean? For starters, a more precise interpretation of the music that was always on your discs to begin with. A truer, more realistic soundstage, articulated without sacrificing musical warmth or smoothness.

Of course, there are other design features that put the CDX-1100U at the forefront of CD performance. Including a floating suspension system that eliminates vibration-induced signal modulation, and photo-optical couplings for a noise-free digital signal transmission.

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." Then you'll know you've finally heard it all.
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
日本聴覚技術
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-
Yamaha's CX-10000 control amplifier includes a digital parametric equalizer and all the functions of the innovative DSP-I 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-I (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."

**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 cassette 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." 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 European 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 "mikirishas ha," 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."

**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...
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 LS'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-
vional 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 Yamagawa [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 blasting out the final strains of a tired jazz standard, trying her very best to sound like 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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**FIRST U.S. TESTS**

**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 experimenting, 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 3⅞ 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 loading system is somewhat different, however. Touching the open/close button causes the door to swing open widely 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 SYNCHIRO and COMPLI-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 4½ 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 flattest 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

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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 recording 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, overshot 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.
"If you've never heard truly great audio reproduction before, slip into a pair of Stax"

Ken Pohlmann
Digital Audio & Compact Disc Review
February 1987

"We rarely state unequivocally that a product is 'the best' of its type, principally because it's usually impossible to define 'best' in universally meaningful terms. The Stax SR-Lambda Professional and its companion driver are an exception."

Julian Hirsch
Stereo Review
April 1986

"The Stax Lambda Pro system is one of the few products unique enough to rise above the issue of its particular technology (of which it is an outstanding example) and be compared on a no-holds-barred basis with the best high-end components around."

Anthony H. Cordesman
Audio Magazine
January 1985

"If you want the ultimate in sound quality, just hook up the output of a CD player to the input on the rear of the SRM-1/Mk2 Professional amplifier, put on the Lambda Professional earspeakers, and play a well recorded CD."

Burt White
Audio Magazine
November 1983

Recommended by Stereophile Magazine in the March and May 1987 issues as “Class A: Best attainable sound, without any practical considerations; “State-of-the-art.”

Recipient of International Audio Review Engineering Achievement Award.

Winner of Audio Video International Hi Fi Grand Prix Product of the Year Award for 1986.
Here's an easy message

Normally we'd write three columns of copy with pictures of our latest products, in an effort to fill your head with all of those aspects of TEAC's technology which we find fascinating: high performance computer memories, Space Shuttle video recorders, pioneering tape recorders in all areas from home hi-fi to studio recording to instrumentation recording, home VHS, and the latest in compact disc players and videodisc recording technology.

All we'd really like is for you to remember one thing about TEAC: our commitment to quality. Maintaining the image of dependable performance behind the TEAC name is always on our minds.

And whenever you stop in a stereo shop and stand in front of a TEAC, you know you're looking at a piece of well designed, well made equipment which is sure to give you years of satisfaction.

Making your life easier... that's the best part of every TEAC.
Introducing the Teac AD-7. Our latest cassette deck that comes with a rather unique attachment—our latest CD player. Together they offer a compilation of technical advancements equal to the most sophisticated of components.

On the left side, we've installed our exceedingly accurate 3-beam laser compact disc player. It includes enough features and programmability to merit a box of its own.

On the right side, there's an auto-reverse cassette deck with real-time reverse record and playback cobalt amorphous heads, Dolby B, C, and dbx noise reduction, 15-selection memory program and bias fine tuning. Plus Time Edit, an exceptionally intelligent device capable of discerning which selections on the disc will fit on each side of the tape. So there's no long blank space at the end of the first side and nothing is recorded over the tape's reversal period. You can even listen to a disc while you're taping an outside source. And all of this can happen via a wireless remote.

Now there's only one question. Is this the most advanced CD player, or is this the most advanced cassette deck?
THINK OF IT AS THE WORLD'S SMALLEST DIGITAL PLAYER.

Now you can take the dynamics of digital performance anywhere. With TDK HX-S. It captures the purity and nuances of digital sound like no other high-bias audio cassette.

Specifically designed to record digitally-sourced materials, HX-S offers four times the magnetic storage capability of other high-bias cassettes available today. Plus unmatched high frequency MOL (Maximum Output Level) for optimum performance.

With all this going for it, HX-S does more than step-up your pocket-sized player. It also acts like fuel injection for your car audio system. And it can turn a boombox into a portable music hall.

TDK HX-S. One small step for digital. One giant leap for music-kind.

TDK is the world's leading manufacturer of audio & video cassettes and floppy disk products.
By William Burton, Wendy Schaub, and John Weinberg

**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 copandera); cast transport; record balance set electronically in 1-dB increments; mic/line mixing; bias selector; timer; timer rec/play standby; timer record level; memory stop/play; LED meters; headphone jack. W&F standard speed 0.04% wrms, high speed 0.03%; FR (with all tape types) standard speed 20-20,000 Hz ± 2 dB, high speed 25-20,000 Hz ± 2 dB; S/N (A-wtd, all tape types) standard speed: >58 dB no NR, >66 dB Dolby B, >74 dB Dolby C, high speed: >60 dB no NR, >68 dB Dolby B, >76 dB Dolby C; line-input sens for 0-dB reading 100 mV; line output level with 0-dB indication 700 mV, line output sens 0.36 mV. 17.5’ W x 7.5’ H x 14.8’ D; 19.6 lb; $900

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-P.L.A. direct-drive capstan; multiple-glide outer-rotor motor; repeat; mic/mic 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 0.03%; 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 dB no NR, >66 dB Dolby B, >74 dB Dolby C, high speed: >60 dB no NR, >68 dB Dolby B, >76 dB Dolby C; line-input sens for 0-dB reading 100 mV; line output level with 0-dB indication 700 mV, line output sens 0.36 mV. 17.5’ W x 7.5’ H x 14.8’ D; 19.6 lb; $900

