

# Stereo Review

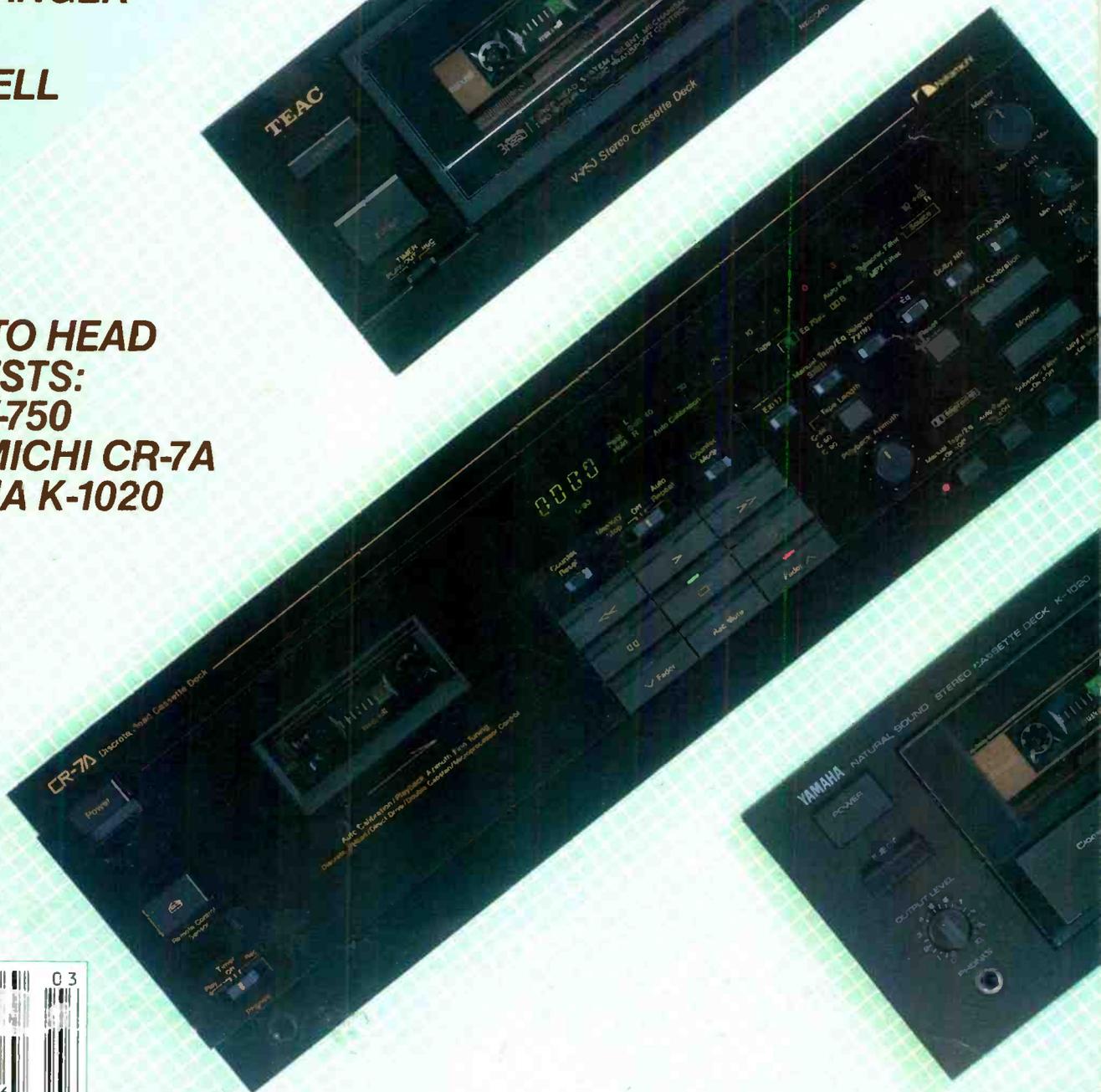
MARCH 1986 \$1.95

**SPECIAL TAPE ISSUE**  
**THREE TOP TAPE DECKS**  
**POCKET STEREO ROUND-UP**  
**GUIDE TO BLANK TAPE**

**SONY'S NEW CAR**  
**CD CHANGER**

**JONI**  
**MITCHELL**

**HEAD TO HEAD**  
**LAB TESTS:**  
**TEAC V-750**  
**NAKAMICHI CR-7A**  
**YAMAHA K-1020**



**In 1954, our Acoustic Suspension  
was the most significant innovation  
in loudspeakers.**



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# Stereo Review



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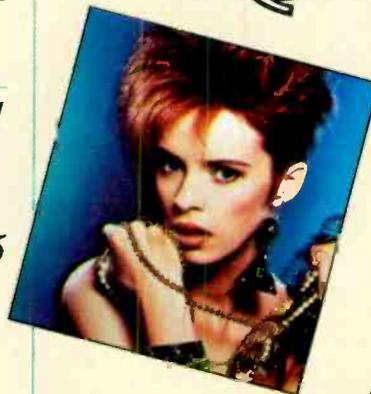
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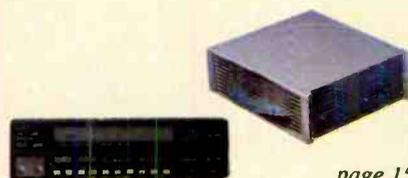
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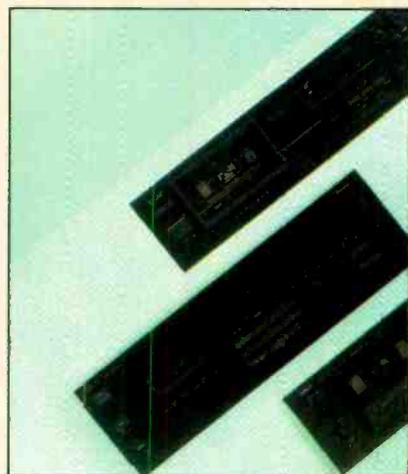
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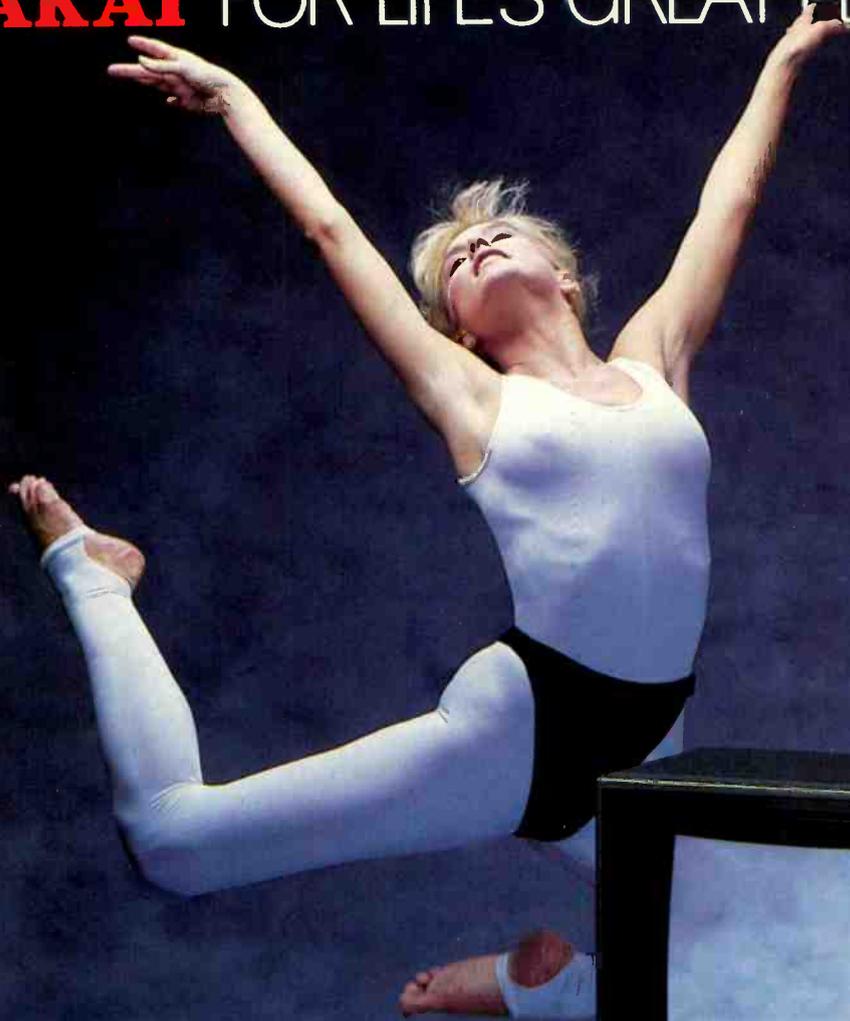
*The Teac V-750, Nakamichi CR-7A, and Yamaha K-1020 cassette decks shown on our cover went head to head in lab and listening tests. See page 54 for the results.*

VOL. 51 No. 3 MARCH 1986 (ISSN 0039-1220)

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by Christie Barter and Gordon Sell



## OPTICAL DISC VENTURE

The Du Pont Company and N.V. Philips have formed a joint venture aimed at becoming the world's largest supplier of optical discs. By 1990 it is expected to generate \$1 billion in sales of Compact Discs, laser-read video discs, and CD-ROM computer data discs. The two companies plan to invest heavily in the development of record/erase optical discs that would make possible home CD recorders, video-disc recorders, and high-capacity computer data storage and retrieval systems. With Du Pont's experience in materials technology and Philips's experience in electronics and laser optics, these two companies make a formidable pair.

## TECH NOTES

Onkyo has demonstrated a pre-production prototype digital-audio-tape recorder that uses the rotary-head format (R-DAT), but it won't be in stores until late in the year, after several key integrated circuits become available. . . . The rights to use the "Altec-Lansing" and "Voice of the Highway" trademarks have been acquired by Sparkomatic. . . . The Delco-GM/Bose music system has been added as an option on five additional car models: Cadillac Cimarron, Buick LeSabre and Somerset Regal, and Oldsmobile Delta 88 and Calais. . . . Ford, which introduced the Ford/JBL sound system in the 1986 Lincoln Continental (see page 21), will include a CD player option when it makes the system available in the Lincoln Town Car this summer. . . . Alpine is rumored to be introducing a trunk-mounted six-cassette changer that is linked to the in-dash control panel by a fiber-optic cable. . . . Phoenix Systems products will henceforth be manufactured and distributed by Rhoades National Corp. of Columbia, Ten-

nessee. . . . The National Association of Broadcasters (NAB) is developing new AM broadcast antenna technology aimed at improving AM reception. . . . Motorola's C-QUAM system for AM stereo has now been adopted by twenty-one manufacturers and 320 broadcast stations. Toshiba, Sprague, and Toko are shipping more than 300,000 C-QUAM decoder chips a month.

