CAR AUDIO SYSTEMS
HEAD OF THE CLASS
CHOOSING THE RIGHT SPEAKERS
CASSETTE DECK BUYING GUIDE
TEST REPORTS:
JVC COMPACT DISC PLAYER
ALLISON LOUDSPEAKERS
SHURE PHONO CARTRIDGE
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EQUIPMENT

CAR STEREO
The Concord CX70 in the lab and on the road
by Julian Hirsch and John Roark

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HEAD OF THE CLASS
High-end car stereo head units
by Michael Smolen

SENSATIONAL DRIVERS
Selecting the right speakers for your car
by Ian G. Masters

CAR STEREO MANUFACTURERS
A directory to the makers of autosound equipment

CASSETTE DECK BUYING GUIDE
Features, specifications, and prices
by Mark Lazarus and John Weinberg

MUSIC

SIMON RATTLE
A conductor on the way up
by Herbert Kupferberg

BEST RECORDINGS OF THE MONTH
The Pogues, Prokofiev's Romeo and Juliet, Wild
Seeds, Liszt piano music

Cover: Rockford Fosgate's SAT 44 car speakers (see page 73) and
Concord's CX70 cassette receiver (page 30); wheel courtesy of BBS.
Design by Sue Llewellyn, photo by Hing/Norton.

STEREO REVIEW BUYER POLL, SEE PAGE 105
Please fill in if you bought equipment in the past thirty days.
READER SERVICE INFORMATION CARD, FACING PAGE 105
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Nakamichi Canada (800) 663-6358

CIRCLE NO. 74 ON READER SERVICE CARD
by Christie Barter and Michael Smolen

FIRST DAT SALES IN U.S.

The first digital audio tape (DAT) machine to be sold in the U.S., Clarion’s playback-only automotive DAC 2000, went on sale at Dow Stereo/Video in San Diego, California, in February. The second, Kenwood’s KD-T99R car DAT player, is now also available in that state. And Harman Kardon is standing firm on its intention of selling home DAT player/recorders sometime next month.

EXPORTS UP

According to the Electronic Industries Association, the U.S. continued to import more electronics than it exported last year, but exports grew at the fastest pace since 1980. Exports rose by 20 percent to $40 billion, from $33.4 billion in 1986, while imports rose 15 percent to nearly $57.9 billion (from $50.3 billion).

BOSE GOES GOLD

Bose Limited, the Canadian subsidiary of Bose Corporation, was the official supplier of professional sound equipment for the recent Winter Olympics in Calgary. The Bose team provided full-coverage sound systems for both the indoor and outdoor competition sites throughout the games.

TECH NOTES

Pilz Compact Disc, a German company, is introducing a promotional package for under $260 that will include a CD player and ten discs from its Vienna Master Series of classical CDs. The Philips and Du Pont Optical Company has announced a new process for putting six-color art directly onto a compact disc. The process is said to overcome the durability problems sometimes associated with silkscreening. Matsushita is establishing a wholly owned subsidiary in Troy, Ohio, to manufacture and sell cathode-ray tubes for color TV sets and video monitors. JVC has succeeded in developing a broadband low-noise device using gallium arsenide. The device has enormous potential for enhancing the performance of next-generation high-definition A/V equipment as well as high-density computer peripherals.

COPYCODE FAILS TESTS

The National Bureau of Standards (NBS) has determined that the proposed CBS copycode system for DAT players “does not work, audibly degrades music, and can easily be bypassed.” The NBS report to Congress stated that the copycode system failed each of its three major tests: It often failed to prevent taping and also often had “false positive” responses, preventing recording even when no encoding was present; the encoding audibly distorted recorded music; and the system could be easily bypassed with simple circuits costing around $100. While the report does not open the floodgates for DAT decks in the U.S. just yet, it does remove one major obstacle to the format’s release here.

MUSIC NOTES

At recent ceremonies in New York, Sony Corporation of America presented its 1988 Master Innovator Awards to two multitalented musicians, Quincy Jones and Herbie Hancock, who had in turn selected three “rising stars” for similar honors. The younger Sony Innovators were saxophonist Donald Harrison, trumpeter Terence Blanchard, and vocalist Al B. Sure. Van Halen, the Scorpions, Dokken, Kingdom Come, and Metallica will share billing on Van Halen’s Monsters of Rock tour this summer. Described as the “first annual touring superstar rock festival,” the show will play stadiums in twenty-five cities across the country. Italian conductor Carlo Maria Giulini has been awarded the first medal of the Amici di Verdi in Milan for his outstanding interpretations of Verdi’s works.

HAPPY BIRTHDAY!

Irving Berlin, recipient of Stereo Review’s 1988 Mabel Mercer Award, will be 100 years old on May 11. In a birthday tribute to the man whom Gary Giddins described in the February issue as “the world’s most famous songwriter,” PolyGram Jazz has dug into its catalog to compile an album called “Irving Berlin Always.” It’s just been released on Verve. Carnegie Hall and the American Society of Composers, Authors, and Publishers, co-founded by Berlin, are sponsoring a birthday gala on May 11. It is being taped by CBS for broadcast at a later date.

CENTENNIAL IN AMSTERDAM

The Concertgebouw in Amsterdam and the Concertgebouw Orchestra, which calls it home, are both celebrating their hundredth anniversary this year. Launched with a series of galas in April, the centennial is being marked by a number of special events stretching well into the 1988-1989 season, including a jazz festival this summer.

Stereo Review May 1988 5
Matthew Polk's ultimate Dream Speakers, the Signature Reference Systems.
Stereo Review Picks
Polk's SDA SRS for
Their Ultimate Dream System!

"Literally a new dimension in sound"
Stereo Review Magazine

If you're looking for the ultimate loudspeaker, follow the advice of Michael Smolen, executive editor of Stereo Review who selected Polk Audio's 2 time Grand Prix Winner, SDA-SRS for his own personal "ultimate dream system" in the March, 1988 issue.

The joy of owning the ultimate.

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 degree 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 composite frequency response was exceptional... The SDA system works... The effect can be quite spectacular... We heard the sound to our sides, a full 90 degrees 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-SRS2 is remarkably similar to that of the SRS. Words alone can not express the experience of listening to these ultimate loudspeaker systems. You simply must hear them for yourself!

Superb sounding Polk speakers start under $100.00 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 under $100 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.

"Simply must be heard to be appreciated!"
Stereo Review Magazine

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There are 5 revolutionary Polk SDA loudspeakers, starting under $395. ea. The experts agree, nothing else compares!

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The Speaker Specialists

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CIRCLE NO. 37 ON READER SERVICE CARD

Where to buy Polk Speakers? For your nearest dealer, see page 120.
MUSIC in cars is certainly not a new idea. Radios, at least, seem to have been in our dashboards for as long as most of us can remember. By now, traveling to music must be part of the American Experience, if there is such a thing. But we've come a long way from the static-filled big-band dance music my father used to try to keep himself awake with when he had to drive at night. I think of that every time the kid from across town circles the block and rolls down his windows to impress the girl across the street with that shuddering, bass-heavy heavy-metal he favors.

The revolution in car listening began with the advent of compact, portable tapes, first the eight-track cartridge and then the cassette. The tapes gave us options. The music we chose to listen to in our cars was no longer dictated by where we happened to be on the highway or the tastes of the nearest radio station's program director. You don't like to listen to country-and-western music just because you are traveling across the western part of the country? Pop in your favorite Rolling Stones concert tape and rock on. Bored with the traffic reports that fill your dial during the rush-hour commute? Zap them with a little Mozart.

Once people on the move could listen to the music they wanted to hear, they started getting more particular about the way it sounded, and some of them set out to make it sound better. So we got more options. The autosound industry flourished. The car companies collaborated with speaker designers to come up with better acoustics; the Delco/Bose system in GM cars and the Ford/JBL system, among others, became widely available.

In component car systems, the "head units"—receivers, tape players, CD players—have become more and more sophisticated. Speakers have been improved, and there are all kinds of clever ways of installing them. Equalizers let you tailor the sound to your taste or compensate for some of the acoustic problems the interior of your car (or truck, or van) presents. Trunks are being used for subwoofers, additional amplifiers, CD changers. And where you used to have a couple of knobs and a dozen station presets, you now have a solid panel of buttons, sliders, knobs, concentric knobs with levers, and displays. Some steering wheels have audio controls on them, and there are remote controls that duplicate front-panel functions and add a few that don't fit anywhere else.

With all that, though, listening to music in a car you're driving is not the same as listening to music in your living room. Nor should it be. Sure, the equipment we have now has helped us cope with space constraints, vibration, and ambient noise. But as long as we're driving, we cannot shut out the rest of the world as we can at home. A story in the paper today illustrates what I'm talking about: "At least 90 members of a Moslem wedding party were killed when their bus overturned and caught fire after the driver lost control while changing a cassette in the tape player, the United News of India said today."

There's no question that music can add to our enjoyment when we travel for pleasure, that it can make the road easier for us when we have to go from one place to another. I just hope the fellow driving that eighteen-wheeler coming down the road toward me is not trying to figure out how to work his equalizer right now.
For people who love music as much as they love their car.

If you love music, you won’t settle for the inaccurate, inadequate sound of so many factory-installed systems. And if you love your car, you want to enhance it. You’d never do anything to compromise its looks or reduce its resale value. Like re-work the entire dashboard just to install a receiver. Or put up with a trunk that looks like an electronics store.

That’s why we endow our car audio with such advanced technologies as the Denon Optimum Reception System to tailor FM tuning to the reception conditions. Or our Dynamic Expansion to restore depth and vibrancy to compressed broadcasts and pre-recorded cassettes.

Dual Azimuth Heads assure that both sides of a tape are played with extended frequency response. Non-NFB and Non-Switching Class A Amplification substantially reduce distortion. And a special Denon circuit eliminates the interference that often occurs when an amplifier is mounted in the trunk.

In terms of sheer sound quality, Denon car audio fully lives up to the standards set by Denon record production, Denon pro studio recorders and Denon home high fidelity. Which means, no matter what you drive, you’ve finally found car stereo as good as your car.

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CIRCLE NO. 12 ON READER SERVICE CARD
Top Tape Decks

Craig Stark's "Five Top Tape Decks" in March was superb. I especially appreciated the remarks about his listening evaluations, particularly those concerning sharpening "air" around instruments. My listening experience has led me to distinguish "mid-fi" from hi-fi equipment on the basis of three factors: sharp imaging, or definition, which lends a three-dimensional "body" to individual instruments or groups of instruments; "air" around instruments, which makes separate instruments or groups of instruments clearly stand apart from one another; and openness, which puts all the instruments into a greater volume of space. I suspect that these three factors are interdependent, if not aspects of a single variable of sound quality, and they can only be ascertained from extended listening evaluations.

THOMAS J. WELLS
Gainesville, FL

Tape Systems

I have always enjoyed reading about the sound systems put together by both your editors and your readers, and "Tape Systems" in the March issue was no exception. William Burton's low-price system was well thought out and, for the money, well equipped. Michael Smolen's gathering of high-end components was a real fantasy system that, if I had the money, could certainly take a place in my listening room.

The system described by William Wolfe, however, seemed to fall short. I would expect that even a mid-price "tape system" would include two cassette decks. By slightly cutting back on the price of the receiver, eliminating the subwoofer, and upgrading the two full-range speaker systems, there would be enough left in the budget for another good cassette deck.

JOHN PAUL OSBORN
North Plainfield, NJ

I was interested and amused by Michael Smolen's choice of components for his $33,230 "super system." I trust he has not assembled this system in reality; if he has, I very sincerely hope he has not turned the power on. If so, he is now the proud owner of some very expensive paperweights.

As Julian Hirsch pointed out in a review in the same issue, the dbx BX1 power amplifier employs a bridged configuration in its two-channel mode, which is how Mr. Smolen chose to use his pair. Unfortunately, the Polk SDA-SRS speakers use a common ground connection to derive the out-of-phase signals for the SDA effect. Connecting a bridged amp to these speakers will blow up both the crossovers and the subwoofers. I understand that Polk Audio can now modify its SDA speakers to eliminate this problem; I do not know if the modification is available for the SRS models yet. (As the owner of a pair of Polk SDA-SRS 2's, I am naturally interested.) Perhaps Mr. Smolen had this in mind when he designed his system.

LES BERKLEY
Nortisoton, PA

Pink Floyd

I found Ann Ferrar's article about Pink Floyd in the March issue to be quite unfair to Roger Waters. It may be true, as David Gilmour asserts, that Waters "insisted on having total control" in the making of "The Final Cut," but Ms. Ferrar nowhere mentions that Waters wanted to make it a solo album and the other band members didn't agree with his proposal (perhaps because they wanted the money from using the name Pink Floyd).

Furthermore, I disagree with Ms. Ferrar's speculation that Waters is suing his former bandmates out of "sour grapes." On the contrary, a major part of his litigation involves protecting his reputation as a songwriter and preventing Pink Floyd from becoming a formula, the "institution" described in Ms. Ferrar's article. Albums such as "The Final Cut" that Roger Waters' music and lyrics are far more intimate and moving than any material ever produced by Gilmour, Nick Mason, or Rick Wright.

DAVID R. STEWART
Atherton, CA

Super VHS

The appearance of Super VHS has not, as William Wolfe stated in March "Video Basics," put "the final nail in Beta's coffin." Mr. Wolfe failed to mention the upcoming introduction of the ED Beta format, which better's S-VHS in almost every measurable parameter, including a horizontal resolution of over 500 lines (100 more than S-VHS). The Beta format has historically always been first with technological advances, and as an audio tool Beta Hi-Fi is at least equal to VHS Hi-Fi, if not better.

Mr. Wolfe claims that buying trends have made VHS the only viable format currently available in this country, but buying trends and marketplace dominance have nothing to do with superior quality and advanced technology. For audio/video phonies who simply want the finest tools with which to create and enjoy their recordings, Beta is still the best.

BOBBY RAYNER
York, PA

In "Video Basics" in March, William Wolfe said that "Super VHS picture quality is better than that of broadcast television and of laser videodiscs." This is patently false. While Super VHS may seem superior by virtue of its somewhat exaggerated resolution, it is in reality vastly inferior. It has extremely limited chroma bandwidth, which blurs all horizontal color detail, and it uses vertical chroma line-averaging, which smears the color vertically. Add a healthy dose of video noise reduction, which gives the picture a kind of "cartoonish" look and causes vertical edges to shake and jitter, and you don't exactly have the recipe for transparent video.

BILL ROOD
Sacramento, CA

William Wolfe replies: While chroma specs are important, Super VHS's strong point, horizontal resolution, should not be summarily dismissed. As for video noise reduction, I think it makes a good picture look better.

Satisfied with DAT

Having just purchased a Sony digital audio tape (DAT) recorder, imported from Japan, for my recording studio, I'd like to say a few things about the copy-prevention controversy.

First, DAT is everything it has been promoted as. When I make a studio mix onto DAT, it sounds just like the original—no added tape hiss. And, yes, when you copy a song from a CD, it sounds just like the CD. The thing is, aside from copying two songs to see how it worked, I won't be using my deck for making copies of CD's. It's stupid to pay around ten bucks for a blank DAT just to record friends' CD's that I could buy for around $13. I prefer to buy the CD's anyway because they don't wear out and they have the lyrics and cover art. So why are the record companies getting so bent out of shape about preventing DAT copies? Are people really going to buy a $2,000 deck and expensive blank tapes to make CD copies? I'm not, and I don't think a lot of other people will either.

Digital audio tape is a beautiful system of recording, and it makes me mad to see a bunch of corporate guys defeat the advancement of technology by putting in chips and copycodes that might degrade the signal. They'll probably get...
The price of power just went down.

For those that demand big power, total performance and state-of-the-art features at an affordable price, Yamaha introduces the YCR-420. A powerful in-dash cassette/receiver boasting 20 watts per channel x 4. And features pre-amp outputs so even more powerful amps or signal processors can be added.

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*Dolby B is a registered trademark of Dolby Labs, Inc.

**Suggested Retail Price.

CIRCLE NO. 14 ON READER SERVICE CARD
everyone so confused that a great format will never catch on.

JIM PORTER
Olympia, WA

Prerecorded Cassettes
I am thoroughly disgusted with the so-called "quality" prerecorded cassettes, which are nine out of ten cassettes I buy. The problem is with the ninety-minute tapes, such as Eric Clapton's "Just One Night" on PolyGram. Nobody should be allowed to put such a long concert (eighty-nine minutes, forty-six seconds) on one cassette. It should have been on two! After playing it for five weeks, it began to stick or drag and soon was eaten up. The record store told me that this happens all the time and they can't help it.

I took what was left of "Just One Night" and put it into a used Maxell UD46 shell. There has been no more dragging, no more squeaking, and no more stretching. Tell the record companies we consumers are fed up with their cheaply made cassette shells. This kind of headache only makes me return to buying LP's again!

DOUGLAS TYSON
Pearl, MS

Heaven Knows
I would like to clear up the misconceptions regarding audible differences between different audio components. Up here there is ample time for discussion and debate over various topics, and STEREO REVIEW's series of articles on how components really sound has been well received. I myself incline toward the view that components measuring the same sound the same, but I was recently informed of certain facts that must change my position—and the magazine's.

The Chief has broken precedent of long standing to intervene in an earthly matter. I am instructed to inform you that there are indeed some audible differences between components. As you may well guess, the accuracy of this comment is not to be questioned. He says that his new preamp (an Audio Research SP 1 Mkt) is a definite improvement on the old one—and you can count on that!

I realize that most people down there don't have hearing as good as the Boss has, but that can't be helped. So quit publishing those articles until you find out why such differences exist. They all go into your files up here and may affect certain decisions that will be made later. I fear that Julian Hirsch is a lost cause already.

RABBI SIMON BAR JONA
(Saint Peter)
Judah Gate, Heaven

Corrections
The price of the Velodyne ULD-12 subwoofer was given incorrectly in William Wolfe's "Tape Systems" in March. The correct price is $950, as was stated in Julian Hirsch's test report in the same issue. Mr. Hirsch was in error, however, in describing the ULD-12's built-in amplifier as having Class D operation. The speaker uses a 100-watt Class B amplifier.

An incorrect telephone number was given for the American Melody Company in April's "Calling All Kids" feature on children's records. The correct number is (203) 457-0881.

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Americans are generally more aware of our inventions than they are of our name. Yet those "Firsts"—from the ubiquitous audio cassette to the flawless sound of the compact disc player—are just a few of the breakthroughs Philips is known for. Philips of the Netherlands is one of the largest electronics companies in the world. With our vast research and development facilities, we have long had a commitment to leadership in consumer electronics that few, if any, can match. Now Philips is here. Not Philips technology under someone else's name. But the real thing. The newest from Philips. Here first, at last.

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Make a lasting impression with Pyle Driver® car stereo speakers and electronic components.

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NEW PRODUCTS

NEC
The AVX-910 Audio/Video Selector from NEC can integrate the most elaborate A/V system. It can independently switch up to five video and ten audio inputs, three video and four audio outputs, an audio/video monitor output, and an A/V recording output. To prevent interference between the video and audio circuits, they are optically coupled and separately grounded and shielded, and there are separate power supplies for each section. The video section features S-type terminals for connecting late-model VCR's and TV sets having separate luminance and chrominance signals, and there are digital noise-reduction circuits to improve the picture sharpness from any video source, new or old. A full-function wireless remote control is included. Price: $699. NEC Home Electronics, Dept. SR, 1255 Michael Dr., Wood Dale, IL 60191-1094.

Circle 120 on reader service card

DataPax
The flat CD Jockee carrying case from DataPax opens into an A-frame shape with eight two-sided, clear-vinyl pockets that can carry up to sixteen CD's. The reverse side of each pocket can hold the printed insert from a CD package or another disc. The exterior of the case is made of nylon, and it has a reinforced framework for durability and protection of the contents. The CD Jockee is available in black with gray pockets or navy-blue with light blue and red pockets. Price: $19.95. DataPax, Dept. SR, 2527 W. Kennewick Ave., Suite 163, Kennewick, WA 99336.

Circle 121 on reader service card

Fox Marketing
The Fox AF275 cordless stereo head- phone system allows headphone listening up to 50 feet away from a stereo system or TV set. The two-piece system includes an infrared transmitter that plugs into a normal headphone jack and a stereo headset with an infrared receiver built into the headband. The head- phones themselves are circumaural types with foam-filled cushions. They have 1.6-inch-diameter Mylar diaphragms and are rated for a frequency response of 20 to 19,000 Hz ±2 dB. Weight of the headset is 10½ ounces. The system is powered by three AAA batteries. Price: $149.95. Fox Marketing, Dept. SR, 4518 Taylorsville Rd., Dayton, OH 45424-2497.

Circle 122 on reader service card

Onkyo
The Grand Integra T-9090 Series II is an improved version of Onkyo's top FM tuner. It features a computer-controlled tuning system that automatically adjusts RF sensitivity, IF bandwidth, channel separation, and mono/stereo mode for optimal reception quality. In addition, there are inputs both for a conventional FM antenna and a cable feed; if both are connected, the tuner will automatically select the better signal for each station. All settings can be overridden manually or by remote control if desired. The twenty station preset memories include optimal tuning modes. Tuning steps are 25 kHz instead of the usual 200 kHz to provide fine tuning of cable channels. The supplied remote control operates all functions including output-level adjustment. The rated 50-dB quieting sensitivity is 37.2 dBf (20 μV) in stereo, capture ratio is 1.0 dB, and adjacent-channel selectivity is 80 dB. Frequency response is 30 to 15,000 Hz ±0.5, ±1.0 dB. Finish is black with wood side panels. Price: $699.95. Onkyo, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

Circle 123 on reader service card
**Soundstream**

Soundstream's TC301 is its lowest-priced car stereo cassette receiver. The autoreverse tape section features a rotating sendust head, Dolby B, a DC servomotor, a music sensor, and ignition-off pinch-roller release. Frequency response is rated as 30 to 18,000 Hz ± 3 dB with any kind of tape. The digital-synthesis PLL tuner section has five AM and five FM presets, auto-seek tuning, and automatic channel blend and high-frequency rolloff to reduce noise on weak FM signals. Loudness compensation is also automatic, and a CD input is provided. Price $299. Soundstream Technologies, Dept. SR, 2907 W. 182nd St., Redondo Beach, CA 90278.

**Yamaha**

The CDX-510U compact disc player from Yamaha features the company's Hi-bit technology, which is said to afford the equivalent of 18-bit resolution, along with a quadruple-oversampling digital filter. A tape-edit feature automatically selects a program of tracks that will fit onto a given length tape cassette. The player provides direct track access, programming for up to twenty-four tracks in any order, index search, auto space, and repeat play of an entire disc, a single track, or a user-defined segment. The three-beam laser pickup is isolated from external vibration by a floating suspension. A full-function remote control is supplied. Dimensions are 17 1/8 x 6 1/4 x 13 1/16 inches. Price: $319. Yamaha Electronics, Dept. SR, 6660 Orange-Thomas Ave., Buena Park, CA 90620.

**Roland**

Roland's DSP-2000 Hi Presence Processor uses digital delay circuits to recreate the effect of sound reflections from the boundaries of various types of halls. Various parameters for the processed signals can be adjusted, and the DSP-2000 includes a program library of forty presets, each of which can be independently adjusted as desired. Dynamic range is rated as greater than 96 dB, signal-to-noise ratio as better than 90 dB, and total harmonic distortion as less than 0.03 percent. The supplied wireless remote control operates all functions except power switching; the volume knob is motor driven for remote adjustment. Price: $1,495. Roland, Dept. SR, 7200 Dominion Circle, Los Angeles, CA 90040.

**Ortofon**

Ortofon has introduced three moving-magnet cartridges—the Models 540, 530 (shown), and 520—that are identical except for their user-replaceable stylus. The top model, the 540, has a Fritz Geiger II stylus that is said to be as close in shape to a cutting stylus as possible without risking damage to the LP's it plays. Response is rated flat from 20 to 27,000 Hz. The Model 530, with a nude-mounted Fine Line stylus, is rated for flat response to 25,000 Hz, and the Model 520, with an elliptical stylus, is flat to 23,000 Hz. All three models are available in P-mount versions. Cartridge mass is 5 grams with a standard body, 6 grams with a P-mount body. The Models 520 and 530 can be upgraded at any time simply by replacing the stylus with that of a higher-rated model. Prices: 540, $300; 530, $225; 520, $150. Ortofon, Dept. SR, 122 DuPont St., Plainview, NY 11803.

**Stereo Setup**

A self-help VHS videotape, "Video/Hi-Fi Stereo Setup," explains how to install and maintain an audio/video component system. Wiring diagrams and step-by-step instructions are provided for connecting each type of component, and there is one on the cover of the tape box showing how to hook up a VCR to a TV set so the tape can be viewed. Placement options are explained along with how to adjust controls for optimal performance and how to clean those components that need such attention. Host of the 36-minute program is Vance Dickason, author of the Loudspeaker Design Cookbook. Price: $19.95 (plus postage and handling for mail orders). Stereo Setup, Dept. SR, 11830 SW Kerr Parkway, Suite 350, Lake Oswego, OR 97034.
The Onkyo Integra TA-2800
Technology with Imagination.

For most people, a cassette deck is an essential part of a high fidelity system. After all, it is the only component designed to preserve a musical event. But frustration often results when that preservation is incomplete, when the cassette deck isn't as good as the music.

That isn't a problem for the Onkyo Integra TA-2800. Our designers realized that the deck's mechanism and the cassette were actually one system. This resulted in a unique three motor dual capstan transport for vibration-free alignment between heads and tape. And even smoother tape motion.

The results are easy to hear. Sustained piano notes don't quaver. Symphonies end in the same key in which they began. Separate recording and playback heads of Special Hard Permalloy feature high precision gaps optimized for full frequency response in any mode. And they provide the additional benefits of instantaneous off-tape monitoring.

Onkyo's exclusive Automatic Accubias system fine tunes bias current for optimum recording with any tape you choose. So the deck and cassette work together to bring you the music.

A precise Record Calibration circuit assures proper level matching between record and playback. And allows Dolby B & C Noise Reduction to work the way it was designed to. So you don't lose musical information along with the noise.

Dolby HX Pro provides extended high frequency response for more lifelike musical experience with any tape. And a unique Real Time Counter shows you exactly how much tape you've already used and how much tape is left.

Remote control using Onkyo's new RI (Remote Interactive) system is standard. So you get convenience and compatibility with a growing number of equally impressive Onkyo high fidelity components.

And that's because Onkyo is there. Even when your music takes you far away.

Dolby B, C and HX Pro are registered trademarks of Dolby Laboratories, Inc.

Artistry in Sound

ONKYO®

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NEW PRODUCTS

NHT

The NHT Model II is a floor-standing three-way speaker system with four drivers that is claimed to provide the relatively seamless response of a classic two-way system while cleanly reproducing the lowest bass fundamentals. The Model II has two 6⅔-inch woofers to cover the range below about 100 Hz (down to a -3-dB point of 43 Hz). Higher frequencies (up to 22,000 Hz) are reproduced by a 6⅔-inch midrange and a 1-inch dome tweeter. The cabinet’s shape is said to prevent excessive wall reflections, to help maintain the stereo sound stage through a broad area between the speaker pair, and to minimize interaural crosstalk for a centrally located listener, resulting in better imaging and a more natural ambience.

Rated sensitivity is 87 dB sound-pressure level at 1 meter with 2.83 volts input, nominal impedance is 8 ohms (4 ohms minimum), and recommended amplifier power is 35 to 200 watts per channel. Dimensions are 37 inches high, 7 inches wide, and 12 inches deep. Finish is hickory-grain vinyl veneer with a black grille cloth. The speakers have a seven-year warranty. Price: $229 a pair. Now Hear This, Inc., Dept. SR, P.O. Box 1228, Fullerton, CA 92632.

Circle 128 on reader service card

Blaupunkt

The car speaker systems in Blaupunkt’s QL series all feature long-throw woofers made of a rigid quartz-polypropylene composite, with aluminum voice coils and high-density foam surrounds, 1-inch Alairium or polycarbonate dome tweeters, and braided copper coaxial leads. The top of the line is the QL 691ST (shown), a 6 x 9-inch three-way system with a rated frequency response of 45 to 20,000 Hz, a sensitivity of 91 dB, and a power-handling capability of 150 watts. Price: $249.95 a pair. Blaupunkt, Dept. SR, P.O. Box 4601, North Suburban, IL 60198.

Circle 129 on reader service card

Pinnacle

The Pinnacle PN 6+ is a two-way speaker system that features a large, tuned, elliptical port whose tube is angled deeply into the enclosure for “the best possible bass response from a small box.” The 6⅔-inch polypropylene-cone woofer crosses over at 4,500 Hz to a ¾-inch ferrofluid-filled dome tweeter. Rated frequency response is 40 to 21,000 Hz, sensitivity is 90 dB sound-pressure level at 1 meter with 1 watt input, and impedance is 4 ohms. Dimensions are 14½ x 9½ x 8½ inches. Finish is hickory-grain vinyl with a black grille cloth. The speakers have a seven-year warranty. Price: $229 a pair. Pinnacle Loudspeakers, Inter-Ego Systems Inc., Dept. SR, 517 Rt. 111, Hauppauge, NY 11788.

Circle 130 on reader service card

Denon

Denon’s DRA-425 digital-synthesis AM/FM receiver features an Integral System remote control that can also operate compatible Denon CD players and cassette decks. The amplifier section uses discrete wide-band, high-current output transistors instead of integrated circuits, and it is rated for 50 watts per channel into 8 ohms with no more than 0.015 percent total harmonic distortion. The preamplifier features electronic function switching, a continuously variable loudness control, a high-speed phono equalizer, and a motor-driven volume-control knob. There are sixteen tuner presets, which can be assigned to any combination of AM and FM stations, as well as manual and auto-scan tuning. The speaker terminals accept spade lugs, banana plugs, or stripped wire ends. Price: $450. Denon America, Dept. SR, 222 New Rd., Parsippany, NJ 07054.

Circle 131 on reader service card
THE END OF THE RECEIVER.

The GTP-500 is the most innovative and logical audio component in years. A superb tuner and preamplifier together on one chassis, completely separate from the power amplifier. This eliminates all the technical limitations of the receiver, assuring uncompromised sonic performance as well as an unrestricted choice of power. And a wireless remote controls the entire system—from your favorite chair or from several rooms in your home. The GTP-500 tuner/preamplifier is shown here with our 60 watt-per-channel* power amplifier. Up to 600 watts per channel are also available. In short, you're witnessing the dawn of a new era. To get the full story, write for our literature and reviews.
INTRODUCING
THE NEW BOSE® 901® SERIES VI
DIRECT/REFLECTING®
SPEAKER SYSTEM
Multiple technologies at work toward one goal: the realism of a live performance.

To accurately judge any speaker, there are only two audio experts you need to consult: your ears. To experience how far technology can take you toward the ultimate goal of all speakers—live music—you owe it to yourself to listen to the new Bose® 901® Series VI Direct/Reflecting® speaker system. Even before the music starts, you'll know that the Bose 901 system is a speaker unlike any other. Its cabinet is a multi-element Acoustic Matrix™ enclosure. It uses the walls of your listening room to re-create live music's natural balance of direct and reflected sound. In fact, the 901 Direct/Reflecting® system incorporates a number of inventions developed and patented by Bose.