**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; megaphone jack; feature switch; timer rec/standby; auto Dolby NR detector; intro-play; Auto-De-Magnetics 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, 16.5’ W x 34.8’ H x 13.1’ D; 12.1 lb; $650

AD-A70U Auto-Sorting Cassette Deck

Auto-reverse cassette deck holds up to 5 cassettes for quick-focus 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 counter; bias selector; W&F 0.06% wrms; FR ferric 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; 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 20-19,000 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; $550

AD-W22OU 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 syncro 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-W80U 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; Dolby B/C; music search; blank skip; Dolby B, 1-touch syncro 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; $350

AD-S40U Dolby B & C Cassette Deck

Features: 3 heads; 2 motors; auto bias/EQ; Dolby B; Dolby C; Dolby HX Pro; bias fine tuning; headphone jack; rec mute; 0.2 sec reverse; auto tape monitor; timer; rec mute; auto Dolby NR detector; electronic digital tape counter; feather-touch IC logic controls; cue & review; fluorescent peak meters. W&F 0.026% 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 reverse; auto tape monitor; timer; rec mute; auto Dolby NR detector; electronic digital tape counter; feather-touch IC logic controls; cue & review; fluorescent peak meters. W&F 0.026% 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

Features: 2 heads; 2 motors; automatic reverse; Dolby B/C; automatic reverse; Dolby B/C. W&F 0.026% 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-S15 Dolby B & C Cassette Deck

Two-motor cassette deck with Dolby B, Dolby C; tape-type selector; fine bias adjustment for normal and high bias tape; rec mute; timer standby; $180

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; timer standby; $150

**AKAI**

GX-899B 3-Head Cassette Deck

Auto-reverse 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-speed DC drive, Teflon-bonded high-tuned head, drive system; Foldback Electrode Transistors (FET) for increased midrange resolution and widened dynamic range. Features: 3 heads; 5 motors; auto bias/EQ; Dolby B; Dolby C; dual jack; rec mute; digital direct drive; elapsed-time counter; remaining-time counter: music search; output level control; memory stop/play; rec mute; headphone jack; !U-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 0.026% wrms; FR ferric 20-16,000 Hz ± 3 dB; $350

**TAPE DECKS BUYING GUIDE**

Singing 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.
TAPE DECKS

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

GX-8-B 3-Head Cassette Deck
Cassette deck with quart-PLL direct-drive motor for low W&F, super GX (glass and crystal) head, manual transport, 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; manual azimuth adjust, tone oscillators; music search; output level control; rec mute; headphone jack; auto mute; record control; gold-plated RCA and headphone jacks. FL display; feather-touch full-logic controls; direct lead-in; power eject. W&F 0.04% wrms; FR ferric 20-19,000 Hz ± 3 dB, high bias 20-20,000 Hz ± 3 dB, metal 20-21,000 Hz ± 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 tape-to-tape 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 ± 3 dB, high bias 20-20,000 Hz ± 3 dB, metal 20-21,000 Hz ± 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-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; real-time counter; programmable dubbing and playback; selectable tape head; menu-driven configuration programming; auto demagnetization; head; auto demagnetization. Features 3 heads; 3 motors; auto bias/EQ; Dolby B; Dolby 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 ± 3 dB, high bias 20-18,000 Hz ± 3 dB, metal 20-19,000 Hz ± 3 dB, metal 20-16,000 Hz ± 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 $530

HX-A451W Double Cassette Deck
High-speed dubbing cassette deck with random-programmable dubbing and playback for both transports. Master driver mechanism uses 3rd motors for tape synchronization. Features feather-touch full-logic controls; high bias tape) 58 dB no NR, 66 dB Dolby B, 68 dB Dolby C. $1,695

HX-351W 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; C; 13 heads; 2 motors; bias fine tuning; manual azimuth adjust, automatic balance, programming, programmable dubbing and playback; separate gaps for recording and playback; programmable tape head. Features 3 heads; 2 motors; Dolby B; Dolby C; Dolby HX Pro; dual capstans. $580

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; switched 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 ± 3 dB, metal 20-16,000 Hz ± 3 dB; S/N (A-wtd) metal: 66 dB Dolby B $229

BANG & OLUFSEN
Beocord 3300 Interactive 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
Stereo cassette deck integrates with Beosystem 3300 system for remote-controlled operation. Features 3 heads; 3 motors; Dolby B; Dolby C; music search; elapsed-time counter; LED metering; mic inputs; rec mute; headphone jack. Wireless remote control optional. W&F 0.05% wrms; FR ferric 30-15,000 Hz ± 3 dB, high bias 30-15,000 Hz ± 3 dB; S/N (all A-wtd) metal: 66 dB Dolby B, 68 dB Dolby C. $1,695

DENON
DR-M14XH 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; output level control; memory stop; led; automatic tape selector; real-time counter, music search, fluorescent meter, MPX filter. $475

DR-M14XH 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-M14XH except lacks remote control $325

Harman Kardon
CD491 Dolby B/C/HX Pro Cassette Deck
Ultrawideband cassette deck with direct-drive dual-motor 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-aided LED meters; mic inputs; mix, mix, mix; memory controls; memory controls. W&F 0.025% wrms; FR with all tape types 20-24,000 Hz ± 3 dB, S/N (A-wtd, with high bias tape) 58 dB no NR, 66 Db Dolby B, 75 dB Dolby C, line-input sensors 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

Denon DR-M441H

Fisher
CR-W9S 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-W9SB. As above in black $300

CR-W5S 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-W5SB. 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

Harman Kardon

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### 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 tuning 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 ±3 dB; S/N (A-wtd) high bias 20-17,000 Hz ±3 dB, metal 20-17,000 Hz ±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; 10.6 lb; $450

**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 ±3 dB, high bias 20-21,000 Hz ±3 dB, metal 20-21,000 Hz ±3 dB, S/N (A-wtd) high bias 65 dB with Dolby 73 with Dolby C. $315