## NEW U.S. CD PLANT

Capitol has announced that it will open a Compact Disc manufacturing plant in Jacksonville, Illinois. Production is scheduled to begin in the fall of this year with an initial annual capacity of 7 million CD's. Angel Records, Capitol's classical division, will get a portion of its CD's from the new plant. The CD plant in Swindon, England, recently opened by EMI (with which Capitol is affiliated) will begin production early this year.

## MUSICAL MISCELLANY

The Mormon Tabernacle Choir, which has sold more records than any other choir in the world, has extended its exclusive contract with CBS Masterworks. In its thirty-six-year relationship with CBS the choir has made more than one hundred recordings and won five gold records. . . . Riccardo Muti and the Philadelphia Orchestra have received Japan's Record Academy Award for their recording of *The Pines of Rome* (reviewed in the "Best of the Month" section in this issue). . . . American composer David Diamond has received Columbia University's William Schuman Award, a \$50,000 prize for lifetime achievement in American musical composition. . . . The G. Schirmer music-publishing firm is celebrating its 125th anniversary this year. . . . Celebrating his seventieth birthday this season, pianist Earl Wild is giving all-Liszt recitals in American cities to celebrate the hundredth anniversary of that composer's death. In February and March, Wild plays at Carnegie Hall in New York and Orchestra Hall in Chicago. . . . The Live from the Met telecast on PBS on March

26 will be Wagner's *Lohengrin* with Eva Marton, Leonie Rysanek, and Peter Hofmann. James Levine conducts. . . . Philips Records is honoring the current tour of the Leipzig Gewandhaus Orchestra conducted by Kurt Mazur by releasing the orchestra's recordings of the Beethoven symphonies on six LP's, cassettes, and CD's. The CD's are promotionally priced at six for the price of five. . . . MCA is reviving the old Impulse label, for years the creative home of such jazz greats as Duke Ellington, Gil Evans, and John Coltrane. . . . Herbert Kupferberg, a STEREO REVIEW contributor, has written *The Book of Classical Music Lists* (Facts on File, \$17.95), an entertaining source of material for a musical game along the lines of Trivial Pursuit.

## THE PRICE OF SUCCESS

Two years ago representatives of CD-player manufacturers and a number of record companies formed the Compact Disc Group to promote the development of the CD format. They succeeded at the job so well that they have now voted the group out of existence.

## A FIRST FOR CANADA

Rock singer Bryan Adams has set a record with his album "Reckless." He is the first Canadian recording artist to sell a million copies of an album in his own country. "Reckless" has sold well over a million copies in the United States, too, and was climbing into the Top Twenty at the beginning of the year.



TERRY ALLEN

# Matthew Polk's Extraordinary New SDA SRS



SDA SRS  
\$1395.00 ea.

Digital D.sc Ready

Matthew Polk's extraordinary new SDA SRS won the 1985 Audio Video Grand Prix Speaker of the Year Award.

# "The Genius of Matthew Polk Creates the Ultimate Loudspeaker for You"

*"Spectacular... it is quite an experience"*

*Stereo Review Magazine*

## **The SDA SRS Matthew Polk's Own Dream Speaker Can Now Be Yours**

**"At the CES (Consumer Electronics Show) among the crop of new and often innovative speaker systems, probably the most impressive was the Polk SDA Signature Reference System, which shook the walls of the Americana Congress Hotel."**

*Stereo Review Magazine*

### **An Extraordinary Combination of Features and Benefits**

**Exclusive, Patented SDA TRUE STEREO Technology** for unequalled three-dimensional imaging and a huge, lifelike soundstage.

**Effective Bass Radiating Area Equivalent to a 40" Woofer** for breathtakingly full, deep, tight, more well controlled bass and sub-bass response.

**Multiple Driver Line-Source Topology** for ideally focused wave propagation which minimizes floor and ceiling reflections combined with greater clarity, lower distortion, higher power handling and increased dynamic range.

**Phase-Coherent, Time-Compensated Driver Alignment** for better focus, lower coloration and a smoother, more coherent midrange.

**Progressive Point-Source Tweeter Array** for greater vertical high frequency dispersion, achieved by eliminating multiple tweeter high frequency cancellations.

**Bi-Wire/Bi-Amp Capability** for greater clarity, greater dynamic range and lower I.M. distortion.

**Monocoque Cabinet Construction** eliminates extraneous cabinet resonances and colorations.

**F**or the last four years, Matthew Polk has been driven by an all consuming passion: to develop the ultimate SDA loudspeaker which fully realized the sonic potential of his revolutionary SDA TRUE STEREO technology.\* Thousands of man hours and hundreds of thousands of dollars have been spent in his single-minded pursuit of this goal. The extraordinary result of his quest is now available in handcrafted limited quantities, for those discerning listeners who seek the absolute state-of-the-art in musical and sonic reproduction.

### **The Joy of Owning the Ultimate**

The SDA Signature Reference System is Matthew Polk's own dream speaker. You too can share and experience his dream. He is so proud of the SRS that each one bears his signature, engraved on a solid brass name plaque. The joy of owning an ultimate loudspeaker knows no bounds. Music lovers who are privileged to own a pair of SRSs will share Matthew Polk's pride every time they sit down and enjoy the unparalleled experience of listening to their favorite music through these extraordinary loudspeakers, or when they demonstrate them to their admiring friends.

### **The SDA Signature Reference System: A Significant Advance in Loudspeaker Technology and Sonic Performance**

The SDA-SRS is the extraordinary flagship model of Polk's critically acclaimed SDA Series which is comprised of the SDA-1, SDA-2, SDA-CRS and the new SDA-SRS. This remarkable sounding, 3rd generation SDA speaker combines, for the first time, the latest refinements in Polk's exclusive and patented TRUE STEREO technology with time-compensated, phase-coherent multiple driver vertical line-source topology. The result is a high efficiency system of awesome and seemingly limitless dynamic range and bass capability which reproduces music with a precise, lifelike, three dimensional soundstage which is unequalled.

Each 63½" x 21" x 13" cabinet contains 8 Polk 6½" trilaminate-polymer drivers, a planar 15" sub-bass radiator, 4 Polk 1" Silver Coil polyamide dome tweeters and an incredibly complex and sophisticated Isophase Crossover System. One of the unique features of the crossover is the progressive variation of the high frequency high-pass circuitry which maintains virtual point source operation resulting in wide horizontal and vertical dispersion. Power handling is nominally rated at 1000 watts per channel, although the high efficiency of the system allows superb performance to be realized with the most moderately powered receiver. Bass performance, in a word, breathtaking. The use of 8 small drivers

coupled to the large 15" sub-bass radiator results in extraordinarily tight, quick and three dimensional mid and upper bass combined with low and sub-bass capabilities which are staggering (clean output at 25Hz exceeds 100db!) An elaborate monocoque cabinet and bracing system results in a remarkably rigid cabinet which virtually eliminates coloration due to panel resonances. Separate inputs for high and low frequency sections of the system allows bi-wire or bi-amp operation without the need for a separate crossover. The speakers are beautifully finished, for an elegant loudspeaker which looks as good as it sounds.

### **The Exquisite Pleasure of Listening to the SDA Signature Reference System**

Awesome is the word most often heard to describe the sound. The extraordinarily lifelike three-dimensional imaging surrounds the listener in 360° panorama of sonic splendor. The awe inspiring bass performance and dynamic range will astound you. The high definition clarity of the SRS allows you to hear every detail of the original musical performance; while the exceptionally smooth, natural, low distortion reproduction encourages you to totally indulge and immerse yourself in your favorite recordings for hours.

**"Exceptional  
performance no matter  
how you look at it"**

*Stereo Review Magazine*

Julian Hirsch of Stereo Review summed it up well in his rave review: "The Signature Reference System, Polk's no-compromise flagship loudspeaker offers new refinements on the Stereo Dimensional Array design... 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, with the SDA-SRS, 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". Words alone can not express the experience of listening to this ultimate loudspeaker system. You simply must hear them for yourself.

**Polk Audio** 1915 Annapolis Road, Baltimore, Md. 21230

In Canada: Distributed by Evolution Technology, Toronto.

# SPEAKING MY PIECE

by William Livingstone



## Professionals

**W**HEN I am old and wise and the secrets of life have been revealed to me, perhaps I will understand all the connections between music and medicine. For centuries poets have dwelt on the soothing qualities of music, and present-day physicians seem to be using it to heal themselves because there is a surprisingly high percentage of doctors among the readers of STEREO REVIEW.

I often send the magazine to doctors I know socially and to those I see professionally. When one of the latter decided to include a CD player among the gifts to his wife and children last Christmas, it pleased me to think he had been influenced by our enthusiastic articles on the Compact Disc system.

When we discussed the matter, I gave the doctor some general buying advice and, considering his fees, suggested that he should junk all his other equipment and start over from scratch. (I don't think he has upgraded that stuff since he was a poor intern.) But he went to an audio store in his neighborhood on the Upper West Side in New York City and got different advice.

He found a congenial salesman at the store, described his present equipment, and explained what he wanted. The salesman steered him to a Compact Disc player that I agree was a good choice, but he advised the doctor not to replace his other components just yet.

"You are going to get a lot of pleasure from moving up to Compact Discs," the salesman said, "and you will be surprised at the quality of sound the CD's can coax from your old speakers. Spend the next few months enjoying that and building up a collection of CD's. Then when the novelty wears off, you can upgrade the rest of your equipment and get another surge of pleasure."

What a smart salesman! I'm always glad to hear stories of people like that in the retail end of consumer electronics, people who are in the business to make a living, not a killing. I know a number of such salesmen, and I meet others every year at the Consumer Electronics Shows. Some of them belong to an organization called the Professional Audio Retailers Association.