What's behind the unique design of the Bose 901 system?
Over thirty years ago, Dr. Amar Bose of the Massachusetts Institute of Technology wondered why so-called "high fidelity" speakers didn't sound like live music. This simple question started the research that led to the original Bose 901 Direct/Reflecting® system—a speaker that, since its introduction in 1968, has earned more critical acclaim and rave reviews than any other. The new Bose 901 Series VI Direct/Reflecting® system incorporates more than 350 improvements over the original. Still, it remains faithful to the original design concept, because the scientific principles behind live music haven't changed. We submit that the use of multiple technologies makes the Bose 901 system the most advanced, lifelike-sounding speaker you can buy—regardless of size or price.

Trust your ears—and judge for yourself.
Active Equalization, full-range drivers, the Acoustic Matrix enclosure and Direct/Reflecting® speaker design are more than innovative audio technologies. They add up to a difference you can hear. Visit your authorized Bose dealer and experience, in full stereo, all the spaciousness, realism and impact that the Bose 901 system is capable of delivering (see diagrams). Once you listen, you'll know why so many people consider this "the speaker to which all others must be compared."

For more information, write Bose Corp., Dept. SR, 10 Speen St., Framingham, MA 01701.
Video Basics

by William Wolfe

Audio/Video Switching

Keeping track of audio and video sources, and switching between them, has become something of a chore for owners of multicomponent audio/video systems. There are several ways to solve the problems of system connections and switching. For example, many manufacturers of audio receivers are building a full complement of video inputs and outputs into their units to accommodate VCR's, videodisc players, and stereo TV sets. But these products are of little use to audiophiles who are happy with the receivers or separates they have. For such people a dedicated audio/video switcher makes more sense.

Some switchers are very simple, providing a few inputs and outputs but nothing more—unless they add distortion to the signals passing through them. MultiVision's Model 1.1 ($329), on the other hand, is a very sophisticated unit with a wide variety of switching functions, and it provides elaborate picture-in-picture (PIP) capabilities for any system that has at least two video sources. (The 1.1 accepts only composite video signals, however, so if either or both of your video sources has RF outputs, you'll need to use one or two RF adaptors.) The 1.1 also offers a loop for an audio processor, such as a graphic equalizer or a surround-sound decoder, and a video processor, such as a color enhancer or a stabilizer.

Whether or not it is used to provide a PIP, the MultiVision 1.1 can be used to select audio and video sources independently. You can, for example, select a video source for the main TV picture and use your FM tuner as the audio source—an instant simulcast. Using a VCR's audio-dub feature and several audio sources to make a new soundtrack for an existing video recording is as easy as pressing a few buttons on the 1.1's remote control—there's no need for switching cables.

One of the nicest aspects of the Model 1.1 is that all of its controls are situated on its wireless remote control. The futuristic-looking main unit has only back-panel connections and front-panel back-lit indicators. The control functions of the remote are divided into two sections: the power, audio-mute, and switching functions are located on the upper half of the unit, and the PIP and audio/video processing functions are located on its lower half. Several of the remote's keys are dual-function controls. A key's secondary function is selected using the remote's SHIFT key, which works like that on a typewriter. The primary functions are labeled in white, the secondary ones in blue.

Up to four video and four audio sources can be connected to the 1.1. To select a source for the main video display, the soundtrack, or thePIP inset display, you need only hit the appropriate button (labeled 1, 2, 3, or 4) in the MAIN, AUDIO, or INSET column. Front-panel indicators on the main unit light up in response to the remote commands: red for the main video display, yellow for the soundtrack, and green for the PIP display.

You can link the audio source to either the main or the inset video source simply by pressing SHIFT and the MAIN 4 button (secondary label A = M) or SHIFT and INSET 4 (A = I), respectively. Linking the audio input means that it will change whenever you change the video source, and you will hear the soundtrack of that source. You can also temporarily monitor the soundtrack accompanying the inset picture by pressing and holding the ASWAP (audio-switch) button. Pressing this button does not interrupt any of the other PIP functions.

The PIP capabilities of the MultiVision 1.1 are probably more sophisticated than you'll ever need, certainly for everyday use, but they are impressive nonetheless. For starters, you can turn the inset picture on or off, swap it with the main picture, change the size of the inset picture (there's a choice of four sizes, from one-third to one-eighth the size of the main screen), move the inset picture up, down, left, or right, and freeze the inset picture.

You can also use the inset picture for scanning all of your video sources. The time allotted to each scanned source is adjustable from 1/16 to 12 seconds using the RATE function. Sources can be deleted from the scan sequence using the DELETE button. The inset picture can also be subjected to strobe processing, which selectively freezes a sequence of frames at an adjustable rate, and its tint and color can be adjusted as well. The inset picture is rated for a horizontal resolution of 286 lines.

The Model 1.1 is very easy to master, although you'll need to use two hands to operate the remote control effectively. It also has some impressive audio specifications: a frequency response of 20 to 40,000 Hz ± 3 dB, A-weighted signal-to-noise ratio of 75 dB referred to 1 volt, and total harmonic distortion of 0.2 percent at 1,000 Hz with full output. The 1.1 will also have no negative effects on the video signals passing through it.

It's easy to see why a product like the MultiVision 1.1 is attractive as an audio/video switcher. Only you can decide if the PIP feature is of interest, of course. If you regularly enjoy a number of video and audio sources, do a lot of audio editing, or are simply a channel hopper, the 1.1 can make things a lot easier.
Stereo Review is written for people who want to make smart buying decisions. We'll help you find the right stereo equipment—the first time you buy—and show you how to use it the right way. Because sound information is the key to getting an audio system that gives you what you really want.

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Subwoofer Placement

Q I use a pair of subwoofers, crossing over at 120 Hz, and I'm not sure where to place them in relation to my main speakers. Does it really make any difference?

A Where you place the subwoofers is very important, but it has little to do with the position of your other speakers. For proper imaging and smoothest frequency response in the midrange and high frequencies, conventional speakers should be placed in similar acoustic environments and equally far from your usual listening position. With subwoofers, on the other hand, different requirements come into play. For one thing, at the low end of the audio spectrum sound is quite nondirectional, so imaging is unimportant and a subwoofer could theoretically be placed anywhere without adversely affecting the sound stage.

But good low-frequency reproduction depends very heavily on the interaction of the speakers and the listening room's acoustics. The wavelengths of some bass notes will hear a close relationship to the room's dimensions, with the result that "standing waves" may be set up at certain frequencies, boosting some frequencies and lowering others. Where the speakers are placed with regard to the walls and the main listening position determines which frequencies are affected and by how much. With a pair of subwoofers, each should be placed so that room effects are minimal and—most important—so that they are different for each of the speakers. This will allow the anomalies to average out, resulting in much smoother bass. There is only one real way to decide on subwoofer placement: trial and error.

Accidental Tape Erasure

Q If a tape recording is erased or distorted by coming too close to a magnetic field, can it be recorded over or is it totally destroyed?

A Stray magnetic fields will have no permanent physical effect on your tapes. A magnetic recording is made up of an orderly arrangement of magnetized particles, and external fields can disturb these, either degrading the sound quality or, in the worst cases, erasing the signal completely. Accidental scrambling of the magnetic pattern on a tape is exactly like what a recorder's erase head does intentionally, so subsequent reuse of the tape will not pose any problem.

Secure Stereo

Q My teenagers insist on blasting my stereo system into oblivion when I'm not home, despite my warnings about damaging speakers and disturbing the neighbors. I don't want to have to dismantle it every time I go out. Is there any device available that will keep meddling hands off delicate equipment?

A I don't know of anything designed specifically for that purpose other than parental threats (and they're not very effective, as you have noticed). One answer might be to install a switch in the power line that can only be turned on by a key. Such devices are available from electronics parts stores, and one might solve your problem—unless your kids are sufficiently resourceful and determined to bypass or remove the switch.

Depending on what your teenagers listen to, removing an important part of the equipment—the phono cartridge, say—might work as a preventive measure. Otherwise, placing the system, or a vital part of it such as the power amplifier (turned off, of course), in a locked cabinet may do the trick. If all else fails, you might consider buying your children a modest system of their own. If they ruin that, at least your equipment will be safe.

Amplifier Bridging

Q According to what I've read, bridging a stereo amplifier to mono means that the effective output power is doubled. How do you go about actually bridging the amplifier, and what special precautions should be taken?

A Actually, most bridged amplifiers produce more power in mono than their total output in stereo, so using a pair of bridged amplifiers is an attractive way to achieve very high wattage levels. Not every amplifier can be bridged, however, the output circuits have to be specially designed for that purpose. If your amplifier can be bridged (or "strapped"), its instruction manual will say so and will tell you how to go about it (it's usually a matter of changing the speaker connections and flipping a switch). If the owner's manual doesn't mention bridging, don't try it.

DAT Degradation

Q If a DAT deck is similar in operation to a videocassette recorder, will a digital audio tape suffer the same sort of signal deterioration with repeated use that occurs in a videotape?

A Physically, yes. The rotating heads of VCR's are notoriously hard on tapes, creating dropouts and increasing background noise, and this will be true to some extent of digital audio tapes as well, even with the high-quality oxides that medium will use. The difference between videotapes and digital audio tapes, however, is that the latter are digital—therefore, background noise will be inherently low, and error-correction circuitry will take care of all but the grossest dropouts.

Tape Storage

Q I have heard conflicting views as to how I should leave my audio and video tapes between plays. Some say that the tape might be deformed if left all on one reel, so it should be wound to...
about the halfway point. Others say this exposes the tape to dust and other types of damage, so it should be rewound or stored. Which method is correct?

CARL BOGGS
Toronto, Ontario

Leaving it halfway between reels strikes me as about the worst thing to do. The reels in a cassette are loosely mounted, so when it is not being played, the tape between the reels sometimes has a tendency to protrude through the opening in the shell, leaving lots of opportunity for damage. If the tape is wound completely to one end or the other, however, only the leader tape is exposed, so any damage is unimportant. Deformation or scratching of a recorded portion of a tape, on the other hand, would be immediately audible.

The ideal way to store a tape, particularly if it is only played rarely, is "tail out" - wound onto one reel at playing speed, not fast forward or rewound. The smooth tape pack this produces minimizes damage to the tape's edges and helps keep dust from between tape layers.

Speaker Listening Tests

Q When I upgrade my speakers, as I intend to do shortly, I feel that the best way to make a choice is with my own ears. Are there any recorded musical selections that are particularly well suited to demonstrating a speaker's full response under a wide variety of listening conditions?

GLEN E. ALLEN
Lincoln, NB

A Yes, thousands. And, like everything else in music, they are subject to periods of popularity and then give way to newer recordings. The ultimate demo recording has yet to be made, but the choice of good ones is so broad that you should be able to assemble a demonstration program of your own as effective as any that I might suggest. There are, however, a few guidelines to keep in mind:

First, obviously, is that only very well-recorded music should be used; it would be fruitless to try and judge speakers using material containing serious flaws. Second, use recordings you know well so that you have some reference by which to judge speaker differences. If you choose an old favorite, it might be wise to buy a fresh copy so that you won't be distracted by the effects caused by years of record wear. The cost, compared with that of a pair of speakers, will be minimal, and you will end up with a fresh version of one of your favorite recordings.

Orchestral music can be useful for gauging a speaker's ability to handle subtle detail, and solo vocal recordings may be used to judge both the sound of the human voice—a ready reference—and the ability of a pair of speakers to produce a stable center image. Classical organ recordings, and some synthesizer-heavy pop records, are good for judging low bass, and anything with brushed cymbals is useful for evaluating the high treble. I have always found choral recordings, particularly religious music, very useful for judging midrange linearity, or depth, although this takes some practice. Beyond these hints, the best advice I can give is that you should arm yourself with as wide a variety of music as possible in the beginning. You will quickly discover which recordings are most useful to you.

Quad for Surround

Q I have an old quadraphonic receiver that contains a host of circuits for producing four-channel sound: SQ, RMT, CD, and discrete. I am interested in taking advantage of the surround information contained in many of the tapes I rent. Is there any way I can do this with my old receiver?

GARY L. RUTLEDGE
Arlington, VA

A Because they were designed to do different things, none of the old quadraphonic systems is suitable for decoding modern Dolby Surround recordings, although they may well produce some interesting unintentional effects. But your old receiver can easily be used as the core of a surround-sound system as long as you use an up-to-date external decoder.

Even though the four-channel systems built into your receiver might be useless for today's material, the four built-in amplifiers will still work, and they offer much more control convenience than you would have with two separate stereo amplifiers. Simply connect the new surround decoder between the source component and the "discrete" inputs on your receiver. You might also try using the older matrices to extract some rear-channel information from conventional stereo (not Dolby Surround) recordings. The results may be unpredictable, but one of the joys of using such equipment back when it was being produced was the discovery of hidden ambience material in ordinary recordings.

If you have a question about hi-fi, send it to Q&A, Stereo Review, 1515 Broadway, New York, NY 10036. Sorry, only questions chosen for publication can be answered.
How it works.  
A brief conversation with Bob Carver.  

Q. How can The Amazing Loudspeaker put out so much powerful, extended bass?  

A. Brute force. A total of 8 subwoofers, each with 4 times the excursion of regular bass drivers for a total displacement (area times excursion) of almost 2000 cubic inches. The low frequency FLF point is 18Hz!  

Q. Why use a ribbon driver?  

A. Because the sound of a ribbon is nothing short of glorious! Free of individual driver anomalies and crossover problems. the Amazing Loudspeaker's extended line source driver delivers a majestic sonic image that literally floats in 3-dimensional acoustic space. Simultaneously, it reproduces an amazing amount of musical detail that's simply unmatched by any point source driver.
Q. But aren't ribbon drivers inefficient?
A. Not when designed with enough magnetic field strength. Each Amazing Loudspeaker ribbon uses 30 feet of high energy magnets in a special focused field gap. At 82dB efficiency, that's almost twice as efficient as any other ribbon that goes down to 100Hz. Our M-1.0I power amplifier yields peak SPLs exceeding 106dB, up to 110dB with an M-1 SI! More than ample to deliver a symphonic orchestra's sonic power, fifth row, center.

This is not a typical speaker ad. Because The Amazing Loudspeaker is anything but a typical speaker.

This isn't even a typical Carver ad. True, the Amazing Loudspeaker breaks so many conventional speaker rules — and succeeds so spectacularly at it — that we're tempted to fill this ad with a litany of hertz, watts and exotic buzz words the way our competitors' ads do.

Because there's bound to be quite a story behind a speaker that's 5½ feet tall and yet just 1½ inches thick. Especially when Bob Carver has a hand (or rather two hands, both feet and a year or so of lab time) in its creation.

But ingenious design is only our means to an end. The beginning of a dramatic awakening that will re-define for you the very essence of music.

The Amazing Loudspeaker can etch a sonic image so detailed you can almost see rosin drift from a bow onto the polished surface of a violin.

It can brighten your listening room with the sheen of a #4 drumstick on a Ziljan hi-hat cymbal. Or darken it with the smokey midnight growl of a battered baritone sax.

It can stun your senses and rearrange your furniture with thunderous salvos of tight, perfectly controlled low bass.

It can meticulously separate every instrument and vocal on a dense, multi-track mix and project each in sharp relief at precise points across the sound field.

In short, the Carver Amazing Loudspeaker restores what time and reading too many speaker ads often takes away.

Sheer wonder.

We have merely touched on the highlights of this truly amazing loudspeaker. We'd be happy to send you more information including reprints of several great reviews.

However, if your immediate interest is the sensation of a listening room melting away to reveal the crystalline clarity of pure music, you need only visit your nearest Carver dealer.

Your amazement will begin when you discover just how affordable the Carver Amazing Loudspeaker really is.
If you had to describe Concord's top-of-the-line CX70 cassette receiver in just a few words, you could say that it's a foundation on which you can erect any number of autosound systems. Its combination of common and not-so-common features affords an unusual degree of flexibility. The special features include line inputs for adding a CD player, switchable center frequencies for the bass and treble tone controls, and Dolby B, Dolby C, and dbx noise-reduction circuits in the autompersece tape player.

One feature of the CX70 that is not found very often is a four-channel amplifier section that can be bridged to two channels at the throw of a switch. The switch lets you drive four 4-ohm speakers with 4.5 watts each or two speakers with 12.5 watts each. If you want more power, you can use the CX70 to drive your front speakers and add an external amp for the rear ones.

If still higher power is in your budget, or if you'd like to reserve the option of adding more power at a later date, you can bypass the CX70's internal amplifiers altogether. It has four line-level preamplifier outputs for connection to an external four-channel amplifier or a pair of two-channel amps.

The CX70 also has a feature you probably won't find on any other car receiver: a switchable electronic crossover at 150 Hz. This built-in crossover makes it possible to create a biamplified subwoofer/satellite system around the CX70 without needing to add an external crossover or to look for an external amplifier that has its own built-in crossover. The CX70 could, theoretically, drive a subwoofer/satellite system without external amplification at all: Two of its amplifier channels could drive a pair of full-range satellite speakers in front, and the other two could drive a subwoofer in the rear deck. Or you could bridge the CX70 to drive just the front speakers at higher power and use an external amplifier for the subwoofer. Though both of these approaches will provide better bass response than a system without a subwoofer, biamplification will produce the most dramatic results when you use two high-power external amplifiers.

The CX70's digital-synthesis tuner has six preset tuning buttons, each assignable to two FM stations and one AM station. In addition to manual selection of preset frequencies, there is a selectable automatic preset programming mode in which the tuner scans the band with its "local" sensitivity setting and stores the frequencies of the stations whose signals are of adequate strength. If there are not enough strong signals to fill all the memories, the tuner then switches to its "distance" sensitivity setting and continues the search process.

For normal listening, stations can be tuned manually, or the tuner can automatically scan either the entire band or just the preset channels. A switchable proprietary FNR + noise-reduction circuit can improve reception of poor-quality FM signals by automatically rolling off high frequencies in weak signal areas. The "+" part of the system, which is always active, helps filter out ignition noise from the car engine or other nearby vehicles.

The CX70 has a single volume knob, which becomes the balance control when it is pulled out. The knob is concentric with the front/rear fader control, and below it are the two small center-detented bass and treble tone-control knobs. These are normally recessed flush with the front panel but pop out for adjustment.

All of the other controls are soft-touch pushbuttons, some of them with dual functions depending on the input signal. For example, stereo/mono switching for FM and the music-search feature for tape listening share a single button (a separate button selects the number of silent intervals to be skipped). The appropriate legend on each dual-purpose button is illuminated in orange. The volume and tone-control knobs are circled by "halos" of light for ease in use at night.

The main LCD display window shows the complete operating status of the receiver. Only the pertinent markings are visible, simplifying interpretation. The center frequencies for the bass and treble tone controls are selected with the T-EQ and B-EQ buttons, each of which toggles through three frequencies on sequential operations: 80, 150, and 240 Hz for the bass control and 3,000, 6,000, and 12,000 Hz for the treble. The selected frequencies are shown on a separate small display. The system resembles a limited parametric equalizer, with a ±12-dB adjustment range at each center frequency. The nearby NR button toggles between no noise reduction...
Years ago, I was working my way through med school and bought my first system. The only place I splurged was on speakers. I bought a pair of KLIPSCH® HERESYs, but to save money I got them in unfinished wood cabinets.

Now I'm a doctor and, frankly, making some bucks. So I recently went back to the same dealer and dropped a bundle for all new electronics and a different brand of speakers.

When I set up the new equipment, I wanted to hear the improvement, so I hooked up the old HERESYs next to the new speakers.

I was quickly disappointed. The old HERESYs sounded a lot better than the new speakers. They just had more life and clarity. I felt like I had wasted my money on speakers.

My dealer was great about it. He let me exchange those speakers for a beautiful new pair of KLIPSCHORNs®. They have the biggest, most lifelike sound I've ever heard.

The old HERESYs? I'm not sure what to do with them but they're definitely not for sale. Neither are the KLIPSCHORNs.

For your nearest KLIPSCH dealer, look in the Yellow Pages or call toll free, 1-800-223-3527.
The CX70's tuner is not turned off or on by the insertion or removal of a cassette; there is a button to select tuner or tape operation. Similarly, the CDI (CD input) button must be pressed to replace either internal source with a signal source plugged into the CD inputs. The tape deck has both 70- and 120-microsecond equalization, but the user must press the appropriate button to match the tape type. And unlike most car FM radios, the CX70 does not automatically reduce stereo separation to zero to lessen noise at usable signal levels. In fact, the channel separation remains fully effective at any signal level unless you manually switch to mono reception. The only operations that are automatic are tape reversal at the end of each side, ejection of the cassette when the receiver is turned off, and local/distance sensitivity selection. The Concord CX70 can be removed from the car by pulling it out of its mounting tray with the handle that is permanently hinged to its front panel. Pulling the receiver out and replacing it are easy and straightforward, requiring no accessory tools. The operation is no more complicated than opening the glove compartment. The docking chassis is installed by sliding it into a DIN-size dashboard cutout and bending mounting tabs to secure it. Price: $750. Concord, Dept. SR, 25 Hale St., Newburyport, MA 01950.

**Lab Tests**

We tested the Concord CX70 in its four-channel mode, which simplified the measurement of its audio output since the two-channel bridged mode does not allow either side of the speaker outputs to be grounded. Because the receiver is rated for 4-ohm loads, we used that value for most of our measurements. For audio measurements, our input signals were connected to the CD inputs, and except for power and distortion readings, the output was measured at the preamplifier line outputs. For perhaps the first time in our experience with car radios, our measurements of FM usable sensitivity and 50-dB quieting sensitivity matched the published specifications exactly. Most of the CX70's other specifications were handily met or surpassed by our measurements. The only reading that was less than good was the AM rejection of 44 db, although a figure like this is typical of car stereo receivers. One of the most striking and unexpected test results was the way the tuner maintained its stereo separation at the lowest signal levels. At 3 dbf (about 0.35 microvolt), the demodulated signal level was not much greater than the noise, but the stereo indicator was on and the channels remained solidly separated. Although the stereo reception at this level was not listenable, we appreciated that the CX70 lets the user decide when to switch from stereo to mono.

The equalizer response was essentially as rated, with a control range of about ±12 db at each center frequency and a typical ratio of bandwidth to frequency, or "Q," of 0.75. The loudness compensation boosted both low and high frequencies as the volume setting was reduced.
"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
vol 8, no. 4

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The power output at clipping was 5 watts per channel into 4 ohms, slightly better than rated, with a total harmonic distortion of only 0.025 percent at the rated 4.5 watts. The line outputs began to distort visibly at about 2 volts, but hard clipping did not occur until 6 volts. The tape deck's performance was equally outstanding. Its frequency response met the published specifications of 30 to 19,000 Hz ± 3 db with metal tape, but that does not tell the full story. From 60 to 15,000 Hz the response varied only ±0.75 db with 120-μs equalization, and with 70-μs equalization the variation was ±1.5 db from 60 to 16,000 Hz. These results represent a much more uniform response at audible frequencies than we have found in almost any other automobile tape deck we have tested. The response was virtually identical in both directions, and the random high-frequency level fluctuations (caused by poor tape-to-head contact) that are characteristic of most car cassette players were essentially absent.

The flutter readings were typical of better car cassette decks, as was the signal-to-noise ratio. Speed accuracy and the fast-forward/rewind times were also typical. In fact, the only tape measurement that was below expectations was interchannel crosstalk at 1,000 Hz, which was -34 db (values of -50 db or more are common in moderate-price home and auto tape decks).

In its measured performance, the Concord CX70 proved to be one of the best car stereo receivers we have tested. And though it has more features than most car receivers, its controls are easy to operate.

The cassette section was impressive. My tapes never sounded better. The finger snaps at the beginning of Ray, Goodman, and Brown's Special Lady snapped tightly. The drum beats at the start of Blondie's The Tide Is High jumped right out of the speakers. The bass in Linda Ronstadt's Heat Wave pounded without sounding tubby. The guitars in Air Supply's All Out of Love were crisp. The flutes in a Vivaldi concerto were sweet and airy. Melissa Manchester's voice was smooth and forward in Don't Cry Out Loud. And the sax in John Klemmer's Glass Dolphins showed no signs of harshness.

The cassette section was so good, in fact, that it made some subtleties audible that had been lost in playback on some other cassette decks. The decay of the finger snaps in Special Lady was more pronounced than before. The back-up vocals in Linda Ronstadt's Prisoner in Disguise could be heard more distinctly while Ronstadt was singing.

The FM section also performed well, but it was susceptible to a little more multipath than I would have expected from an expensive receiver. About 15 miles outside of New York City, where Interstate 80 snakes around a solid rock cliff, the CX70 held onto a strong stereo signal, but multipath-induced noise was noticeable and annoying for quite a stretch. While no other tuner I've used has passed by this section of I-80 without a lapse, a few have come through it without letting multipath-induced noise creep into the foreground.

As for sensitivity, the tuner did a good job of picking up some relatively noise-free New York stations from about 40 miles outside the city in the hilly, rural parts of northwestern New Jersey. The CX70's FNR+ system helped to minimize background noise, although the circuitry sometimes kicked in and out so quickly and frequently that listening became fatiguing. The fidelity of the FM reception was quite good. The drums in Charlie Daniels's The Devil Went Down to Georgia were powerfully reproduced, and, in fact, the tuner did a fine job of reproducing music up and down the frequency spectrum.

Operating the CX70 while driving was relatively painless. The large on-off/volume knob was easy to find without looking, the recessed, pop-out bass and treble controls didn't get in the way when they were not being used, and the night illumination was both aesthetically appealing and made it easier to find various controls in the dark.

There were a couple of operational drawbacks, however. For greater convenience, some two-step operations should really be one-step operations. For instance, when you hit the preset-scan button, the tuner will scan through one bank of six FM presets. To scan through the second bank, you have to hit the button again. Other cassette receivers let you scan through both banks automatically.

Also, the tuner's auto-scan function works in one direction only, up the radio spectrum but not down, although you can tune manually in either direction.

These small operational quirks, however, would not deter me from buying the CX70. The cassette section is among the best there is, the FM section performs relatively well, and if you want to build your way into a high-power multichannel, multi-speaker system one step at a time, the CX70 will give you the flexibility to upgrade without scrapping your existing components. J.R.

Road Tests

The CX70's docking sleeve slipped right into the dash, as it should, and the CX70 in turn slipped into the sleeve without much fuss. The unit fit snugly, but it didn't put up a fight when I pulled it out by its handle.

I used Concord's preamp-level outputs to bypass the internal amplifier and go directly to an outboard 75-watt-per-channel amplifier feeding a pair of component speakers in the front doors.

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If you think custom sound has to be complicated and exorbitant, this will come as a shock to your system.

In the past, if you wanted phenomenal sound tailored to your car, you drove to your local autosound dealership, where you were confronted by such a bewildering array of choices that you briefly considered making do with a Walkman."

Eventually, of course, you selected your components and left your car with the dealer, who installed over the next several days a battery of amps, equalizers, networks, switches and other exotic what-nots in your trunk.

The net effect was to reduce your cargo space to a size barely large enough for an attache case. And your bank account by a sum of money that would fill the attache case.

But let's recognize one thing: You drove away with an absolutely sensational sound system.

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a/d/s/, the company that pioneered high performance car audio, has created autosound's latest and most refined concept.

Using newly developed a/d/s/ components based on a unique multi-channel architecture, you can now configure a 2, 4 or 6-channel system of superior sound quality more simply, quickly and affordably than you thought possible.

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And if the PH15 is the muscle of the system, the 642CSi Electronic Signal Processor is its heart. A 6-channel programmable electronic crossover network, the 642CSi splits music into highs, lows and very lows, then routes the signals left and right to the appropriate amplifier channels. It also features interface circuitry that makes an a/d/s/ system compatible with virtually any head unit, including the AM/FM cassette that comes in the best cars today.

That means the $750 or so you would have plunked down for a new head unit can be applied instead to the system itself or to the purchase of an additional source—a CD player, say. Either way, you come out ahead.
The 6-channel PH15 amplifier is a finely finished dynamo that produces 300 clean watts of power. Whether you choose a 2, 4 or 6-channel a/d/s amp, you'll be getting a high-current amp that stands as the state-of-the-art in its class.

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a/d/s loudspeakers have long been the speakers of choice in the finest autosound systems. Among the signs of recognition they've garnered are 10 "Product of the Year" Awards from Audio Video International.

The a/d/s 320i was the first speaker to do for the car what the best home speakers do: project an accurate, stable stereo image.

The a/d/s 300i, Audio Video International 1988 Speaker of the Year, is an extraordinarily smooth speaker that prompted this from Car and Driver:

"... the high end systems made by a/d/s have reached the status of modern classics."

And for speakers that reach down to the very fundamentals of music — to notes you feel as well as hear — a/d/s offers the long excursion, low distortion S7 subwoofer.

The sound is superb, no matter how many channels you choose.

With 2, 4 and 6-channel amplifiers that deliver unadulterated power, and with a range of speakers capable of noteworthy impact and realism, a/d/s can help you create precisely the system your needs define.

Because a/d/s systems require fewer components and are simpler to install, the total cost of creating a sound system of convincing accuracy and gut-satisfying power is significantly reduced.

If none of this comes as a shock to your system, why not visit your a/d/s dealer for a demonstration.
If you think custom sound has to be complicated and exorbitant, anyone here will happily disabuse you of the notion.

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It took as many as 8 separate components in a conventional custom sound system to approximate the performance of this 300-watt, 6-channel sound system.

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Auto Sound, Ltd.
Audio Design
Car Tunes, Inc.
Installations Unlimited
Auto Sound Systems, Inc.

For more information, visit an authorized a/d/s/ dealer. Or phone us, toll-free, at 1-800-345-8112. (In PA, the number is 1-800-662-2444.)
Car Stereo: What Price Progress?

FEW consumer electronics products today are as complex or compact as the in-dash “head units” of car stereo systems. Far more than mere “radios,” these units typically include not only tuner and amplifier circuitry but also players for cassettes, CD’s, and—now—digital audio tapes. Their minimum size and high performance capabilities are made possible by the use of microprocessors and memory chips whose internal operating complexity is actually many times greater than that of the products containing them. But at least the semiconductor circuit elements have no controls that must be handled by a human being.

The control panel of a typical head unit measures about 2 x 7 inches. Within that area must be placed controls for most of the functions of a full-featured home receiver (essentially everything but recording functions), as well as controls for the built-in CD or tape player. Moreover, a portion of that area must be devoted to the loading slot for the player, and another valuable fraction must be devoted to a display showing the tuner frequency, the CD or tape program track, and other operating information. All of this takes about 3 square inches of the panel area, leaving a mere 11 square inches for the operating controls.

It does not require a mechanical-engineering degree to appreciate the difficulty of squeezing so many controls and features into so little space. The problems are formidable, and it is to the credit of the designers of car audio equipment that they have been solved so successfully in so many cases. In some head units, for instance, the display is combined with the door that covers the tape opening, an ingenious solution made possible by the development of flat liquid-crystal displays.

In some of the more complex units, portions of the circuitry, such as the tuner and certain power-supply components, are housed in outboard modules that can be installed wherever convenient. The controls, the disc- or tape-playing mechanism, and their related circuitry are in the main unit, which fits a DIN-standard dashboard cutout. Not only does this approach leave room inside the head unit for additional performance-related features, but it also extends the life of the system by removing heat-generating circuitry from an area where it can do real damage.

Still, even the most ingenious packaging solutions risk approaching a point of diminishing returns where more features may become less useful. The more sophisticated car stereo equipment becomes, the more vital it is that due attention be paid to the “ergonomics,” or human engineering, of the products.