**Hitachi**

**D-W99 Double Cassette Deck**

- Front-loading, logic-controlled double auto-reverse 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; auto-reverse; 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 ±3 dB, high bias 30-15,000 Hz ±3 dB; S/N metal 65 dB Dolby B, 72 dB Dolby C. $700

**D-W77 Double Cassette Deck**

- Logic-controlled auto-reverse 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; time/rec/play; blank skip; rec mute; headphone jack; unified control compatibility. FR ferric 30-14,000 Hz ±3 dB, high bias 30-15,000 Hz ±3 dB, metal 30-16,000 Hz ±3 dB; S/N metal 65 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 auto-reverse high-speed dubbing cassette deck with auto tape selector, timer rec/play; continuous playback, and synchronized dubbing start. Features 2 heads; 2 motors; auto-reverse, two transports; Dolby B, blank skip; LED meters; W&F 0.08% wrms; FR, ferric 30-14,000 Hz ±3 dB, high bias 30-15,000 Hz ±3 dB, 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 Compulink Components. Features 2 heads; 2 motors; LED meters; soft-touch controls; mic inputs; rec mute. W&F 0.08% wrms; record/playback FR (± 3 dB) ferric 40-14,000 Hz, high bias 40-15,000 Hz, S/N (A-wtd) metal 58 dB no NR. 7 lb. $185

**Kenwood**

**KX-95W(B) Double Cassette Deck**

- Auto-reverse 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; FR metal 20-18,000 Hz ±3 dB; S/N (A-wtd) metal 73 dB Dolby C; 16.22" W x 4.42" H x 10.62" D; 13 lb $365

**KX-96W Double Cassette Deck**

- Double auto-reverse cassette deck with Dolby B and Dolby C; remote control; simultaneous and sequential recording; relay play; high-speed dubbing; full-logic controls; music scan; 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 auto-reverse; 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 ±3 dB, S/N (A-wtd) metal: 73 dB Dolby C. $245

**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 auto-reverse; 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 ±3 dB, S/N (A-wtd) metal: 73 dB Dolby C. $245

### Harman Kardon CD491

- Components. Features 2 heads; 3 motors; LED meters. W&F 0.05% wrms; FR with all tape types 20-22,000 Hz ±3 dB; S/N metal 65 dB no NR. 7 lb

### JVC

**DD-VR77 Autoreverse Cassette Deck**

- Hi-fi U-turn quick reverse 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; rec mute; headphone jack. W&F 0.038% wrms; record/playback FR (± 3 dB) ferric 20-19,000 Hz, high bias 20-19,000 Hz, metal 20-19,000 Hz, S/N (A-wtd) metal: 58 dB no NR. 17.125" W x 4.375" H x 11.125" D; 450

**TD-V660BK 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. Remoterollable with selected JVC Compulink 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 (± 3 dB) ferric 20-19,000 Hz, high bias 20-19,000 Hz, metal 20-19,000 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-W600 Double Cassette Deck**

- Double cassette deck with quick auto-reverse 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) $315

**TD-W55R(B) Similar to TD-W660 except lacks quick auto-reverse system**

**TD-W600BK 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 Compulink Components. Features 3 heads; 3 motors; auto bias/EQ; Dolby B & C; music search; LED meters; soft-touch controls; headphones. W&F 0.08% wrms; record/playback FR (± 3 dB) ferric 30-14,000 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; 10.6 lb. $385

**TD-W300 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 Compulink Components. Features 2 heads; 3 motors; LED meters; soft-touch controls; mic inputs; rec mute. W&F 0.08% wrms; record/playback FR (± 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

### Kenwood

**KX-75R(B)**

- Basic Series Cassette Deck

- 3-head cassette deck with Dolby B and C noise reduction; full-logic control; photo-sensor auto-reverse; rotary head system; direct program search; index scan. $295

**KX-780(B)**

- Basic Series Cassette Deck

- 3-head cassette deck with Dolby B and C noise reduction; full-logic control; photo-sensor auto-reverse; rotary head system; direct program search; index scan. $295

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TAPE DECKS

**KYOCERA**

D-811 Dolby HX Pro Cassette Deck
Features 2 heads; 3 motors; 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; remote control; rec mute; wireless remote. W&F 0.02% wrms; metal 20-22,000 Hz ± 3 dB, high bias 20-20,000 Hz ± 3 dB, normal 20-20,000 Hz ± 3 dB; S/N (A-wtd) metal: 58 dB no NR, 10 dB Dolby B, 20 dB Dolby C, line input level with 0 dB indication 780 mV; mic input sens 0.5 mV. $625

D-611 Dolby B & C Cassette Deck
Features 2 heads; 3 motors; bias/EQ presets; bias fine-tuning; direct drive; output level control; memory repeat/stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; remote control; rec mute; wireless remote. W&F 0.035% wrms; metal 20-22,000 Hz ± 3 dB, high bias 20-20,000 Hz ± 3 dB, normal 20-20,000 Hz ± 3 dB; S/N (A-wtd) metal: 58 dB no NR, 10 dB Dolby B, 20 dB Dolby C, mic input sens 0.5 mV. $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/stop-play; headphone jack; rec mute; logic control; Duo-Beta circuitry. W&F 0.002% wrms; FR ferric 20-20,000 Hz ± 3 dB, high bias 20-20,000 Hz ± 3 dB, metal 20-20,000 Hz ± 3 dB; S/N (A-wtd) ferric: 65 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 no NR, 67 dB Dolby B, 73 dB Dolby C. W&F <0.06% wrms; S/N 77.4 dB with metal tape. $1,200

K-106 Autoreverse Cassette Deck
Remote-capable cassette deck with timer function; blank search; rect mute/auto space; 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/stop-play; LED meters; soft-touch controls; rect 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 Dolby C, 90 dB dbx; metal: 67 Dolby B, 71 Dolby C, 90 dbx. W&F 0.018% wrms; S/N 77.4 dB with metal tape and Dolby. $380