Several audio/video salespeople have written to me to say that they were offended by some buying advice Chris Albertson gave in our "Video Basics" column last fall. They were stung by his use of the word "clerk" and reacted as a doctor might on hearing a colleague described as a "quack." I think Albertson made it clear that he was not referring to responsible, well-informed salesmen, because he wrote such things as: "I speak here not of respectable list-price outlets . . . but rather of the discount merchants. Never approach a cut-rate video store without first doing some homework."

Anybody who finds an audio or video salesman he likes and trusts should hang onto him. The West Side salesman gave my doctor good advice. Like most new owners of CD players, the doctor finds that he is spending a lot more time listening to music than he used to.

I don't think I have to tell you where the doctor will go and whom he will consult when the novelty has worn off and he wants his Compact Discs to sound better still. He is already referring friends and patients to his neighborhood audio salesman, and although I have never met the man, I've sent a friend to him on my doctor's recommendation. It sounds to me as though the salesman is a wise man to whom some of the secrets of life have already been revealed. □

## Stereo Review

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CIRCLE NO. 44 ON READER SERVICE CARD

## CD-Player Listening Tests

"Do All CD Players Sound the Same?" in January is a superb example of the kind of technical reports that audiophiles and music lovers alike expect and deserve to see in leading industry journals. It's about time that someone has stepped forward to do some really meaningful research rather than simply repeating rhetoric born of speculation.

Publishing the detailed listeners' scores was especially useful, because it allows the reader to draw his own conclusions. For instance, if one excludes the data from the Carver test with the Time Lens on and the data from the test with the inadvertent 0.2-dB level error, so that only normal CD-player operation is compared, a somewhat different conclusion may be reached than the one stated in the article.

Tabulation of the remaining data yields only 365 correct choices out of 683 total, or 53.4 percent, which approaches the 50 percent statistical result to be expected if there were no audible differences between the units. If the white-noise and impulse tests are also

excluded, leaving only music test data, the correct choices drop to 49.4 percent. The deviation from an exact 50 percent is probably due more to the relatively small sample base of listeners and tests than to any significant perception of sonic differences.

In the final analysis, purists who insist that double-blind testing is invalid because the differences are only apparent in extended listening will never be satisfied that any two of anything sound alike. But for those of us who are inclined to a more analytical, albeit less emotional, approach, your editorial coverage is much appreciated.

DENNIS R. CIAPURA  
San Diego, CA

Thank you for the kind and accurate description of the Southwestern Michigan Woofer and Tweeter Marching Society (SMWTMS) in the January article on CD-player listening tests by Ian Masters. We would like, however, to correct a few minor errors that crept into the article and William Livingstone's editorial in that issue.

First, SMWTMS does not conceal its location or address, and we would like

serious audio constructors to know that they may write to us at P.O. Box 1464, Berkley, MI 48072-0464.

Second, neither David L. Clark nor his DLC Design company alone developed the ABX comparator. It was co-designed and co-developed by all six directors of the ABX Company (including Mr. Clark) and would not exist without the contributions of every single one of them. Finally, DLC Design is not located in Ann Arbor but in Farmington Hills, which is about 35 minutes from Ann Arbor or downtown Detroit.

DAVID CARLSTROM  
Secretary/Treasurer, SMWTMS  
Berkley, MI

## LP's Are Not Dead!

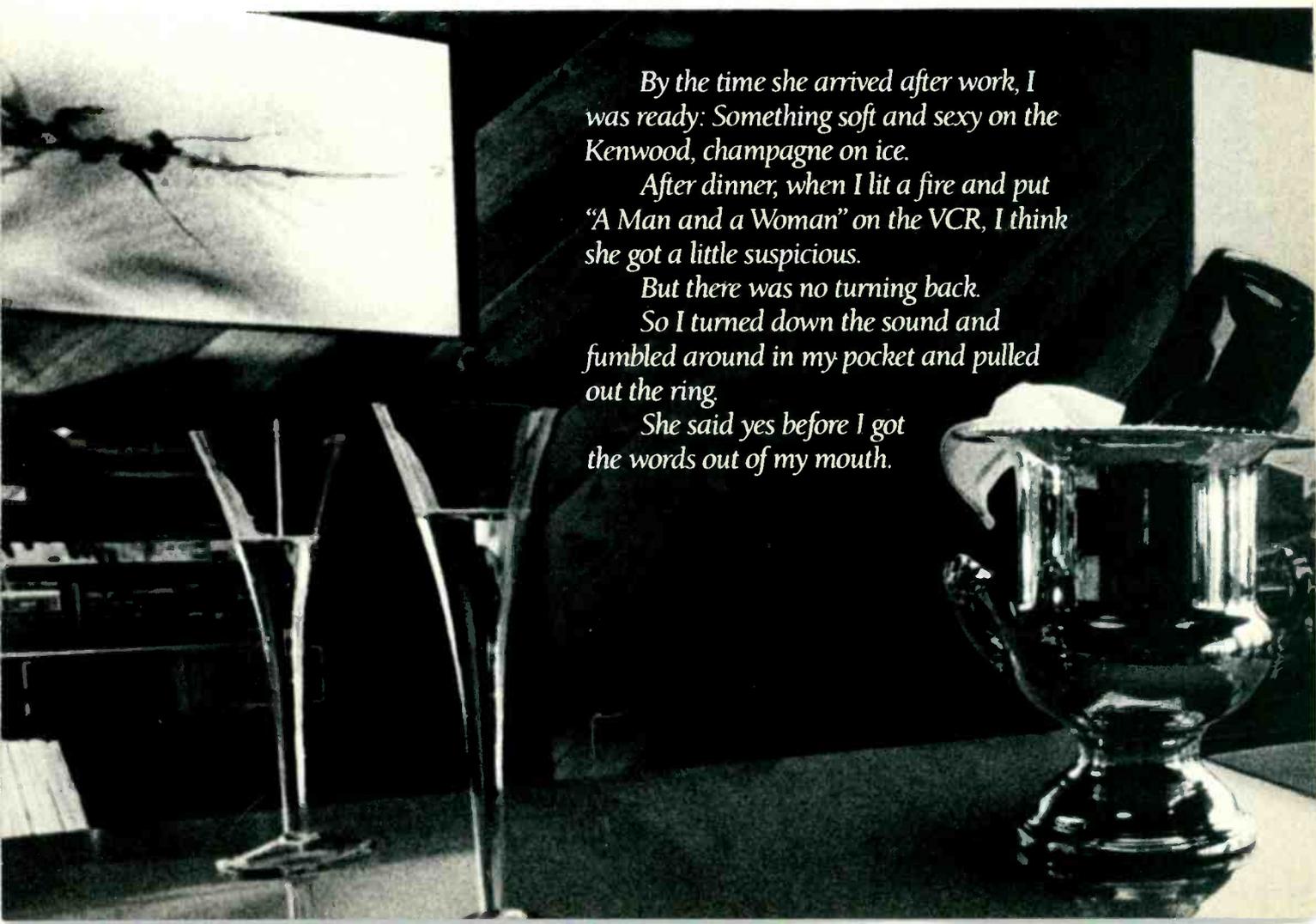
Although I did not use my record player much this past year, I did note what seemed to be a slight deterioration in its sound. I had the stylus checked, and it appeared to be in good shape, but I was still not satisfied, so I returned the cartridge to the manufacturer (Shure). While the diamond stylus itself was not worn, apparently the mounting had de-

*By the time she arrived after work, I  
was ready: Something soft and sexy on the  
Kenwood, champagne on ice.*

*After dinner, when I lit a fire and put  
"A Man and a Woman" on the VCR, I think  
she got a little suspicious.*

*But there was no turning back.  
So I turned down the sound and  
fumbled around in my pocket and pulled  
out the ring.*

*She said yes before I got  
the words out of my mouth.*



teriorated just enough to affect the sound adversely. The cartridge was returned to me with a new stylus—and what sound! The difference was just incredible. Digitally mastered LP's sounded . . . well, like digital recordings! LP's are not dead!

I wanted to pass this good news on to other readers. Have your stylus and its mounting checked, and if a replacement is necessary, go for it. The difference in sound may make your LP's as satisfying as CD's or tapes.

DAVID E. LICHT  
Jackson Heights, NY

### CD Convert

Although I am a charter subscriber to STEREO REVIEW (back when it was *Hi-Fi Review*), I have never before written a letter to the editor. But the pro-and-con discussion of Compact Discs in the "Letters" columns finally got to me.

I have thousands of analog recordings and some fairly decent equipment. Although I had listened to broadcasts of CD's, I did not plan to purchase a player for at least another year. After all, my records sounded great. Six weeks

ago, however, I heard a CD player at a friend's house for the first time. When I returned home and turned on my equipment, I was crushed. My records sounded lifeless!

Since then I have purchased a Sony CD player and new Cerwin-Vega speakers. It is once again exciting to listen to music, especially the lush Romantics and the Baroque organ works that I enjoy. Yes, the sound is different, and I sometimes wish I couldn't hear music sheets turning or chairs shifting. But it's the closest thing to being there, and I love it!

WALTER JOHNSON  
Red Bank, NJ

### Digital Issues

I like the idea of the Compact Disc system, and the few CD's I have heard sound just fine. But until I can buy the kind of music I like on CD, mostly folk and traditional music, I have no intention of buying a CD player. CD's are fine for the classical or popular-music fan, but those who favor the small independent labels are left out in the cold and probably will be for years.

Also, I have noted a very ominous trend for CD's to have more or different music than the LP or cassette releases. I feel that the LP and cassette buyers are being shortchanged when there's more on the CD version, and I urge readers to let the record companies know how they feel.

WILLIAM I. WHITTEN  
Birmingham, AL

The best audio news since the CD itself is that at least one company, Delos (November "Bulletin"), is committed to producing discs that utilize the full potential running time. So far I've restricted my purchases to items that are cheaper in CD than LP, such as two-disc versions of operas that take three regular LP's.

When will the manufacturers realize that they can't go on cheating us by putting a single LP onto a single CD? Surely it doesn't cost any more to produce a 74-minute disc than a 50-minute one. The premium price entitles us to three Mozart piano concertos on one Compact Disc.

PETER T. DANIELS  
Chicago, IL

Orchestrating special moments in life requires a certain amount of freedom. With Kenwood's full range of Home Entertainment Systems, you can choose from a spectrum of performance-matched systems, or create your own from Kenwood's line of superior components.