For example, consider knobs. Years ago, home receiver designers abandoned rotary, knob-operated controls in favor of pushbuttons, even though, as many people now realize, some functions are most easily and effectively controlled with a knob or even a slider. This transition was initiated by the increased availability of inexpensive integrated circuits whose functions could easily be switched or varied smoothly by a simple contact closure. While it may take two or more buttons to replace one knob, a knowledgeable packaging designer can make a rather complex control panel look relatively uncluttered by using inconspicuous or small buttons, sometimes hiding them behind a hinged door. The misuse of pushbutton controls, however, especially in combination with multicolored displays, can easily result in a panel more appropriate for the cockpit of an F-15 than for a consumer product!

Some car stereo head units still use a couple of knobs, mainly for tuning and volume control. A useful variant is the “pop-up” control, a small-diameter knob that is normally recessed flush with the panel but emerges sufficiently to be grasped when it is pressed and can be pushed back into the panel after use. Another, more common system is to use a single full-sized knob for several functions, depending on whether it is pulled out or pushed in from its normal placement. When a multifunction knob is combined with one or more additional concentric controls, operated by small levers extending radially from behind the knob, it is possible to fit a considerable number of control functions within the same panel area. If this approach is carried to extremes, however, it can greatly increase the time that is required for a user to become thoroughly familiar with the equipment.

Difficult as it can be to operate a head unit with many tiny buttons, the problem is compounded when the buttons must serve multiple functions. Sometimes analogous
TECHNICAL TALK

functions, such as auto-seek tuning and tape or CD track skipping, can be assigned to the same button. Usually there is no problem with the common functions, such as volume or tone adjustment, but occasionally a pair of volume-control buttons, say, will also be used as tone controls, balance controls, or front/rear faders, requiring still other buttons to transfer the functions. And often two or three specialized and unrelated operations—such as automatic signal-seeking tuner scans, tape noise-reduction selection, and preset selection or programming—are combined in a single control button. Space limitations on the panel can prevent adequate identification of these various functions, resulting in a cryptically marked control whose purpose may not be at all obvious to the user.

Some full-featured car stereo head units have reached the point where it is difficult for a driver to operate the controls safely while driving. Even relatively simple radios can present operating difficulties. It can be dangerous for a driver to take his eyes off the road for the time needed to find and use one control among the many crowded together on the panel. But to use a control successfully without looking at the panel requires skill and luck.

In lab testing full-featured head units, I frequently have to study the front panels at close range for some time to determine how to achieve a particular result. True, I have not had the benefit of long experience using the car components I test. But do many drivers study the instruction manuals for their stereo systems enough that operating them becomes second nature before they hit the road?

I suspect that if I had one of those units in my car, I would find myself using few of its capabilities—at least not while in motion. Probably the same can be said for some of the people who buy these products for their cars. Is there a way that manufacturers can preserve a better balance between a wealth of features and ease of use? Is it necessary for a car component to have every known form of noise reduction and every operating feature found in a home tape deck or CD player?

Some car stereo designers have managed to incorporate a full gamut of features into head units without unduly complicating their operation. And when I have the opportunity to test such products, assuming that their performance is otherwise at least adequate, I praise them in unmistakable terms (see the test report on the Concord CX70 in this issue). In general, however, there needs to be a greater, more deliberate effort on the part of more manufacturers to achieve this end. I don't think my reaction to this situation is unique, and I would be interested in hearing from readers about their pro and con reactions to the present state of car stereo human engineering—or the lack of it.
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Why spend the rest of your life with a single disc CD player, when you can experience the joy of six? Introducing Pioneer's newest 6-Disc CD Changer, the PD-M70. With its unique programming capabilities, you can hear all six discs straight through, play only your favorite songs and skip the rest, or push "non-repeating random play" and let it choose tracks and play them for you. And thanks to Pioneer's exclusive Magazine Program Selection System, you can now program up to 80 songs on any combination of eight magazines for instant recall.

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All three new Advents have natural wood tops and bases. Even if you never hooked them up, they’d make great looking furniture.

Come in to your nearest Advent dealer and listen to the new Mini-Advent, Prodigy Tower and Baby Advent. And don’t worry about the crowds. With these speakers, there’s always plenty of room.

ADVENT
Sound as it was meant to be heard.

CIRCLE NO. 30 ON READER SERVICE CARD
FOR some years, audio (and video) products made by the Dutch electronics giant Philips—the co-developer, with Sony, of the compact disc—have been sold in the U.S. under the Magnavox, Sylvania, and Philco brand names. The Philips brand itself had been absent from the American market until recently, when a number of new Philips components were introduced here. Among them is a deluxe CD player, the CD960, that offers nearly every imaginable feature.

The CD960 has separate quadruple-oversampling digital filters and digital-to-analog (D/A) converters for each channel. Most of its performance specifications are truly state of the art, including an amplitude flatness of ±0.01 dB, a phase linearity of ±0.2 degree from 20 to 20,000 Hz, and a distortion rating of 0.0015 percent over the same range.

The outstanding performance specifications of the CD960 are complemented by the great variety of its operating features. It offers direct keypad access to any track or indexed portion on a disc, and it can be set to start playing a track at any time after its starting point. Up to twenty tracks can be programmed in one playback sequence (that number is considerably reduced if programming by index or time is also required). Any programmable sequence can also be stored in the Favorite Track Selection (FTS) memory, which retains its information, including disc identification, until erased.

Other operating modes include SCAN, which plays the first 10 seconds of each track before going on to the next; AUTO PAUSE, which stops playback after each track until the pause button is pressed; COPY PAUSE, which inserts a 4-second interval between tracks; and SINGLE PLAY, which plays only the current track. The repeat mode replays the entire disc, a selected track, or any selected portion of a disc.

The principal operating controls of the Philips CD960 are grouped by function, with the play, pause, stop, search, and skip buttons at the right of the front panel. An angled secondary control panel, containing...

Lab Tests
The CD960 delivered 2.07 volts per channel into an EIA-standard load from a 0-dB test signal, with a channel imbalance of 0.2 dB. Its frequency response was one of the flattest we have yet measured, within ± 0.05 dB overall from 20 to 20,000 Hz. The variations consisted entirely of high-frequency ripples above 2,000 Hz; the average playback level did not change detectably over the full range.

The 1,000-Hz total harmonic distortion (THD) was 0.0024 percent at 0 dB, increasing to 0.0057 percent at -10 dB and 0.02 percent at -20 dB. These readings were of actual harmonic components below 20,000 Hz. It was not possible to measure THD plus noise because of the presence in the output of ultrasonic signal components from the digital circuitry. While these ultrasonic components were not large enough to affect playback in any way (they measured about -70 dB, or 0.03 percent amplitude), they made it necessary to use a spectrum analyzer for our distortion measurements.

We have previously encountered this same problem with other Philips-made CD players such as the Sylvania models.

The A-weighted noise from the "infinity-zero" track of a test CD was -124 dB referred to a 0-dB level, and the dynamic range was an estimated 105 dB (the broad-band noise portion of this measurement was also obscured by the player's ultrasonic output signals).

The measured channel separation surpassed the player's already impressive specifications, ranging from 118 dB at 100 Hz to 109 dB at 20,000 Hz. Interchannel phase shift was zero over most of the audio range, reaching 4 degrees at 100 Hz and 0.7 degree at 20,000 Hz. The D/A converter's linearity error at low levels was -1.2 dB at -80 dB, -5.4 dB at -90 dB, and -4.5 dB at -100 dB.

The slew time of 2.4 seconds from Track 1 to Track 15 of the Philips TS4 test disc was about average for players not using a linear motor for laser slewing. The cueing accuracy was excellent, and the player had no difficulty tracking through the largest defects on the Philips TS5A test disc. The headphone volume was excellent, sufficient for very comfortable listening levels.

The CD960 excelled in its immunity to physical shock. Even hard slaps and blows with a fist on any part of its exterior did not cause audible mistracking or other effects. We were able to induce a skip only by a truly violent blow on the top plate, above the disc mechanism.

Curious about the reasons for the CD960's considerable weight and immunity to physical impact, we removed the top cover. The chassis

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**FEATURES**

- Separate quadruple-oversampling digital filters and D/A converters for each channel
- Scan mode to play first 10 seconds of each track
- Single-play mode for one track only
- COPY PAUSE to insert 4-second intervals between tracks
- AUTO PAUSE to halt play after each track
- Remote control of all playing functions except special play modes and FTS
- Display of track and index numbers, status of all operating modes, and time (switchable between elapsed and remaining time)
- Slide-away panel for little-used controls
- Analog and digital electrical outputs, digital optical output
- Separate quadruple-oversampling digital filters and D/A converters for each channel
- Scan mode to play first 10 seconds of each track
- Single-play mode for one track only
- COPY PAUSE to insert 4-second intervals between tracks
- AUTO PAUSE to halt play after each track
- Remote control of all playing functions except special play modes and FTS
- Display of track and index numbers, status of all operating modes, and time (switchable between elapsed and remaining time)
- Slide-away panel for little-used controls
- Analog and digital electrical outputs, digital optical output

**LABORATORY MEASUREMENTS**

- **Maximum output level**: 2.07 volts
- **Total harmonic distortion at 1,000 Hz**: 0.0024% referred to 0 dB, 0.0057% referred to -10 dB, 0.02% referred to -20 dB
- **Signal-to-noise ratio (A-weighted)**: -124 dB
- **Channel separation**: 113 dB at 1,000 Hz, 109 dB at 20,000 Hz
- **Frequency response**: ± 0.025 dB from 20 to 20,000 Hz
- **Dynamic range**: 105 dB
- **Maximum phase shift (from 100 to 20,000 Hz)**: 4 degrees at 100 Hz, 0.7 degree at 20,000 Hz
- **Cueing time**: 2.4 seconds
- **Cueing accuracy**: A
- **Impact resistance**: top, A; sides, A
- **Defect tracking**: tracked maximum defect levels on Philips TS5A test disc

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**TEST REPORTS**
TEST REPORTS

turned out to be a heavy, single-piece casting, with the disc mechanism constructed on a separate cast-metal frame floating on vibration isolators. Even the top cover was made of a heavier gauge of metal than is used on most compact disc players.

Comments

Not only can the Philips CD960 do an amazing number of things (many of them quite useful), but it does them as easily and naturally as one could possibly expect from such a complex piece of equipment. This is a tribute not only to the engineering acumen of its designers but also to the talents of those who wrote its instruction manual. Rarely have we seen the instructions for such a versatile and sophisticated consumer product written so clearly and logically—in plain English. The manual tells you just what to do to achieve a desired effect, and it usually follows an instruction with a list of the proper responses to the action and possible reasons for an error indication or other undesired effect. If the same care were taken with VCR manuals, imagine how many more people would be able to program their recorders successfully!

We tried each of the many operating modes of the CD960, and they all worked exactly as they were supposed to. In fact, there was not a thing in the operation of this player that left us dissatisfied or puzzled. Possibly some users with minimal patience would wish for a fast, linear-motor drive for the laser to cut its slew time from a couple of seconds to a fraction of a second, but we did not begrudge the machine its one leisurely action, especially in view of the smoothness and silence of its operation.

Whether the Philips CD960 sounds any different from a number of other top-of-the-line CD players is debatable, but in the factors that we consider really important—such as flexibility, ease of use, state-of-the-art measured performance, immunity to external vibration, substantial construction, and similar qualities—it ranks with the very finest CD players we have had the pleasure of using.

Circle 140 on reader service card

ALLISON ACOUSTICS IC20 LOUDSPEAKER SYSTEM
Julian Hirsch, Hirsch-Houck Laboratories

The IC20 is the first "Image Control" loudspeaker from Allison Acoustics as well as the most expensive speaker to carry the Allison name. It represents a logical extension of Allison's approach to speaker design, including the "Room-Matched" feature that has been a characteristic of every Allison speaker so far.

Normally, when a woofer is located a foot or two from the floor or a wall, its low-frequency response becomes irregular, with an actual loss of bass output power, because of interference between its direct
output and the sound waves reflected from the wall and floor. Floor-mounted Allison speakers are designed to be placed against a wall, with the woofer as close as possible to the floor and the wall. This placement shifts the interference region upward in frequency, so that using a low woofer crossover frequency effectively eliminates the interference problem.

Another feature of the IC20 is the use of proprietary convex-diaphragm tweeters and midrange drivers. These drivers, designed and built by Allison Acoustics, have an extended frequency range and a very wide dispersion angle that makes them effectively omnidirectional forward of their mounting panels.

The Image Control characteristic of the IC20 refers to its switchable horizontal directional pattern, which can be changed by a wireless remote control. Each enclosure actually contains two speaker systems, mounted at right angles to each other and facing 45 degrees to the left and right of the forward axis. In each system, the middle and high frequencies are radiated by a line array of two midrange drivers and two tweeters near the top of the panel. This configuration concentrates sound energy at a listener's ear level and minimizes the effects of ceiling and floor reflections. The woofers are at the bottom, closest to the floor.

The output levels from the two groups of middle- and high-frequency drivers can be switched to shift the total radiation pattern to either side or directly forward without changing the overall sound level. When the output of one group of drivers is reduced, the other is increased to maintain a constant overall output, with the overall system radiation favoring the side having the higher output. The pattern shift can be performed on the left or right speaker or on both simultaneously. When the radiation pattern of each speaker is switched outward, the sound stage is expanded beyond the speakers themselves. With both radiating inward, a tightly centered stage is produced, and when the output from both is beamed forward, the speakers have a virtually omni-directional horizontal pattern in the listening area.

The two woofers at the bottom of each cabinet are mounted unconventionally. One faces outward in the normal manner, while the other faces into the enclosure. They are driven in opposite electrical phase, so that their cones move out at the same time and their acoustic outputs are in phase. According to Allison, this arrangement reduces second-harmonic distortion, typically by about 10 dB, at moderate-to-high sound levels. The woofers are acoustic-suspension types operating in fully enclosed volumes.

The 10-inch woofers operate up to 350 Hz, where each crosses over to a pair of 3½-inch convex-diaphragm midrange drivers, damped and cooled by ferrofluid. The second crossover, at 3,750 Hz, is to a pair of 1-inch convex-diaphragm tweeters with silicone damping and cooling. The crossover have 8-dB-per-octave slopes. The nominal system impedance is 6 ohms, with an average value of 8 ohms and a minimum of 5 ohms. The rated sensitivity is 87 dB sound-pressure level (SPL) at 1 meter with a 2.83-volt input. The IC20 is recommended for use with amplifiers rated between 30 and 400 watts per channel. Its power-handling capacity is specified as 175 watts for 10 seconds and 1,500 watts for 0.1 second.

Separate five-way binding post terminals for the woofers and for the mid/high drivers, with a switch to join or separate them, are recessed into the rear of the cabinet. When the terminals are separated, the speakers can be bi-wired, with separate cables carrying the low and mid/high frequencies from the amplifier, or bi-amplified, with separate amplifiers for the low and mid/high frequencies.

At the top of the rear panel are two toggle switches. One is set to correspond to the position of the speaker (left or right), so that the remote control will switch its radiation pattern in the appropriate directions, and the other can be used to select the pattern manually. A pair of red LED's on the front of the cabinet indicate the directional setting (both light when the pattern is forward).

The Allison IC20 is a fairly large speaker, measuring 48 inches high, 21 inches wide, and 12 inches deep. It has a truncated triangular cross section, with a removable black grille over each speaker panel and a narrow wooden strip on its front face. The drive units are protected against overload by a fast-acting bistable resistor that resets automatically. Each driver is protected against physical damage by a perforated-metal cover, and since the wooden exterior is fully finished except for the back panel, the speakers can be operated with or without the grilles in place. Each speaker weighs about 100 pounds. The IC20 is available in black, oak, and walnut finishes. Price: $4,900 a pair. Allison Acoustics Inc., Dept. SR, 7 Tech Circle, Natick, MA 01760.

**Lab Tests**

The room response of the Allison IC20 speakers was virtually unaffected by their pattern settings, confirming that their total acoustic power output was not affected by the settings of the image controls. Above 500 Hz, where room-boundary effects are minimal, the averaged response was unusually flat all the way up to 20,000 Hz. The close-miked woofers were flat within 3 dB overall from 35 to 350 Hz. Spliced to the room curve, it resulted in a composite frequency response flat within ±2.5 dB from 32 Hz to beyond 20,000 Hz.

Our quasi-anechoic FFT response measurements confirmed the essential properties of the speakers' room curves. Since the "off" panel is never really turned off, merely reduced in level, it produced interference-cancellation notches in the FFT response that were not present in the room response. The group delay of each panel was constant within 0.15 millisecond from 5,000 to 22,000 Hz.
Plain Vanilla

Not only do we design and build it, we know how to put it together...simple as plain vanilla.

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The sensitivity was 86 dB SPL on the forward axis when the radiation pattern favored that direction. When we drove the system at a 4.5-volt level, corresponding to a 90-dB SPL, the woofer distortion was very low, 0.5 to 1 percent from 100 Hz to below 30 Hz and a maximum of only 1 to 1.5 percent at 20 Hz. Not surprisingly, the IC20 was able to absorb huge power inputs without significant nonlinearity. With single-cycle bursts at 100, 1,000, and 10,000 Hz, the amplifier clipped before there was visible or audible distortion on the speaker's acoustic output waveform. The respective power levels reached were 810, 850, and 1,300 watts. The middle- and high-frequency power levels were not unusual—most speakers can handle tremendous inputs at those frequencies—but the IC20's woofer was perhaps the first we have found that could take over 800 watts input at 100 Hz without even sounding raspy!

Comments

One of the most striking characteristics of the Allison IC20 is its lack of striking characteristics. Most speakers can be described in terms of a special sound quality—brightness, heaviness, airiness, etc. To prefer one or another of these properties is perfectly acceptable, and most of us have our own ideas of what a speaker should sound like. We base our purchases in good measure on those ideas (tempered by economic considerations).

The IC20, however, is one of the most neutral speakers we have ever heard. It never sounded shrill, heavy, forward, or otherwise unlike the real music it is meant to reproduce. In many ways it is a "forgettable" speaker, since a listener easily accepts its output as music and forgets that a speaker has been interposed between the performance and the hearing.

I don't mean to say that the Allison IC20 is "perfect" (whatever that might be), but merely that it is probably one of the least colored speakers on the market today. Neither its low bass nor its extreme treble is likely to arouse comment, but when the music contains substantial energy at either end of the spectrum, it will be heard (or felt) as it was meant to be.

All of this is completely consistent with the IC20's measured frequency response and other characteristics. On the other hand, some other speakers manage to produce fairly similar measured results without sounding at all like the IC20's, which emphasizes the difficulty of determining a speaker's sound from its measurements.

I will confess that on first hearing the Allison IC20's I wondered what was so special about them and whether it was enough to justify their rather high price. Further listening soon answered the first part of the question: the second will have to be a personal decision by every potential buyer. As I listened to them, playing various CD's, I had to remind myself that those imposing black boxes against the wall were the source of the music that filled the room. This "invisibility" is a reflection of the system's ease and smoothness, resulting in an effortless, seamless sound quite different from that of lesser speakers.

What about those spatial qualities that the novel design of the IC20 is intended to provide? Although the sound character changed audibly when the radiation pattern was switched, I did not find the differences to be significant. After some experimenting, I remained with the forward (hemispherical) pattern, which seemed to be best suited to my room and tastes.

The bottom line on the Allison IC20 is that it is a superbly neutral, clean-sounding speaker with one of the flattest frequency-response characteristics we have measured as well as some of the lowest bass-distortion readings in our experience. It is not "flashy" sounding, but there is nothing dull about it either. Judging from my own reaction, the longer you listen to these speakers, the more they will appeal to you.

Probably the most serious weakness of the IC20 is the very high price tag. I suspect that some people will expect a $5,000 pair of speakers to sound strikingly different from others; if so, they are doomed to disappointment. Nevertheless, the Allison IC20 is worth the price if you can afford it, and worth hearing even if you cannot. The experience will give you some idea of what qualities to look for in a speaker system, even if this one is beyond your means at the moment.

Circle 141 on reader service card
Obvious but very deceptive...

You'll probably notice our 50-watt RX-533 offers obvious features such as Digital AM/FM cassette/radio with Dolby® B & C noise reduction, 24-preset stations, preset scan, tape program search, separate bass & treble tone controls, etc., and of course, it's removable!

But you'll probably overlook the not-so-visible but specially engineered features such as FM optimizer II circuitry designed for superior FM reception and built-in Automatic Radio Monitor for filling the void with music while you are fiddling with your tape. Special cassette features such as "Auto Azimuth Correction System" rotates the tape head 180 degrees whenever tape direction changes to keep perfect azimuth alignment, Keyoff Pinch Roller Release minimizes wear and tear of tape pinch roller and DC servo motor accurately controls tape movement thus minimizing wow and flutter.

Plus pre-amp outputs and CD/AUX input capability designed for flexible system expansion, two-tone illuminated control panel guarantees easy viewing and identification and replaceable Lithium back-up battery helps protect and store information in the microprocessor.

Though not in plain view, these state-of-the-art engineering innovations are obviously what you have come to expect from a company with over 11 years of manufacturing experience. Coustic...a sound investment.

Coustic... a sound investment.

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ONKYO TX-SV7M
AUDIO/VISIO RECEIVER

Julian Hirsch, Hirsch-Houck Laboratories

The Onkyo TX-SV7M is the first audio/video receiver we have tested since 1982 (the now-discontinued Jensen AVC-1500) that includes a video tuner instead of just switching circuits for video sources. Along with the AM and FM bands, the digital-synthesis tuner section receives the audio portions of the VHF band (Channels 2 to 13), and there is an MTS/SAP decoder for stereo TV programs as well as the Separate Audio Programs transmitted by many TV stations. The TX-SV7M also includes a decoder for Dolby Surround sound in its basic, passive form, and there is a HALL surround mode that uses the time-delay circuits of the Dolby system. Another enhancement mode, MATRIX, adds spaciousness to stereo programs without using time delay. There is also a simulated-stereo circuit for mono programs and a dynamic bass expander to enhance low-bass reproduction by a boost centered at 70 Hz, the amount of boost being proportional to the level of the program’s bass content.

The TX-SV7M provides four channels of amplification. The front-channel amplifiers, when used for normal stereo playback, are rated to deliver 100 watts per channel into 8 ohms from 20 to 20,000 Hz with no more than 0.04 percent total harmonic distortion. In a surround mode, their power rating is reduced to 90 watts per channel and the rear speakers are driven by a 20-watt-per-channel amplifier, which is rated at less than 0.08 percent distortion from 20 to 20,000 Hz. The front and rear preamplifier outputs and main-amplifier inputs, brought to separate connectors on the rear apron, are normally joined by connecting links. By removing the links, external amplifiers or signal-processing accessories can be inserted into the signal path while retaining the receiver’s full control capability and without sacrificing one of the tape-recording circuits.

The AM and FM bands are tuned in increments of 50 and 10 kHz, respectively. Each of the twelve preset memories can be assigned to one AM and one FM station; in the TV mode they are permanently assigned to the twelve VHF channels.

The front panel of the Onkyo TX-SV7M presents a clean, uncluttered appearance, with the large display window being its most prominent feature. A row of seven large pushbuttons selects the program source: TAPE-2, TAPE-1, VCR-2, VCR-1/VDP, tuner, phono, and CD. Smaller buttons select the speaker outputs, FM/TV muting and mono/stereo mode, and loudness compensation. The large volume-control knob, with an
What has prism effect, a refractive phenomenon, to do with audio equipment? Nothing, except that it is the simplest analogy to describe what our sophisticated XM-3* Mobile Electronic Crossover does to audio signals.

When an ordinary ray of white light passes through a prism, it is systematically separated into the primary colors of the spectrum—optically much more aesthetic than the original light.

Similarly, when an audio signal enters the XM-3, the original signal is then separated, via various controls, to the front and/or rear tweeters, midranges and sub-woofers, creating distinctive bands of the audio frequency spectrum that are space and user-specific.

Specially engineered features such as Front and Rear Pre-Amp Inputs and Front and Rear Outputs as well as a constant: Sub-Woofer Output, Asymmetrical Electronic Crossover which has two high-pass (32-400 Hz variable) crossover points for the front and rear outputs and a low-pass (32-400 Hz variable) crossover point for the sub-woofer output, Woofer/Enclosure Equalization engineered for optimizing bass response, Phase Inverter allowing the sub-woofer output to be shifted 180 degrees out-of-phase to compensate for in-vehicle acoustical abnormalities and Frequency Multiplier Switch which, by multiplying crossover points for the front channel, transforms the XM-3 from a BI-AMP SYSTEM to a TRI-AMP SYSTEM, etc., all contributed to create the PRISM EFFECT and make the XM-3 the most versatile electronic crossover ever manufactured for automotive use.

Coustic… a sound investment.
illuminated red index pointer, is at the right along with three small, center-detented knobs for the bass and treble tone controls and the balance control. The front panel also contains a headphone jack.

A large rectangular section below the input-selector buttons hinges downward to form a sloping control panel with a number of less often used buttons, including the twelve preset selectors, the FM/AM/TV selector, and up/down tuning buttons for the radio bands, which combine manual and automatic-seek tuning functions. Four surround-mode buttons select Dolby, HAL, MATRIX, and bypass modes (BYPASS also silences the rear-channel speakers). Smaller buttons switch the delay time sequentially to 15, 20, or 30 milliseconds (the Dolby mode always comes on initially at 20 milliseconds), turn the dynamic bass enhancer on and off, and select the simulated-stereo mode. The ANTENNA button connects the tuner input to either the regular or cable antenna connectors in the rear of the receiver. The MTS button toggles between the main and subchannel programs of a stereo TV broadcast, and a TV FINE TUNING button, for use with CATV systems having nonstandard channel frequencies, allows the regular tuning buttons to shift the frequencies of preset TV channels over a ±2-MHz range in 50-kHz steps.

The display window is exceptionally complete, showing the status of every operating mode or feature. A tuning-information section shows the status of all tuner functions, including the preset station number or the TV channel.

The receiver's rear apron has coaxial 75-ohm F connectors for an FM antenna, a TV antenna or cable-TV transmission line, and an output to the antenna input of an external TV receiver. There is also a coaxial output to a video monitor. The receiver includes a detachable, pivoted-loop AM antenna and terminals for an AM wire antenna. The signal connectors include record and play jacks for two audio tape decks and two VCR's (both audio and video circuits), inputs for a videodisc player and a CD player, and a phono input for a moving-magnet cartridge. There are insulated binding posts for two sets of front speakers and one pair of rear speakers. Two of the three AC convenience outlets are switched.

Finally, the Onkyo TX-SV7M comes with a full-system remote control, befitting the receiver's status as a virtually complete A/V control center. The remote is considerably larger than the usual such unit, and its control panel is divided into two sections. The main portion, containing thirty-four buttons, is permanently programmed to duplicate most of the functions of the receiver's front-panel controls, including power switching and volume-control, as well as the controls of compatible Onkyo turntables and CD players. The remaining twenty-one buttons can be programmed by the user to memorize the remote-control commands for any make of TV set, cable box, and VCR.

The remote's audio-muting function (a 20-dB volume reduction) has no counterpart on the receiver itself. There is also a front/rear balance adjustment, critical to proper operation of a surround-sound system, that can only be made from the remote (the relative gain settings of front and rear channels are shown in the receiver's display window). Although the remote control is rather bulky for normal hand-held use, its infrared output is strong enough that, in moderate-size rooms, it can be placed on a table and need not be pointed directly at the receiver.

The Onkyo TX-SV7M is a fairly large and heavy receiver. It measures 18½ inches wide (including its woodgrain side panels), 16½ inches deep, and 5½ inches high, and it weighs 31 pounds, 5 ounces. The remote control is 8 inches long, 4 inches wide, and 1½ inches thick. Price: $990 (including remote). Onkyo U.S.A. Corp., Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

Lab Tests

The FM tuner section of the TX-SV7M equaled or surpassed the manufacturer's ratings in all respects, within normal measurement tolerances. It had excellent sensitivity and distortion characteristics, with an 11.8-dB usable sensitivity and typical distortion readings at a 65-dB input level of about 0.1 and 0.15 percent in mono and stereo, respectively. The 1.1-dB capture ratio was also better than average, although the selectivity measurements (4.5 and 67 dB, respectively, for adjacent-channel and alternate-channel spacings) were average, and the 40-dB image rejection, which matched the published rating, was marginal for a receiver in this price range.

The frequency response was almost rater-flat (+0.1, -0.3 dB) from 30 to 10,000 Hz, with a drop of just over 1 dB at 15,000 Hz. The channel separation was close to 50 dB at low to middle frequencies and better than 30 dB over almost the entire audio range. The signal-to-noise ratio was good, though not exceptional, measuring about 78 dB in mono and 72 to 75 dB in stereo (which required at least a 65-dB input for full quieting). The AM frequency response was down 6 dB at 60 and 2,600 Hz.

The tone controls had good characteristics, although the available bass boost of about 21 dB at 20 to 30 Hz should be used with discretion in view of the receiver's considerable power capability. The loudness compensation boosted both low and high frequencies to a moderate degree (a maximum boost of 7 dB in the bass and 2.5 dB in the treble). The RIAA phono equalization was good, with a maximum error of ±0.35 dB from 20 to 20,000 Hz. The phono input's termination was 46,000 ohms in parallel with only 56 picofarads of capacitance, and it overloaded at an input level of about 162 millivolts over the full audio range.

Although the TX-SV7M's power amplifiers are rated only for 8-ohm loads, a supplementary fact sheet from Onkyo indicates that the receiver can not only drive 4-ohm speakers but will not be damaged with two pairs of 4-ohm speakers operating at the same time. Its amplifiers and power supply are rather "robust," in the manufacturer's word, and are protected against excessive output current or overheating by a relay system. Our findings confirm those statements.

We preconditioned the receiver for 1 hour with each front channel
Remote Possibilities

With the remote control of the Dragon II Mobile Security System, the possibilities are tremendous.

With the simple touch of a button, the Dragon II will, by remote control...
- Lock/Unlock your doors
- Continuously monitor your hood, trunk, doors and windows against tampering
- Release your trunk or activate another Dragon Security System in a second car
- Blink your parking lights rapidly for 30 seconds so you can easily locate your car even in a large, crowded parking lot

But just touch the car and the Dragon II will...
- Activate a very loud siren
- Blink your parking lights rapidly for visual warning
- Instigate an unpleasant sounding siren inside the Passenger Compartment
- Bypass the Starter Relay to prevent unauthorized starting of your car

The remote controlled Dragon II Mobile Security System does all this and MUCH, MUCH MORE...
Go get one and enjoy the possibilities.
Coustic...a sound and secure investment.

Dragon II Features:
- Two-Channel Remote Control Transmitter
- Selectable Automatic/Remote Arming/Disarming
- Audible Status Signal with Defeat
- LED Status Indicator with Prior Attempt Indication
- Electro-Magnetic Transducer (EMT)
- Motion and Shock Sensor
- Multi-Sensor System
- Starter Bypass Relay
- Remote Panic Alarm
- Valet Parking Override
- External Antenna Connector
- Automatic Door Lock/Unlock Interface*
- Courtesy Light Interface*
- Parking Light Interface*
- Trunk Release Interface*

Optional relay(s) required.
†Patent pending.