K-105 Autoreverse Cassette Deck
Remote-capable cassette deck with blank search, rect mute/auto space, 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/stop-play; LED meters; soft-touch controls; rect 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 Dolby C, 90 dB dbx; metal: 67 Dolby B, 71 Dolby C, 90 dbx. W&F 0.018% wrms; S/N 77.4 dB with metal tape and Dolby. $380

**MARANTZ**

SD255 Double Cassette Deck
Features 2 heads; Dolby B; Dolby C; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.018% wrms; FR ferric 40-12,500 Hz ± 3 dB, high bias 40-12,500 Hz ± 3 dB; metal 35-17,500 Hz ± 3 dB; S/N (all A-wtd) metal 65 dB Dolby B, 72 dB Dolby C. 16.5' W x 4' H x 12.1' D; 16 lb. $450

SD155 Double Cassette Deck
Features 2 heads; Dolby B; Dolby C; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.018% wrms; FR ferric 40-12,500 Hz ± 3 dB, high bias 40-12,500 Hz ± 3 dB; metal 35-17,500 Hz ± 3 dB; S/N (A-wtd) ferric: 51 dB no NR, 57 dB Dolby B, 65 dB Dolby C. 10.4 lb. $250

**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-gap head. Dolby HX Pro and Dyneg headroom extension; Play Trim; real-time counter. W&F 0.018% wrms; S/N 77.4 dB with metal tape and Dolby C. $798

6155 Dolby B/C/HX Pro Cassette Deck
Cassette deck with Play Trim circuit to adjust playback for both transports. Features 15-song quick music search, auto tape selector; high-speed dubbing; mic/mic mixing; auto rec mute; Dolby B & C; 2 heads; 2 motors; memory stop/stop-play; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.066% wrms; FR ferric 30-15,000 Hz, high bias 30-17,000 Hz, metal 30-17,000 Hz; S/N (A-wtd) metal: >65 dB Dolby B, >70 dB Dolby C; metal: >65 dB Dolby B, >70 dB Dolby C. 7.7 lbs; 17.25' W x 4.5' H x 12.6' D. $480

6240 Dyneg Cassette Deck
Cassette deck with Dyneg 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

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-power way. W&F 0.12% wrms; FR ferric 40-12,500 Hz ± 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; auto level control; switchable limiter; 3-power way. W&F 0.12% wrms; FR ferric 40-12,500 Hz ± 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

NAD 6155 Cassette Deck
Cassette deck with Play Trim circuit to adjust playback for both transports. Features 15-song quick music search, auto tape selector; high-speed dubbing; mic/mic mixing; auto rec mute; Dolby B & C; 2 heads; 2 motors; memory stop/stop-play; LED meters; soft-touch controls; mic inputs; headphone jack. W&F 0.066% wrms; FR ferric 30-15,000 Hz, high bias 30-17,000 Hz, metal 30-17,000 Hz; S/N (A-wtd) metal 65 dB Dolby B, 72 dB Dolby C. 16.5' W x 4' H x 12.1' D; 20 lb. $330
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 retraction slotted 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 bias/eq switches for ZX, SX, and EX cassettes; direct-coupled recording and playback amplifiers; left, right, master input levels; output control level; rec mute; high-output headphone jack; detachable infrasonic filter; 4-digit LED electronic counter with memory stop and repeat. W&F 0.019% wtd rms; FR 20-22,000 Hz ±3 dB with ZX tape; S/N Dolby C/B on 66/72 dB at 400 Hz with 3% THD (A-wtd) with ZX tape at 400 Hz, 0 dB); spj/crossstalk 200 kHz, 45 mW/8 ohms for headphones; 17.5" W x 3.51" H x 11.81" D; 21 lb $1,995

**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, pitch control; wired remote control; 2-speed master fader; deficient MPX filter; 2-position EQ switch; 3-position tape selector; separate L + R output level. W&F 0.027% (wrms), FR, ferric 18-21,000 Hz ±3 dB, S/N (all-A-wtd), metal 66 dB Dolby B, 72 dB Dolby C, line-input sensitivity 0 dB reading 50 mV; line output at 0 dB, 1,000 mV $995

**RX-503 3-Head Cassette Deck**

- Discrete stereo cassette deck with unidirectional auto-reverse 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 peal 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 ±3 dB all tape; NR >70 dB with Dolby B; metal tape, THD <0.9% with ZX tape; line-input sensitivity for 0 dB reading 50 mV; line-output level with 0 dB indication 1,000 mV; 17.75" W x 3.69" H x 11.81" D; 22 lb $1,295

**MR-1 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; Crystal clarity recording and playback; subsonic filter; MPX filter, ±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 adapter. Optional remote control. W&F 0.027% wtd ±0.048% wtd peak; FR 20-20,000 Hz ±3 dB at -20 dB $945

**CR-SA 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 ±3 dB, S/N (all-A-wtd), metal 66 dB Dolby B, 72 dB Dolby C, line-input sensitivity 0 dB reading 50 mV; line output at 0 dB, 1,000 mV $945

**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; deficient 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 ±3 dB, high bias 20-20,000 Hz ±3 dB, metal 20-20,000 Hz ±3 dB, S/N (A-wtd) metal: 64 dB Dolby B, 70 dB Dolby C; line-input sensitivity 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/play; LED meters; soft-touch controls; headphone jack; rec mute, pitch control; wired remote control; auto repeat; hyperbolic-contour laminated sendust rec/playback head. W&F 0.03% (wrms), FR, ferric 20-20,000 Hz ±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; defective 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 ±3 dB, S/N (A-wtd) metal 15 dB lower in NR, 70 dB lower in B, 70 dB lower in C, 87 dB dbx; line-input sensitivity for 0 dB reading 60 mV; line-output level with 0 dB indication 730 mV; mic inputs 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 HPX 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 0.04% wrms; record/playback FR high bias 30-17,000 Hz ±3 dB, metal 30-18,000 Hz ±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