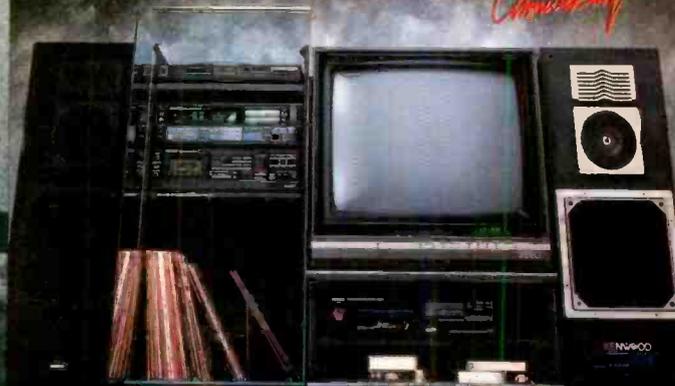
The system picture is fully remote controlled and includes a 26" cable-ready color monitor. A 70W\* per channel integrated audio/video receiver. A Hi-Fi VHS stereo video recorder with 14-day, 8-event programming. Kenwood's full logic auto-reverse cassette deck. A linear tracking, fully automatic turntable. And a pair of 150W 3-way tower speakers.

The Home Entertainment System. Designed by Kenwood for people with a flair for improvisation.

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25<sup>th</sup>  
Anniversary



# KENWOOD

CIRCLE NO. 29 ON READER SERVICE CARD

# "CARVER CD PLAYER: SUPERB SOUND PLUS THE DIGITAL TIME LENS"

AUDIO MAGAZINE

*"Leave it to Bob Carver to come up with a CD player designed to please both those who love CDs and those who still have reservations about their sound quality."*

—Leonard Feldman  
AUDIO MAGAZINE



The Carver Compact Disc Player answers the audiophile's demand for a CD Player which provides not only the greater dynamic range and richer bass expected from compact disc technology, but also the musicality, spectral balance and spatial qualities of well executed analog high fidelity recordings.

## LOGICAL

How logical it is for a physicist dedicated to delivering music with maximum dynamic impact to offer a state-of-the-art CD player. Anyone who ever wondered why Carver makes amplifiers capable of delivering hundreds of watts of power need wonder no longer after they have heard the Carver Compact Disc Player as a sound source.

There are dozens of models of compact disc players now available, many of them demonstrating little regard for the finer points of digital playback technology. Bob Carver was in no hurry. He wanted to do digital right. And he did.

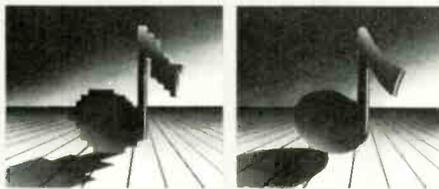
The state of the art has advanced considerably since the first players appeared several years ago. The Carver Compact Disc Player makes use of the latest **triple laser beam** pickups, **sophisticated oversampling**, **digital**

**filtering** technology and, very importantly, Carver's unique distortion reducing **dither signal** that effectively removes the low level quantization distortion existing in all other CD players.

Except for features like display and programming, the real determining factor in CD player quality is its ability to reconstruct music from digital information bits. And that is not an easy job nor one that can be effectively achieved while skimping on circuitry.

## IMPROVED TRACKING

The Carver Compact Disc Player reads discs with more precisely focused laser power than most other models, resulting in improved tracking and less chance of drop-outs when dust or smudges are encountered on a CD.



*The Digital Time Lens circuitry restores the octave-to-octave balance originally intended by the musician and recording engineer.*

## DIGITAL FILTERING

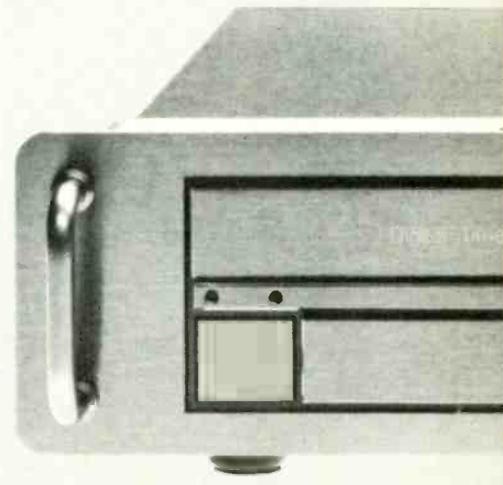
Along with a potentially audible signal ranging up to 20kHz, there are endless images of the signal at 40kHz, 80kHz and 160kHz. While they are above the range of human hearing, they must be removed from the signal to prevent harmonic problems which could turn into audible distortion. Earlier CD models placed an anti-imaging filter after the digital/analog converter stage. Carver uses **DIGITAL** filtering ahead of the D/A converter through a process called multiple oversampling. The sig-

nal is passed through a shift register which delays the samples, so that the weighted average of a large number of signals is generated. Through a complicated process, frequency bands are suppressed between 20kHz and 160kHz, eliminating harmonic distortion problems early on before the complicated D/A 16 bit translation.

The same oversampling process also distributes the same amount of noise over twice as wide a frequency range, resulting in half as much noise in the final signal. Then after translation to analog, the signal is once again filtered for a gentle roll-off above 20kHz. This yields a marvelously natural musical sound to the final output.

## ABSENCE OF PHASE ERROR

One of the important tests applied to determine the effectiveness of digital-to-analog translation circuitry is the reproduction of a square wave.



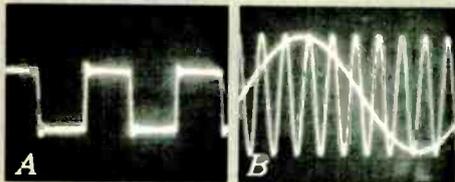
# CARVER

POWERFUL

Corporation, PO Box 1237, Lynnwood, WA 98046

"Reproduction of a 1kHz digitally generated signal was as close to a true square wave as I have ever seen from a CD player that used digital filtering. (The Carver Digital Disc Player) shows a virtual absence of phase error."

AUDIO MAGAZINE



A. Square-wave reproduction, 1kHz.

B. Two-tone phase test signal (200Hz and 2kHz) with Digital Time Lens off.

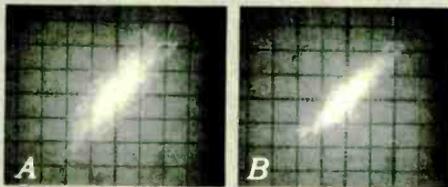
### PLUS THE DIGITAL TIME LENS

On top of this unerring ability to produce natural, real-sounding music from the CD's digital bits, the Carver Compact Disc Player has the remarkable Digital Time Lens circuit to insure your listening enjoyment.

The Carver Compact Disc Player is the world's only compact disc player to address the problem of the bright, hot, harsh sounding midrange and a lack of ambience and spatial detail characteristic of the majority of compact discs currently available.

When Bob Carver obtained his first compact disc player, he was surprised at the sound derived from most of the compact discs he purchased. The three-dimensional musical perspective which his analog system provided in lush abundance on phono discs evaporated into a flat, brittle wasteland. After extensive testing, Bob uncovered two fundamental flaws in almost all compact discs: 1) An unpleasant, harsh spectral energy balance. The overall octave-to-octave energy balance was shifted on the CD towards more midrange above 400Hz; 2) The amount of L-R signal (which carries the spacial detail of the music) on the CD was inexplicably, but substantially, reduced

when compared with the amount of L-R signal found on the corresponding analog disc



A. Lissajous pattern showing spatial detail (L-R)/(L+R) ratio from an LP record.

B. The same instant of music but taken from the CD version. Note the decreased (L-R) content, as shown by the narrowed trace.

Carver's circuitry corrects the ratio of L-R to L+R by performing one extra, but important mathematical operation on the signal stream that all other CD players fail to perform. This final operation makes all the difference.

The result is a natural sound with more of the three-dimensional information that places us in the same space with performers. You won't need the Digital Time Lens on all CDs. But it is there when you need it.

In the beginning, Carver hoped, indeed he expected, that once recording artists and engineers became more experienced with CD technology fewer and fewer CDs would require the Digital Time Lens. But both laboratory and listening tests reveal that the great majority of even the most recently released CDs benefits significantly from the Digital Time Lens.

### EASY TO USE

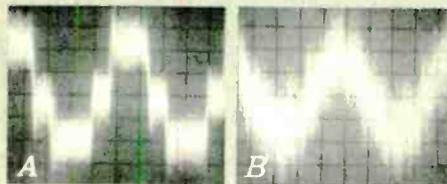
Ease of operation is a hallmark of Carver components and the Carver Compact Disc Player is no exception. A subtle but easy-to-read LCD display not only shows selection number, elapsed time and total time of the CD, but also "talks" to the user. Turn on the Carver Compact Disc Player and the display asks for a disc. When the disc tray is open, the display reminds you with an OPEN readout. When a CD has completed playing, the multi-function display reads END.

With the Carver Compact Disc Player's Programmable Random Access Playback System, track search and programming of different selections is a snap, as is automatic repeat of a previous selection or an entire CD. For classical music lovers, the Carver Compact Disc Player has complete indexing capabilities as well.

The large, easy-to-use feather-touch controls include pause, fast forward and reverse. You can even monitor music at high speed to find a certain portion of a selection.

We know you really enjoy music so, you owe it to yourself to begin your digital experience with the only full feature CD player that has the Carver touch. The only CD player that can actually improve on what is already the best playback medium ever offered.

Audition the Carver Compact Disc Player with Digital Time Lens at your Carver Dealer.