Dragon I Features:
- Remote Control Transmitter
- Audible Status Signal with Defeat
- LED Status Indicator with Prior Attempt Indication
- Electro-Magnetic Transducer (EMT)
- Motion and Shock Sensor
- Multi-Sensor System
- Starter Bypass Relay
- Remote Panic Alarm
- Valet Parking Override
- External Antenna Connector

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CIRCLE NO. 68 ON READER SERVICE CARD
delivering 33 watts into 8 ohms and each rear channel operating at about 7 watts. No part of the cabinet exte-

FEATURÉS

- Digital-synthesis tuner for AM, FM, and VHF TV (sound only)
- Preset station selectors for twelve AM, twelve FM, and all VHF channels
- MTS/SAP decoder
- Dolby Surround, HALL, and MXTIN, surround-mode modes
- Selectable surround-mode time delays of 15, 20, or 30 milliseconds
- Four-channel amplifier, rated for 100 watts per channel in front-only stereo mode, 90 watts per channel front and 20 watts rear in surround mode
- Separate pre-amplifier outputs and main-amplifier inputs
- Inputs for CD, phono, two audio tape decks, and two VCR's or one VCR and one VDP
- Audio and video tape-copying facilities
- Video output to monitor
- Switchable antenna inputs for FM, TV, CATV
- TV antenna output to external TV receiver or VCR
- Bass and treble tone controls
- Switchable loudness compensation
- Dynamic bass expander
- Audio muting (remote only)
- Simulated stereo for mono programs
- Display of complete operating status
- Outputs for two pairs of front speakers, one pair of rear speakers, and one pair of center speakers
- Universal remote control for all receiver functions; can operate compatible Onkyo source components
- Memory control codes for any brand of TV set, VCR, or cable box

LABORATORY MEASUREMENTS

- 19-kHz pilot-carrier leakage: -62 db
- Hum: -77 db
- Stereo channel separation at 100, 1,000, and 10,000 Hz: 45, 47, and 30.5 db
- Frequency response: FM, 30 to 15,000 Hz: ±0.3, ±1.2 db; AM, -6 db at 60 and 2,800 Hz
- Clipping headroom (relative to rated output, 8 ohms): front, 1.25 db; rear, 2.3 db
- Dynamic power output (front channels): 136 watts into 8 ohms, 242 watts into 4 ohms, 306 watts into 2 ohms
- Dynamic headroom (front channels, 8 ohms): 2.38 db
- Harmonic distortion (THD + noise) at 1,000 Hz into 8 ohms: front, 0.055% at 1 watt, 0.0175% at 10 watts, 0.0165% at 100 watts; rear, 0.012% at 1 watt, 0.095% at 10 watts, 0.021% at 20 watts
- Maximum distortion (20 to 20,000 Hz): front, 0.05% at 50 watts (20,000 Hz); rear, 0.021% at 20 watts (20,000 Hz)
- Sensitivity (for a 1-watt output into 8 ohms): Cd, 17.5 mV; phono, 1.84 mV
- A-weighted noise (referred to a 1-watt output): Cd, -75.3 db; phono, -73.6 db
- Phono-input overload: 162 mV
- Phono-input impedance: 46,000 ohms in parallel with 56 pf
- RIAA equalization error: ±0.35 db
- Tone-control range: 100 Hz, ±11.5, -10 db; 10,000 Hz, ±10 db
- Slew factor: 3
- Stability: Oscillated with 0.035 μF or greater capacitive load

TEST REPORTS

or more than moderately warm to the touch. The front channels clipped at 120 watts (at 1,000 Hz) and the rear channels at 34 watts. We did not test the rear channels with less than 8 ohms, but the front channels delivered 175 watts per channel into 4 ohms. We also measured an impressive 200 watts into a 2-ohm load on one channel (the other had a 4-ohm load).

The amplifier distortion was unusually constant with frequency. At 100 watts into 8 ohms it measured about 0.02 percent from 20 to 6,000 Hz, rising to 0.046 percent at 20,000 Hz. At lower power levels the shape of the curve was similar but with lower readings (between 0.01 and 0.015 percent at 10 watts, for example). The rear channels, at their rated 20 watts, had very similar characteristics except for a rise above 4,000 Hz to a maximum of 0.15 percent at 20,000 Hz.

The 1,000-Hz distortion of the front channels reached 0.036 percent at the 120-watt clipping point into 8 ohms, 0.2 percent at 170 watts into 4 ohms, and 1 percent at 200 watts into 2 ohms. Based on the 90-watt surround-sound rating, the clipping headroom was 1.25 dB. In our dynamic power tests the front channels clipped at 156 watts into 8 ohms, 242 watts into 4 ohms, and 306 watts into 2 ohms. The dynamic headroom was 2.38 dB.

The slew factor of 3, reflecting the limited high-frequency power capability of the output transistors, was relatively low but still perfectly adequate. The waveform became triangular at about 60,000 Hz with a drive level of 100 watts into 8 ohms. Potentially more serious, the amplifier became unstable and oscillated at a high ultrasonic frequency (about 50,000 Hz) when it was loaded with a capacitance exceeding 0.035 microfarad. Although some speakers may present an appreciable capacitive load at certain frequencies, it is likely that most conventional (nonexotic) speakers will present a safe load to this receiver. We did not experience any problems with either the MB Quart 390 or the Allison IC20 speakers, both of which have rather uniform impedance characteristics. Some special high-capacitance speaker cables, or unusually long spans of ordinary speaker cable, should be avoided, however.
Comments

Clearly, the Onkyo TX-SV7M is a potent receiver, not only because of its many features but because of its performance in general. Little of importance seems to have been sacrificed in either its design or its construction.

In particular, its ability to deliver a high current when needed is impressive. Although high-current capability is now a feature of a number of other receivers as well, Onkyo seems to have carried this design approach further than one would expect in a four-channel receiver from a mass-market manufacturer. We confess to some concern regarding the ability of the amplifiers in this receiver to deliver their full performance into difficult loads. Obviously, it passed our tests with a qualification: If instability with large capacitive loads is truly typical of the product, and not the result of some flaw in our test sample, some of the speakers that could benefit most from its large power reserves may be excluded from consideration. On the other hand, it is unlikely that the typical purchaser of an A/V receiver like the TX-SV7M would connect it to such a load.

The TX-SV7M had one other idiosyncrasy, which may also be a sample flaw: audible gear noise from the volume-control drive motor during remote operation. We heard a similar noise when balancing the front and rear channels; the control for this adjustment may use the same motor, though the front-panel volume knob does not turn during balancing.

The receiver's surround-sound modes worked well, although we did not have the opportunity to judge the Dolby Surround circuits with properly encoded material. And we must admit that stereo TV programs played through its tuner and MTS decoder sounded far better than what we are accustomed to hearing from TV receivers. Overall, the Onkyo TX-SV7M made a highly favorable impression. It does so much, so well, and with so little operating complexity that it should be considered by anyone in the market for an integrated audio/video receiver and control center.

SHURE VST III PHONO CARTRIDGE

Julian Hirsch, Hirsch-Houck Laboratories

SHURE BROTHERS has introduced a new line of moving-magnet phono cartridges that brings the essential features and performance of the company's widely acclaimed V15 series to a more affordable price range. The VST (for V15 Series Technology) Special Edition Series consists of three models: the VST V, whose performance is equivalent to that of the top-ranking V15 Type V-MR; the VST III, which features Shure's distortion-reducing hyperelliptical stylus shape as well as the multipurpose Dynamic Stabilizer that is used in the V15 series; and, finally, the VST III-P, a P-mount version of the VST III that lacks the Dynamic Stabilizer.

Both the VST III and the VST III-P have Shure's Microwall/Be stylus shank, a telescoped thin-wall beryllium cantilever that combines high rigidity with low effective tip mass, and Side-Guard stylus-protection system, which causes the stylus to move up and out of the groove if the cartridge is accidentally scraped across the record surface. And all the VST cartridges feature a fully encapsulated molded-plastic body that permanently locks in place the internal components (the coils and magnets).

The Dynamic Stabilizer, long a feature of Shure's audiophile-grade cartridges, looks like a small record-cleaning brush attached to the replaceable stylus assembly. Removing surface dust from a record, which it does very well, is perhaps the least of its benefits, however. The brush consists of a large number of microscopically fine synthetic fibers that can penetrate well into the groove. The fibers are also electrically conductive and are connect-
The Shure VST III comes with a Dynamic Stabilizer if it is used. The force is 1.25 grams, but an added 0.5 gram separation is specified as 25 dB from the record, the actual tracking force is as close to perfect as we have seen from any cartridge, with only a single small overshoot on its flat top. Third-order intermodulation distortion, also measured with the CTC 310 record, varied from 5 percent at 0 dB to 20 percent at +12 dB, performance that ranks with the best of the five leading cartridges we tested for the January issue.

Comments

In listening tests, the Shure VST III lived up to the promise of its measurements. Its flat frequency response, freedom from resonant peaks in the audible frequency range, and excellent trackability justified-and actually require-the high-level 32-Hz tones of the Cook Series 60 record and the 30-cm/s 1,000-Hz tones of the Fairchild 101 record.

The output of the VST III from the 1,000-Hz square waves on the CBS CTC 310 distortion test record was as close to perfect as we have seen from any cartridge, with only a single small overshoot on its flat top. Third-order intermodulation distortion, also measured with the CTC 310 record, varied from 5 percent at 0 dB to 20 percent at +12 dB, performance that ranks with the best of the five leading cartridges we tested for the January issue.

Lab Tests

We installed the Shure VST III in the tonearm of a JVC QL-F6 record player. The QL-F6’s arm mass of about 16 grams is a typical one, and it is compatible with cartridges having a moderate compliance. The recommended cartridge load is 47,000 ohms in parallel with a capacitance of 200 to 300 picofarads (pF). We used a termination of 47,000 ohms and 300 pF. We used the Dynamic Stabilizer throughout our tests, so we set the tracking force to 1.75 grams.

Several different test records were used to measure frequency response and channel separation. As usual, there were considerable differences between the channel-separation curves we obtained, although the frequency-response curves were very similar. The best frequency-response curves were obtained with the new CBS CTC 300 test record. The response curves from the two channels matched almost perfectly from 20 to 20,000 Hz. The overall variation was less than 1 dB up to 17,500 Hz, and the output was down 2 dB at 20,000 Hz. The average channel separation was 26 dB from about 300 to 2,500 Hz, 22 dB at 10,000 Hz, and 12 dB at 20,000 Hz. The Brul & Kjaer QR-2009 test record gave a generally similar frequency response. The channel separation with the QR-2009 measured about 28 dB through the midrange and was still a strong 25 dB at 15,000 Hz.

The 1,000-Hz cartridge output was 2.65 millivolts (mv) at a 3.54-cm/s velocity, with the channel levels matched to within 0.1 dB. Vertical tracking angle measured 20 degrees, the industry standard. The tracking ability of the VST III—which Shure calls “trackability”—was very good, though not quite the equal of the V15 Type V-MR, whose trackability is probably the highest available from any cartridge. The VST III was able to play the 80-micrometer amplitude level of the 315-Hz test tones on the DIN 45549 test record. It also had no problems with the high-level 32-Hz tones of the Cook Series 60 record and 30-cm/s 1,000-Hz tones of the Fairchild 101 record.

The output of the VST III from the 1,000-Hz square waves on the CBS CTC 310 distortion test record was as close to perfect as we have seen from any cartridge, with only a single small overshoot on its flat top. Third-order intermodulation distortion, also measured with the CTC 310 record, varied from 5 percent at 0 dB to 20 percent at +12 dB, performance that ranks with the best of the five leading cartridges we tested for the January issue.

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THE West German company MB Quart may be a new name to American audiophiles, but it has been in business for more than twenty years (formerly under the name Peerless MB) making microphones, head-phones, and speaker drivers. The company's drivers are still used by many well-known speaker manufacturers in Europe and North America, and its own line of MB Quart systems are among the best-selling speakers in Germany. Unlike most other loudspeaker companies, which purchase many of their drivers and other components from outside sources, MB Quart fabricates “in house” more than 80 percent of the parts going into its speakers.

All MB Quart speakers use infinite-baffle (sealed-enclosure) woofers and 1-inch titanium-dome tweeters. Titanium is extremely rigid and light, making it an ideal material for a tweeter dome. The woofers have butyl-rubber suspensions and ceramic magnets, and the cones are aged and processed so that they too are low in mass and highly rigid. The crossover networks use close-tolerance air-core inductors and high-quality capacitors. The cabinets are made of ¾-inch-thick, multilayer, compressed-wood panels, with solid-wood corners and edges. The front panels are flocked with a special material whose fibers are electrostatically aligned at right angles to the panel's surface in order to minimize diffraction effects that could affect the speaker's radiation pattern.

The MB Quart 390 is a three-way bookshelf system that measures about 20½ inches high, 12¾ inches wide, and 11¼ inches deep and weighs 28 pounds. It features a 10-inch woofer, which crosses over at 400 Hz, with an 18-dB-per-octave slope, to a 4-inch midrange driver. The soft-dome midrange is constructed much like the woofer, with a compliant butyl-rubber suspension, and it is acoustically isolated from the woofer. The 12-dB-per-octave crossover to the ferrofluid-cooled tweeter is at 1,800 Hz.

The woofer is located at the bottom of the speaker panel. The two higher-frequency drivers are vertically aligned above it, slightly to the left of the center line. All the drivers are mounted flush with the panel, and the removable black cloth grille is retained by plastic snaps. The binding-post terminals, recessed into the rear of the cabinet, accept bare wires or single banana plugs, but their ½-inch spacing prevents the use of standard dual banana plugs (which have ¼-inch centers). There are no external balance adjustments.

According to the manufacturer, the Model 390 can handle up to 130 watts of continuous sine-wave input, and a minimum amplifier rating of 35 watts per channel is recommended. The system's rated frequency response is 40 to 32,000 Hz (no tolerance specified). Its nominal impedance is 4 ohms, and the rated sensitivity is 87 db sound-pressure level (SPL) at 1 meter with an input of 1 watt.

The standard cabinet finish for the MB Quart 390 is matte gray, white, or black lacquer. Special-order finishes include pine, mahogany, rosewood, and cherry veneers, high-gloss white or black lacquer, and a high-gloss walnut. The speakers carry a five-year limited warranty. Price: $849 a pair with a standard finish. MB Quart Electronics U.S.A., Inc., Dept. SR, 25 Walpole Park S., Walpole, MA 02081.

Lab Tests

Although the MB Quart 390 can be installed on a shelf, we found it more convenient to place the speakers on 16½-inch stands, which put the tweeters about 35 inches from the floor, close to a seated listener’s ear level. The speakers were about 7 feet apart and 2 feet in front of a wall.

The room-response curve was notable for its smoothness and general freedom from major peaks and dips caused by boundary reflections. There was a plateau from 70 to 500 Hz and a moderate dip and rise in the 500- to 1,400-Hz range; the curve was extraordinarily smooth from 1,500 to 20,000 Hz, varying only ±2 db. The output level in the upper part of the fre-
Sometimes you just have to be there.

If you have never experienced it, you cannot believe the beauty of a sunrise in the mountains—or the fresh scent of clean mountain air.

Few have ever experienced the effect of superbly reproduced music of their choice played in the private environment of their automobile. Music, reproduced with lifelike quality, has the power to touch our deepest emotions and to elevate our moods. And this to an extent that is not expected.

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It's who we are.
The close-miked woofer response peaked at 90 to 100 Hz, falling off at 12 dB per octave at lower frequencies and at about 5 dB per octave from 100 to 350 Hz, where the midrange crossover took effect and the slope became much steeper. The best splice of the woofer response to the room response resulted in a composite frequency response that was very similar to the room curve but with a better-defined bass range below 60 or 70 Hz. The output at 40 Hz, the lower limit of the speaker's specified frequency response, was about 10 dB below the average midrange level.

The speaker's quasi-anechoic frequency response, measured with our FFT analyzer, confirmed the general characteristics of the other measurements and also established that the titanium-dome tweeter had an extraordinarily flat and extended high-frequency response. The output variation on-axis from 14,000 to 27,000 Hz (our upper measurement limit) was only ±1.5 dB, and the system response from 180 to 27,000 Hz was flat within ±3 dB. The horizontal dispersion was very good; a significant difference between the frequency response on-axis and at 45 degrees off-axis became apparent only above 10,000 Hz. The system's excellent phase response was demonstrated by its overall group-delay variations of 0.2 millisecond from 3,500 to 22,000 Hz and 0.6 millisecond from 350 to 3,500 Hz.

The system's sensitivity measured 88 dB SPL at 1 meter with a 2.83-volt input of pink noise. Although the impedance averaged 6 to 9 ohms over most of the range from 400 to 20,000 Hz, its minimum was only 2.9 ohms at 125 Hz, and the maximum was 10 ohms at 60 Hz (the system's resonance frequency). The bass distortion with a drive level of 3.5 volts, corresponding to a 90-dB SPL, was just under 1 percent from 100 to 80 Hz, rising to 3.5 percent at 60 Hz and 6.6 percent at 50 Hz. Pulse power-handling tests showed that from 100 Hz upward, the Model 390 could absorb anything we could put into it. The amplifier clipped before the acoustic-output waveform from the speaker was visibly or audibly distorted. The power level at clipping ranged from 1,100 watts at 10,000 Hz to 1,455 watts at 100 Hz. The fact that even such a huge input did not drive the woofer to the limits of its suspension travel testifies to the high quality of its design and construction.

Comments
Following our usual practice, we listened to the MB Quart 390 speakers for some time before making any measurements. From the start, it was evident that these were truly excellent speakers, with a smooth, seamless overall frequency balance and a believable sound stage. The sound had a distinct forwardness and a clean, crisp top end that was always a pleasure to listen to. It was clear that the strong highs we heard did not result from a response peak, since there was no accentuation of background hiss and not a hint of shrillness.

The MB Quart 390's sound had a distinct forwardness and a clean, crisp top end that was always a pleasure to listen to. There was no accentuation of hiss and not a hint of shrillness.
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TDK HAS THE NEW TECHNOLOGIES.

ANY QUESTIONS?

Super VHS and DAT are the newest stars in video and audio tape recording. But these new technologies require a new generation of hardware and tapes.

Q. WHAT IS DAT?
A. DAT, short for Digital Audio Tape, is one of the most significant achievements in recent magnetic recording history, representing the collective engineering of the world's leading audio hardware and tape manufacturers. In a sophisticated ultra-compact cassette (about half the size of the analog audio cassette) DAT provides up to 2 hours (4 hours in EP mode) of uninterrupted digital recording with specs that equal the performance characteristics of professional studio digital recorders.

Q. DOES THE DAT SYSTEM MEAN I'M LIMITED TO RECORDING DIGITAL SOURCES?
A. Not at all. There is a significant improvement in sound reproduction when recording from your analog library of LPs and tapes. However, DAT's sophisticated recording technology will be fully realized when using today's highest quality digital sources.

Q. HOW GOOD IS DAT?
A. You'll have to hear DAT to believe how good the sound can be. The quality is comparable to Compact Discs. Frequency response is flat from 2 to 22,000Hz. Dynamic range is an incredible 96dB over the entire audio band. Hiss and modulation noise, wow and flutter, and distortion are essentially nonexistent. That means whatever you record suffers virtually no degradation in signal quality when played back. In addition, its unique transport system allows extremely fast track-to-track scanning and rewind time.

Q. HOW CAN DAT DO IT ALL IN SUCH A SMALL PACKAGE?
A. Achieving the required recording density of 3 million bits per second using a tape only 3.81mm wide is no easy feat. The tape is withdrawn from the cassette housing and threaded around a rotating head drum—a technique similar to that used in VCRs. Typical DAT mechanisms use a 30mm diameter drum rotating at 2,000 RPM with the tape contacting a quarter of its circumference. The tracks laid down by the rotating heads are narrower than the width of a human hair!

And that inevitably brings up new questions from your customers. That's where TDK can help. When it comes to state-of-the-art recording technology, we have the answers.

Q. WHAT HAPPENS IF A TAPE DROP OUT OCCURS?
A. In addition to extremely tight cassette and deck mechanism tolerances, DAT relies on a highly sophisticated error correction system. Most data losses which might be encountered are reconstructed by the built-in hardware circuitry.

Q. DOES THIS MEAN I DON'T HAVE TO WORRY ABOUT THE QUALITY OF TAPE I USE?
A. To the contrary. As with any other recording system—audio, video, or data—using inferior magnetic media is just asking for trouble. For over a decade, TDK has pioneered the development of metal particle technology, Super Finavinx, which has become an IEC standard for Type IV audio cassettes. In addition, TDK's experience with precision cassette mechanisms and shell construction helped accelerate the development of the DAT system. So, instead of depending on your DAT hardware's correction circuitry, you can count on the dependability and reliability of TDK's DAT cassettes.

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Q: WHAT IS SUPER VHS?
A: Super VHS, or S-VHS for short, is the latest generation of VHS. With 425 lines of horizontal resolution (nearly double the 240-line capability of standard VHS) it delivers dramatic improvements in color and clarity.

Q: IS SUPER VHS COMPATIBLE WITH STANDARD VHS?
A: Yes and no. Because Super VHS uses a higher frequency band to record the video signals, Super VHS recordings made on the new VCRs cannot be played on conventional VHS VCRs. Conventional VHS tapes, however, can be recorded, played, and freely interchanged between Super VHS and conventional VHS equipment.

Q: WHAT DO I NEED TO ENJOY THE FULL BENEFIT OF SUPER VHS?
A: You'll need a Super VHS VCR, a high-quality video monitor preferably equipped with an S-Video (or Y/C) connector, and, for live taping, a Super VHS camcorder. You'll, of course, also need a supply of Super VHS cassettes.

Q: CAN I GET THE SAME RESULTS WITH MY CONVENTIONAL TV?
A: Yes, you can use Super VHS VCRs with conventional TVs and camcorders that don't have S-Video connectors, but the resolution will be limited to the specifications of the TV or camcorder.

Q: WHAT IS S-VIDEO, AND WHY IS IT IMPORTANT?
A: S-Video is one of the ways Super VHS achieves its superior performance. S-Video cables and connectors separate the luminance and chrominance components of the video signal, which are normally combined in conventional video connections. This eliminates interference (noise) and provides cleaner, truer color pictures and greater audio fidelity.

Q: WILL I NOTICE A DIFFERENCE IN PICTURE QUALITY WHEN I USE SUPER VHS TO TAPE BROADCASTS?
A: Yes. The incoming TV broadcast signal is higher in horizontal resolution (336 lines) than conventional VHS recording. The difference you see will, of course, depend on the resolution ability of your television set or monitor. You'll see the greatest improvement when taping "live" with a Super VHS camera or camcorder because this equipment takes full advantage of Super VHS's 425-line resolution capability.

Q: WHY DO I HAVE TO USE SUPER VHS CASSETTES IN ORDER TO MAKE SUPER VHS RECORDINGS?
A: Super VHS video tape must meet short wavelength recording requirements: high output, high frequency response, and an extremely smooth tape surface, just to name a few. TDK Super VHS XP, available in VHS and VHS-C formats, utilizes an ultra-fine Super Avilyn formulation possessing all the magnetic and physical properties needed for high-quality Super VHS recording. For professional-quality performance, reliability, and durability, you need look no further than TDK XP.

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The critics have spoken. They’ve praised Ford Audio Systems for superb performance and exacting quality. And they’ve honored them with impressive awards.

Here’s what the experts said about the Ford JBL Audio System in the 1987 Lincoln Continental:

“...transcends the normal car stereo experience and begins to enter the realm of good home equipment... the sound is exemplary... This is the first factory system we’ve heard that could deliver real sock ‘em bass response... the Ford JBL system is simply spectacular.”

Automobile Magazine

“...more expensive than concert tickets and probably better.”

Playboy

“...the Ford JBL system gives the best value of the three.” (in a comparison with the Delco/Bose and Chrysler Infinity systems)

Popular Mechanics

Also earning recognition was the Ford Premium Sound System in the Ford Taurus and Mercury Sable:

“Its purely technical performance is among the best. The premium sound system’s modest price buys a tremendous jump in performance.”

Automobile Magazine

There’s good reason for the high marks given to Ford Audio Systems. Each system is designed and engineered for the specific acoustic requirements of Ford, Mercury and Lincoln vehicles, giving you true custom-tailored performance.

Ford Audio Systems — the sound of quality in every car we make.
EW technology tends to appear rapidly in high-end home audio products, but significant improvements in automotive stereo equipment have traditionally lagged far behind. In fact, the phrase “high-end car audio” has until recently been viewed as a contradiction in terms. But now bucket-seat disc-jockeys have finally gotten the edge on the armchair variety. You can actually buy a digital audio tape (DAT) player for your car, though you can’t get one for your listening room yet. Both Clarion and Kenwood are selling car DAT players through authorized dealers, and Ford and GM plan to offer DAT systems for their top-drawer cars. And for those speed demons who enjoy the flexibility of home CD changers, Alpine, Pioneer, Sony, and Technics all sell sophisticated configurations of multidisc car CD players. If you’re sticking with analog cassettes as the format of choice, Nakamichi, Concord, Harman Kardon, and Soundstream, to name just a few, make head units that are beginning to rival high-quality home decks. And if you’d rather let someone else be your DJ, advanced tuner circuitry such as diversity tuning and Schotz front ends will keep you happy.

I’m waiting for the car DAT changer.

The products shown here represent the head of the class in high-end car audio design. So get out your checkbooks, roll down the window, and hit the gas.
The CR-151 is Harman Kardon's first cassette receiver. It utilizes the same heads as H/K's home decks, and the autoreverse mechanism has a dual azimuth adjustment system. Frequency response for the tape section is rated as 20 to 18,000 Hz ±3 dB with any tape. Price: $599.

Soundstream's TC 308 cassette tuner has become a favorite among high-quality head units. It offers Dolby B and Dolby C noise reduction, Schotz FM circuitry, sendust tape heads, an anti-theft chassis, a tuner-monitor option during fast tape winding, and an adjustable CD input. Frequency response is rated as 30 to 18,000 Hz ±3 dB. Price $640.

Kenwood's KDT-99R AM/FM tuner and DAT player manages to fit an impressive number of features into a tiny package without any sacrifice in performance. Most of the pushbuttons on the clean control panel perform dual functions depending on the source being used. Price: $2,000.
Sony's trunk-mounted CDX-A20 ten-disc CD changer (center, $750) can be teamed with a variety of components and head units to offer the driver every possible program source. The XR-7300 cassette receiver (right, $700) offers such worthwhile amenities as a dynamic-range compressor, X-tal Lock quartz-PLL tuning, adjustable azimuth control, and dual amplifier outputs. The system can also be controlled by a hand-held remote ($230).

Special alarm circuitry is a welcome feature of Sansui's RE-7 autoreverse cassette receiver, which also offers a seven-band graphic equalizer/ spectrum analyzer and three banks of six presets. The amp delivers 16 watts per channel into 4 ohms. Price: $950.

Denon's DCD-8920 CD tuner features a super-linear D/A converter, thermal shut-down circuitry, and a built-in DC-to-DC converter to maintain a steady current supply. It also has a front-panel input for a separate cassette player. Price: $900.
Yamaha's YCDT-1000 CD tuner has a protective cartridge-loading system, a floating suspension, shock-sensor circuitry, a continuously variable loudness control, and a four-channel preamplifier output with a front and rear fader. Price: $699.

One of the slickest features of Pioneer's KEX-M700/CDX-M100 system—which includes an auto-reverse cassette player, a ten-disc CD changer, and an AM/FM tuner—is a tiny wireless remote control for many of the most often used tape and CD functions. System price: $1,300.

Akamichi's TD-1200II is the cassette tuner of choice for many professional auto installations. Frequency response is rated as 20 to 22,000 Hz ± 3 dB, and with Dolby C the signal-to-noise ratio is 70 dB. A microprocessor-controlled tape transport is at the heart of the system. Price: $1,450.
If you want a complete, high-quality system but are on a budget, just add a pair of speakers to Sanyo's FT-5000 CD tuner. It comes with a separate 60-watt, four-channel amplifier and features twenty-track random-access programming and an isolated suspension. Price: $600.

On sale in Japan, the Technics CQ-DT1D DAT player comes with a built-in AM/FM tuner, random-access programming of up to eight tape selections, and front and rear preamplifier outputs. Frequency response is rated as 15 to 22,000 Hz ± 0.05 dB for the tape section, with a signal-to-noise ratio greater than 90 dB.

Laupunkt's Berlin is an advanced cassette tuner with a programmable security system, 16-bit/32K microprocessor control, and a future-oriented data-bus linking system. Its Codem III diversity tuner can automatically preset the sixteen best radio signals. Price: $1,500.
Selecting the right speakers for you and your car  

Buying along the freeway surrounded by your favorite music is one of audio's most satisfying experiences. Traffic snarl ahead? Not to worry. Insane drivers all around you? No problem. You've got your Dvořák or Dire Straits to keep you company. Too often, though, it sounds more like Bert Dvořák or Dire Stress.

At its best, car stereo equipment has begun to rival its home equivalent in performance, but the interior of an automobile is a very difficult environment in which to reproduce sound. Cars are designed for just about everything but that, so finding the components able to overcome whatever sonic liabilities your particular vehicle has can be a time-consuming project. Fortunately, the options are many, as the audio companies offer an enormous selection of stereo equipment designed to meet virtually any automotive installation requirement you might have. The trick is in finding the components that are right for you and your car.

As with any audio system, the speakers you choose will have a decisive effect on the sound quality you end up with. The other components are very important, of course, but the speakers have the last word—unless they work well, even the best electronics will sound awful.

Altec Lansing's ALS-62 (above) is a two-way speaker featuring a 6 1/2-inch carbon-fiber-cloth woofer, a 0.55-inch polyimide-dome midrange/tweeter, and a 13.7-ounce magnet. Suggested retail price is $150 a pair.

The Phase Linear PL 2460 (left) is a 4 x 6-inch two-way dashboard replacement speaker with a graphite woofer mounted next to a polycarbonate-dome tweeter. Price: $100 a pair.
Before you even begin to consider the audio performance of a pair of speakers, however, you will have to take some physical matters into account. Unlike a home listening room, a vehicle is likely to have very limited possibilities for speaker placement, so your choices will have to be restricted to what can actually be installed in your car. The more elaborate the system you contemplate, the more difficult this becomes, but the audio manufacturers have recognized this and make speakers in a wide variety of configurations, many of them designed to fit in the most cramped and awkward corners.

A few measurements of your car's doors, dashboard, trunk, rear deck, and so forth will give you some idea of what you can and can't accommodate. A qualified autosound installer will be able to help you, and he may recommend appropriate equipment, but bear in mind that any installer who goes to this trouble will naturally expect to sell you your final system; you may not be willing at that stage to restrict your choices to what any one retailer has to offer.

The simplest sort of auto speaker is a full-range device that fits into a cutout in the rear deck of a car. Most of today's cars already have such openings, which are usually accessible by making a hole of appropriate size in the surface material used to finish the deck. These factory cutouts can be very convenient, but their size and shape are by no means standardized, so you will either have to limit your choices to speakers that fit the existing openings or make new ones of the correct size and shape for the speakers you buy.

Factory-made cutouts in sedan-style cars not only simplify speaker mounting, but also help bass performance by using the trunk as a large speaker enclosure. This isn't possible in most hatchbacks or vans, so specially designed speakers with their own enclosures must be used for these vehicles. A number of manufacturers also produce add-on boxes that can be used with virtually any car speakers. The main drawback of these enclosures is their size, which makes them appropriate for larger vehicles but rules them out for cars with limited space.