**RA-W99 Dual Auto Reverse Cassette Deck**

- Features 2 heads; 4 motors; auto bias/EQ; Dolby B, Dolby C; auto-reverse, high-speed or real-time dubbing, music search; mono mic input; headphone jack; rec mute; search dubbing function. W&F 0.05% wrms; FR 30-4,000 Hz ±3 dB ferric, 30-15,000 Hz ±3 dB high bias, 30-16,000 Hz ±3 dB metal, S/N (A-wtd) metal 58 dB no NR, 68 dB Dolby B, 78 dB Dolby C, line-input sensitivity 60 mV; line-output level 500 mV; mic-input sensitivity 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; 3 motors; 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 0.04% wrms; record/playback FR high bias 30-17,000 Hz ±3 dB, metal 30-18,000 Hz ±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

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**TAPE DECKS**

**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% w/rms; FR ferric 30-15,000 Hz ± 3 dB, high bias 30-15,000 Hz ± 3 dB, metal 30-16,000 Hz ± 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.

**TAPE DECKS**

**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; high-speed dubbing; relay and mic inputs; headphones jack; auto rec mute; auto tape select; remote control; timer record and playback, 9 program memory selection; digital snooze; 3 memory buttons; music search; selectable time stop; selectable time repeat; selectable time skip. W&F 0.02% w/rms; FR ferric 30-19,000 Hz ± 3 dB = 9000.

**TA-R22B Autoreverse Cassette Deck**
Computer-controlled cassette deck with Dolby B and Dolby C. Features 4 heads; 2 motors; music search; blank skip; LED meters; mic inputs; headphones jack; auto rec mute; delay forward/reverse; music search; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.07% w/rms; FR ferric 30-19,000 Hz ± 3 dB, high bias 30-15,000 Hz ± 3 dB; metal 30-16,000 Hz ± 3 dB; line-input sensit 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 4.75" H x 10.18" D; 12 lb. $260.

**TA-W55 High-Speed Dubbing Cassette Deck**
Features 4 heads; 2 motors; Dolby B; music search; blank skip; LED meters; mic inputs; headphones jack; auto rec mute; delay forward/reverse; music search; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.02% w/rms; FR ferric 30-20,000 Hz ± 3 dB; metal 30-20,000 Hz ± 3 dB; S/N (A-wtd) ferric: 60 dB no NR, 66 dB Dolby B, 76 dB Dolby C.

**TA-202B 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 control; music search; memory stop/place; LED meters; mic inputs; headphones jack; auto rec mute; timer/ rec/play; music search; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.06% w/rms; FR 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.

**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; stereo/mono switching; timer rec/ play; remote control. W&F 0.06% w/rms; FR ferric 30-20,000 Hz ± 20 dB, S/N 57 dB without NR.

**CT-1380WR Double Autoreverse Cassette Deck**
Double cassette deck with 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% w/rms; 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/search for up to 15 tracks; auto bias/EQ; rec mute; 1-touch recording; of up to ten selections per side; music search; repeat; skip search; music control; headphones jack; microphone jack; S/N 57 dB without NR.

**CT-2070R Autoreverse Cassette Deck**
Autoreverse cassette deck with Dolby B, Dolby C, and dbx noise reduction. Features full-motion controls; music search; memory stop/place; LED meters; mic inputs; headphones jack; auto rec mute; timer/ rec/play; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.08% w/rms; FR ferric 40-14,000 Hz ± 3 dB, metal 40-14,000 Hz ± 3 dB; line-out 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.

**PROTON 740**

**AD-300 Autoreverse Cassette Deck**
Full-logic autoreverse cassette deck with Dolby B and Dolby C, continuous play; tape-speed dubbing; auto tape-type select; memory, optional remote control; FR ferric 30-17,000 Hz ± 3 dB with metal tape.

**PROTON 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; Dolby B; Dolby C; metal tape; S/N 72 dB with metal tape and Dolby C; FR 30-17,000 Hz ± 3 dB with metal tape.

**AE-300 Autoreverse Cassette Deck**
Double-cassette deck with Dolby B and Dolby C. Features 2 transports; fade out; tape-speed dubbing; relay/rec-play; auto tape-type select; memory, optional remote control; S/N 72 dB with metal tape; W&F 0.08% w/rms; S/N 73 dB with Dolby C, 61 dB with Dolby B. $230.

**SCT-1000 Dolby B & C Double Cassette Deck**
Double cassette deck with Dolby B; Dolby C; high-speed dubbing; delayed transport; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.08% w/rms; S/N 73 dB with Dolby C, 61 dB with Dolby B. $180.

**SCT-100 Double Cassette Deck**
Double cassette deck with Dolby B; Dolby C; high-speed dubbing; selectable time stop/stop; selectable time repeat; selectable time skip. W&F 0.08% w/rms; S/N 73 dB with Dolby C, 61 dB with Dolby B. $180.

**SCT-43 Dolby B & C Cassette Deck**
Features 2 heads; automatic bias/level equalization tuning system; direct drive; remaining-time counter; music search; output level control; memory stop/play. W&F 0.05% w/rms; FR ferric 25-16,000 Hz ± 3 dB. $299.

**SCT-45 Double Cassette Deck**
Features 4 heads; 2 motors; 2 transports; Dolby B, manual azimuth adjust; selectable tape counter; mic inputs, headphones jack. W&F 0.1% w/rms; FR ± 3 dB ferric 40-12,500 Hz, S/N (A-wtd) ferric 60 dB Dolby B.