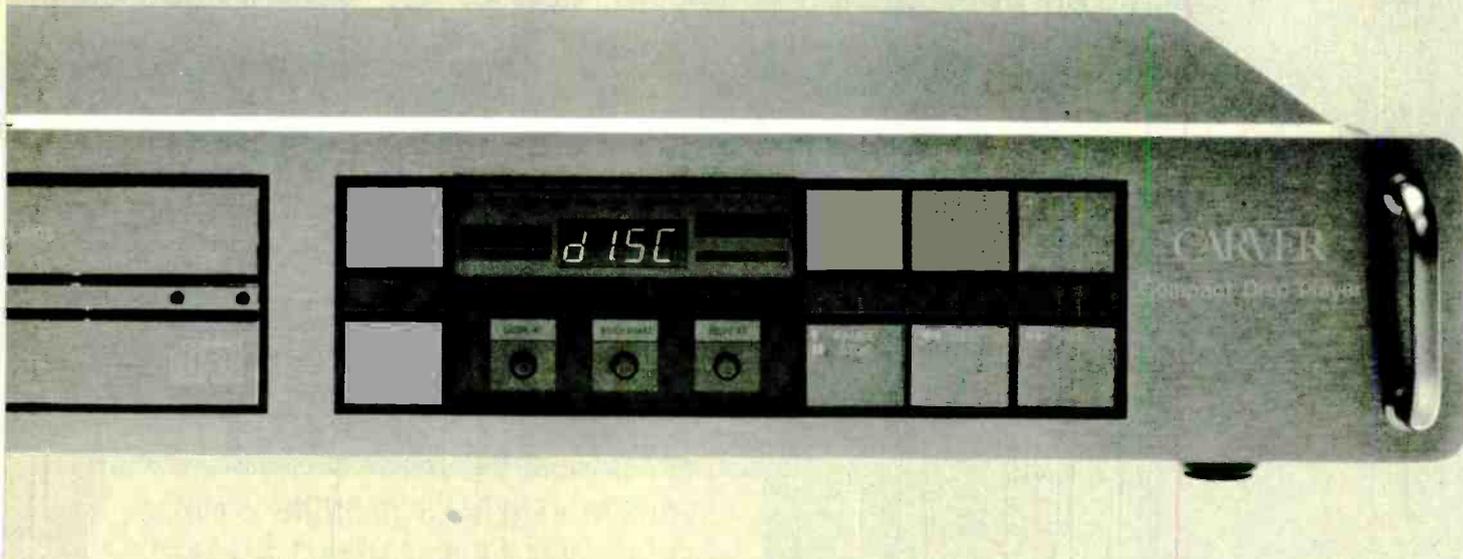
A. Ultra-low-level (4 significant bits) 1kHz signal, as reproduced by conventional CD players.

B. Same signal with dither added before D/A conversion by Carver CD player. Note that dither has caused the distorted step-wise approximation of the 1kHz tone virtually to vanish. Quantization distortion has been reduced to insignificance.

### IF YOU ALREADY HAVE A CD PLAYER

By buying a CD Player you made a commitment to vastly improve your sound source, now you can go the short extra step that lets digital realize its true potential.

That step is the CARVER Digital Time Lens. Simply connect it between your CD player and your preamplifier or receiver.



MUSICAL

ACCURATE

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CIRCLE NO. 49 ON READER SERVICE CARD



# Marlboro



Famous Marlboro Red and Marlboro Lights—  
either way you get a lot to like.

Lights: 10 mg "tar," 0.7 mg nicotine—  
Kings: 16 mg "tar," 1.0 mg nicotine  
av. per cigarette, FTC Report Feb '85

**SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy.**

# NEW PRODUCTS

## Sony

Sony has taken a new approach to car stereo with the CDX-A10 DiscJockey, a ten-CD player/changer with remote control and an optional digital-synthesis AM/FM tuner module. The player/changer is designed to be mounted in the trunk or rear compartment of a vehicle, where it is isolated from road shocks by a free-floating subsuspension and protected from dust and moisture by a rugged outer case that opens for insertion of the disc magazine (right rear in photo). Outputs from the CDX-A10 connect to one or two external stereo power amplifiers.

All control functions for the CD player and tuner module are handled by a remote "commander" (right front in photo) whose DIN-standard height and width (7 inches wide, 2 inches high) enable it to be mounted in a normal dashboard opening. But at only 1 inch deep, the control unit can also be left unmounted so it can be hidden under a seat or in the glove compartment when not in use. An LCD (liquid-crystal display) panel on the commander shows the operating status of the CDX-A10 or the XT-10 tuner.

A three-position Dynamic Range Suppressor can reduce the dynamic



range of a program so that the quiet passages are audible over the noise of a moving car—or boat, plane, or recreational vehicle. Other features include a switchable Surround Sound circuit, which feeds an L-R signal to the rear channels for enhanced ambience; programming of up to ten tracks from any of the discs in the magazine in any order, with no more than 10 seconds access time between discs; an Automatic Music Sensor to skip from track to track in either direction; a Random

Music Sensor for automatic playback or repetition of up to five tracks selected at random; direct access to individual selections by disc and track number; and audible search in either direction.

Prices: CDX-A10 DiscJockey with remote commander, connecting cables, and one XA-10 disc magazine, \$999.95; XT-10 tuner pack, \$129.95; extra XA-10 magazines, \$19.95 each. Sony Corporation of America, Dept. SR, Sony Dr., Park Ridge, NJ 07656.

**Circle 120 on reader service card**



## Marantz

The VR550HQ VHS Hi-Fi VCR from Marantz has a decoder for stereo TV sound and HQ (High Quality) circuitry for a better picture. When stereo sound or a separate audio program is

broadcast, the MTS decoder allows either soundtrack to be recorded on video tape or played through a separate amplifier and speakers. There are input-level controls and an LED level display for each audio channel.

The VHS Hi-Fi circuitry records and plays the audio signals through separate heads on the rotating video head drum. Dolby circuits reduce noise on conventional longitudinal stereo soundtracks. The HQ circuitry decreases video noise and increases resolution and contrast compared with conventional VHS recordings; the system is playback-compatible with non-HQ tapes and VCR's.

The 140-channel quartz-synthesis tuner in the VR550HQ can be programmed to record eight events over a three-week period. Price: \$949.95. Marantz, Dept. SR, 20525 Nordhoff St., Chatsworth, CA 91311.

**Circle 121 on reader service card**

## Sansui

Sansui's two-motor, three-head D-705 cassette deck has dual capstans to eliminate variations in tape speed. Features include Dolby B and Dolby C noise reduction, record pause, automatic tape-type selection, memory stop and rewind, Automatic Music Program Search for up to fifteen selections, and timer record/play. Frequency response with metal tape is given as 20 to 20,000 Hz, wow-and-flutter as 0.035 percent



wrms. Signal-to-noise ratio is rated as 60 dB with no noise reduction, 80 dB with Dolby C. Price: \$400. Sansui Elec-

tronics Corp., Dept. SR, 1250 Valley Brook Ave., Lyndhurst, NJ 07071.

**Circle 122 on reader service card**

A hand is shown holding a black Sony UCX-S cassette tape against a background of a vinyl record. The record's grooves are visible, and a hand is positioned as if about to play it. The overall color palette is warm, with shades of orange, yellow, and brown.

## What other audio tapes fail to hear.

One audio tape is so sensitive it can hear a pin drop. Or the full crash of a cymbal.

To no one's surprise, it's made by Sony.

Designed with our widest dynamic range ever, the UCX-S can pick up the softest softs you've never heard.

Or the loudest louds.

Without distortion.\*

And since we pack smaller, more uniform particles on our tape, you can pack more music in it.

And go from one extreme to the other.

So pick Sony. And hear what you've been missing.



**SONY**  
THE ONE AND ONLY.®

© 1985 Sony Corp. of America. Sony is a registered trademark of Sony Corp. "The One and Only" is a registered trademark of Sony Corp. of America. \*(Third harmonic distortion at 0-0dB)

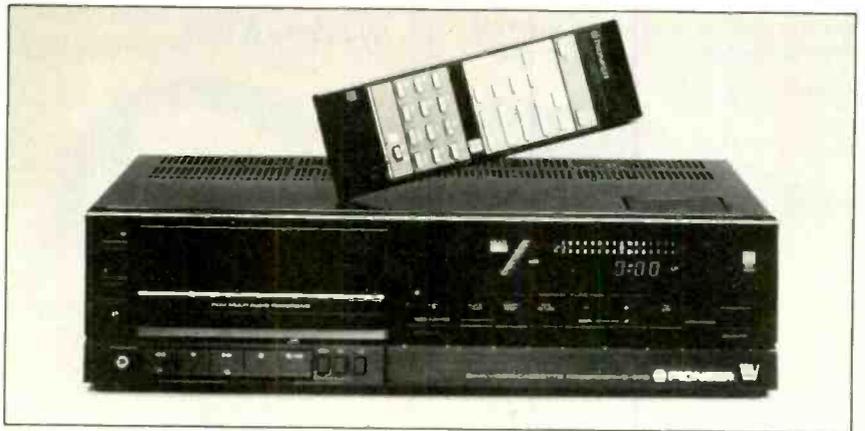
CIRCLE NO. 53 ON READER SERVICE CARD

## NEW PRODUCTS

### Pioneer

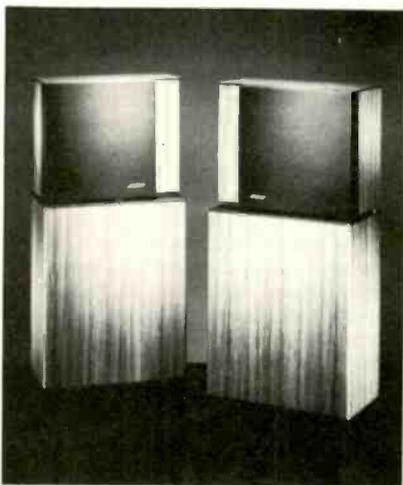
Pioneer's VE-D70 two-speed, remote-control 8mm video recorder can record four hours of picture and sound or twenty-four hours of digital audio with no picture on six separate tracks. There are separate audio level controls and recording-level meters for each channel on the front panel. An MTS decoder is included for recording stereo broadcasts.

The cable-ready video tuner receives 181 channels, and it can be programmed for unattended recording of six events over three weeks. Other features include a remaining-time counter, high-speed picture search, and noiseless freeze-frame and slow motion. Frequency response of the digital soundtrack is given as 20 to 15,000 Hz, the



dynamic range as greater than 88 dB. Wow-and-flutter is said to be unmeasurable. Price: \$1,500. Pioneer Electron-

ics (USA), Inc., Dept. SR, P.O. Box 1720, Long Beach, CA 90801.  
**Circle 123 on reader service card**



### Bose

The Models 10.2 and 8.2 (shown) floor-standing Stereo Everywhere speakers from Bose are designed to produce full stereo imaging in all parts of a room. Both systems feature a pair of 3-inch tweeters pointed in different directions in front of a ported front-mounted woofer so that the speaker produces its greatest output at angles of about 45 degrees off axis. Interactive crossovers and special cabinetry designs contribute to the imaging effects. The 10.2 has two 8-inch woofers, and the 8.2 has one 10-inch woofer. Both enclosures have contemporary styling with rounded corners. The 10.2 is finished in wood veneer, the 8.2 in wood-grain vinyl. Prices: Model 10.2, \$1,199 per pair; Model 8.2, \$949 per pair. Bose Corporation, Dept. SR, 100 The Mountain Road, Framingham, MA 01701.