Smaller, self-contained units are usually referred to as "surface-mount" speakers to distinguish them from the "flush-mount" speakers that are recessed into a rear deck or a door. Typically, surface-mount devices are small boxes that are affixed to convenient spots within a vehicle by means of supplied brackets. In spite of their diminutive size, surface-mount systems often produce surprisingly robust bass, although most of them require considerable amplifier power if they are to live up to their potential.

Both surface-mount and flush-mount speakers are available at a number of different levels of technical sophistication. The simplest are single-cone full-range speakers, which are most economical and can boast good sound, although they tend to be weak at the highest frequencies. Some manufacturers compensate for this weakness by including a second, concentric cone to handle the highs.

These "dual-cone" speakers should not be confused with true two-way systems. Like home speakers, the more advanced automotive units use two or more drivers to

Jensen's JXL-653 Triax speakers can handle a huge input: 135 watts of peak power and 65 watts continuous. Rated frequency response is 58 to 23,000 Hz and sensitivity is 91 db. Price: $110 a pair.
The Model 757 "uniaxial" speaker from Boston Acoustics combines a 5 1/4-inch long-throw woofer and a 1/4-inch wide-dispersion tweeter. Frequency response is 58 to 20,000 Hz ± 4 dB. Both drivers use weatherproof copolymer diaphragms. Price: $119.95 a pair.

handle different parts of the audio spectrum, incorporating a crossover network to route the signals to the appropriate drivers. Two-way and three-way car speakers are common, and they generally offer the same advantages as their domestic equivalents. Most multidriver surface-mount speakers are arranged like home speakers, with the various drivers placed side by side on the front panel. Some flush-mount speakers are built the same way, but the majority of two-way models have the tweeter mounted on the axis of the woofer and fit into the cutouts designed primarily for full-range systems. Such speakers are called "coaxial"; three-way versions usually have the tweeter and midrange mounted side by side in front of the woofer, but they are called "triaxial" nonetheless. Whatever configuration is used, however, two- and three-way speakers can offer close to home-style performance even within the constraints presented by a typical automotive interior.

A popular alternative is separately mounted speakers to handle the various parts of the audio spectrum. Separate mounting allows each driver to be positioned optimally to handle its frequency range—for instance, woofers in the rear deck, midranges in the door panels, and tweeters closer to the front seats for better imaging. Such an arrangement will require a crossover network, either the passive sort often supplied with kits of matched speakers or an outboard active type. An active crossover will allow you to tailor the sound to your particular vehicle by mixing and matching speakers from different manufacturers,
State-of-the-art performance is delivered by the a/d/s/ 300i, a two-way speaker housing a 5¼-inch Stifflite woofer and a 1-inch woven soft-dome tweeter. It also features a three-way tweeter level control and a tweeter fuse. Power-handling range is 5 to 100 watts. Price: $310 a pair.

Rockford Fosgate's teardrop-shape speaker pods are available in both 4-ohm (SAT 44) and 8-ohm (SAT 88) models. The enclosure is angled to allow for a variety of installations, and the cases are made of high-impact, injection-molded plastic. The TX-124 crossover used in both models is claimed to yield a flat response from 300 to 20,000 Hz. Price: $270 a pair.

if you wish, or by biamplifying your system. Bi amplification may be the best solution in difficult situations, but it is an expensive one, as it often requires separate amplification for each individual driver.

A specialized variant on the separate-speaker theme is the inclusion of a subwoofer for truly thunderous bass. Some subwoofers can be driven by your main amplifier, but the amount of power required for a strong bass output usually makes a separate amplifier for the subwoofer a sensible addition to any system.

Even if you are not interested in hearing the lowest organ notes as you travel the highway, multiple speakers may be an attractive option. Many systems feed a full-range signal to separate sets of speakers in the front and rear of the car, both to provide decent sound to all passengers and also to obtain the benefits of good imaging from the front speakers and reasonable bass from the rear. In such installations, the requirements for each set differ, but their combined virtues can add up to fine-sounding audio at fairly low cost.

In most cars, the front speakers will have to be mounted in the doors, which makes achieving good low-frequency response almost impossible. The closeness of these speakers to the main listeners, however, makes them well suited to handle the highs and the midrange—the most important part of the spectrum for spatial and directional information—particularly if they are angled upward toward the front-seat passenger and the driver rather than directing the sound to their knees. Because the rear speakers will be more...
bass-oriented, full-range speakers may be appropriate for that location.

Bear in mind when selecting speakers that the arrangement you choose places some fairly specific demands on the electronics you use to drive them. If you are starting from scratch, you should select your amplifier or amplifiers to match the speakers you have selected, but if you are upgrading an existing car stereo system and are not willing to replace your head unit or amplifier, the speakers should be chosen with the capabilities of the electronics in mind. High sensitivity will be an important consideration if your amplifier is relatively low powered, and this may limit your choice to flush-mount speakers. If you have large reserves of power, on the other hand, your range of possible speakers will be much wider.

Be aware as well of your amplifier’s ability to tolerate very low-impedance loads. Car speakers are typically rated at a low 4 ohms; using more than one pair can easily drop this to 2 ohms or less at some frequencies, and amplifiers vary widely in their ability to handle such low impedances. Your amplifier’s owner’s manual should tell you what you can and can’t do; if not, ask the dealer from whom you bought it.

Once you have a basic idea of what the specific requirements and limitations are, it’s time to shop for a retailer to sell it to you. Only the bravest audiophile will want to attempt installing a sophisticated car system, and very few dealers will install a system they have not sold, so you should keep in mind two things in choosing a dealer: the selection of products available and the quality of the installation work. Installation expertise can be difficult to ascertain. Usually the best way to discover a good installer is to ask around; if your friends or acquaintances have been satisfied with a particular retailer, chances...
Blaupunkt's MD5054, a 5-inch, four-way multidirectional speaker, has a fiber-reinforced polycarbonate chassis, a rated frequency response of 50 to 23,000 Hz, and a 50-watt peak power-handling ability (20 watts continuous). The tweeter and midrange elements can be adjusted for individual listening preferences as well as to compensate for odd acoustical characteristics of the car's interior. Price: $140 a pair.

are you will be too. Fortunately, the choice of autosound speakers is wide enough that any well-equipped dealer should have something very close to what you need and can afford.

As with any speakers, your final decision will have to be made on what a particular model sounds like. This may not be easy to discover, however, as few stores have demonstration facilities that will give a realistic idea of how a particular system will perform in your vehicle. The usual wall of speakers may be adequate for eliminating the obviously unsuitable ones, but when you have narrowed the field to a choice of two or three models, such arrangements give very little clue as to how they will sound in the distinctive acoustic environment of your car. The only way to tell is to listen to them in your vehicle, and that might not be an easy matter. With surface-mount speakers, you may be able to borrow a set and simply place them in your car without actually mounting them; this should give a fairly close idea of the sound you will end up with. Flush-mount speakers are much harder to evaluate in your own car, as very few dealers are willing to install speakers—or any other equipment—that you may end up not buying.

Checking out friends' systems may help as long as their cars are very similar to your own and their systems have the same basic configuration you intend to buy. But while this might give you some guidance as to possible brands and models, it can only be approximate. The retailer may be able to refer you to customers who have similar installations, and you might be allowed to audition their systems, but, again, the information you receive will only be a rough guide unless the system is exactly the same as the one you are considering. In the end, about the only way to make sure about car speakers is to buy the most promising ones, have them installed, and live with them for a while. Before you do that, though, find out whether your dealer will exchange them if you're not satisfied; if he won't, pick a different dealer.

A good autosound system can make the difference between driving as a chore and driving as a pleasure. There are numerous first-class car stereo components on the market, but the ones that will have the greatest effect on your enjoyment are the speakers. It's worth the time it takes to find the right ones.
CAR STEREO MANUFACTURERS

Compiled by Mark Lazarus and John Weinberg

Acoustic Research, 330 Turnpike St.,
Canton, MA 02021. (617) 821-2300.

a/d/s/, One Progress Way, Wilmington,
MA 01887. (617) 658-5100.

AFS Kriket, P.O. Box 68893,
Indianapolis, IN 46268. (317) 842-0620.

Aiwa America, 35 Oxford Dr.,
Moonachie, NJ 07074. (201) 440-5220.

Alaron, 185 Park St., P.O. Box 550,
Troy, MI 48099. (313) 585-8400.

Allsop, 4201 Meridian St., P.O. Box 23,
Bellingham, WA 98227. (206) 734-9090.

Alphasonik, 701 Heinz Ave., Berkeley,
CA 94710. (415) 548-4005.

Alpine, 19145 Gramercy Place, Torrance,
CA 90501. (213) 326-8000.

American Audio Corp., 636 Forbes Blvd.
P.O. Box 550, Troy, MI 48099. (201) 227-9280.

American Audio Corp., 9181 Gazette Ave.,
Chatsworth, CA 91311. (818) 882-9027.

Audio Control, 6520 212th SW, P.O. Box 80260.
Torrance, CA 90810. (213) 973-1100.

Audio Source, 1185 Chess Dr., Suite G,
Milford, CT 06776. (203) 354-9332.

B&W Loudspeakers, P.O. Box 653,
Foster City, CA 94404. (415) 574-7585.

B&K Manufacturing, 5222 W. 33rd Ave.
Denver, CO 80212. (303) 775-8462.

BGS Systems, 13130 S. Yukon Ave.,
Hawthorne, CA 90250. (213) 973-8090.

Bib Audio/Video Products, P.O. Box
27682, Denver, CO 80227. (303) 972-0410.

Blaupunkt, 2800 S. 25th Ave., Broadview, IL 60153. (312) 865-5200.

Bose Corporation, The Mountain,
Framingham, MA 01701. (617) 879-7330.

Boston Acoustics, 247 Lynnfield St.
Peabody, MA 01960. (617) 532-2111.

Charles Brown & Co., 152 Broadway,
Brooklyn, NY 11211. (718) 387-3900.

Calrad Electronics, 819 N. Highland Ave.,
Los Angeles, CA 90038. (213) 465-2131.

Canton North America, 915 Washington Ave.,
Minneapolis, MN 55415. (612) 338-1150.

Carver Corporation, P.O. Box 1237,
9210 33rd Ave. W., Lynnwood, WA 98036. (206) 775-1202.

Carver Corporation, 5500 Rosecrans,
Lawndale, CA 90810. (213) 637-1001.

Clarion, 5500 Rosecrans, Lawndale, CA 90260. (213) 973-1100.

Clarion, 5500 Rosecrans, Lawndale, CA 90260. (213) 973-1100.

Concord Electronics, 6025 Yolanda Ave.,
Tarzana, CA 91356. (818) 344-9335.

Cousic, 4260 Charter St., Vernon, CA 90058. (213) 582-2832.

Craig Corporation, 12700 Park Central Place,
Dallas, TX 75251. (214) 575-1723.

Craigm, 921 W. Artesia Blvd.,
Long Beach, CA 90810. (213) 582-2832.

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Long Beach, CA 90810. (213) 582-2832.

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Long Beach, CA 90810. (213) 582-2832.
CAR STEREO MANUFACTURERS

KEF, 14120-K Sallyfield Circle, Chantilly, VA 22021. (703) 631-8618.
Kenwood Electronics, 2201 E. Dominguez St., Long Beach, CA 90810. (213) 639-9000.
Kraeco, 505 E. Euclid Ave., Compton, CA 90745. (800) 421-1910.
Kustom Kreation, Inc., 19316 Condecar St., Northridge, CA 91324. (213) 886-8383.
Linear Power, 11545 D Ave., Auburn, CA 95603. (916) 823-7891.
Madisound Speaker Components, 8608 95603. (916) 823-7891.
Magnat America, 70 Atlantic Ave., University Green, Madison, WI 53711. (608) 831-3433.
Madisound Speaker Components, 8608 95603. (916) 823-7891.
Magnat America, 70 Atlantic Ave., Marblehead, MA 01945. (617) 639-1400.
Magnum Dynalab, 255 Great Arrow Ave., Buffalo, NY 14207. (716) 873-9475.
Magna Loudspeakers (Mitek), One Mitek Plaza, Brookline, MA 02146. (617) 277-6663.
Magnum Loudspeakers, One Mitek Plaza, Winslow, IL 61089. (815) 367-3000.
Matsui America, 14120-K Sallyfield Circle, Chantilly, VA 22021. (703) 631-8618.
Magnat America, 70 Atlantic Ave., Marblehead, MA 01945. (617) 639-1400.
Magna Loudspeakers (Mitek), One Mitek Plaza, Brookline, MA 02146. (617) 277-6663.
Rattle

"I've really been around a long time. Players may get mad at me, but they can’t get mad because I’m a young conductor!"

No young conductor today has compiled so impressive a track record as Simon Rattle. At only thirty-three, he is one of the most talked-about and sought-after British maestros since Sir Thomas Beecham. He has his own orchestra in Birmingham, England; he is principal guest conductor of the Los Angeles Philharmonic; he has been conducting recently at the Glyndebourne Festival; and, with the enthusiastic support of EMI-Angel, he has already made twenty-five recordings, with at least as many to come. He has also just finished leading his City of Birmingham Symphony Orchestra on its first tour of the United States, with stops in eleven cities including Los Angeles, San Francisco, Washington, Boston, and New York.

All this might convey the impression that Simon Rattle is a young man in a hurry, but nothing could be further from the truth. Part of what intrigues the musical world about Rattle is that he turns down more offers than he accepts. Among his rejected musical suitors, at least temporarily, are the Chicago Symphony, the Philadelphia Orchestra, the New York Philharmonic, and the Metropolitan Opera.

"I think conductors tend to work too much, too hard, and too promiscuously," he told me by way of explanation. "I think guest conducting should be rather restricted. It's like having a pina colada, or whatever—good, but something to limit. It's wonderful to meet other orchestras, but basically what counts is one's own orchestra. I like to rehearse very hard and in very great detail, and that often makes orchestras that don't know me very twitchy. I don't want to spend my time like a yo-yo. Meeting an orchestra for a couple of days is not the way I want to make music. Most of the time I'm a lousy guest conductor."

Critics and audiences in cities where Rattle has appeared would disagree. Slim and handsome, with a somewhat pixie-ish face framed by an abundance of curly dark hair, he is becoming an increasingly familiar figure on world podiums. His fresh approach to familiar works and his remarkable ability to defang supposedly forbidding modern compositions stimulates listeners and sends them home happy. When he began his most recent season with the Los Angeles Philharmonic in January, he put together a typically offbeat program—the threeLeonore Overtures of Beethoven, played in numerical order, followed by two Stravinsky works, the Concerto for Piano and Winds and the Symphony in Three Movements. The Los Angeles Times used such adjectives as "provocative," "bracing," and "probing" to describe the evening's music making.

"Slowly and surely it is becoming the equal of any in England, and it has toured with great success in Europe and Japan. "Slowly and surely it is becoming one of the finest orchestras in Europe," Rattle said with evident pride. "It's a very young orchestra—I recently realized that the average age of the musicians is now thirty-one, so I'm actually older than they are!"

Rattle spends at least half of each year in Birmingham and also has a home in London, but he was born in Liverpool and got his early music education in Beatles country. "Rock was all around me," he said, "but I was never pulled to the rock side. Maybe it was so pervasive that I avoided it. I never realized until I became much older what wonderful songwriters the Beatles were."

Rattle's parents were both musical; his father actually headed a jazz ensemble in Oxford for a time. Young Simon took up the drums as a child and developed an interest in jazz along with his devotion to symphonic music. At the age of eleven he played as a percussionist with both the Royal Liverpool Orchestra and the National Youth Orchestra under Pierre Boulez. Subsequently he enrolled in the Royal Academy of Music, where he studied conducting. At nineteen he won the John Player Conductors' Competition, which numbered among its prizes the assistant conductorship of the Bournemouth Symphony Orchestra and the Bournemouth Sinfonietta.

"I spent the next two years with those two orchestras, and I've been conducting ever since," he said with a slight smile. "So I've really been

by Herbert Kupferberg
around a long time. Players may get mad at me, but they can’t get mad because I’m a young conductor!”

After stints with the Royal Liverpool Philharmonic and the BBC Scottish Orchestra, Rattle was appointed to his present post in Birmingham. Almost simultaneously the guest-conducting offers began to pour in, including an invitation from the Metropolitan Opera to conduct Janáček’s Jenůfa. One of the factors in his refusal, he acknowledged, was a lack of rehearsal time. “I felt I just couldn’t produce the kind of performance I would like. The Met has one of the greatest living conductors in Jimmy Levine. He can work at a rate of speed ordinary mortals can’t match, but then the Met is his own place. To me, it would be like trying to conduct a small village! I’m very spoiled. When I conduct at Glyndebourne, I’m used to a month or even two months with all the singers there all the time.”

Rattle made his first guest appearance with the Los Angeles Philharmonic in 1981, and he was subsequently offered the job of music director, to succeed Carlo Maria Giulini. Rattle preferred to continue his work in Birmingham, however, and accepted only the post of principal guest conductor, working contentedly with André Previn, who took the main job. Rattle’s New York debut in 1985 was with the Los Angeles Philharmonic, and the reviews, as elsewhere, were glowing.

Although his musical interests reach back to the Classical era, much of Rattle’s programming is devoted to the unusual and the contemporary. His Birmingham recordings, for example, encompass such works as Messiaen’s Turangalîla Symphony, Shostakovich’s Symphony No. 13 (Babi Yar), and Janáček’s Glagolitic Mass. He is also recording all seven symphonies by Sibelius, a composer for whom he has a particular affinity. In several cities on the recent U.S. tour he conducted a program consisting in its entirety of the Sibelius Symphonies Nos. 5, 6, and 7. “I wanted to play the all-Sibelius program in New York,” he said with a tinge of regret, “but both Carnegie Hall and Avery Fisher Hall turned it down.”

Rattle’s continuing interest in the jazz idiom is attested to by his recent Angel recording entitled “The Jazz Album,” with music by Milhaud, Gershwin, Stravinsky, and Bernstein in performances by, among others, the London Sinfonietta and Harvey and the Wallbangers. At Glyndebourne he has conducted an all-black cast in Gershwin’s Porgy and Bess, with “a great singer in every part.” EMI has just recorded that Porgy in London for release next spring.

“As time goes on, there are more and more things I find I love in great music,” Rattle said, adding that “one blind spot” he has is the music of Tchaikovsky. “Perhaps I was exposed to him too much as a boy. But he’s surviving very well without me.”

Rattle is married to the American soprano Elise Ross, and they have a four-year-old son, Alexander—one more reason, the conductor said, that he doesn’t like to be away from home more than two months at a time. His interests extend to non-musical areas such as playing squash and watching old movies. In 1980 he took a year off to study English literature at Oxford. “It was a wonderful sabbatical,” he said. “I was a postgraduate student reading Donne, Marvell, Joyce, and Eliot, dealing in a discipline that wasn’t music, living again with the written word. I recommend it to my fellow musicians—it cleans your ears.”

Asked what advice he would give to young people with ambitions to conduct, Rattle responded, “I would tell young people of all persuasions to listen to everything, all styles of music, all styles of interpreters. I would say, read as much as you can—all kinds of books. Race to your nearest art gallery. Immerse yourself in every aspect of the world of the arts, and the life around you, so that you actually have something to bring to music when your time comes. In the end, playing the right notes is the least important part.”

And as for whether he himself ever thinks about life beyond Birmingham: “I think about it—and then I put it away. The notion of a career is the thing that interests me least. The making of music is much more important to me.”

Herbert Kupferberg is a senior editor of Parade magazine and the author of The Book of Classical Music Lists, which will be issued in paperback this fall by Penguin.
CASSETTE DECKS: BUYING GUIDE

Cassette decks should be evaluated by their sound quality, ease of use, and special features. The specifications here can give you an idea of each deck's sonic performance, and the descriptions can lead you to well-designed decks with useful features. Once in the store with a short shopping list, you can listen for yourself and push the buttons.

All of the information is from the manufacturers. Prices are suggested; actual prices are set by each dealer. Like any such guide, this one cannot be complete, and if a particular model is not included, that should not reflect on its quality. Manufacturers' addresses are on page 92.

AD/WX220U Double Cassette Deck
Features 2 heads; 2 motors: auto bias/eq; Dolby B & C. Features fine tuning, music search; output level control; LED meters; mike inputs; headphone jack; rec mute; dual-play speed; program playback; Dolby B & C.

AD/SA90 Dolby B & C Cassette Deck
Features 3 heads; 2 motors: auto bias/eq; Dolby B & C. Features bias fine tuning, headphone jack; rec mute; music sensor (both decks); high-tuned DC motor; motor drive in die-cast metal chassis; timer standby (deck 2); Dolby B & C; tape counter; recording; Dolby B & C.

AD/WX707 Double Cassette Deck
Auto reverse cassette deck with Dolby B & C. Features bias fine tuning; continuous playback; Dolby B & C; dual capstan; bias fine tuning; remaining-time counter; Dolby B & C; tape counter; recording; Dolby B & C.

AD/F770UB Dolby B & C Cassette Deck
Features 3 heads; 2 motors: auto bias/eq; Dolby B & C. Features bias fine tuning; remaining-time counter; music search; output level control; memory stop/play; LED meters; headphone jack; rec mute; Dolby B & C.
Cassette Decks

**Beocord 5500 Autoreverse Cassette Deck**
Features autoreverse for both transports; synchronized 1-touch high-speed dubbing; sequential play; Dolby B & C NR; metal tape capability (both transports); electronic full-logic controls; FL display/level indicators. Black   $400

**DR-M10HX Cassette Deck**
Features Dolby B & C NR; full-logic control transport; computer-controlled silent mechanism; non-slip reel drive; manual bias fine-tuning; full auto-stop; SF R/P head; dual power supply; 4-digit tape counter with memory stop; FL peak level meter; balance control; rec pause/mute; auto-space; music search; 1-touch rec/standby; output level control; headphone jack. FR 25-18,000 Hz ±3 dB with metal tape; w&F 0.05% wrms; s/N >72 dB (Dolby C)   $400

**DR-M12HX. As above except without remote control**   $340

**DR-M100XH Three-Head Cassette Deck**
Features Dolby B & C NR; full-logic control transport; manual bias fine-tuning; full auto-stop; SF R/P head; dual power supply; 4-digit tape counter with memory stop; FL peak level meter; balance control; rec pause/mute; auto-space; music search; 1-touch rec/standby; headphone jack. FR 25-18,000 Hz ±3 dB with metal tape; w&F 0.05% wrms; s/N >72 dB (Dolby C)   $280

**DR-M07 Cassette Deck**
Features Dolby B & C NR; full-logic control transport; manual bias fine-tuning; full auto-stop; SF R/P head; 3-digit tape counter; LED 6-segment peak level meter; balance control; SF R/P head; 3-digit tape counter; 1-touch rec/standby; headphone jack. FR 40-16,000 Hz ±3 dB with metal tape; w&F 0.057% wrms; s/N >73 dB (Dolby C)   $210

**MIDO-98 Four-Head Autoreverse Cassette Deck**
Features Dolby B & C NR; full-logic control transport; computer-controlled silent mechanism; non-slip reel drive; manual bias fine-tuning; full auto-stop; SF combination head; dual power supply; PMX-filter switch; 4-digit tape counter with memory stop; SF R/P head; 3-digit tape counter; 1-touch rec/standby; headphones jack. Includes wood side panels. FR 25-20,000 Hz ±3 dB with metal tape; w&F 0.035% wrms; s/N >75 dB (Dolby C)   $650

**FISHER CR-W89 Double Autoreverse Cassette Deck**
Double autoreverse cassette deck with 6-function wireless remote control. Features autoreverse for both transports; synchronized 1-touch high-speed dubbing; sequential play; Dolby B & C NR; metal tape capability (both transports). Silver   $300

**CORPUS**
Includes wood side panels. FR 25-16,000 Hz ±3 dB with metal tape; w&F 0.035% wrms; s/N >75 dB (Dolby C)   $500

**Beocord 3300 Dolby B/HX Pro Cassette Deck**
Integrates with Beosystem 3300 for remote control from multiple rooms; black plexiglass and brushed aluminum; optional wall brackets; controls remote controlled from Terminal 3300 remote, communicates with 3300 turntable and CD player for coordinated recording, auto search; meters adjust for tape type; sendust heads; auto demagnetization. w&F <0.07% wrms; speed deviation ± 1.5%; s/N (A-weighted) metal 70 dB ±3 dB with chrome tape >65 dB Dolby B, 16.5" x 3" h x 11.75" d; 18.7 lb   $999

**Akai GX-8-B**
Twin-field Super GX head with separate gaps for recording and playback; twin active power supply for stable amplification and lower IMD. Features feature-touch full-logic controls; FL display; direct-rec-in, power eject; reverse selector; peak to peak spectrum meters; auto mute; direct lead-in, power eject; rec balance; 2 heads; 3 motors; auto bias/eq; Dolby B & C; dials; auto demagnetization. w&F 0.09% 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-weighted) metal 70 dB Dolby B, 80 dB Dolby C   $549

**Beocord 5500 Cassette Deck**
Features Dolby B & C NR; full-logic control transport; computer-controlled silent mechanism; non-slip reel drive; manual bias fine-tuning; full auto-stop; SF combination head; dual power supply; PMX-filter switch; 4-digit tape counter with memory stop; SF R/P head; dual power supply; 4-digit tape counter with memory stop; FL peak level meter; balance control; rec pause/mute; auto-space; music search; 1-touch rec/standby; output level control; headphone jack. FR 25-18,000 Hz ±3 dB with metal tape; w&F 0.045% wrms; s/N >72 dB (Dolby C)   $400

**Beocord 5500 Autoreverse Cassette Deck**
Features autoreverse for both transports; synchronized 1-touch high-speed dubbing; sequential play; Dolby B & C NR; metal tape capability (both transports). Silver   $300
CASSETTE DECKS

(basic transports; soft-touch controls; switchable mp3 filter; black $250)

FOSTEX
Model 160 4-Track Cassette Deck/Mixer
Records 4 tracks in 1 direction (up to 2 at once); Dolby B and Dolby C NR; pitch control; 2 mic inputs; 4 line outputs; overdub and punch-in; sync inputs to track 4 for MIDI; ch insert points for signal processors. Each input ch has straight-line fader, high and low tone controls, source/tape button, assignment button to mix buses or direct, pan control, aux send control, w&F 0.1% peak w/f; 14,000 Hz; s/N 70 dB w/f; $795

Model X-30 4-Track Cassette Deck/Mixer
Records 4 tracks in 1 direction (up to 2 at once); Dolby B and Dolby C NR; pitch control; color-coordinated controls; 4 track by 2 ch submixer for overdub monitoring; optional foot control for overdubbing, punch-in, programming, w&F 0.1% peak w/f; 14-20,000 Hz; s/N 70 dB w/f; $950

HARMAN KARDOON
CD941 Dolby B/C/HX Pro Cassette Deck
Ultraheads cassette deck with direct-drive dual-capstan transport; 3 heads; 2 motors; Dolby B, Dolby C; Dolby HX Pro, bias fine trim with calibration test-tone oscillators; music search, output level control; memory stop/play; line control; weighted peak-U/L 220 meters; mic inputs, mic/mixing; headphone jack; rec mute. Timer controllable. w&F 0.02% w/m; with all tape types 20-24,000 Hz ± 3 dB; s/N (A-wide, high-bias tape) 58 dB no NR, 66 dB Dolby B, 75 dB Dolby C $950

TD392 Dolby B/C/HX Pro Cassette Deck
3 heads; sendest record head, narrow-gap high-density ferrite play head; 1 motor; Dolby B, Dolby C; Dolby HX Pro; bias fine trim with test-tone oscillator; output level control; weighted LED meters; headphone jack; rec mute. w&F 0.05% w/m; with all tape types 20-22,000 Hz ± 3 dB, s/N (A-wide, high-bias tape) 66 dB Dolby B, 75 dB Dolby C; $675

C3920 Cassette Deck
Cassette deck with sendest record/playhead and logic-controlled solenoid transport; Dolby B, Dolby C; Dolby HX Pro; bias fine tuning; output level control; rec mute; headphone jack; defeatable multiplex filter, w&F 0.050% w/m; record-play 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-wide, high-bias tape) 66 dB Dolby B, 75 dB Dolby C $450

CD202 Cassette Deck
Narrow-gap permanmex record/play head; Dolby B and C NR; logic transport with solenoid controls; bias fine tuning; 2 heads; LED meters, w&F 0.05% w/m; record-play FR, ferric 20-20,000 Hz ± 3 dB, high-bias 20-21,000 Hz ± 3 dB, metal 20-21,000 Hz ± 3 dB, S/N (A-wide) high bias 65 dB with Dolby B, 73 dB with Dolby C $325

HITACHI
DW99 Double Autoreverse Cassette Deck
High-speed 1-tap dubbing; 20-part ft. peak with peak-hold selector; timer rec/play; 4-digit ft. counter; music scan; random memory program search; 3 motors; Dolby B and Dolby C; blank skip memory, stop/play; unified remote-control compatibility; w&F 0.04% w/m; FR ferric 30-14,000 Hz ± 3 dB, high bias 30-15,000 Hz ± 3 dB, metal 30-16,000 Hz ± 3 dB; $240

KENWOOD
KX-96W Double Autoreverse Cassette Deck
Double cassette deck with dual bidirectional rec/play system. Features quick reverse: two motors; full-computer control; Dolby B & C NR: high-speed dubbing; continuous relay play; relay and dual recording; direct 16-program search system; index scan; headphone jack; Dolby peak meters; auto tape selector, w&F 0.1% w/m; 72 dB; FR 30-15,000 Hz ± 3 dB (Type II); Remote controlled through KC-206 preamp and Kenwood receivers; 76.53" x 4.99" x 10.44" d; 11 lb $380

KX-606XH Full-Logic Cassette Deck
Basic series cassette deck with Dolby B Pro headroom extension system. Features Dolby B & C NR with dynamic auto level, recording and recording bias adjust control; low-imp Permick rec/play head; silent 2-motor drive with full-log-ic computer control; high-rigidity mechanism and head mount; direct 16-program search system; auto rec mute; blank search; index scan; recording standby; repeat with auto blank skip; counter zero stop; master rec and L/R preset level controls; Ft. wide-range peak meters. Ft. linear counter, after a tape is recorded; Dolby B; L/R mic inputs, timer rec/play capable; FR 20-18,000 Hz ± 3 dB (metal); w&F 0.06% w/m; 17.31" x 4.44" x 12.81" d; 11 lb $300

KX-66CW Double Cassette Deck
Cassette deck with autoreverse play/rec deck and bidirectional playback only deck. Features full-computer control; Dolby B & C NR; two motors; high-speed dubbing; continuous relay play; relay recording; direct 16-program search system; index scan; auto tape selector; auto rec mute; headphone jack; L/R peak meters, w&F 0.1%; s/N 72 dB; FR 30-15,000 Hz ± 3 dB (Type II); Remote controlled, although KC-206 and Kenwood receivers; 11.2 lb $280

KX-76R Autoreverse Cassette Deck
Full-logic control cassette deck with 9-program search system. Features Dolby B & C NR: index scan; continuous autoreverse; auto tape selector; auto recording mute; LED peak meters; headphone jack; L/R mic inputs; remote controlled through KC-206 preamp and Kenwood receivers. w&F 0.06% w/m; s/N 73 dB; FR 30-15,000 Hz ± 3 dB (Type II) $250

KX-66CW Double Cassette Deck
Features 1 rec/play mechanism; Dolby B & C NR; two motors; soft-touch controls; high-speed dubbing: single relay play; auto tape selector; LED peak meters; headphone jack; L/R mic inputs; timer ready; remote controlled through KC-206 preamp and Kenwood receivers. w&F 0.19% w/m; s/N 72 dB; FR 30-15,000 Hz ± 3 dB (Type II); 16.56" x 4.69" x 10.44" d; 8.8 lb $200

KX-46C Cassette Deck
Features soft-touch controls; music search; Auto tape selector; LED peak meters; L/R mic inputs; headphone jack; timer ready; remote controlled through KC-206 preamp and Kenwood receivers. w&F 0.05% w/m; s/N 72 dB; FR 30-15,000 Hz ± 3 dB (Type II); 16.56" x 4.81" x 10.56" d; 8 lb $175

KYOCERA
D-811 Dolby B/C/HX Pro Cassette Deck
3 heads; 2 motors; Dolby B; Dolby C; dual capstans; bias fine tuning; direct drive; digital electronic counter for elapsed and remaining time; output level control; memory repeat start/stop; LED peak-hold meters; soft-touch controls; remote control. Dual autoreverse cassette deck with automatic dolly; w&F 0.15% w/m; S/N 72 dB; FR 30-15,000 Hz ± 3 dB $220

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CASSETTE DECKS

20,000 Hz ± 3 dB, S/N (A-wtd) metal: 58 dB no NR, 10 dB Dolby B, 20 dB Dolby C. Line-input senses for 0 dB reading 70 mV; line output level with 0 dB indication 580 mV; line input senses 0.5 mV.