**SCP-25 Autoreverse Cassette Player**
Cassette player automatically plays both sides of tape. Features Dolby B; fast forward, rewind, fast reverse, playback, motor control. W&F 0.08% w/rms; S/N 66 dB with metal tape.
### TAPE DECKS

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<td>RD850 Dolby B &amp; C Cassette Deck</td>
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<td>SANSUI D-W10</td>
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<tr>
<td>S-260R Autoreverse Cassette Deck</td>
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### Details

**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 ±3 dB metal and high bias.
- **Price:** $80

**REVOLV R215 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-casting, motorized, azimuth-stable pivot headblock, 2 programmable locate buttons; loop mode; auto start-of-record locate. Counter computes elapsed time. W & F 0.1% wms; FR ferric 30-18,000 Hz ±3 dB.
- **Price:** $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; separate capstan and reel motors; high-gain; auto breeze; parallel高尔夫: 13,000 Hz, S/N (A-wtd) ferric 62 dB Dolby C; 68 dB Dolby B.
- **Price:** $500

**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 control; memory stop/play; LED meters; soft-touch controls; sendust heads; remote motor optional. W & F 0.9% wms; FR 20-20,000 Hz ±3 dB for all tape types. 19" W x 5.25" H x 12.5" D; 17 lb.
- **Price:** $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% wms; FR 20-20,000 Hz for all tape types.
- **Price:** $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-second format; separate capstan and reel motors; music search; intro skip; mic input; mix input; S/N >37 dB over 1,000 Hz with Dolby C and metal tape.
- **Price:** $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.
- **Price:** $80

**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; auto azimuth adjust; time counter; music search; blank skip; headphone jack; rec mute; black or silver. W & F 0.06% wms; FR metal 30-17,000 Hz ±3 dB; S/N (A-wtd) metal: 73 dB Dolby C.
- **Price:** $600

**D-E750 Double Cassette Deck**
- Double-speed dubbing cassette deck. Features 2 heads and 2 motors in each transport; Dolby C, dual capstans, time counter; memory search; memory stop/play; W & F 0.06% wms; FR metal 20-17,000 Hz ±3 dB; S/N 78 dB Dolby C.
- **Price:** $500

**D-705 Dolby B & C Cassette Deck**
- Cassette deck 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; memory stop; rec mute. W & F 0.035% wms; FR metal 20-21,000 Hz ±3 dB; S/N (A-wtd) metal: 68 dB Dolby C.
- **Price:** $500

**RDW89 Double Cassette Deck**
- Double-speed dubbing cassette deck. Features 2 heads and 2 motors in each transport; normal or double-speed dubbing; 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, time counter; memory search; memory stop/play; W & F 0.06% wms; FR metal 20-17,000 Hz ±3 dB; S/N (A-wtd) metal: 72 dB Dolby C.
- **Price:** $500

**RDW50 Double Cassette Deck**
- Double-speed dubbing cassette deck. Features 2 heads; 2 motors; bias fine tuning; manual azimuth adjust; elapsed-time counter; remaining-time counter; memory stop/play; LED meters; soft-touch controls; microphone; Dolby C; rec mute; headphone jack. W & F 0.08% wms; FR ferric 30-17,000 Hz ±3 dB.
- **Price:** $219

**RDW49 Double Cassette Deck**
- Double-speed dubbing cassette deck with Dolby B & C. Features 2 heads; 2 motors; two transports; music search; LED meters; soft-touch controls; headphone jack; continuous-play function. W & F 0.08% wms; FR 40-13,000 Hz, bias 30-14,000 Hz, metal 30-15,000 Hz; S/N (A-wtd) ferric 62 dB Dolby B, 70 dB Dolby C.
- **Price:** $90

**SANSUI D-W10**
- Double-speed dubbing cassette deck with full-logic microprocessor system. Features 2 heads; 2 motors; LED meters; soft-touch controls; microphone; Dolby C; rec mute; headphone jack. W & F 0.08% wms; FR ferric 40-13,000 Hz, S/N (A-wtd) ferric 61 dB Dolby B.
- **Price:** $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% wms; record/playback FR 40-13,000 Hz ±3 dB.
- **Price:** $220

**RT-W5000(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% wms; record/playback FR 50-11,000 Hz ±3 dB, high bias 50-12,000 Hz ±3 dB.
- **Price:** $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% wms; record/playback FR 50-11,000 Hz ±3 dB.
- **Price:** $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% wms. FR ferric 25-16,000 Hz ±3 dB.
- **Price:** $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% w rms; FR ferric 30-15,500 Hz ± 2 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 input level controls. W&F 0.08% w rms; FR ferric 30-15,500 Hz ± 2 dB $200

S-95 Dolby B & C Cassette Deck
Metal-capable cassette deck with 2 heads. Features bias fine tuning; elapsed-tape counter; LED controls; auto bias; auto tape/source selecting; auto tape transport; LED meters; auto muting; metal tape; function indicators; damped cassette door; separate L/R input level controls. W&F 0.08% w rms; FR ferric 30-15,500 Hz ± 2 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; mic inputs; headphone jack. W&F 0.05% w rms; 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 HS Pro headroom extension, auto tape-type selector; music scan; feather-touch controls; headphone jack. W&F 0.05% w rms; S/N 72 dB with Dolby C and metal tape $500

TC-WR750 Double Cassette Deck
Double cassette deck with Dolby B; Dolby C; high-speed dubbing; cue review; continuous play; optional remote control. W&F 0.07% w rms; 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% w rms; 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; LED controls; soft-touch controls; metal tape. W&F 0.07% w rms; 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% w rms; S/N 70 dB with Dolby C and metal tape $210

TANDBERG
TCD 3014A Cassette Deck
8-bit, 32K, EPROM 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/feature. $210

Tanberg 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; Dyneteq record equalization; Actiliner 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

AD-850X 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; blink 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 Tracking (ICMT); W&F 0.09% w rms; FR ferric 25-19,000 Hz ± 3 dB $749

V-580X Dolby B/C/dbx Cassette Deck
Double 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; headphone jack. W&F 0.06% w rms; FR ferric 25-16,000 Hz ± 3 dB $468

V-550X Dolby B/C/dbx Cassette Deck
Full-IC-logic cassette deck with cobalt amorphous head in deck I; continuous playback; auto bias/eq; elapsed-time counter; music search; memory stop/play; LED meters; rec mute; headphone jack; intro check; gold-plated jacks; MPX filter; Compu-Commander (RMPD); Cobalt Memory Memory Play, intro check, MPX filter, headphone jack, metal tape capable; continuous playback; auto bias/eq; dbx TANDBERG TCD 3014A