**Circle 124 on reader service card**

### Mitsubishi

The DA-R56 digital-synthesis AM/FM receiver from Mitsubishi includes a circuit to decode AM stereo (Motorola system) and extensive video switching facilities. There are four video inputs and three video outputs in the rear, along with the usual audio connections, and a combined front-panel set of audio/video input and output jacks. The receiver permits dubbing between VCR's with audio added from another source, and there is a video enhancement circuit to improve the picture

quality of video dubs. Other features include a built-in five-band graphic equalizer and a switchable synthesized-stereo circuit for mono sound sources.

The amplifier section is rated to deliver 70 watts per channel (rms) into 8 ohms from 20 to 20,000 Hz with no more than 0.015 percent total harmonic distortion. There are tuner presets for seven AM and seven FM stations. Price: \$450. Mitsubishi Electric Sales America, Inc., Dept. SR, 5757 Plaza Dr., P.O. Box 6007, Cypress, CA 90630-0007.

**Circle 125 on reader service card**



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## AUDIO Q. AND A.

by Larry Klein



### Double Speaker Wire

**Q** Since heavier-gauge speaker wire is not always readily available at a reasonable price, I wonder about the feasibility of doubling up standard 18- or 16-gauge two-conductor zip cord. I would like to convert each pair of conductors to a single conductor by stripping the wires at each end, twisting them together, and soldering them. Is there anything wrong with my plan? What equivalent gauge would I achieve?

RUSSELL JOSEPH  
Bella Vista, AR

**A** Your idea is a good one, and in case it's not clear to other readers what you mean, we've provided an illustration below. As far as I'm concerned, when you are dealing with reasonable lengths of speaker wire, the only important electrical factor is resistance. Wire resistance must be kept low in order to avoid power loss, damping-factor reduction, and, most important, frequency-response aberrations caused by the wire's resistance interacting with the speaker's normal impedance variation with frequency.

A standard American Wire Gauge table shows that 16-gauge copper wire has about 0.04 ohm of resistance for every 10-foot length; 10 feet of two-conductor zip cord connected to a speaker would thus have a total series resistance of 0.08 ohm (0.04 ohm in each leg of the

wire). Converting the 16-gauge zip cord to a single cable would halve the single-conductor resistance, yielding 0.02 ohm, which is the equivalent of a 13-gauge wire. Doubling up 18-gauge lamp cord would provide the equivalent of a 15-gauge cable, with 0.03 ohm per 10-foot length. I would say that as long as the total wire resistance in series with a speaker system is kept below 0.2 ohm or so, it is unlikely to cause problems.

### Polypropylene Cones

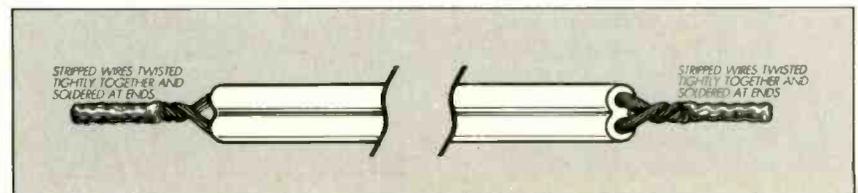
**Q** There seems to be considerable controversy over the relative advantages of polypropylene and paper speaker cones. I was once told that a 12-inch polypropylene-cone woofer could move as much air as a 15-inch paper-cone woofer. Is this claim true, or am I woofing up the wrong tree?

MATTHEW Z. DRURY  
St.-Sauveur, Quebec

**A** Certain plastics are said to have advantages as a cone material, but pushing more air isn't one of them. In a direct-radiator loudspeaker, the amount of air moved by a cone is determined by the diaphragm's effective surface area and the distance it moves, not by the material (or shape) of the cone.

Compared with paper cones, the major advantages claimed for plastic cones is a greater resistance to flexing and modal resonances (cone breakup), higher sensitivity because of plastic's relatively lighter weight, and better internal damping to resist unwanted vibrations traveling through the cone material itself. Proponents of paper claim that all these properties can be realized for less cost and trouble with properly designed and treated paper cones. Incidentally, paper cones are seldom made of pure wood pulp but rather of a mixture of materials designed to provide the desired physical properties. And there is a wide variety of cone materials other than paper and plastic in use, all of which have their own advocates.

If asked for my opinion about the best cone/dome/diaphragm material, I would fall back on something I've said before: You should judge a speaker system (and every other component) by the sound that comes out of it rather than by the special elements its manufacturer may have put into it. Keep in mind that a properly designed product



without special circuitry or parts is likely to sound better than a poorly executed product that features all the latest concepts and materials.

### Bottom Woofers

**Q** Why do you almost always see speakers with the woofer at the bottom? After much experimentation, I installed my speakers with the woofers on top because they sound much cleaner to me that way.

BRIAN MACILROY  
St. Petersburg, FL

**A** Sound, like light, can be reflected, refracted, absorbed, and directed by the surfaces encountered during its propagation. The location of the drivers in a speaker system helps to determine the way the sound waves it produces interact with the boundaries (walls, floor, and ceiling) of the room it is installed in. These boundary interactions, in turn, affect the perceived frequency balance and stereo imaging.

Low-frequency cancellations result when a speaker's bass frequencies are reflected out of phase with the original sound by nearby floor and wall surfaces. This effect can be minimized or eliminated by designing the speaker system so that its woofer is either as close as possible to the wall or floor surfaces or adequately distant from them.

Aside from possible cancellations in the mid to upper bass, there is also a reinforcement of the lower bass brought about by installation in corners and at wall/floor junctions. Whether this lower-bass reinforcement has a positive or negative effect depends very much on whether the speaker was designed to make use of it in achieving its desired balance between the high and low frequencies. For example, a bookshelf-sized speaker installed on the floor is likely to have a somewhat bass-heavy, muddy sound quality both because of excessive bass reinforcement and because the kneecap-high location of its tweeter causes much of its high-frequency energy to be lost before it reaches the ears of the listener.

It is the interaction of these and other acoustic variables in listening rooms that makes setting up speakers for optimum performance such a hit-and-miss, trial-and-error proposition—even when the speaker designer has done his part of the job well.

I suspect that your speakers sound cleaner because your upside-down installation has eliminated some unwanted bass reinforcement. However, if the tweeters are devoting most of their energy to stirring up the dust in your carpet, it is probable that your speakers' high-to-low frequency balances are not all that they could be.

## ARE THESE THE WORLD'S BEST-SELLING HEADPHONES?



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CIRCLE NO. 54 ON READER SERVICE CARD

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Five NEW models, power packed and distortion free for pure explosive sound. Pyle Digital Demand amplifiers, preamp/EQ and electronic crossover are American made and fine tuned by over 30 years experience. Perfectly Pyle!

  
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CIRCLE NO. 35 ON READER SERVICE CARD

# MOST VALUABLE PLAYER



With so many inexpensive CD players around, what makes the CD-100X from ADC such an exceptional value?

Quality. And a company name *known* for quality in the audio industry.

Features. And a suggested retail price of only \$299.

This is no lightweight. With its triple-beam pickup and advanced circuitry, it can track the most demanding passage on the most demanding CD.

Metal chassis—not plastic. Metal transport, too. And 16-track programmability.

If you listen to other low-priced CD players, you quickly discover they don't match this one for quality.

And if you check out other name-brand players with comparable features, you find they don't sport such a low price.

For the most value in a CD player, there's no contest.



**The winner: CD-100X**



A division of BSR North America Ltd.

CIRCLE NO. 74 ON READER SERVICE CARD

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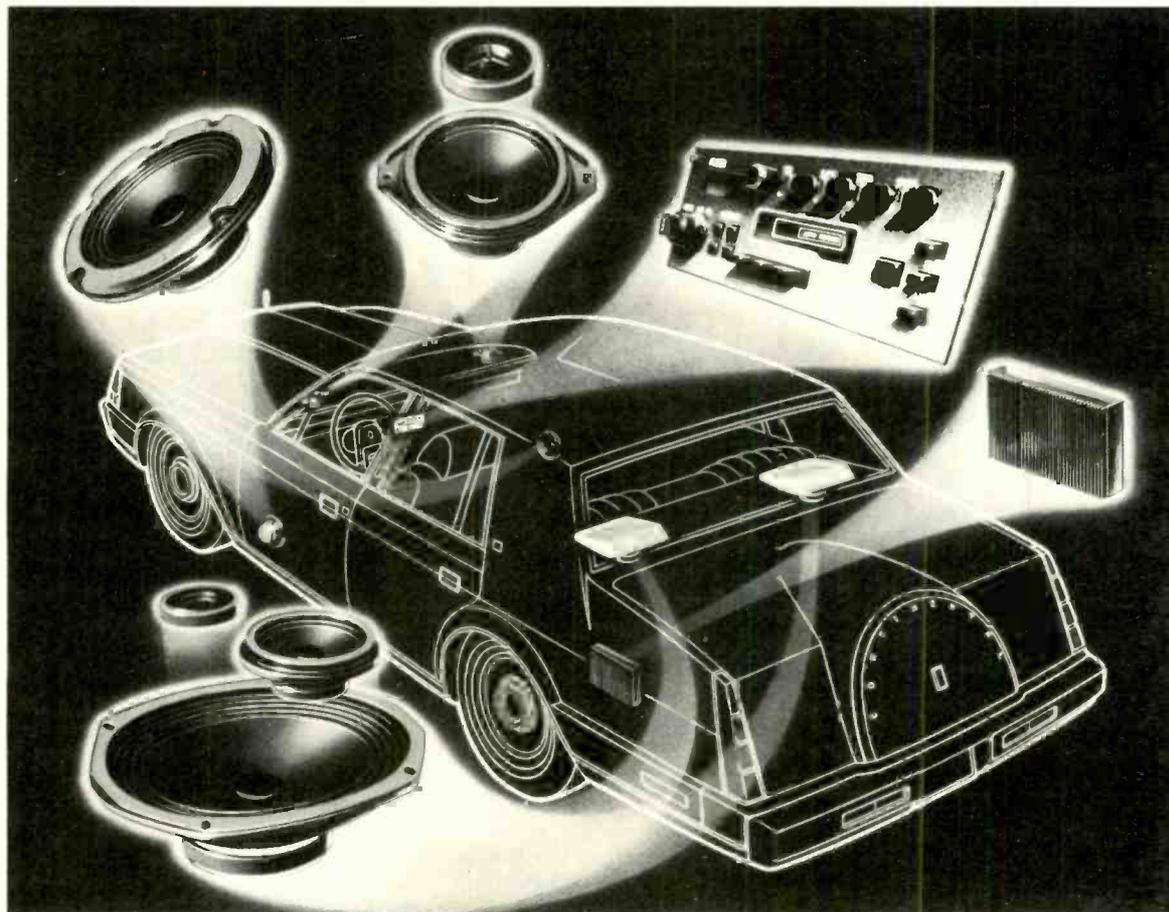
71 Chapel Street, Newton, MA 02459

(617) 964-3210



On The Road With The

# FORD/JBL CAR STEREO SYSTEM



**L**AST fall, the Ford Motor Co. and JBL introduced a high-quality sound system for the 1986 Lincoln Continental that combined Ford's experience with automotive electronics and JBL's expertise in speakers and acoustics. Design of the system—which includes a radio, cassette player, amplifier, and speakers—was begun while the car itself was still on the drawing board. Aesthetic and acoustic issues were addressed at the same time, and the result is a package that is substantially more unified and less obtrusive in appearance than all but the most costly after-market car stereo installations tend to be.