$750

D-611 Dolby B/C Cassette Deck
2 heads; 3 motors; 3 preset eq's/eq's; bias fine tuning; direct drive; output level control; memory repeat; stop/play; LED meters; soft-touch controls; mike inputs; headphone jack; rec mute; wireless remote; W & F 0.035% wrm; metal 20-20,000 Hz ± 3 dB, high bias 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 senses for 0 dB reading 70 mV; line output level with 0 dB indication 580 mV; mike input senses 0.5 mV. 18.12' x 4' x 12.12' d; 16 lb.

$550

LUXMAN
K-03 Direct-Drive Cassette Deck
3-head cassette deck features 3 motors. Dolby B and C NR; dual capstans; bias fine tuning; direct drive; remaining time counter; output level control; memory stop/play; LED meters; soft-touch controls; rec mute; headphone jack; rect mute; wireless remote; W & F 0.035% wrm; metal 20-20,000 Hz ± 3 dB, high bias 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 senses for 0 dB reading 70 mV; line output level with 0 dB indication 580 mV; mike input senses 0.5 mV.

£1,200

K-106 Autoreverse Cassette Deck
Remote-capable cassette deck with timer function. Features blank search; rec mute/auto space; auto tape selector; programmable search; auto record pause; auto scan; intro scan; 2 heads; 3 motors; Dolby B, Dolby C, dbv. Dolby, HX Pro; dual capstans; bias fine tuning; blank.

$1,395

K-112 Cassette Deck
Features Dolby HX Pro, Dolby B and C; feathertouch full-logics-controls; 4-digit electronic counter with memory; fine bias control; system remote control capability; S/N metal Dolby 24 dB; Dolby C 24 dB.; C; 72 dB; distortion 0.3%; W & F 0.05% wrm; metal 20-21,000 Hz ± 3 dB, CR02 72 dB; 20-20,000 Hz ± 3 dB.

$80

RX-505 3-Head Cassette Deck
Discute 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-capsule-closed-loop transport; auto fade (20 sec) before end of tape; Dolby B and C; DC servo motors; auto record pause; LED peak level meters reading from -40 to +10 dB; auto-dual-speed master fader; punch-in recording; memory stop/play; soft-touch controls. W & F <0.04% wrm; FR 20-20,000 Hz ± 3 dB all tape types; S/N >70 dB with Dolby B and C; metal tape; THD <0.9% with ZX tape; line-input senses for 0 dB reading 50 mV; line-output level with 0 dB indication 1,000 mV.

$1,495

RX-505 3-Head Cassette Deck
Discute 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-capsule-closed-loop transport; auto fade (20 sec) before end of tape; Dolby B and C; DC servo motors; auto record pause; LED peak level meters reading from -40 to +10 dB; auto-dual-speed master fader; punch-in recording; memory stop/play; soft-touch controls. W & F <0.04% wrm; FR 20-20,000 Hz ± 3 dB all tape types; S/N >70 dB with Dolby B and C; metal tape; THD <0.9% with ZX tape; line-input senses for 0 dB reading 50 mV; line-output level with 0 dB indication 1,000 mV; 17.75' w x 5.3' h x 12' d.

$1,495

RX-505 3-Head Cassette Deck
Discute 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-capsule-closed-loop transport; auto fade (20 sec) before end of tape; Dolby B and C; DC servo motors; auto record pause; LED peak level meters reading from -40 to +10 dB; auto-dual-speed master fader; punch-in recording; memory stop/play; soft-touch controls. W & F <0.04% wrm; FR 20-20,000 Hz ± 3 dB all tape types; S/N >70 dB with Dolby B and C; metal tape; THD <0.9% with ZX tape; line-input senses for 0 dB reading 50 mV; line-output level with 0 dB indication 1,000 mV; 17.75' w x 5.3' h x 12' d.

$1,495

STEREO REVIEW MAY 1988
Since the invention of the Compact Disc, speaker companies have been talking about how their speakers are "digital ready". This seems odd when except for the addition of "digital ready" stickers, many name brand speakers are pretty much what they were in the days of analogue.

So you still have that agonizing choice between the very efficient, very dynamic speakers versus the softer sounding brands. Isn't it time for an end to this either/or dilemma?

Finally, a speaker, designed after CD was invented, that can boast not only audiophile performance, but also the efficiency to deliver the "full impact" of digital's dynamic range...SPL MONITORS.

SPL Monitors challenge the best of the low efficiency audiophile brands and, "far out perform them" in dynamic range and efficiency. When compared to the high efficiency brands, SPL Monitors play as loud, but sound, "so much smoother and more open".

Check for yourself at your nearest SPL Monitor Dealer. Be surprised at how great this digital sound miracle of CD and DAT really can be.

"FIRST CAME THE CD, THEN CAME THE SPEAKER"
SPL MONITORS.
CIRCLE NO. 45 ON READER SERVICE CARD
CR 5A 3-Head Cassette Deck
Discrete cassette deck with asymmetrical diffusion-resonance dual-captain transport. Features 3 motors; Dolby B; Dolby C; bias fine tuning; high-speed dubbing; dual capstans; multi-programming system; random program selection; music search; memory stop; auto bias/EQ; remote control; rack mount. Features 2 heads; metal: 68 dB, s/N 70 dB Dolby B, 72 dB Dolby C.

CR-5A 3-Head Cassette Deck
Features asymmetrical dual-captain transport; Dolby B and C NR; bias fine tuning; handle levels of ±10 dB with metal tape; remote control with optional unit or through CA-7A preamp; independent bias and EQ settings; selectable \( f \)-MHz filter; 30-B Decade electronic peak-level meter; -touch rec pause; rec mute; 4-digit LED counter with memory stop and auto repeat; compatible with EIA standard rack-mount adapters. FR 75-20,000 Hz; s/N 92 dB with dbx.

D-1001II Autoreverse Cassette Deck
Features 3 heads; Dolby B, C, and dbx; automatic bias programming system (AAPS); manual bias system; random program song selection (RPSS); direct program song selection (DPSS); index programming; real-time counter; intro check; auto space; 1/96 mic inputs; rec mute; multiplexer filter; peak reading meters; Optional wired remote control and rack mount. FR 25-20,000 Hz; s/N 92 dB with dbx.

D-8001i
Same as above except 2 heads and FR 20-19,000 Hz metal; 20-18,000 Hz high bias, 25-17,000 Hz normal; s/N 92 dB with dbx.

D-60W Double Cassette Deck
Features 6 motors; high-speed dubbing; Dolby B & C; AAPS; IP; RPSS; random dubbing song search (RSAPS). Optional rack mounts.

NEC K-700E Double Cassette Deck
High- and normal-speed dubbing cassette deck can be remote controllable when used with NEC unified-remote integrated amps or receivers. Features 2 heads; 15-program random memory; for recording an automatic bias correction system; Dolby B & C; continuous playback; music search; flip-through recording; auto intro; intro playback; auto rec mute; 4-digit counters; LED meters; master left/right level fader with balance fine tuning. w&F <0.05% wrms; FR 17-18,000 Hz (Type-I tape); 20-17,000 Hz (Type-II tape); 25-19,000 Hz ±3 dB (Type-I tape); 25-19,000 Hz ±3 dB (Type-II tape); s/N (Type-I tape) 70 dB, s/N (Type-II tape) 70 dB.

D-600W Double Cassette Deck
Features high-speed dubbing; Dolby B & C; AAPS; IP; RPSS; random dubbing song search (RSAPS). Optional rack mounts.

ONKYO
Integra TA-2090 Unidirectional Cassette Deck
Computer-controlled cassette deck with Dolby B, C, dbx, and Dolby NB and Dolby HX Pro. Features 3 heads; 2 motors; auto bias/dbx; dual capstans; bias fine tuning; direct drive; elapsed-time tape counter; memory search; auto search; output level control; memory stop/play; mic input; headphone jack; rec mute; record calibration controls; sendout heads; MPX filter; two-color peak hold. Remote control and side panels optional. w&F 0.045% wrms; FR 17-18,000 Hz ±3 dB (Type-I tape); 25-19,000 Hz ±3 dB (Type-II tape); 25-19,000 Hz ±3 dB (Type-I tape); s/N (Type-I tape) 70 dB, s/N (Type-II tape) 70 dB.

NEC K-700E
Full-auto/two-speed dubbing cassette deck with Dolby B & C.

ONKYO
Integra TA-2098 Unidirectional Cassette Deck
Features 3 heads; 2 motors; auto bias/dbx; dual capstans; bias fine tuning; direct drive; elapsed-time tape counter; memory search; auto search; output level control; memory stop/play; mic input; headphone jack; rec mute; record calibration controls; sendout heads; MPX filter; two-color peak hold. Remote control optional. w&F 0.045% wrms; FR 17-18,000 Hz ±3 dB (Type-I tape); 25-19,000 Hz ±3 dB (Type-II tape); 25-19,000 Hz ±3 dB (Type-I tape); s/N (Type-I tape) 70 dB, s/N (Type-II tape) 70 dB.

NEC K-700E
Full-auto/two-speed dubbing cassette deck with Dolby B & C.

NEC K-700E
Full-auto/two-speed dubbing cassette deck with Dolby B & C.

ONKYO
Integra TA-2098 Unidirectional Cassette Deck
Features 3 heads; 2 motors; auto bias/dbx; dual capstans; bias fine tuning; direct drive; elapsed-time tape counter; memory search; auto search; output level control; memory stop/play; mic input; headphone jack; rec mute; record calibration controls; sendout heads; MPX filter; two-color peak hold. Remote control optional. w&F 0.045% wrms; FR 17-18,000 Hz ±3 dB (Type-I tape); 25-19,000 Hz ±3 dB (Type-II tape); 25-19,000 Hz ±3 dB (Type-I tape); s/N (Type-I tape) 70 dB, s/N (Type-II tape) 70 dB.
THE 3D APPROACH TO MUSICAL ACCURACY AND EFFICIENCY

DYNAMICS:
The DB PLUS DIGITAL MONITORS are highly efficient, enabling moderately powered amplifiers or receivers to generate DYNAMIC VOLUME LEVELS, distortion free.

DIVERSITY:
The musical accuracy of the DB PLUS DIGITAL MONITORS is exceptional at all music levels. From the highest of volumes to the lowest, DB PLUS resists compression and remains sensitive enough to yield true depth and tonal balance, regardless of the music selected.

DISPERSION:
The excellent dispersion of the DB PLUS DIGITAL MONITORS provides spaciousness and stereo imaging that is as real as real can be!

DB PLUS DIGITAL MONITORS – Your link to sound perfection
### CASSETTE DECKS

**TA-RW-44 Double Cassette Deck**
- Features autoreverse (deck 2 only), high-speed and normal-speed dubbing, Dolby B, 2 DC servo motors; auto bias/EQ (deck 2); rec mute; auto stop; time standby mode; music search (deck 2); soft-touch controls; master level fader; w&F 0.07% wrms; FR 30-15,000 Hz ±3 dB (Type-I tape), 30-16,000 Hz ±3 dB (Type-II tape). 11.7 lb tape) 58 dB no NR, 17.12' w x 4.38' h x 10.12" d; 11.7 lb
- $260

**TA-R240 Autoreverse Cassette Deck**
- Features Dolby B & C, 2 heads, 2 motors; computer-controlled silent-mechanism transport; fine-tuning accu-bias; automatic music control system; auto bias/EQ; blank skip; mic inputs; headjack; auto space; LED meters. Remote control optional. w&F 0.07% wrms; FR 30-14,000 Hz ±3 dB (Type-I tape), 30-15,000 Hz ±3 dB (Type-II tape), 30-16,000 Hz ±3 dB (Type-IIV tape). S/N (Type-I tape) 58 dB no NR. 17.12" w x 4.38" h x 10.38" d
- $199

### Phillips

**FC 567 Dual Autoreverse Cassette Deck**
- Dual autoreverse solenoid ceramic cassette deck with quick music search. Features digitally controlled electronic autoreverse tape transports; continuous playback or recording with both decks; simultaneous recording on both decks; normal or double-speed dubbing; auto-space record mute; high-integration electronics; Dolby B and C NR; auto tape selection; selectable cinch/DIN connections; optional remote control
- $479

**FC 566 Autoreverse Cassette Deck**
- Autoreverse solenoid electronic cassette deck. Features digitally controlled electronic autoreverse tape transport; index scan and quick music search; auto space; blank skip; automatic two-way recording; high-integration electronics; Dolby B and C NR; auto tape-type selection; selectable cinch/DIN connections
- $379

### Pioneer

**CT-49S Unidirectional Cassette Deck**
- Features 3 heads; closed-loop dual-capstan drive system; quartz-PLL servo direct-drive capstan motor; ribbon send/pulse record/play head.

35-segment FL level meters; real-time tape counter; Dolby B & C, DC playback EQ; auto loading, power eject, tape return; music search, auto monitor; auto tape selector; master fader; black finish with rosewood side panels; w&F 0.018% wrms; S/N 58 dB no NR. 5.12" h x 14.75" d
- $900

**CT-1380WR Double Cassette Deck**
- Features Pioneer "SR" unified remote control; autoreverse recording and playback in both decks; Dolby B & C; high-speed dubbing, continuous dubbing; relay record and play, random-access programming of up to 10 songs per tape side; music search; music repeat; skip search; record mute; synchro start; timer record and playback; gold-plated headphone jack. w&F 0.06% wrms; S/N 57 dB no noise reduction. 16.56" wide x 4" high x 12.38" deep
- $500

**CT-V70 Double Cassette Deck**
- Features autoreverse; Dolby B, C, and dbx; record and playback on both decks; high-speed dubbing; simultaneous recording; relay record and play; random-access programming of up to 10 songs per tape side. 5/7 kHz NR, 92 dB w. dbx. 16.56" w x 4" h x 13.28" d
- $485

**CT-X700WR Double Cassette Deck**
- Features autoreverse playback and recording on deck 2; autoreverse playback on deck 1; Dolby B & C, relay play; high-speed dubbing; full-logic control; music search; skip search; auto tape selector; record mute. Remote controllable with Pioneer "SR" unified remote control. w&F <0.09% wrms; S/N 57 dB no NR. 3.94" h x 14.19" w x 12.94" d
- $325

**CT-1280WR Double Cassette Deck**
- Features autoreverse playback and recording on deck 2; autoreverse playback on deck 1; Dolby B & C; relay play; high-speed dubbing; full-logic control, music search, skip search, auto tape selector; record mute. Remote controllable with Pioneer "SR" unified remote control. w&F <0.09% wrms; S/N 57 dB no NR. 16.38" w x 4.75" h x 10.44" d
- $300

**CT-2070R Autoreverse Cassette Deck**
- Features Dolby B, C, and dbx; full-logic operation; headjack; auto space; LED meters. Remote control optional. w&F 0.06% wrms; FR 30-15,000 Hz ±3 dB (Type-I tape), 30-16,000 Hz ±3 dB (Type-II tape), 30-17,000 Hz ±3 dB (Type-IIV tape). S/N (Type-I tape) 58 dB no NR. 17.12" w x 4.38" h x 10.38" d
- $240

**Proton**

**CT-1380WR**
- 740 Autoreverse Cassette Deck
- Features Dolby B, C; Dolby NR; autoreverse (deck 2 only). high-speed dubbing; Dolby F; Dolby C; dbx. 16.56' w x 4' h x 12.38" d
- $75

**AD-300 Autoreverse Cassette Deck**
- Features Dolby B & C NR; autoreverse (in play and record). MXF filter; auto bias selector; full-logic control; metal bias 40-17,000 Hz ±3 dB; S/N CrO, 70 dB, THD 1.5% (metal tape). 1.8% (CrO3). 1.2% (normal tape)
- $299

**72DOLBY B & C Cassette Deck**
- Stereo cassette deck with Dolby B and C. Features DTS-200 -touch operation; one-touch record; bias circuit to reduce crosstalk between stereo channels; defective MXF filter; LED record indicators; Dolby B, C, and dbx; mic/mixing capability. w&F 0.08% wrms; FR 30-17,000 Hz ±3 dB (ferrie). 30-17,000 Hz ±3 dB (high bias). 30-18,000 Hz ±3 dB (metal); S/N ferric. 65.5 dB with Dolby B. 74 dB with C. high-bias-metal tape. 69.5 dB with Dolby B, 78 dB with C
- $199

**Realistic by Radio Shack**

**SCT-100 Double Autoreverse Cassette Deck**
- Dolby B and Dolby C; high-speed dubbing; compatible with normal, high-bias, metal tapes, mic inputs; headphone jack; 2-color & LED peak-level meters; sequential play; soft-touch controls. w&F 0.08% wrms; FR ±3 dB ferric 40-12,000 Hz, high bias 13,000 Hz. metal 40-14,000 Hz. S/N 69 dB Dolby C. 61 dB Dolby B
- $230

**SCT-83 Autoreverse Cassette Deck**
- Dolby B; Dolby C; music search; solenoid operation; plays 1 side, both sides, or repeats continuously; compatible with normal, high-bias, metal tape; mic and headphone jacks; intro scan. w&F 0.06% wrms; FR ±3 dB ferric 40-12,000 Hz, high bias 13,000 Hz. metal 40-14,000 Hz. S/N 70 dB Dolby C
- $220

**SCT-74 Double Cassette Deck**
- Dolby B and Dolby C; high-speed dubbing; compatible with normal, high-bias, metal tapes; LED's for power and recording; mic inputs; headphone jack. w&F 0.12% wrms; FR ±3 dB ferric 60-10,000 Hz, high bias 60-12,000 Hz. metal 60-14,000 Hz
- $180

**Revox**

**B215 3-Head Cassette Deck**
- Cassette deck with 3 microprocessors for control of bias, level, EQ, transport, and real-time counter. Features 3 heads; 4 motors; digital storage of bias, level, EQ settings for 6 tape formulations; manual or auto record-level setting; disc-jet transport chassis; azimuth-stable pivoting headstock; 2 programmable locate buttons; loop mode; auto start-of-record locate. Counter computes elapsed time on partially wound tapes. w&F 0.1% wrms; FR ferric 30-18,000 Hz ±3 dB, high bias and metal 30-20,000 Hz ±3 dB. S/N (A-wtd) ferric. 55 dB no NR. 64 dB Dolby B. 70 dB Dolby C, high bias. 57 dB no NR. 65 dB
- $499

**Revox B215**
CLOSE YOUR EYES...

Step beyond a fourth dimension where picture perfect sound is the only reality. Experience the ultimate live performance in your own living room.

Introducing HOLOGRAPHIC SOUND from IMAGE! Your doorway to great musical performances of past, present, and future has finally been opened. From the threshold of Sound Engineering Excellence, IMAGE captivates you with brilliant performances of listening pleasure.

— IMAGE — a product so special that simply owning it says you recognize the utmost in quality. The objective of the IMAGE Acoustical Engineers was to create a line of loudspeakers that would further the integrity of reproduced sound. Our Commitment to Excellence with constant improvement and innovation is the driving force behind IMAGE.

THE HOLOGRAPHIC "IMAGE"

Instead of taking a back seat to the live musical performance, HOLOGRAPHIC SOUND from IMAGE makes you feel like a participant. Music has been given a 4-Dimensional depth and clarity that is unwavering both on and off-axis. True, vibrant sound "appears" in your listening window right out of thin air. HOLOGRAPHIC SOUND from IMAGE — for musical coherence and accuracy the name says it all!
## CASSETTE DECKS

### DOLBY C101 3-Head Cassette Deck
- Features sendust/rec/play head, precision transport mechanism; 2 heads, 2 motors; bias fine tuning, direct drive; LED meters; soft-touch controls; mic inputs; headphone jack. w&F 0.05% wrms; FR 30-20,000 Hz ± 3 dB; S/N (A-wtd) metal: 68 dB.
- **Price:** $1,880

### RD850 Dolby B & C Cassette Deck
- Cassette deck with sendust/rec/play head, ferrite core erase head. Features soft-touch controls; LED meters; mic inputs; I.C. servo motors; headphone jack; microphone input; Dolby B & C. 17" w x 4.5" h x 10.62" d; 9.1 lb.
- **Price:** $229

### RD870 Dolby B/C/HX Pro Cassette Deck
- Features sendust/rec/play head; precision transport mechanism; 2 heads, 2 motors; bias fine tuning, direct drive; LED meters; soft-touch controls; mic inputs; headphone jack. w&F 0.05% wrms; FR metal 30-20,000 Hz ± 3 dB.
- **Price:** $499

### SAE C102 2-Head Cassette Deck
- Full-logitech microprocessor cassette deck. Features 2 heads and 2 motors for each transport; LED meters; Dolby B & C; manual azimuth adjust; elapsed-time counter; remaining-time counter; output level controls; memory stop/play; LED meters; soft-touch controls; sendust heads.
- **Price:** $650

### C101 3-Head Cassette Deck
- Full-logitech microprocessor cassette deck. Features 2 heads and 2 motors for each transport; LED meters; Dolby B & C; manual azimuth adjust; elapsed-time counter; remaining-time counter; output level controls; memory stop/play; LED meters; soft-touch controls; sendust heads; FR ferric 30-17,000 Hz ± 3 dB, high bias 30-17,000 Hz ± 3 dB, metal 30-18,000 Hz ± 3 dB; S/N (high bias): 55 dB no NR, 66 dB Dolby B, 75 dB Dolby C.
- **Price:** $500

### SANYO RDW79 Autoreverse Cassette Deck
- Features 3-way autoreverse program: in-fade reverse sensor, tape counter; high-speed dubbing; tape capability; dual level meters; auto-stop; soft-touch transport controls; headphone jack. w&F 0.06% wrms; FR ferric 30-14,000 Hz ± 3 dB, metal 40-16,000 Hz ± 3 dB; S/N 55 dB no NR, 70 dB with Dolby B, 75 dB with Dolby C.
- **Price:** $250

### RDW59 Double Cassette Deck
- Features Dolby NR: continuous playback; high-speed dubbing; synchrono dubbing; metal tape capability; dual level meters; auto-stop; soft-touch transport controls; 3-digit tape counter; headphone jack.
- **Price:** $229

### RDS9 Cassette Deck
- Features soft-touch controls; Dolby NR; permanent-playback capability; metal tape capability; 3-digit rear digital indicators; relay playback for continuous listening; music search; auto tape select; LED peak level indicators; dual capstans; bias fine tuning; tape capability; 2 heads; 1 motor, music search; auto music sensor; Dolby B & C for both decks; super bias technology; 2 laser amorphous heads in each deck; 2 motors for each deck; 12 selections; 6 memory direct-access random music sensor for programming and recording; sync record; timer record and playback; auto music sensor for both decks; blank skip for both decks; auto pause; auto space; auto record; record and playback; linear counter; remaining-time indicators; 2 laser amorphous heads; 2 motors; music search; auto tape select; Led peak level indicators.
- **Price:** $700

### SANSUI D-W11 Double Autoreverse Cassette Deck
- Autoreverse high-speed dubbing cassette deck. Features 2 heads and 2 motors for each transport; LED meters; Dolby B & C; dual capstans; auto azimuth adjust; elapsed-time counter; remaining-time counter; memory stop/play; LED meters; mic inputs; headphone jack; continuous play. w&F 0.12% wrms; FR 30-17,000 Hz ± 3 dB; S/N 59 dB (without NR, Type-IV tape).
- **Price:** $700

### D-3000WR Double Autoreverse Cassette Deck
- High-speed dubbing autoreverse deck. Features 2 heads and 2 motors for each transport; LED meters for each channel; full/logitech; soft-touch controls; Dolby B and C; AMPS (Automatic Musical Program Search); record mute; w&F 0.08% wrms; FR metal 20-14,000 Hz ± 3 dB; metal 40-16,000 Hz ± 3 dB; 17" w x 4.89" h x 9.89" d.
- **Price:** $220

### RT-V650 Double Cassette Deck
- Cassette deck with high-speed synchronous dubbing and continuous playback capability. Features 2 heads, 1 motor, Dolby B, L, & C; peak level meters; headphone jack; mic inputs; metal tape capability; auto stop. w&F 0.12% wrms; record/playback FR ferric 40-13,000 Hz ± 3 dB, high bias 40-14,000 Hz ± 3 dB; 17" w x 4.89" h x 9.89" d.
- **Price:** $120

### SHERWOOD S-289RD Double Cassette Deck
- Features autoreverse dubbing capability; 2 dubbing speeds; Dolby B & C NR; compatible with Sherwood Digi-Link remote components; auto music search; auto tape select; LED peak level indicators; relay playback for continuous listening of both decks; timer/stop; rec mute.
- **Price:** $300

### SONY TC-K700ES Unidirectional Cassette Deck
- Three-head cassette deck with a center-located drive system that separates the centre-lead/track from the audio circuits. Features twin-mono DC amp design; LC-OFIC laser ammonia heads; Dolby B and Dolby C noise reduction; memory stop/play; auto playback-EQ selector; MPX filter switch; auto play; auto space; tape counter; record and playback; linear counter; remaining-time indication; headphone jack with adjustable level. w&F 0.025% wrms; FR 20-20,000 Hz ± 3 dB (no NR, Type-IV tape); s/n 60 dB (no NR, Type-IV tape).
- **Price:** $1,880

### TC-WR950 Double Cassette Deck
- Remote-controlled high-speed-dubbing cassette deck with autoreverse, record, and playback for both decks. Features Dolby B & C for both decks; super bias technology; 2 laser amorphous heads in each deck; 2 motors for each deck; 24 selections; 6 memory direct-access random music sensor for programming and recording; sync record; timer record and playback; auto music sensor for both decks; blank skip for both decks; auto pause; auto space; auto record; record and playback; linear tape counter (deck A); switchable tape counter (deck B); headphone jack with adjustable level; feather-touch controls w&F 0.05% wrms; FR 30-17,000 Hz ± 3 dB (Type-IV tape); signal-to-noise ratio 59 dB (without NR, Type-IV tape).
- **Price:** $300

### TC-R503 Autoreverse Cassette Deck
- Features remote control; Dolby B & C; Dolby HX Pro; 2 laser amorphous heads; 2 motors; record-level calibration; timer record and playback; auto music sensor; music scan; blank skip; auto play; auto space; relay playback; auto playback-EQ selector; 24-segment FL meter; linear tape counter; headphone jack with adjustable level; feather-touch controls w&F 0.05% wrms; FR 30-17,000 Hz ± 3 dB (Type-IV tape); s/n 59 dB (no NR, Type-IV tape). 17" w x 5" h x 11.25" d.
- **Price:** $700

### TC-WR870 Double Cassette Deck
- Remote-controlled high-speed-dubbing cassette deck with autoreverse, record, and playback for deck B and playback for autoreverse. Features Dolby B & C; 2 sendust heads (deck B).
- **Price:** $900

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### Specifications

- **Dolby B, 72 dB**
- **Dolby C, metal: 58 dB no NR,** 66 dB Dolby B, 72 dB Dolby C; line-input sensitivity for 0-dB reading 30 mV, line output level 0-dB 775 mV; 17.7" x 6" x 13".
- **Price:** $1,880

- **Rotel RD850 Dolby B & C Cassette Deck**
- Cassette deck with sendust/rec/play head, ferrite core erase head. Features soft-touch controls; LED meters; mic inputs; I.C. servo motors; head- phone jack; microphone input. w&F 0.05% wrms; FR metal 30-20,000 Hz ± 3 dB; S/N (A-wtd) metal: 68 dB.
- **Price:** $229
CASSETER DECKS

B.1 sendust head (deck A); 2 motors for each deck; sync record; timer record and playback; auto music sensor for both decks; blank skip for both decks; auto pause; auto play;自主 space; rec mute; auto playback-EQ selector (deck A); manual playback-EQ selector (deck B); 12-segment LED meter; drum tape counter (deck B); headphone jack; feather-touch controls. w&F 0.07% w厮ms; FR 30-15,000 Hz ± 3 dB (Type-IV tape); s/N 58 dB (no NR, Type-IV tape). 17" w x 5.12" h x 10.88" d. $400

TC-WR550 Double Cassette Deck
Remote-controlled high-speed dubbing cassette deck with record and playback for deck B and parallel recording; 3 motors; 2 erase heads, 1 rotating record/play head; logic control; remote control; Dolby HR Pro headroom extension; double Dolby B, Dolby C, dbx NR; 2-color L/R peak meters; intro check; blank scan; memory stop/play; timer compatible; manual tape calibration; headphone jack; electronic tape counter; CD level check; program search; direct selection; block repeat; MPX filter; optional wooden side panels; output level control. w&F 0.02% FR 25-20,000 Hz with metal tape; s/N (3% distortion, wid) 60 dB no NR, 80 dB over 1,000 Hz Dolby C, 92 dB dx b (1,000 Hz). 13.3 lb $749

V-9700 Dual-Capstan 3-Head Cassette Deck
Closed-loop transport: 3 motors; 1 erase head, 1 record head, 1 play head; logic control; remote control; Dolby HR Pro headroom extension; double Dolby B, Dolby C, dbx NR; 2-color L/R peak meters; intro check; blank scan; memory stop/stop; timer compatible; manual bias calibration (adjust for L and RH); headphone jack; electronic tape counter displays time; CD level check; program search; direct selection; block repeat; MPX filter; optional wooden side panels; output level control. w&F 0.02% FR 25-20,000 Hz with metal tape; s/N (3% distortion, wid) 60 dB no NR, 80 dB over 1,000 Hz Dolby C, 92 dB dx b (1,000 Hz). $699

AD-4 Cassette Deck and CD Player
Wireless remote control; random program dubbing of 16 tracks; auto space: Dolby B and Dolby C NR; 1 erase, 1 record/play head; autoreverse; synchro start auto dubbing; CD repeat; CD player section: s/N 94 dB; TD 0.02%; sep 90 Hz. Cassette deck section: w&F 0.05%; FR to 16,000 Hz $599

W660R Double Autoreverse Cassette Deck
Double quick-autoreverse cassette deck with all IC logic transport control. Features 2 heads; 3 motors; transport controls; 3-speed play; record; playback for deck B and tape copy for deck A. Features Dolby B & C; 2 -color L/R peak meters; intro check; gold-plated jacks; MPX filter; Compu-matic Program Search (CPS). w&F 0.05% FR 25-18,000 Hz ± 3 dB, high bias 25-19,000 Hz ± 3 dB, metal 20-20,000 Hz ± 3 dB (A-wtd); metal 69 dB Dolby B. 74 dB Dolby C. 17.12" w x 4.75" h x 10.44" d. $429

R-455X Cassette Autoreverse Deck
Cassette deck with rotary head system. Features 2 heads; 1 motor; Dolby B, Dolby C; dx b; output level control; LED meters; soft-touch controls; mic inputs; rec mute; headphone jack; electronic tape counter displays time; CD level check; program search; direct selection; block repeat; MPX filter; CD level check. w&F 0.029% FR 25-18,000 Hz ± 3 dB, high bias 30-17,000 Hz ± 3 dB, metal 30-17,000 Hz ± 3 dB; s/N (A-wtd) metal: 65 dB Dolby B, 70 dB Dolby C. 90 dB dx b. $299

TECHNIQUES

RS T80R Double Autoreverse Cassette Deck
Features quick autoreverse, record, and play for both transports; 4 reverse modes; parallel and 3 -hr series recording; high-speed transports; series playback; synchro start; CD player display; auto bias/EQ; feather-touch controls; remote-control capability with some Techniques receivers; high-speed editing; 4 heads; 2 motors; Dolby B, Dolby C, dx b nr; erase/mute; headphone jack. w&F 0.08% w陋ms; s/N (A-wtd) high bias 57 dB no NR, 67 dB Dolby B, 75 dB Dolby C, 92 dB dx b. 16.94" w x 4.36" h x 10.91" d. 11.7 lb $600

RS-T55R Double Autoreverse Cassette Deck
Features quick autoreverse for both transports; Dolby B, Dolby C, dbx NR; high-speed dubbing; auto bias/EQ; synchro start/stop; composite auto space, anti-resonant metallic feet; edit search on Transport A; soft-touch controls. 28-32 bit digital peak readout $420

RS-T33R Double Autoreverse Cassette Deck
Double quick-autoreverse cassette deck with coil amorphous head. Features 2 heads, 2 motors; auto bias/EQ; call the Touch controls; mic inputs; rec mute; headphone jack. w&F 0.05% FR 25-16,000 Hz ± 3 dB, metal 20-20,000 Hz ± 3 dB (A-wtd); metal 69 dB Dolby B. 74 dB Dolby C. 90 dB dx b. $225

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

RS-T11. Similar to RS-T22 except lacks Dolby B and Dolby C. 90 dB dx b (1,000 Hz). 11 lb $195

RS-B29R Autoreverse Cassette Deck
Cassette deck with V-Tri-Hold rotary head and

STEREO REVIEW MAY 1988 91
3-point head support for minimal lateral/vertical variance and precise alignment in both directions. High-pitch extra-tempered steel-azimuth adjusting screws maintain correct head angle. Features 2 heads; 1 motor; Dolby B and Dolby C; remote-controlled through some Tech-
nics options; features 2-speed dubbing; synchro-start dubbing; continuous play; power-assist transport controls; mic inputs; manual dubbing/recording level; metal-tape capability; FR 40-1,000 Hz metal tape; s/N 75 dB (with Dolby B noise reduction); wow-and-flutter 0.08% weighted rms; 17.25 x 4.5" x 10" d.; 85 lb.