V-770 3-Head Cassette Deck
Features full IC-logic transport; 2 motors; auto bias/eq; Dolby B & C; Dolby HS 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-Commander (RMPD); Cobalt Memory Memory Play, intro check, MPX filter, headphone jack, metal tape capable; continuous playback; auto bias/eq; dbx $379

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, 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-Commander (RMPD); Cobalt Memory Memory Play, intro check, MPX filter, headphone jack, metal tape capable; continuous playback; auto bias/eq; dbx $379

W-440GCL 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; headphone jack. W&F 0.06% w rms; FR ferric 25-16,000 Hz ± 3 dB $468

R-455X Autoreverse Cassette Deck
Cassette deck with rotary head system. Features 2 heads; 2 motors; 2 transports; auto bias/eq; Dolby B; Dolby C; LED meters; soft-touch controls; rec mute; headphone jack. W&F 0.06% w rms; FR ferric 30-16,000 Hz ± 3 dB $425

R-435X Autoreverse Cassette Deck
Cassette deck with rotary head system. Features 2 heads; 2 motors; 2 transports; auto bias/eq; Dolby B; Dolby C; LED meters; soft-touch controls; rec mute; headphone jack. W&F 0.06% w rms; FR ferric 30-15,000 Hz ± 3 dB $425

V-583X 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% w rms; FR ferric 30-15,000 Hz ± 3 dB $425

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

**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-resentant metallic feet; edit search on Transport A; soft-touch controls; 28-step digital peak readout

**RS-T33R.** Similar to RS-T55R except lacks dbx and autoreverse on Transport B...

**RS-T22.** Similar to RS-T33R except lacks synchro stop and rec mute...

**RS-T11.** Similar to RS-T22 except lacks Dolby C and digital peak readout...

**RS-B29R Autoreverse Cassette Deck**
Rear-negative-cue 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

**RS-B107 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, head-phonc jack. W&F 0.08% wrms

**RS-B105Dolby 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

**USB OF AMERICA**

**CR 1601 Portable Cassette Deck**
Compact front-loading portable cassette record-er 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 ±2% wrms; FR ferric 20-19.000 Hz ±3 dB; 9.3' W x 2.3' H x 7.3' D; 5 lb

**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 dubbed; built-in monitor speaker; built-in microphone; 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 ±3 dB; high bias 30-16,000 Hz ±3 dB, SN/FER: 63 dB in NR, 63 dB in 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-160A V 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; separate channel record control; 3 built-in monitor speakers. Operates on dry cells, 12 volt car battery or 120 V AC. W&F 0.2% DIN; FR ferric 30-16,000 Hz ±3 dB...

**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; 20-16,000 Hz ±3 dB; high bias, 20-17,000 Hz ±3 dB; metal, 20-18,000 Hz ±3 dB; S/N metal 55 dB in NR, 65 dB in B, 75 dB in C...$899

**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 ±3 dB at 20 dB with metal tape...

**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 ±3 dB at 20 dB with metal tape...

**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 ±3 dB; high bias, 30-16,000 Hz ±3 dB; metal, 30-17,000 Hz ±3 dB; S/N metal 55 dB in NR, 65 dB in B, 75 dB in C...

**KX-W500U Double Cassette Deck**
Double autoreverse cassette deck with Dolby B and Dolby C. Remote controlled through Yamaha RX-1000U, RX-1000R, RX-1000W; head-phonc 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...

**KX-400U.** Similar to KX-W500U except single transport; Dolby RX Pro; intro scan; blank space; auto fader. W&F <0.04% FR ferric 30-15,000 Hz ±3 dB; S/N 74 dB Dolby C; 17.12" W x 4.62" H x 10.75" D; 9.7 lb...

**K-540B Dolby B & C Cassette Deck**
Features full-logic operation; low-imp sendust rec/play heads; Dolby RX Pro, bidirectional intro scan, LED peak level meter, 4-digit linear counter; 2 DC servos, 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 jack; timer level control; auto source change. W&F 0.05% wrms; FR 25-20,000 Hz ±3 dB metal; S/N 74 dB in B Dolby C; 17.12" W x 4.36" H x 10.75" D; 10.6 lb...

**KX-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; auto control through Yamaha RX-1000U, RX-1000R, RX-1000W; head-phonc control; permalloy heads; auto tape selector; rec return; auto rec mute; auto tape selector; full/0-M repeat; memory stop; music search; headphone jack; timer level control; auto source change. W&F 0.05% wrms; FR 35-16,000 Hz ±3 dB metal; S/N 74 dB in B Dolby C; 17.12" W x 4.36" H x 10.75" D; 9.2 lb...

**KX-340B Dolby B & C Cassette Deck**
Features full-logic operation; low-imp sendust rec/play heads; Dolby RX Pro, intro scan, LED peak level meter; 4-digit linear counter; 2 DC servos, 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 jack; timer level control; auto source change. W&F 0.05% wrms; FR 25-20,000 Hz ±3 dB metal; S/N 74 dB in B Dolby C; 17.12" W x 4.62" H x 10.75" D; 9.7 lb...

**KX-W500U Double Cassette Deck**
Double autoreverse cassette deck with Dolby B and Dolby C. Remote controlled through Yamaha RX-1000U, RX-1000R, RX-1000W; head-phonc 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...

**KX-400U.** Similar to KX-W500U except single transport; Dolby RX Pro; intro scan; blank space; auto fader. W&F <0.04% FR ferric 30-15,000 Hz ±3 dB; S/N 74 dB in B Dolby C; 17.12" W x 4.62" H x 10.75" D; 9.7 lb...

**STEREO REVIEW JULY 1987**
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 Markovitch 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-88113). Itzhak Perlman and Pinchas Zukerman, though, with Mehta and the Israel Philharmonic (CBS MK 42026) give large-scaled, warm-hearted, 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. 35, in D Major ("Haffner").** 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, offers 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 inspiriting, 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 (39c), 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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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 Pilate, 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.