The overall approach in designing the Ford/JBL system was fairly conventional—no radically new technology is involved—but the placement, equalization, and powering of

*by Christopher Greenleaf*

the speakers, perhaps the most important factors in the performance of a car stereo system, have been carried out with an unusual degree of refinement. Coming about two years after the much-praised Delco-GM/Bose system, the Ford/JBL system can reasonably be seen as a different approach to high-quality manufacturer-installed car stereo.

Ford's part in the project was to provide the in-dash radio/cassette player from its Canadian electronics division, the facilities for computer-aided acoustic modeling at its Dearborn, Michigan, headquarters, and, of course, the car. JBL provided the speakers—front and rear pairs of tweeters, midrange drivers, and woofers—and a trunk-mounted, four-channel, 140-watt amplifier.

The goal was simple but technically challenging: to provide the 1986 Continental, and other Ford models to follow, with as accurate, uncolored, and full-range a sound system as possible. Achieving this goal required a high degree of coordination among the different design teams that were responsible for the various parts of the sound system and the car.

The designers of the Ford/JBL system used a total of six omnidirectional microphones in different locations in the car in order to average out the wildly uneven readings from different parts of the "normal" listening areas in the two front seats. The microphone readings were used to devise individual equalization curves for the front and rear speaker arrays. Besides flattening out the car interior's effect on the speakers' output, the equalization includes a

# THE SILENT TREATMENT.

## WHY BOB CARVER'S MINIATURE RADIO STATION LEFT THE AUDIO PRESS SPEECHLESS AND HOW IT LED TO THE MOST COMPLETE STEREO TUNER EVER OFFERED.

The new Carver TX-11a Stereo AM-FM Tuner is a technical four-de-force which further distances Bob Carver's unique products from traditional electronic components—and which can vastly enhance your musical enjoyment.

### TWO TECHNOLOGICAL INNOVATIONS.

The performance of the legendary TX-11 Asymmetrical Charge Coupled FM Stereo Detector Tuner is increased by the addition of Ultra High Frequency Wide Band AM Stereo circuitry. With the new TX-11a, AM stereo sounds as good as FM.

Yes, contrary to popular belief, most AM stereo stations have frequency response (20Hz-15kHz), separation (35dB) and signal-to-noise ratios (70dB) audibly indistinguishable from FM stations of equal strength. It's just that **only** Carver offers the technology to appreciate this hidden performance.

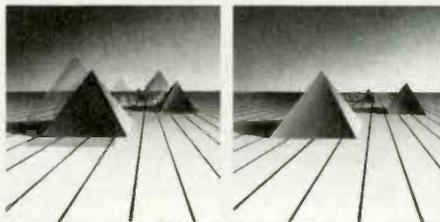
As for FM stereo, the TX-11a virtually eliminates multipath and distant station noise while providing fully-separated stereo reception with space, depth and ambience!

Bob Carver's Asymmetrical Charge Coupled FM Stereo Detector removes (without affecting stereo imaging, frequency response or dynamic range) the hiss, clicks, pops, "picket fencing" and the myriad other unpredictable noises which all too often disturb FM listening.

(Still interested in the story of the miniature radio station and how it impressed hard-to-impress audio critics? Read on. We'll get to it

after we explain why the quartz-synthesized TX-11a Stereo AM-FM Tuner will impress you in your own listening environment).

## A CLEANER, WIDER FM WINDOW ON THE WORLD.



Because of the TX-11a's Charge-Coupling and Leading Edge Detection technology, ownership may very well change your listening habits. Right now, you probably confine your FM listening to those stations which are strong and relatively interference-free, avoiding weak stations and those filled with distortion. Your options are therefore limited. The TX-11a can significantly expand your choices by recovering stations previously buried in hiss or prone to sudden tantrums of noise.

**Ovation Magazine** observed that the circuit, "...may well mean the difference between marginal reception of the station signals you've been yearning to hear and truly noise-free reception of those same signals, permitting you to enjoy the music and forget about noise and distortion."

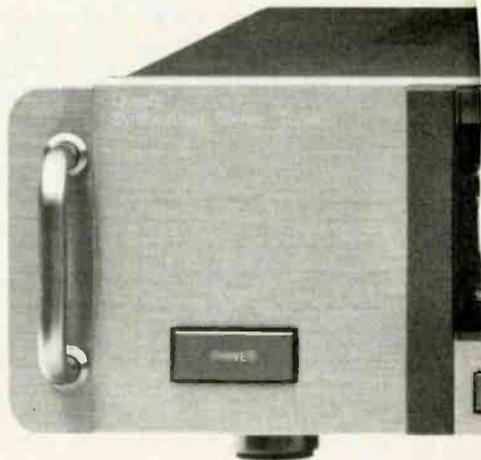
In **Audio Magazine**, Len Feldman said "The significance of its design can only be fully appreciated by setting up the unit, tuning to the weakest, most unacceptable stereo signals you can find, then pushing those two magic buttons."

"Separation was still there; only the background noise had been diminished, and with it, much of the sibilance and hissy edginess so characteristic of multi-path interference."

## WHY THE ASYMMETRICAL CHARGE-COUPLED FM STEREO DETECTOR GIVES NOISE THE SILENT TREATMENT.

Thirty years ago, the FCC turned clear mono FM into a substandard stereo medium (with fifteen times poorer signal-to-noise ratio) by approving a broadcast system that is extraordinarily prone to multipath and distant-station-noise.

This system separates stereo into two different bands. Unfortunately, the bands aren't pure Left and Right. Instead, one band is comprised of those parts of a stereo signal that are common to both channels, (L+R, or mono). The other signal, far more fragile and prone to interference, is the difference between the left and right signal (L-R). It bounces off buildings, hills and other objects, and wreaks havoc when



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recombined with the strong mono signal.

Bob Carver's Charge-Coupling circuit takes advantage of the fact that almost all noise and distortion is exactly 180 degrees out of phase with the signal it's part of. The TX-11a Stereo AM-FM Tuner cancels these "dirty mirror" images before they can reach your ears. That eliminates up to 85% of the potential noise found in distant or noisy stations.

But Bob wasn't satisfied and knew you wouldn't be either. So another circuit, the Leading Edge Detector, goes a step further by taking advantage of a little-appreciated FM phenomenon: Just 5% of the L-R signal actually contributes to the stereo experience. The rest simply gets in the way of skyscrapers and mountains.

The Carver leading Edge Detector operates only on this critical 5% of the L-R signal, filtering out noise and restoring just that part of the signal needed by our ears and brain to construct stereo imaging.

Blended back into the mono (L+R) signal matrix, a net reduction of 93% - or better than 20dB of noise reduction - is achieved. All ambient and localizing information is recovered. Only hiss and distortion are left behind. Or, as **High Fidelity Magazine** put it, "... clean, noise-free sound out of weak or multi-path-ridden signals that would have you lunging for the mono switch on any other tuner."



### THE LITTLEST AM RADIO STATION.

Before we describe the remarkable attributes of the TX-11a, we owe you the story that proves just how far performance can be extended when a component comes from Carver.

At a recent press conference, Bob Carver unveiled a small antenna connected to a very low powered AM stereo broadcast transmitter (C-QUAM format). Dubbed "Station CARVER," it sat next to a Carver Compact Disc Player and the same TX-11a that's on your dealer's shelves right now.

Bob Carver routed the Compact Disc's signal to the antenna for reception by the TX-11a, and also directly to a preamplifier.

In front of America's top stereo writers, Bob switched back and forth between the transmitted signal (as received by the TX-11a) and the direct CD signal. All listeners had difficulty distinguishing between the outputs of the CD player and the TX-11a Stereo AM-FM Tuner!

Most could tell no difference at all!

### HOW AM STEREO GETS THE SILENT TREATMENT WITH THE TX-11a.

- \* *Unique de-emphasis curve*
- \* *Whistle Stop cancelling circuit*
- \* *Pilot Signal cancelling circuit*
- \* *Ultra-low noise balanced station detector*
- \* *Very wide band, minimum phase intermediate frequency amplifiers.*

Think of it. Compact Disc frequency response and freedom from noise with AM stereo and the TX-11a. Only Carver could pull it off. But then only Carver could do the same for FM, too.

### HUMAN-ENGINEERED FEATURES AND CONVENIENCE.

Many tuners with far less exclusive circuitry than the TX-11a have far more complicated exteriors. Bob Carver wanted to make tuning stations easy, not impress you with flashing lights or complex programming.

So thirteen presets, wide/narrow band selectors, automatic/manual scanning and the buttons which activate the remarkable Charge-Coupled circuits (Multipath and Noise Reduction) are all tastefully inset into the burnished anthracite metal face. Full instrumentation including digital station frequency readout, 6-step 10dB-interval signal strength LED's and other monitor functions is recessed behind a panel, visible but not garish.

The result is performance without theatricality. Access without complication.