$225

BC-1305 Dolby B & C Cassette Deck Features FL peak-level meters; 1-touch recording; full auto stop; digital counter; PL display; record level balance controls; timer/rec/play; 2 heads; 1 motor; elapse-time counter; mic inputs; headphone jack; soft-touch controls. W&F 0.08% wrms; s/N (A-wtd, with high-bias tape) 56 dB no NR, 65 dB Dolby B, 75 dB Dolby C. 16.94" w x 4.53" h x 8.75" d; 6.6 lb.

$145

K-4020B 3-Head Cassette Deck Features precision closed-loop dual-capsaic transport; sendust rec/play heads; iron-plated double-gap erase head; optimum record bias tuning; double dbx, double Dolby B & C; Dolby HX Pro; dynamic bias servo; high quality amplifier; head, full-logix control, optimum recording level indicator. RS-B207 dbx Cassette Deck

$225

Cartridge Deck

Features 2 heads; 2 motors; Dolby B, Dolby C, and dbx nr; elapse-time counter; mic inputs; headphone jack; soft-touch controls; 1-touch recording; full auto stop; digital counter; PL display; record level balance controls; timer/rec/play. W&F 0.08% wrms; s/N (A-wtd, with high-bias tape) 57 dB no NR, 66 dB Dolby B, 74 dB Dolby C. 92 dB dbx. 16.94" w x 4.53" h x 8.75" d.

$225

RS-B107 Dolby B & C Cassette Deck Features FL peak-level meters; 1-touch recording; full auto stop; digital counter; FL display; record level balance controls; timer/rec/play; 2 heads; 1 motor; elapse-time counter; mic inputs; headphone jack; soft-touch controls. W&F 0.08% wrms; s/N (A-wtd, with high-bias tape) 57 dB no NR, 66 dB Dolby B, 74 dB Dolby C. 16.94" w x 4.53" h x 8.75" d; 7.5 lb.

$190

RS-B105 Dolby B Cassette Deck Features direct-mode switching: 2 heads; 2 motors; 1-touch recording; full auto stop; record level balance controls; timer/rec/play; elapse-time counter; LED meters; soft-touch controls. W&F 0.08% wrms; s/N (A-wtd, with high-bias tape) 56 dB no NR, 66 dB Dolby B. 16.94" w 4.53" h x 9.4" d; 4.31" h x 2.3" w x 7.3" d; 3 lb.

$699

K-640B Autoreverse Cassette Deck Features 2-speed dubbing; synchro-start dubbing; continuous play; power-assist transport controls; 3 heads; 2 motors; dual capstans; 2 colors 6-segment digital display; timer rec/play; 2-color 6-segment display; memory stop/ play; auto tape selector; full 0-M repeat; memory stop/ play; auto tape selector; full 0-M repeat; memory stop; music search; dual digital; FET eq. amp. W&F 0.03% wrms; FR ferric 20-19900 Hz ±3 dB; metal tape, 95 dB with dbx; 17.12" w x 5.25" h x 15.7" d; 16.7 lb.

$649

K-720B Autoreverse Cassette Deck Features pure sendust heads; Dolby B, C, and HX Pro; dbx; intracass; music search; remaining time; auto fade; linear counter; programmable recording and playback. Black: 13 lb.

$499

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Revox, 122 Dupont St., Plainview, NY 11803

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Sherwood, 13845 Artesia Blvd., Cerritos, CA 90701

Sony, Sony Dr., Park Ridge, NJ 07646

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BEST RECORDINGS OF THE MONTH

Stereo Review’s critics choose the outstanding current releases

IT’S FOLK! IT'S PUNK! IT’S THE POGUES!

The word “pogue” is short for “pogue mahone,” which is Gaelic for “kiss my ass”—well, you know what it’s Gaelic for. So the question isn’t if the Pogues will fall from grace with God but when, how far, and can we go too? Their new album, “If I Should Fall from Grace with God,” is a riotous, whirling, reeling brawl of tavern ribaldry, pockmarked love songs, boozy prayers, gutter balladry, Thatcher-bashing, and, above all, Joycean romanticism. If you’re already acquainted with the Pogues, “If I Should Fall from Grace with God,” their third album in the U.S. and their first on Island, will come as a bit of a surprise. While the Pogues have always had a reputation as “folk-punks,” this is the first album in which they’ve really made the connection.

The music here is rooted firmly in the Irish folk tradition. Every tune sounds like a variation on a well-worn reel or jig or chantey. Tom Waits has called the Pogues “drunk Clancy Brothers,” and the comparison is apt. There are no synthesizers; there aren’t even any electric guitars. And yet there’s a frenzy in this music that pushes it out way beyond even the wildest folk improvisation. Credit producer Steve Lillywhite for making it work: eight musicians flailing away at banjo, fiddle, concertina, acoustic guitar, dulcimer, drums, piano, tin whistle, and saxophone, never stopping for breath, and yet they’re as tightly knit as a band of IRA irregulars out for an evening raid.

In the middle of this tunefully chaotic maelstrom is Shane MacGowan. MacGowan, who sings most of the lead vocals, is an expatriate Irishman living in London who shares his countrymen’s natural antipathy toward the English. He is always in a rage. You may not understand a word he says, but he sings with such bloodcurdling passion that you somehow know what he means anyway. MacGowan also wrote most of the songs here, and they’re a wonderful lot. Among my favorites are the title song, an absolutely irresistible double-time romp; Bottle of Smoke, an even faster tune about the incomparable joys of hitting a long shot at the racetrack (“Slip a fifty to the wife, and for each brat a crisp new five, to give me a break on a Saturday night”); and Fairytale of New York, a love duet that’s sung by two derelicts (“You’re a bum, you’re a punk, you’re an old slut on junk”).

There is a renegade morality and idealism at the heart of “If I Should Fall from Grace with God.” The wastrels and drunkards, the profligates and rebels who populate MacGowan’s songs are the victims of demons beyond their control—social, economic, political, and psychological demons along with the evil spirits that come tumbling out of a bottle. Yet even at their most profane, they fight back with defiant dignity. With its racing snare drum and pennywhistle, “If I Should Fall from Grace with God” goes to work first on your feet. From there, it’s just a short trip to your soul. Mark Peel

THE POGUES: If I Should Fall from Grace with God. The Pogues (vocals and instrumentals). If I Should Fall from Grace with God; Turkish Song of the Damned; Bottle of Smoke; Fairytale of New York; Metropolis; Thousands Are Sailing; Fiesta; Streets of Sorrow/Birmingham Six; Lullaby of London; Sit Down by the Fire; The Broad Majestic Shannon; Worms. ISLAND 90872-1, © 90872-4, © 90872-2 (44 min).

OZAWA CONDUCTS PROKOFIEV

Seiji Ozawa’s new recording of Prokofiev’s Romeo and Juliet with the Boston Symphony on Deutsche Grammophon is only the third stereo version of the complete ballet score. The first two, and until now the only, complete stereo recordings were Lorin Maazel’s with the Cleveland Orchestra on London and André Previn’s with the London Symphony on Angel, released simultaneously.

The Pogues: pockmarked love songs and gutter balladry
SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.
nearly fifteen years ago. Since transferred to CD, they remain appealing both sonically and musically, but Ozawa's set must now be considered the first choice.

The Ozawa recording also happens to be his first appearance with the Boston Symphony on Deutsche Grammophon in seven or eight years. One of their last DG releases was a splendid account of Tchaikovsky's Swan Lake. That did not stay in the catalog very long, but it did give a fine demonstration of Ozawa's feeling for Russian balletic idiom—an idiom very much shared by the Prokofiev score. And when it comes to Prokofiev, the Boston Symphony can boast an especially rich tradition, established by Serge Koussevitzky. Among the several Prokofiev recordings Koussevitzky made in Boston was one with music from Romeo and Juliet, and both his immediate successor, Charles Munch, and his successor, Erich Leinsdorf, made memorable recordings of greater parts of the score. From the first bars to the last, the new recording suggests nothing less than total absorption in the special world Prokofiev created in this ballet. The playing is at all times brilliant, elegant, evocative, and compassionate. Ozawa is certainly mindful of Prokofiev's statement that he had "taken special pains to achieve a simplicity which will, I hope, reach the hearts of all listeners," but he is no less mindful of the score's remarkable richness of color and sumptuousness. Where he gains over both Maazel and Previn, I think, is in realizing the specifically Russian qualities in Prokofiev's fairy-tale view of Shakespeare. We are reminded not only of the score's connections with Prokofiev's Fifth Symphony but of those with his Alexander Nevsky as well.

If Ozawa does not quite match the symphonic sweep of Maazel's version in terms of continuity, he is far ahead of Previn in this respect, and he is more enlivening than Maazel in the crowd scenes. He balances the elements of poignancy and earthiness a little more convincingly than either of the other conductors, and, unexpectedly, he enjoys a clear advantage in the recorded sound itself. While both the earlier recordings stand up well, DG's sound is richer and better balanced. In sum, Ozawa's recording strikes me as combining and amplifying upon the strongest features of both previous versions.

Richard Freed

PROKOFIEV: Romeo and Juliet, Op. 64 (complete). Boston Symphony Orchestra, Seiji Ozawa cond. DEUTSCHE GRAMMOPHON © 423 268-1 three LP's, © 423 268-4 two cassettes, @ 423 268-2 two CD's (144 min).

WILD SEEDS: "MUD, LIES & SHAME"

SOME bands make you dance, some bands make you think, and some bands make you laugh. And occasionally a band manages a musical hat trick and makes you do all three. Such a band is Wild Seeds, an Austin outfit that has been one of the better-kept secrets of Texas rock-and-roll but whose new album, "Mud, Lies & Shame," should get it national notice in a hurry.

The basic musical mix is as rootsy and eclectic as you might expect—a little hard country (there are hints of the Gram Parsons-era Burrito Brosweeh), a little blues-based Stonesish guitar rock, a little unclassifiable weirdness (Timbuk 3 comes to mind). But what holds it all together is lead singer/songwriter Michael Hall, who sounds like an adenoidal Lou Reed on a tequila bender and writes like a bastard relation of Randy Newman, Buddy Holly, and the young Graham Parker. Equally at home with no-subtext stompers, tuneful, keenly observed relationship songs, and caustic satire, Hall is clearly a major find. In 'I'm Sorry, I Can't Rock You All Night Long', the album's masterpiece, he's concocted a hilariously on-the-money deflation of the adolescent macho-rock mystique. "It's an interesting idea, baby," he sighs, "but it would be wrong," and you can practically hear him pulling the covers over his head.

Meanwhile, the rest of the band makes a terrific guitar-heavy racket behind him, Howard Benson's production is clean and unfussy, and, best of all, Kris McKay, clearly the band's secret weapon (mostly she's relegated to background vocals), gets to close the album with a tour-de-force country weeper, All This Time. It works up a sort of Janis Joplin Goes Minimalist intensity that will knock your socks off. In short, this is a little gem of an album that proves, once again, that the best rock-and-roll addresses the feet, the brains, and the heart more or less equally. You should hear it immediately.

Steve Simels

WILD SEEDS: Mud, Lies & Shame. Wild Seeds (vocals and instruments); other musicians. Debi Came Back; I'm Sorry, I Can't Rock You All Night Long; You Will Be Married to a Jealous Man; I Have Died a Thousand Times for True Love; Long Gone Train; Like a Fall; Jack's Walking with the King; Rambin'; If I Were a Storm; Virginia; All This Time. PASSPORT PB 6060, © PBCD 6060, © PBCD 6060 (38 min).
NOJIMA'S
KNOCKOUT
LISZT

WINNING major competitions does not necessarily insure a major career, which nowadays surely requires recordings. Winning the Van Cliburn International Piano Competition in 1969 did not even get Minoru Nojima a listing in Grove or Baker's, and this Japanese pianist's name is still likely to be as unfamiliar to most American music lovers as the label on which he has just made his American recording debut, the San Francisco-based Reference Recordings. Once his new Liszt recital begins to circulate, though, it should dramatically alter that situation. It's an absolute knockout, vividly recorded and alive with the sort of pianism and the sort of music making we don't encounter every other Tuesday.

The program itself is a splendid one in both substance and contrast. It begins with the Mephisto Waltz No. 1, proceeds to the most intriguing of the Paganini Etudes (La campanella), and two sharply contrasting numbers from the Transcendental Etudes, and concludes with the great Sonata in B Minor. Nojima's technique—the rhythmic steadiness, the clarity, the regard for tone evident in every note, the marvelous dynamic shadings, the incredibly beautiful and even runs—is something that might well be admired and enjoyed for its own sake, but it is not technique alone that makes listening to his playing the experience it is. What we hear is a stunning demonstration of technique put at the service of profoundly musical ends by a pianist with an intellect and an emotional depth that are even rarer than dazzling technique.

The Mephisto Waltz is indeed diabolically brilliant here, but it is no mere knuckle-buster. Nojima projects the most impressive sort of power by avoiding percussiveness, and the quieter portions, without being the least bit overindulged, are downright poetic in a way that may remind more than a few listeners of Wagner's Tristan und Isolde.

The sonata at the end of the program is nothing less than a triumph, but Nojima has seen to it that the triumph is Liszt's rather than his own. The "middleman" simply disappears. Nothing is laid on externally; instead, the listener is drawn into the core of the music. The contrasts are magnificently realized and particularly effective within the seamless continuity of Liszt's vision. There is an abundance of intensity, conviction, and unfailing taste—a combination so irresistibly powerful that many listeners may find themselves holding their breath through the final bars, as I did, lest the delicate line be broken, the sense of exaltation shattered. How fortunate we are, too, that this recital comes to us at a time in which the science of sound recording has reached its present refined state. (The CD is marked DDD; the label advises, however, that the LP version is "pure analog" and Direct Metal Mastered.) The informative accompanying leaflet is handsomely designed and ornamented with drawings of Liszt. According to the notes, Nojima had until now been reluctant to make recordings; that is perhaps the one lapse in artistic judgment with which he may be charged.

Richard Freed

LISZT: Mephisto Waltz No. 1; La campanella; Harmonies du soir; Feux follets; Sonata in B Minor. Minoru Nojima (piano). REFERENCE RR-25, © RR-25CD (59 min).

Minoru Nojima: breathtaking

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□ ORFF: Carmina Burana. Ozawa.
RCA PAPILLON 6533-3-RG (mid-price). "Dynamic" (Best of Month, September 1970).

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POPULAR MUSIC

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

T BONE BURNETT: The Talking Animals. T Bone Burnett (vocals, guitar); vocal and instrumental accompaniment. The Wild Truth; Monkey Dance; Image; Relentless; Purple Heart; and five others. COLUMBIA BFC 40792, © FCT 40792.

Performance: Uneven
Recording: Very good

The best producers act as catalysts, helping musicians to achieve their own artistic visions without superimposing an outside sensibility. T Bone Burnett has shown a great talent for doing just that. He's successfully produced such disparate talents as Leo Kottke, Los Lobos, Peter Case, and Elvis Costello. But it's this versatility that hampers Burnett's latest solo project, "The Talking Animals." He flings himself boldly into a variety of musical experiments, and the results are very uneven.

The strongest song in the album is also the first. The Wild Truth is a dazzling jeremiad about the state of the world. It uses a spoken rather than sung bridge, but the biting lyrics keep this device from seeming hokey. Image doesn't come off as well. The song's one verse, about the failed love between the images two people have of themselves, is sung by Burnett in English, then by others in French, Spanish, and Russian. Not only does the repetition fall flat, but the song is performed to a gooey, melodramatic string arrangement by Van Dyke Parks.

Other songs get a more conventional treatment, but "The Talking Animals" just doesn't hang together. Burnett's last solo release, "T Bone Burnett," was a successful exploration of his country roots. In that album, however, he chose a simpler approach and made unforced music. This time, he tries to do more and gives us less.

RON GIVENS

THE CHRISTIANS. Garry A. Christian (vocals); Russell Christian (saxophone, vocals); Henry Priestman (keyboards, guitars, vocals); instrumental accompaniment. Forgotten Town; When the Fingers Point; Born Again; One in a Million; Sad Songs; and four others. ISLAND 90852-1, © 90852-4, © 90852-2 (42 min).

Performance: A joy
Recording: Bright

The Christians' remarkable debut album may be the best attempt yet to merge the styles of Motown and British synth-pop. The vocals will remind you again and again of the Temptations and the Four Tops. Garry A. Christian and his brother Russell are black Liverpudlians who have the gift of soul, and it runs deep. The instrumental accompaniment, primarily by Henry Priestman, a white man also from Liverpool, has the catchiness we've come to expect from U.K. techno-wizards. The combination is true to both traditions and at the same time a rich, new musical experience.

The group's name, taken from the adopted last name of the two brothers, indicates the spiritual nature of the music. And even in Born Again and Save a Soul in Every Town, the material isn't overtly religious so much as positive and uplifting. The butter-smooth singing in these tunes, and in the more secular numbers such as Sad Songs, is a joy. The beliefs of the Christians are not the point here. Your enjoyment of their music will not depend on your theology but on your ears and your heart.

RON GIVENS

NANCI GRIFFITH: Little Love Affairs. Nan GRIFFITH (vocals, guitar); vocal and instrumental accompaniment. Anyone Can Be Somebody's Fool; I Knew Love; Never Mind; Gulf Coast Highway; Outbound Plane; and six others. MCA © MCA-42102, © MCAC-42102, © MCAD-42102 (36 min).

Performance: Just right
Recording: Nice

In producing folkabilly artist Nanci Griffith's two major-label albums, first "Lone Star State of Mind" and then this new one, MCA's Tony Brown had to walk a slippery path: He somehow had to retain the integrity of Griffith's four lyrically and instrumentally rich folk albums on Philo/Rounder and yet make her welcome on commercial country radio. If he failed, he knew there was both a record company and a fanatical cult following to answer to. To resolve his dilemma, Brown wisely brought in many of the same master pickers Griffith had worked with at Philo, and he also opted for the live-recording approach she knew best. Then
Brown added electric bass, piano, drums, and singer Mac McAnally to beef up the backing.

If "Lone Star State of Mind" played it too radio-ready, with only a smattering of Griffith's unique original songs, her second MCA album, "Little Love Affairs," finds her more relaxed in her bid for commercial acceptance and showing more of the flavor of her early progressive Texas sound.

There are several standouts here, including Never Mind, the Harlan Howard tune of love between itinerant fruit pickers, which seems beneath Griffith's dignity but boasts the kind of pat and simple problem/solution that country radio demands. Country radio should also eat up her rolling duet with John Stewart, Sweet Dreams Will Come, as well as Outbound Plane (co-written with Tom Russell), an energetic tune with an irresistibly infectious chorus. But the songs that burn in the memory are Love Wore a Halo (Back Before the War) and Gulf Coast Highway. Both are originals (the latter co-written with keyboardist James Hooker and guitarist Danny Flowers), and they examine the lives of two very different married couples.

Throughout the album, Griffith shapes her plant and elastic voice into a variety of grains and fabrics—rough and gravelly one moment, soft as a new baby blanket the next. "Little Love Affairs" is a work worthy of her stunning efforts for Philo, and one that points to an even greater maturity in her writing and vocal performance. It is an album that should win Nanci Griffith her just rewards.

Melissa Morgan: Good Love. Melisa Morgan (vocals); vocal and instrumental accompaniment. If You Can Do It: I Can Too!; Here Comes the Night; Just for Your Touch; Love Changes; Think It Over; and four others. CAPITOL CLT-46943, © C4T-46943, © CCT-46943 (45 min).


The high visibility of Whitney Houston and Anita Baker over the past two years has tended to obscure the work of another exceptionally talented new artist, Melisa Morgan. Her first album, "Do Me Baby," released in 1986, was an R&B top seller that included the utterly spectacular ballad Do You Still Love Me. Morgan not only co-wrote most of the best selections in the album with keyboardist Lesette Wilson, but she co-produced them with the same partner. Such versatility and self-assurance are rare for an artist still in her early twenties.

Happily, "Good Love," Morgan's second album, is equally fine. While she delivers her material assertively, there...
is a sweetness in her voice that's immediately appealing. And again she has co-written most of the best material, in several instances with Wilson. The dance numbers are freshly conceived and brightly executed, especially the engaging *Think It Over*, and the ballad *I'll Love No More* is of the same high quality as *Do You Still Love Me*. "Good Love" serves notice that Whitney, Anita, and the others might just have to move over and make room for Melisa Morgan.

**P.G.**

**OF THEE I SING/LET 'EM EAT CAKE** (George and Ira Gershwin), narrated by Murray, Larry Ketty, David Garrison, Paige O'Hara (vocals); others. New York Choral Artists; Orchestra of St. Luke's, Michael Tilson Thomas cond. CBS 0 S2M 42522 two LP's, © S2T 42522 two cassettes, © M2K 42522 two CD's (143 min).

**Performance:** Disappointing

**Recording:** Excellent

This is the kind of release that will make show-music lovers jump for joy, and they will certainly want to add it to their collections—even though it is disappointing in some respects. With a score by George and Ira Gershwin, and a book by the equally legendary George S. Kaufman and Morris Ryskind, *Of Thee I Sing* (1931) was the first Broadway musical ever to win a Pulitzer Prize. *Let 'Em Eat Cake* (1933) was the less-successful sequel by the same creative team. In satirizing Presidential politics of the Twenties and Thirties, both shows were (for their time, anyway) bold hybrids of musical comedy and comic opera—or, as one contemporary critic called them, "Jazzy Gilbert and Sullivan." *Of Thee I Sing* has had a couple of revivals, on Broadway in the early Fifties and on television in 1972, but the more controversial *Let 'Em Eat Cake* hasn't been a real rarity.

Last year, as part of the extensive tributes marking the fiftieth anniversary of George Gershwin's untimely death in 1937, both shows were revived in concert form at Brooklyn's Academy of Music. They were conducted by Michael Tilson Thomas, long an avid Gershwin champion both on records and in the concert hall. He was able to use the recently rediscovered original orchestrations of *Of Thee I Sing*, but most of the materials for *Let 'Em Eat Cake* are still lost, so he and some dedicated colleagues reconstructed them from Ira Gershwin's workbooks.

Much as I feel that such efforts to preserve classic musicals in as authentic as possible re-creations should be applauded, I find the pleasures of these recordings from those Brooklyn performances to be intermittent at best. Maybe it's just that lampoons of matters Presidential have taken on such new and more soothing dimensions in recent years, but despite good casting in*

**THE POGUES: If I Should Fall from Grace with God** (see Best of the Month, page 95)

**THE RAINMAKERS: Tornado.** The Rainmakers (vocals and instrumental). Snakedance, Tornado of Love, The Wages of Sin; Small Circles: No Romance; and five others. MERCURY 832 795-1, © 832 795-4, © 832 795-2 (40 min).

**Performance:** Mostly terrific

**Recording:** Impressive

There's good news and bad news about the Rainmakers' sophomore album. The good news is that their songwriting remains as intelligent as before: "Tornado" has substantial tunes, lots of clever lines, and a heartening structural directness (some of the songs on the band's debut record seemed unnecessarily fuzzy and eccentric). The bad news is that nothing in "Tornado" is as funny and audacious as *Downstream* (in which Chuck Berry met Harry Truman) or *Let My People Go Go* and that the band may be succumbing to Creeping Significance. Listening to Snakedance and Tornado of Love, for example, you can almost visualize a ghostly neon sign hovering over the album: THIS BAND CARRIES THE WEIGHT OF THE WORLD ON ITS SHOULDERS! Still, the Rainmakers is one of the few mainstream acts around that is even addressing the real world, so I probably shouldn't complain as especially as "Tornado" also includes songs as straightforwardly moving as Small Circles and One More Summer. And, as a bonus, lead singer Bob Walkenhorst continues to sound more eerily like Gene Pitney than ever, while the rest of the band makes appropriately Stones-ish and Who-ish noises behind him. Actually, there's nothing wrong with this band that the lift of a hit single couldn't cure. Programmers, please take note. S.S.

**DAVID LEE ROTH: Skyscraper.** David Lee Roth (vocals); Steve Vai (guitars); vocal and instrumental accompaniment. Knuckleboxers: Just Like Paradise; The Bottom Line; Skyscraper; Damn Good; and five others. WARNER BROS. 25671-1, © 25671-4, © 25671-2 (41 min).

**Performance:** Slipping

**Recording:** Good

The jacket photo on "Skyscraper" shows David Lee Roth suspended from...
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SUPERTRAMP: Free as a Bird. Supertramp (vocals and instrumentals); vocal and instrumental accompaniment. It's Alright: Not the Moment; It Doesn't Matter; Free as a Bird; You Never Can Tell with Friends; and four others. A&M SP-5181, ©CS-5181, ©CD-5181 (44 min).

Performance: No muscle tone Recording: Good

If you're in your thirties, divorced, maybe a little disillusioned, Supertramp wants to be your rock band. The ironically titled "Free as a Bird" contains six songs about the pain of separation and betrayal, one song about drug abuse, and one up-tempo number called Thing for You. The jazz-rock rhythms are lively but unthreatening, a friendly dance track for a single-parent mixer. If you're a recent "ex," the lyrics will seem amazingly perceptive, but teenagers would laugh at this record. They always think they know more about rock-and-roll than grownups.

M.P.
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SWING OUT SISTER: It's Better to Travel. Swing Out Sister (vocals and instrumentalists), other musicians. Breakout; Twilight World; After Hours; Blue Mood; Surrender; and four others. Mercury 832 213-1, © 832 213-4, © 832 213-2 (40 min).

Performance: Seamless, romantic
Recording: Excellent

The appearance of retro-cool artists like Sade and Everything But the Girl may signal a mild revival of Fifties romanticism, when Nelson Riddle made music for candlelit dinners and rainy evenings. Swing Out Sister is a trio squarely in that romantic tradition. Its music is synth-pop, but without the genre's archcynicism or acute hipness—old-fashioned love songs on newfangled instruments. The biggest single from this album, Breakout, is really just a perky, Astrud Gilberto-style vocal with a savvy, New Wave synth overlay. Elsewhere in "Better to Travel," vocalist Corrine Drewery, keyboardist Andy Connell, and drummer Martin Jackson fuse Fifties cool, Gamble-Huff soul, and Eighties dance rhythms into evocative, seamlesss pop music. Drewery's vocals are particularly appealing, free of mannerism or pretension, pure and clear as falling rain. The settings swing gently, a feathery cushion of sampled sounds along with piano, saxophone, and Jackson's smooth brush work.

JAMES TAYLOR: Never Die Young. James Taylor (vocals, guitar); vocal and instrumental accompaniment. Never Die Young; T-Bone; Runaway Boy; Sun on the Moon; Home by Another Way; and five others. Columbia FC 40851, © FCT 40851, © CK 40851 (40 min).

Performance: Back on track
Recording: Nice

In his last album, James Taylor was halfway through a winning performance of melancholy and upbeat observations on life when he stubbed his toe on side two and sat out the dance. Now Taylor returns with his most exuberant album in a decade, a surprising tour de force that finds him sounding muscular and lithe and ready to beat the band.

Framed by his usual ensemble of elegant bass, crisp percussion, shimmering electric guitar, pastel washes of background singers, and his own sparse and sparkling acoustic-guitar work, Taylor moves further into the jazzy milieu that has attracted him for some time now. He and producer Don Grolnick experiment boldly with varying rhythms—usually within each song—from Forties romance to R&B and reggae, and even country hoedown, in arrangements that are deft, sophisticated, but accessible.

Taylor, with his trademark calm-as-a-cantaloupe vocals, can be charmingly jaunty, as in Home by Another Way, or drivingly hypnotic, as in Runaway Boy. But in the weakest cut, First of May, which screams for Sergio Mendes and Brazil '66, he is also annoyingly facile, a musical dilettante. Where he especially shines is in the wistful material like Baby Boom Baby, which is as much about fame as panacea as it is about looking up old flames. And Letter in the Mail, popular music's one-millionth you-can't-go-home-again song, works in an unsettling, bare-bones way, reaching past sentimentality and nostalgia and grabbing hold of something real. In between, Taylor sends the listener spiraling from gooney-eyed euphoria to grateful contentment, with a little healthy cynicism thrown in for Valentine's Day.