Stoddar 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); Neil Archer, Rufus Muller (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" hysteries.
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 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. Mignon’s 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.
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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 Poltergeist 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 cinematic, and while his work on “Tango” does not come near his almost cinematic, and while his work on “Tango” does not come near his almost cinematic, and while his work on “Tango” does not come near his almost cinematic, and while his work on “Tango” does not come near his almost cinematic, and while his work on “Tango” does not come near his almost cinematic

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.

To add to all this some genuinely spooky stuff that verges on actual rock-and-roll—the insinuatingly tri- bial 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.

Fleetwood Mac: Tango in the Night. Fleetwood Mac (vocals and instruments). 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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- **GLUCK**: Aci e Temistocle. Berlin. CHANDOS CHAN 8403. (Complete 3-CD's).

- **LISZT**: Piano Sonata in B Minor; Ballade in B Minor; Consolation No. 3; Mephisto Waltz No. 1; Horowitz RIC 5935-2-RC. "Tops for "simple, poetic fantasy and depth of feeling" (May 1978).

- **MOZART**: Concerto for Flute and Harp. PIERRÉ: Concerto. BÖRJLIEHDEU: Harp Concerto. Laskine, Rampal; Martinon. ERATO ECD 88069. One of the label's early best-sellers.


- **STRAVINSKY**: Le Sacre du printemps; Petrushka. Boulez. CBS MK 42395. Performed with "opulent coloration and rhythmical thrust" (August 1972).
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**Dwight Yoakam**

After all the praise honky-tonk man Dwight Yoakam got for his debut in “Guitars, Cadillacs, 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 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.

Irrationally, 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.

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**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

**Explanation of Symbols:**
- **= Digital Master LP
- **= Tape Cassette
- **= Compact Disc

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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.

It’s a very impressive achievement, in-
Chris Isak: 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 refusal of loving — 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. Picky to click: a very smart neo-country remake of the Yardbirds' Heart Full of Soul and Isaak's own swirly 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: Good Things Come to Those Who Wait; and five others. WARNERS 17219 $8.98. EMI AMERICA 4XT-17219 $8.98.

Performance: Partial knockout Recording: Terrific

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 "Silvertone," 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 swirly and hypnotic Fade Away. Recommended. S.S.

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. WARNERS 25536-1 $8.98, © 25536-4 $8.98, © 25536-2 no list price.

Performance: Intense Recording: Excellent

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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 goth-icisms 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 overachievement 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're "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 instrumentalists); vocal and instrumental accompaniment. Never Be the Same; Right on Track; Kiss and Tell; Always Be Like This; Rico Mambo; Expressway to Your Heart; Speciality; 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 "Shaggun 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); Halloween Liar; Chan Hitchhikes to Shanghai; Victor Should Have Been a Jazz Musician; Crush; and five others. MANHATTAN © ST-53038 $8.98, © XT-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.

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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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 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 guitarists 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 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-yourself 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, Never Enough 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?

A.N.
If you're like most people who listen to audio cassettes, you've probably used a tape head-cleaner and felt pretty good about your conscientious attitude toward machine maintenance. Unfortunately, most cleaning cassettes allow contaminants to build up on the capstan/pinch roller assembly. It's a situation that, if left uncorrected, can result in your valuable cassettes being "eaten" when they stick to, and wrap around, the pinch roller (a problem that's even more common in car systems). Fortunately, Discwasher has a simple solution.

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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 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 with 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 to the Urge Within." Courtney Pine (tenor saxophone); Ray Carliss (baritone saxophone); Susaye Greene (soprano saxophone); 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. Recorded at Island and Mustang Recording.

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 (tenor saxophone); Ray Carliss (baritone saxophone); Susaye Greene (soprano saxophone); 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. Recorded at Island and Mustang Recording.

ROSEMARY CLOONEY: The Music of Jimmy Van Heusen. Rosemary Clooney (vocals); John Oddo (piano); instrumental accompaniment. Love Won't Let You Get Away; Imaginations; 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.

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; Madam; 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 0 5704-1 sixteen LP's $95.98, © 5704-4 sixteen cassettes $95.98.


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 Berigan, Lionel Hampton, and maestro Goodman himself on some of the 252 sides recently re-
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 reissue (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. PROJAZZ © 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 0 417 488-1 $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 languidours 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. Sirenes, 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 processional 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; Rene Schirrer (baritone) Leone. English Baroque Soloists, John Eliot Gardiner cond. ERATO/RCA © NUM 75278 three LP’s $32.94, © MCE 75278 three cassettes

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A CHILD OF OUR TIME

UNTIL I heard Andrè 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 © MCA-6202 $9.98, © MCAC-6202 $9.98, © MCAD-6202 no list price.
$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 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 Ragn, 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)


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’ poem Les Espaces du sommeil, this time sung by Dietrich Fischer-Dieskau, for whom the work was composed. Philips does not bother to give us the work’s date or to mention that its premiere 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. And, 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 consideration for the orchestra 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 downbeat 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 © 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.


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 unmuddied. 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 Klavierstucke (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 Klavierstucke. 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 Klavierstucke, and the whole sequence is given a warm, limpid sonic frame. R.F.

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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 Feurmann 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-sponsored 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 texture in the Shostakovich, but that is a minor cavil about what is a generally fine achievement on the part of all concerned.

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 backed 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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PAGE
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 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 has been described as "sort of Aida without the elephants." It will have its world première 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

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.

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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.

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 J9966).

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 hitmakers Gregory Abbott and the Bangles' 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.

GUESTNOTES. 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, unaulnated, the old Monkees will be hit 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.
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 grimly 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. 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 listening 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,

$$f = \sqrt{\frac{10}{d}}$$

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. Virtuosic piano music reproduced with authority and at length will bring even heavy-metal freaks to their knees.

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