There is still that resolute tightness about Taylor's music—a refusal really to "let go"—that has marked almost all of his work on records since Steamroller Blues. But there is also such variety, such musical optimism and growth, that the criticism barely matters. A.N.

WILD SEEDS: Mud, Lies & Shame (see Best of the Month, page 97)
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Django

Europe provided fertile ground for jazz in the Twenties and Thirties, but it contributed little to the music itself. To be sure, there were Continental jazz musicians, but almost all were pale imitators of American counterparts. Guitarist Django Reinhardt was a notable exception.

Born in Belgium in 1910, Django (as he became known) began his musical career in the tradition of his ancestral gypsy heritage, but jazz was sweeping Europe by the time he reached the end of his teens, and it changed his course. Combining elements of guitar styles defined by Lonnie Johnson and Eddie Lang, he still imbued his playing with an unmistakable gypsy flavor, and the result was stunning. A new set in DRG Records’ ongoing reissue series of material from the French Swing label documents Django’s transition from pop accompanist to jazz soloist. Its 112 tracks range from his banjo sessions of 1928 to Radio broadcast, captures one of those intimate collaborations.

No guitarist or jazz lover should be without these superb recordings, but you don’t have to be either of these things to enjoy the spirit and beauty of the performances. Chris Alberson

Django Reinhardt: Django/USA. Django Reinhardt (guitar); Quintet of the Hot Club of France; other musicians. ORIENTAL SHUFFLE; ISE A-MUGGIN; LIMEHOUSE BLUES; OUT OF NOWHERE; MAHÉ; SOLID OLD MAN; BABY; EASY GOING; MYSTERY PACIFIC; SWING INTERPRETATION OF THE FIRST MOVEMENT OF THE CONCERTO IN D MINOR BY J. S. BACH; SWING GUITARS; CHARLESTON; NUAGES; NAGASAKI; BODY AND SOUL; DAPHNE; DINAH; PARAMOUNT SWING; BOLERO DE DJANGO; FROM YOU; MADEMOISELLE ADELINA; THE SHEIK OF ARABY; YOU RASCAL YOU; ST. LOUIS BLUES; VIPER’S DREAM; SWEET GEORGIA BROWN; AND EIGHTY-SIX OTHERS (SIXTY-EIGHT OTHERS ON CD). SWING/DRG 8420/26 seven LP’s, © CDSW 8421/23 two CD’s (143 min) and CDSW 8424/26 two CD’s (145 min).

This album will remind you of Sergio Mendes—and for good reason. Oscar Castro-Neves, a native of Rio de Janeiro, had a lot to do with the Mendes sound, working on fifteen Mendes albums as a guitarist, a music director, and a conductor. A number of the songs in “Brazilian Scandals,” including the title track and Sugarloaf Skyride, combine a light chorus of wordless vocals with a sizzling bossa-nova groove. And that’s as far as the accompanist produces; the singer develops his music. It simmers, but it never comes to a boil. The pristine quality of the recording, as well as the ample use of strings, makes it sound like the contemporary Brazilian version of a Creed Taylor production, but it’s as if one of Taylor’s master arrangers went to Rio and forgot to take any soloists with him.

Ron Gievis

DICK HYMAN AND RUBY BRAFF: Manhattan Jazz. Ruby Braff (cornet); Dick Hyman (piano). Jeppers Creepers; I’m Crazy ’Bout My Baby, and My Baby’s Crazy ’Bout Me; Jubilee; You’re Lucky to Me; Some Day You’ll Be Sorry; and five others. MUSICMASTERS 20136W, © 40136T, © 60136M (44 min).

Performance: Sparkling
Recording: Excellent

Cornettist Ruby Braff and pianist Dick Hyman have each pursued their own successful careers, but since 1975 they have occasionally combined their talents to re-create a sound first established by Louis Armstrong and Earl Hines. “Manhattan Jazz,” recorded in a New York studio for a 1985 Public Radio broadcast, captures one of those intimate collaborations.

Hyman is a man who spends a good deal of time exploring great styles of the past, which has not left him much time to develop a style of his own, but he’s very good at doing what he does. Braff’s rich cornet tone virtually defines the words “listening pleasure.” Put them together and you have a set that evokes the lyricism of Bix Beiderbecke and the delightful keyboard ramblings of Art Tatum, with a whole lot of other goodies thrown in. “Manhattan Jazz” doesn’t cut any new paths, but it offers a surpassingly smooth ride over a few old ones.

C.A.

OSCAR CASTRO-NEVES: Brazilian Scandals. Oscar Castro-Neves (acoustic guitar, synthesizer, percussion); Gilson Peranzzetta (acoustic piano), other musicians. Brazilian Scandals; Pensaand: Sugarloaf Skyride; Return to Rio; Tropical Dream; Ipanema Afternoon; and five others. JVC © SC-3302, © JD-3302 (45 min).
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BRAHMS: Piano Concerto No. 1, in D Minor, Op. 15. Alfred Brendel (piano); Berlin Philharmonic Orchestra, Claudio Abbado cond. PHILIPS © 420 071-1, © 420 071-4, © 420 071-2 (49 min).

Performance: Inspiring
Recording: Superb

Alfred Brendel often provides a corrective to pomposity, and his approach is especially welcome in the Brahms Piano Concerto No. 1. Even more than his earlier recording of it, with Hans Schmidt-Isserstedt and the Concertgebouw Orchestra, the new performance is utterly free of any gesture resembling pompous declamation. His choice of tempo is a bit slow at times—especially in the slow movements—but the pianist sustains the momentum, and his approach is sensitive and attuned to the work's poetry. He is especially effective in the Andante, and his playing is full of feeling and conviction. The orchestra responds with warmth and enthusiasm, and the recording is clear and balanced. Overall, it is a highly rewarding performance that should be enjoyed by all lovers of Brahms' music.

THE VOLUPTUOUS CORE OF RAVEL

The composer Gabriel Fauré liked to remark that “art has every reason to be voluptuous,” and he encouraged his students to explore the sensuous potentialities of their art. Ravel, too, was a great lover of voluptuousness. His Piano Concerto No. 2 in D minor, Op. 15, is a perfect example of his approach to this spirit. The work is sumptuous and luxurious, and Ravel evokes warm colors, shimmering textures, and sumptuous melodies. The pianist Mikhail Rudy, who performed the concerto at a recent concert of the Berliner Philharmoniker, demonstrated his exceptional poetry and technical skill in this difficult role. His playing was compared to the sound of a piano, and the well-focused recording, made in the Church of Notre-Dame du Liban in Paris, could serve as an outstanding demonstration of how vividly and beautifully the sound of a piano can be reproduced.

Rudy's playing is as effective as his impulse is sure, and the well-focused recording, made in the Church of Notre-Dame du Liban in Paris, could serve as an outstanding demonstration of how vividly and beautifully the sound of a piano can be reproduced. The same is true of the other pieces. The Pavane pour une infante défunte, La Valse, Miroirs, Gaspard de la nuit, Mikhael Rudy (piano). ANGEL © CDC-49275 (68 min).

THE composer Gabriel Fauré liked to remark that “art has every reason to be voluptuous,” and the young Russian-born, Paris-based pianist Mikhail Rudy seems to have taken that dictum to heart in his new Ravel program for Angel. While other pianists may attack Ravel's solo-piano version of La Valse for its pyrotechnical possibilities, Rudy goes right to the core of voluptuousness around which the piece was conceived. Every phrase is opened up to its heady potentialities; in place of icy brittleness, Rudy evokes warm colors, shimmering and sumptuous—until the concluding section, which becomes all the more effective for the chilling contrast it makes with what has gone before. And he sustains the work's momentum beautifully. The same is true of the other pieces. The Pavane pour une infante défunte, especially, benefits from Rudy's steady, dignified pace, its tilt toward briskness neatly offsetting the poignancy that might have become mawkish at a more indulgent speed. There are fireworks aplenty in the Alborada del gracioso movement of Miroirs and in the Scarbo that concludes Gaspard de la nuit. Indeed, both of these suites are brought off on an exceptional level of poetry, making the most of their contrasting moods while avoiding any hint of exaggeration or excess. Rudy's tone is at all times as handsome as his impulse is sure, and the well-focused recording, made in the Church of Notre-Dame du Liban in Paris, could serve as an outstanding demonstration of how vividly and beautifully the sound of a piano can be reproduced.

Rudy and the Berliner Philharmoniker gave a rapturously received performance of the Emperor. That was the only one of Beethoven's five concertos to be performed in the concert, and it was especially welcome in the Brahms Piano Concerto No. 1. Even more than his earlier recording of it, with Hans Schmidt-Isserstedt and the Concertgebouw Orchestra, the new performance is utterly free of any gesture resembling pompous declamation. His choice of tempo is a bit slow at times—especially in the slow movements—but the pianist sustains the momentum, and his approach is sensitive and attuned to the work's poetry. He is especially effective in the Andante, and his playing is full of feeling and conviction. The orchestra responds with warmth and enthusiasm, and the recording is clear and balanced. Overall, it is a highly rewarding performance that should be enjoyed by all lovers of Brahms' music.

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Performance: Committed Recording: Very good

While it is convenient to have integral collections of the Chopin waltzes, the mazurkas, the nocturnes, etc., it is good to have programs like this on records, too. The mazurkas and waltzes here are actually more scattered through the program than the heading above would suggest, and the variety this affords is altogether agreeable. So is Ruth Laredo's playing. If she brings no startling new insights to this familiar material, she is unfailingly responsive to the character of the pieces and certainly has the technical resources to back up her commitment. The fine sound of the piano in this recording only enhances this musically lovely package.

R.F.

HAYDN: The Creation. Judith Blegen (soprano), Gabriel; Thomas Moser (tenor), Uriel; Kurt Moll (bass), Raphael; Lucia Popp (soprano), Eva; Kurt Ollmann (bass/baritone), Adam; Bavarian Radio Chorus and Symphony Orchestra. Leonard Bernstein cond. DEUTSCHE GRAMMOPHON © 419 765-1 two LP's, © 419 765-4 two cassettes, © 419 765-2 two CD's (117 min).

Performance: Wonderful Recording: Excellent

Addressing himself to the glories of Haydn's Creation, Leonard Bernstein reveals a particular affinity for the Viennese master. While the score is filled with delightful evocations of nature as angels relate the Biblical story of the creation, Haydn's message is essentially a serious ode to the Creator, and Bernstein achieves a perfect balance between the charm and the dignity of the work. His overall view places the narrative climax not at the end of the second part, where some conductors do, but more appropriately in the section depicting the creation of man in the third part. In many ways, Haydn actually underlines the story in the orchestral writing, using the vocal forces to amplify upon and celebrate the individual events. And so it is in this reading, which is enriched by the glowing sonorities of the Bavarian Radio Symphony. This is by no means to belittle the work of the excellent roster of soloists nor the sumptuous singing of the Bavarian Radio Chorus. Each singer discharges his or her role with technical and artistic confidence, complementing Bernstein's profound vision of this miraculous music.

S.L.

LISTEN: Mephisto Waltz No. 1; La campanella; Harmonies du soir; Feux follets; Sonata in B Minor (see Best of the Month, page 98)

MONTEVERDI: L'Orfeo. Anthony Rolfe Johnson (tenor), Orfeo; Julianne Baird (soprano), Euridice; Lynne Dawson (soprano). La Musica: Anne Sofie von Otter (soprano), Messaggiera; Mary Nichols (soprano), Speranza; John Tomlinson (baritone), Caronte; Diana Montague (soprano), Prospera; Wiliard White (baritone), Plutone; others. Monteverdi Choir; His Majesties Sagbutts and Cornets; English Baroque Soloists, John Eliot Gardiner cond. ARCHIV © 419 250-1 two LP's, © 419 250-4 two cassettes, © 419 250-2 two CD's (105 min).

Performance: Superb Recording: Superb

Of all the recordings of L'Orfeo, Monteverdi's masterpiece, this is the only one I know in which every singer and instrumentalist is so at home with the singing style of Monteverdi's day and with the early Baroque style of instrumental playing that the opera comes off as naturally as though it were Traviata or Carmen being performed by the greatest international operatic celebrities. Anthony Rolfe Johnson, in the taxing role of Orfeo, is superb. The clarity and agility of his voice never fail him, and his sense of characterization is extraordinary. Julianne Baird is a wonderful Euridice; her response to
Orfeo's backward glance in Act IV, "Ahi, vista troppo dolce," is heartbreaking. The lesser parts are also beautifully sung, as are the ensembles of shepherds and spirits. The choral and instrumental work is especially strong in its movement from the deft lightness of celebration in the beginning to the austere tragedy of the ending. As usual, conductor John Eliot Gardiner draws the most from his forces and paces the work convincingly. This Orfeo is a must.

S.L.

MOZART: Mass in C Major (K. 317, "Coronation"); Vesperae solennes de confessore (K. 339). Joan Rodgers (soprano); Elisabeth von Magnus (contralto), Josef Protschka (tenor); László Polgar (bass); Arnold-Schönberg Chor, Choralschola der Wiener Hofburgkapelle; Concentus Musicus Wien, Nikolaus Harnoncourt cond. TELDEC/KOCH IMPORT SERVICE © 8.43555 ZK (57 min).

Performance: Excellent
Recording: Excellent

In contemplating Nikolaus Harnoncourt's remarkable contribution to authentic performance practice and early music, I find that I am most impressed with what he has done for Mozart. This recording of the well-known Coronation Mass and the rarely heard Vespers only reinforces that assessment. Not only does Harnoncourt observe, in the orchestral playing, the sharp accentuations and precise articulation of the Classical period, but, more important, he applies the same techniques to the choral singing, and in such a way that they sound natural rather than contrived. The result is that he imparts to the music a vigor that it often lacks and reinstates its eternal freshness. The soloists, too, obviously understand what Harnoncourt is after. It's also worth noting that Harnoncourt respects the tradition of inserting the appropriate Gregorian antiphons (or chants) in the Vespers, and how beautifully they are sung under his direction!

S.L.

PROKOFIEV: Romeo and Juliet, Op. 64 (see Best of the Month, page 95)


Performance: Handsome
Recording: Very good

In this performance of Prokofiev's heroic Fifth Symphony, André Previn proves himself more than a match interpretively for all his rivals. Of the two other versions on compact disc with which I am familiar, Leonard Slatkin's for RCA, which won a well-deserved Grammy Award, may have a slight edge in brilliance, and the rich chestral playing, the sharp accentuation, which Harnoncourt observes, in the orchestra itself, contribute greatly to the sonic impact of this masterly achievement. If Levine is the recording's most luminous star, the singers also shine. In the title role, Peter Hofmann sounds more secure than he has of late, creating a believable, sympathetic character happily removed from "the innocent fool" he's called in the libretto, while Simon Estes gives an arresting portrayal of Amfortas. Hans Sotin's Gurnemanz is movingly humane throughout. Matti Salminen and Franz Mazura, as Titurel and Klingsor, respectively, are excellent in their strongly contrasting roles.

As Kundry, Waltraud Meier is dramatically affecting; she creates a character that is both pitiable and hateful in the earlier sections of the opera and later effectively conveys her transfiguration. Meier's singing is not always marked by beauty of tone—there is some stridency at the top—but she uses her voice intelligently and with expressive purpose.

The Bayreuth Festival Chorus and Orchestra perform, as you might expect under these circumstances, with eloquence and skill. You sense, as with cast and conductor, a particular devotion to the opera and to the specific occasion in Bayreuth's history that resulted in this well-engineered, outstandingly realized recording.

Robert Ackart

WAGNER: Parsifal. Peter Hofmann (tenor), Parsifal; Waltraud Meier (mezzo-soprano), Kundry; Hans Sotin (bass), Gurnemanz, Simon Estes (baritone), Amfortas; Matti Salminen (bass), Titurel; Franz Mazura (baritone), Klingsor; others. Chorus and Orchestra of the Bayreuth Festival, James Levine cond. PHILIPS © 416 842-1 five LP's, © 416 842-4 four cassettes, © 416 842-2 four CD's (278 min).

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sonics of Vladimir Ashkenazy's recording with the Concertgebouw on London are enticing. But along with impressive musicianship, Previn's package offers a very substantial and attractive coupling in the form of Prokofiev's most popular symphony, the Classical, or Symphony No. 1.

In this reading of the Classical Symphony, Previn matches the finesse of his famous London Symphony recording on Angel, and his pacing is surprisingly close to that of Koussevitzky's recording with the Boston Symphony on 78's, which for years was regarded as the ultimate realization of this piece. The Fifth Symphony is even more impressive. Previn fully plumbs the tragic depths of this symphony on "the spirit of Man." Perhaps the scherzo could have been a bit more diabolical, but the rest of the performance is a most telling amalgam of impassioned lyrical drama and overall formal command. In the finale particularly, Previn and the Los Angeles Philharmonic give their all, building up to a conclusion that packs a real visceral wallop.

UCLA's Royce Hall is not as brilliant a recording venue as some, but it serves more than adequately here, and what sounds to my ear like a fairly close microphone setup makes for a better result than that achieved by Telarc in Previn's somewhat less successful recording of Alexander Nesky in the same locale.


Performance: Lush
Recording: Fine

Typically for Saint-Saëns, his E Minor Piano Trio is a monument to eclecticism, filled with bombast and passion interlarded with delightful waltzes and scherzos, and the fugal finale includes every contrapuntal device in the book. And it is marvelously presented here by the Arden Trio in a performance that milks every effect for all it's worth. Unfortunately, the players carry some of Saint-Saëns's bombast over into the Ravel Trio in A Minor, which is a very different sort of work. As a result, much of the delicacy of Ravel's writing is overwhelmed, and his supple melodic style becomes stiff. Nonetheless, this release is of interest for the rarely heard Saint-Saëns, and the recorded sound is first-rate throughout.


Performance: Splendid
Recording: Exceptional

Villa-Lobos: Bachianas brasileiras Nos. 1 and 5; Suite for Voice and Violin; Four Preludes and Fugues. J Jill Gomez (soprano); Peter Manning (violin); Pleeth Cello Octet. HYPERION/HARMONIA MUNDII USA © A 66257, © KA 66257 © CDA 66257 (54 min).

Performance: Good
Recording: Good

VILLA-LOBOS: Five Preludes; Chôro No. 1; Three Études; Suite populaire brésilienne. Philippe Lemaigre (guitar). RICERCAR © RIC 039012 (57 min).

Performance: Committed
Recording: Unusually high level

Last year marked the centenary of the birth of Heitor Villa-Lobos, and these two recordings, each containing some of

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his best-known works, are among those made in observance of that anniversary. The Hyperion release comes into fairly direct competition with a recent Delos CD of the same two Bachianas and a handful of Bach transcriptions played by the Yale Cellos under Aldo Parisot. It is in depicting so well the performances of the Bachianas the English team is cleaner and more precise in No. 1, but Parisot's players are even more clearly superior in No. 5, not only in their own right but thanks to Arleen Augè's truly incomparable singing of the soprano part. (The only other duplication is the Delos disc is the transcription of the Prelude in F-sharp Minor from Book I of Bach's The Well-Tempered Clavier.) But Jill Gomez and Peter Manning do convey here the charm of the Suite for Voice and Violin.

Philippe Lemaître's painting of Villa-Lobos, reproduced on the booklet with the Ricercar CD, is a touching indication of the commitment felt in his performances. The guitar pieces he has recorded are all presented on other CD's, but his seem to be the only one to bring them all together. It's a pity he recorded only three of the twelve études (although there would not have been time for all of the nine he omitted), but he does include the Chôrinho frequently appended to the four movements of the Suite populaire brésilienne. The sound level is unusually high on this disc, but the quality is pleasant enough when the playback setting is adjusted. The documentation is somewhat less satisfactory. The Chôro No. i is listed as Chôros typical, with no reference to its being the first in the cycle of numbered works called chôros; the title Chôrinho is consistently misspelt; and Lemaître's annotation is poorly translated.

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The Met's artistic director, Troyanos is the Composer. James King sings the role of Zerbinetta, Bacchus, Kathleen Battle is Adriana, Ariadne, and Tatiana Troyanos is the Composer. The Met's artistic director, James Levine, conducts the performance.

More good news for Norman's legion of fans is that she's just recorded Ariadne for Philips under Kurt Masur's direction. Opposite her as Bacchus is a newcomer to discs, Canadian tenor Paul Frey, Zerbinetta is sung by Edita Gruberova's follow, Julia Varady is the Composer. The recording is slated for release early next year.

More from PBS, too: On May 7 the network will carry a performance of the American Ballet Theatre's Romeo and Juliet. ABT's three-act Romeo, set to the popular Prokofiev score, is choreographed by Sir Kenneth MacMillan.

ATTENTION, Space Cadets. Is there a gaping hole in your soul where classic Seventies space music of the Tangerine Dream/Pink Floyd variety is concerned? Well, then, keep an ear out for Wavestar, a British band whose recently released album "Moonwind" (Passport) reprises the exotic sounds of vintage Dream and Floyd. It should be just your cosmic cup of tea.

Wavestar's John Dyson recently told us that the record's lush electronic textures were created on an antique eight-track tape machine with absolutely no digital gear. Even more surprising, Dyson also let it slip that the band's original musical inspirations were two decidedly un-spacy Sixties rock groups, the Ventures and the Shadows. But does he mind that Wavestar's efforts are being tagged as New Age music? "I don't know," Dyson answered. "Looking at the three of us, perhaps you should call it Middle Age music."

The final performance in March of the Metropolitan Opera's outstanding production of Strauss's Ariadne auf Naxos, with Jessye Norman in the title role, was taped for television and will be shown on PBS stations countrywide on April 27. James King sings the role of Bacchus, Kathleen Battle is Zerbinetta, and Tatiana Troyanos is the Composer. The Met's artistic director, James Levine, conducts the performance.

Wavestar: spacy Not many all-instrumental rock albums on small labels get nominated for Grammys (not many get released, either), but that's exactly what happened to "Trash, Twang & Thunder," by the all-star outfit Big Guitars from Texas, when Austin-based Jungle Records released it in 1985. A killer anthology of bluesy, surfy tunes in the great tradition of Sixties rockaxemasters like Freddie King and Lonnie Mack, the album is at last available on CD courtesy of Delos.

More news: The new disc is appropriately subtitled "A Listener's Guide to the Art and Science of Recording the Orchestra." The annotation describes some of the engineering challenges Eargle had to meet in recording the new disc is appropriately subtitled "A Listener's Guide to the Art and Science of Recording the Orchestra." The annotation describes some of the engineering challenges Eargle had to meet in recording each work (often with spectacular results) and includes a valuable glossary of terms used by recording engineers and writers in the audio field.

WAVESTAR Fat Boys fans can kill time waiting for the new collaboration to be released (it's due out Memorial Day weekend) by watching the Warner Home Video version of the Boys' feature-film debut, Disorderlies, which also stars the eternally put-upon Ralph Bellamy.

Norman as Ariadne

In any case, fans of contemporary Texans like Stevie Ray Vaughan or the Fabulous Thunderbirds are advised to check it out immediately.

New compact disc from Delos, "The Symphonic Sound Stage," is more than just a sampler and more than just an audiophile demo record. It is both, but it's also a sort of sonic profile of John Eargle, a leader in the field of audio engineering who is celebrating his twenty-fifth year in the business. Eargle has worked with Delos for almost ten years and has engineered some of the label's most successful recordings, including Strauss's Thus Spake Zarathustra with the Seattle Symphony under Gerard Schwarz and Respighi's Roman Festivals with James DePriest and the Oregon Symphony. Containing short passages from these works and other tidbits from the Delos catalog, the new disc is appropriately subtitled "A Listener's Guide to the Art and Science of Recording the Orchestra." The annotation describes some of the engineering challenges Eargle had to meet in recording each work (often with spectacular results) and includes a valuable glossary of terms used by recording engineers and writers in the audio field.

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MTV, but the Hall of Fame has complete footage in its archives. It strikes us as monumentally unfair that the full performances are seen only by the industry bigwigs who can afford tickets to the black-tie galas themselves. C'mon, Hall of Fame: How about some power to the people?

Entering the final planning stages for the Eighth International Van Cliburn Piano Competition, to be held a year from now in Fort Worth, the Van Cliburn Foundation has for the first time commissioned a poster—and commissioned it from a distinguished native Texan, painter Robert Rauschenberg. The poster will be distributed internationally for promotional purposes and will serve as the cover of the official competition program. Copies of the poster can be ordered for $20 each from the foundation at 3505 W. Lancaster, Fort Worth, TX 76107; or telephone (817) 738-6536.

The fourteen-member jury converging on Fort Worth next May to judge the competing young pianists includes a number of eminent pianists. Among them are Christina Ortiz, a Van Cliburn Gold Medalist in 1969 (she has records on the Angel and London/Decca labels), György Sándor (currently represented on the Vox label), Abbey Simon (on Turnabout), and John Lill, a 1970 Tchaikovsky Competition winner (on Deutsche Grammophon and ASV). Other Van Cliburn jurists whose names may be familiar to record buyers are John Pfeiffer, the veteran RCA producer, and American composer John Corigliano.

RCA Red Seal has signed the Tokyo String Quartet to an exclusive, long-term contract and set as an early priority a recording of the complete quartets of Schubert. The first release in the cycle, a coupling of the Quartets Nos. 9 and 13, is due this month.

Founded in 1969 at the Juilliard School in New York City, where its original members had come to complete their studies, the Tokyo Quartet came to worldwide attention a year later by winning an international competition in Munich. With that start in mind, the ensemble will help boost the careers of some young pianists by accompanying the semifinalists in next year’s Van Cliburn Competition.

The Tokyo Quartet’s current discography spans a number of labels, including RCA, and ranges from works of Haydn (the Prussian Quartets, Op. 50, on Deutsche Grammophon) and Mozart (the Flute Quartets, with flutist Paula Robison, on Vanguard) to Respighi’s Il tramonto (with soprano Renata Scotto, on Vox) and Bartók’s quartets (again on DG).

Vestron Music Video is readying a documentary entitled “British Rock: The Legends of Punk and New Wave.” The tape features footage of the Sex Pistols, the Clash, the Pretenders, and the Boomtown Rats... According to Spring Arbor, a distributor of gospel records, sales of albums by Jimmy Swaggart have not declined since the controversial TV evangelist confessed to indiscretions with a New Orleans hooker... Separated at birth? Comedian Jay Leno, appearing on the David Letterman show after the Grammy Awards, noted the resemblance between Grammy winners U2 and the Larry, Darryl, and Darryl characters on CBS’s Newhart...
Cassette Redux

You've noticed, surely, that with the forces of digital audio now swarming freely over the land, there has been an aggravating tendency for older analog media suddenly to become "finished"—that is, to become refined to a point that would have been almost unthinkable when they had only each other as competition. Where were these advancements when we really needed them, you justifiably ask? Well, in the case of one whose acquaintance I've just recently made, it's correct to say that digital technology was a prerequisite for its existence, although the medium it serves is entirely analog. In fact, it's a very humble form of analog audio: the prerecorded tape cassette.

What makes the prerecorded cassette such a mediocrity among recorded-music formats? High-speed duplication, essentially, but that answer requires some expansion. Duplication speeds of thirty-two and sixty-four times the cassette playing speed of 1/8 ips, speeds that are standard in the duplication industry, pose no insurmountable problem for the cassette tape on which the music message is being recorded. What they hurt is the "running master" tape from which the message comes. In the interest of quality, you'd like to record these masters at 7 1/2 ips, but multiplying that speed by sixty-four risks turning tape into tatters. So you compromise with a master recording speed of 3 3/4 ips. This frequently amounts to a major compromise, overall quality being dismal and azimuth problems with a wide-track format being formidable. And you're still running somewhat too fast for comfort in the duplicating stage.

Okay. Are we ready, then, to start thinking about a system with an 80:1 duplication speed and negligible transfer loss? Richard Clark of American Multimedia is. Digital Audio Analog Duplicator (DAAD) is his designation for a system based not on a duplication-master tape, but on a 14-inch computer hard disk that spews forth data at a speed of 14 megabytes per second, leading to a digital-to-analog (D/A) conversion rate of 3.58 million samples per second—somewhat above the more familiar rates of 44.1 and 48 kHz used in the CD and DAT formats, you'll grant. The system uses 16-bit linear pulse-code modulation (PCM), which Clark chose not because it makes life easier (it doesn't), but because it amounts to something of a standard in an area that needs standards.

In operation, the system is loaded with the program—from a digital tape or a CD, usually—in real time. A brief diversion into the analog domain is necessary to permit Dolby B or Dolby C encoding. Then, with a blast of super-density data, the disk unloads into the D/A converters ($300 two-chip affairs of unique properties), which provide the analog output for the high-speed slave recorders. Clark uses Dolby HX Pro headroom extension on the slaves for Type II tapes, but he is not yet satisfied with its results on metal formulations.

The speed at which the DAAD functions does not permit any error correction or error detection beyond the simplest sort of parity check, and at first this problem loomed large. Today, error-prone conditions on the disk (which is sealed away in an evacuated chamber of the proprietary drive) cause the pickup to be diverted off to another, unused portion of the disk, and the new address is stored in memory. Allowing for this mode of operation, the capacity of the system is about 50 minutes of four-track program—more than enough for a C-90 cassette.

When an invited group of audio experts visited American Multimedia's plant in Burlington, North Carolina, we amused ourselves running off copies of CD's on metal cassettes with Dolby C and trying to tell source from tape. My score with the ABX double-blind tester was a bare squeak above 50 percent, meaning I could very occasionally hear and correctly identify a difference. Hearing a difference, however, did not mean having a preference. On balance, I found the two formats equally satisfactory in all important listening respects—something I have decided to announce in print only after much soul searching.

Fortunately for cassette purchasers, Clark's operation is a large one, broadly based in both hardware and software manufacture (including everything from mastering through to label printing and packaging) and with sufficient buoyancy to launch new technology and keep it afloat. Interest in the DAAD system has reportedly been expressed by RCA and Telarc, and Doug Sax of Sheffield Labs went away a happy convert after our visit, particularly pleased that the system manages both to advance quality greatly and to reduce production time—and therefore cost—significantly.

Interestingly, Sax says he means to obtain from Clark an exclusive on metal-tape duplication. "Metal tape is a must for quality," he insists. "Type II recordings just go away within a year, steadily if you store them and even more quickly if you actually play them. Metal's magnetic properties prevent that [deterioration]."

Hmm. Could it be that metal tape, which not all that many people have found all that much use for so far, is on the brink of a vast new theater of operations? If so, it probably won't be the only big cassette change that Clark's efforts bring about.

by Ralph Hodges
The McIntosh XRT 22 Loudspeaker System delivers

The McIntosh XRT 22 is the purest expression of the loudspeakers scientist's endeavors. It is the one right combination of component parts that has eluded the diligent searcher for the loudspeaker bridge to the dominion of reproduced musical reality. The high-frequency radiator column is an illustration of the right combination. The 23 tweeter elements can reproduce 300 watts sine wave input power at 20 kHz, with the lowest measured intermodulation distortion. Because each tweeter mechanism handles a small quantity of the total power, extremely low quantities of distortion are developed. The total column radiates the energy in a half cylindrical time co-ordinated sound field. The low distortion transparency of sound, coherence of sound images, definition of musical instruments, and musical balance is simply a revelation that you must experience.

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