A tuner **High Fidelity Magazine** called, "By far the best tuner we have tested..."

### CLEAR THE AIR BY VISITING YOUR NEAREST CARVER DEALER.

Ask to hear the most expensive tuner they sell. (It won't be the Carver TX-11a). Now tune a multi-path-ravaged, hiss-filled FM station. Tune the same station on the TX-11a Stereo AM-FM Tuner and press the Multipath and Noise Reduction buttons. You'll see why no other FM tuner can approach it. And why no other AM stereo tuner this good exists anywhere!



variable loudness-compensation curve that also introduces a response "bump" in the middle bass and lower midrange to overcome the masking effect of the car's very low but irreducible interior noise. The circuit boosts both the lower region and the high treble at low volume settings and approaches flatness as the volume is increased.

Before the Ford/JBL system was officially introduced, I had a chance to audition it in several cars on Ford's Dearborn test track, and I heard enough music of different types to be very impressed with what the engineering had achieved. But it was not until JBL's senior director of research, John Eargle, handed me the keys to a new Continental in front of his New York hotel that I was able to try out the system on our own grueling urban "test track." I returned from the rough streets of my familiar route through the shabbier industrial sections of Brooklyn unshaken, unruffled, and thoroughly sold on what I'd heard.

*With the engine off, the sound of the Ford/JBL system was slightly heavy in the bass and lower midrange, but as soon as the car was in motion it became bewitchingly lean and tonally honest.*

With the engine off, the nondefeatable loudness compensation gave a slight heaviness to the sound in the upper bass and lower midrange, but as soon as the engine was running and the car in motion, the effect was transformed to a bewitchingly lean, tonally honest sound. The Lincoln Continental is among the very quietest vehicles on the road, so I had the pleasure of listening to music at low volumes without sacrificing its intelligibility. The tonal balance did not appear to favor any one region of the musical frequency spectrum nor to add any coloration not already in the program signal. In other words, the system performed very much like a good home stereo system.

Although there was no overemphasis, the Ford/JBL system clearly excelled in the deep bass. Programs with strong deep-bass content

sounded little short of hair-raising. The midrange was even more impressive considering that it is the most difficult part of the spectrum to reproduce accurately in a car. String quartets and female vocalists show up problems in this area very quickly. With the Ford/JBL system, the leanness I had sensed in other music became a vibrant tautness in some Haydn quartets and made Joni Mitchell's light soprano sound startlingly vivid.

The system also provided good, at times surprising, localization of instruments with stereo recordings of acoustic ensembles such as orchestras or jazz combos. The synthetic imaging of studio-recorded rock or electronic music was reproduced transparently and unambiguously. Dry or poorly recorded sound was not prettified. The system's authoritative support of strong transients, the deepest bass, and clear treble appeared to be similar at all listening levels from background to ear-shattering.

Besides impressive sound quality, the system's autoreverse cassette player and tuner have plenty of features. The tape deck has Dolby B, music search, and—wonder of wonders—automatic equalization setting for the tape type used. (Why more companies have not adopted this simple and useful feature is a mystery to me!) The sound in both forward and reverse play was identical—firm, steady in pitch, with all the treble clearly audible. The usual caveat about music search applied: it worked well with constant-level recordings, like most popular-music tapes, but failed to be useful for classical music because it cannot distinguish between the breaks between selections and quiet passages in a selection. The cobblestone streets and granite-block alleys of our test route failed to make the transport burble even once.

The AM section of the tuner was a revelation. The sound was clean and quiet, with as nicely calculated a compromise between effective hash filtering and a full musical bandwidth as I've heard. FM too was very quiet, with unobjectionable, low-pitched multipath noise only in the worst reception areas at either end of the Brooklyn Bridge. Such performance is rare enough to cheer about!

The tuner's automatic blending to mono in poor signal conditions was unobtrusive, with nicely judged at-

tenuation of the noise-prone treble. I missed a mono button on principle, but I didn't really need it. The four presets each for AM and FM are probably inadequate for the listening habits of most urban drivers, and the 8-second audition period during scanning provided a more leisurely perusal of the broadcast spectrum than I prefer. The manual tuning buttons did speed things up, however.

*The tuner's AM reception was a revelation, clean and quiet. FM too was very quiet, with only occasional low-pitched, unobjectionable multipath noise—performance rare enough to cheer about!*

The bass and treble tone controls affected a bit too wide a range. The bass control boost or cuts not only the low bass but also the upper bass and even some of the midrange. Similarly, the treble control dipped into the upper midrange, which can be a problem if you'd like to tone down an overly bright recording without affecting other vital areas. The DNR (Dynamic Noise Reduction) circuit worked on both radio and tape playback. It wasn't much help with good Dolby B tapes, but it could really save old or poor non-Dolby tapes by appreciably cutting high-frequency noise.

Overall, the Ford/JBL system is outstanding. The styling of the tuner/tape unit's faceplate is unlike that of traditional car stereos because it is matched to the interior of Ford's luxury cars. The system is a successful example of integrated car/audio engineering. The speakers, electronics, and acoustical treatment combine the latest technology with proven car stereo applications. In a vehicle as beguilingly shaped to the owner's comfort as the Continental, and in other models in the years to come, the Ford/JBL audio system should be a strong additional enticement to buyers. □

*For more information about the Ford/JBL audio system, write to Ford Motor Co., Audio Products Group—EED, Dept. SR, 17000 Rotunda Dr., P.O. Box 6010, Dearborn, MI 48121-6010.*



## The New KLIPSCH kg<sup>4</sup>, Unconventional Thinking At Its Best

It's never been the habit of anyone at KLIPSCH® to be *conventional*. Take, for example, the pillar of the organization, Paul Klipsch. How many 80-year-olds swim in the buff everyday? Or keep two grand pianos in their living room?

Then there's Gary Gillum, one of the design engineers. He drives an immaculate BMW 528i, grows his own vegetables, and lives in a log cabin. Not just any log cabin mind you, but quite an elaborate one he built himself from trees he cleared off his land.

The people of KLIPSCH have never professed to be *conventional*. Or create speakers that are. The new KLIPSCH kg<sup>4</sup>, pictured above, is Gary's latest creation and serves as an excellent example.

Consider the KLIPSCH designed

tweeter. Good, conventional tweeters may deliver similar bandwidth and smoothness. But nowhere near the detail or dynamic range that so well characterize the KLIPSCH "sound."

Then there are the woofers. It's not conventional to put two in one speaker. Yet, Gary found that two 8" (20 cm) drivers operating in unison sound musically superior to one larger driver in the kg<sup>4</sup> cabinet. And don't require as much room.

Finally, there's the passive radiator for low bass. Conventional thinking would mount it on the front of the cabinet. KLIPSCH mounted it on the rear. Measurements and listening tests proved it didn't matter. And with it on the rear, the kg<sup>4</sup> delivers a big sound without a big cabinet.

All of this unconventional thinking results in a speaker which *Stereo Review*

describes as "truly excellent." And one you can likely afford.

Of course, a visit to your nearest KLIPSCH dealer would be a most conventional way to hear the new kg<sup>4</sup>. But since you would be in the pursuit of sonic excellence, the people of KLIPSCH would likely forgive your behavior.

For your nearest authorized dealer, look in the Yellow Pages or call toll free 1-800-223-3527.

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**"Great and important"**

—Julian Hirsch,  
*Stereo Review*

**"Tour de force"**

—Hans Fantel,  
*New York Times*

**"Glorious"**

—David Ranada,  
*Stereo Review*

**"Breakthrough"**

—Peter Mitchell,  
*Boston Phoenix*

ONE revolutionary speaker technology—and the unique musical experience it evokes—has inspired unprecedented critical acclaim.

But with all their superlatives, the audio reviewers have not succeeded in putting that musical phenomenon into words. You must experience it. You must hear

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"Incredible," Len Feldman exclaimed in *Ovation*.

The acoustic achievement that aroused such enthusiasm is patented Soundfield™ technology. It takes you beyond stereo.

Into the dbx zone.

Into an era in which every listener is freed forever from the "stereo sweet spot" in front of a pair of conventional speakers.

dbx One speakers deliver a musically accurate, balanced stereo image throughout the room.

*Wherever you go. Even within a foot of either speaker.*

Hans Fantel said, "Always the sound was everywhere... but with every detail just where it ought to be." Precisely so.

The dbx One takes you beyond stereo. Beyond what other kinds of speakers—even the recent imitators—promise, much less deliver.

And now there's the more affordable dbx Ten.

"Does it produce a stable

stereo image throughout the listening area?" asked Julian Hirsch. "The answer is yes, definitely."

About the overall sound Hirsch wrote, "We cannot recall ever measuring as flat a high-frequency room response... it is a sound I can listen to for hours on end!"

If you are serious about music, you must hear them. For the location of the dbx speaker dealer nearest you, call us directly, at (617) 964-3210.

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*Beyond stereo*



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71 Chapel Street

Newton, Massachusetts 02195

(617) 964-3210

by Julian Hirsch



## FMX: A Major FM Improvement

**T**HERE have been few significant technical improvements in FM broadcasting since stereo transmission was authorized more than twenty years ago. Although the stereo broadcast system approved by the FCC does allow reasonably good reception quality, as well as compatibility with mono receivers, it exacts a severe penalty from both the listener, in the form of a reduced stereo signal-to-noise ratio (S/N), and from the broadcaster, in the form of a substantial reduction of the service area compared with mono coverage.

Most of us are aware that switching an FM tuner or receiver from stereo to mono mode usually makes a very audible reduction in noise (hiss) level. Except for very strong signals, the difference in S/N is about 23 dB, and a signal that is acceptably quiet in mono can often be unlistenable in stereo because of the added hiss. Multipath distortion effects are also more severe on stereo signals.

The principal reason for the higher noise level of a stereo signal is that the noise energy in an FM transmission increases with the modulation frequency at a rate of 6 dB per octave. A mono program is modulated in the frequency band from 0 to 15,000 Hz, but the stereo information—in the form of a signal representing the *difference* between the left and right channels, or  $L - R$ —is transmitted in the band from 23,000 to 53,000 Hz. The noise present in the demodulated  $L - R$  program is added to that in the mono program, which represents the *sum* of the two channels, or  $L + R$ , when the two signals are combined for stereo playback. As a result, the final stereo program is invariably noisier than the corresponding mono program.

By partially blending the higher audio frequencies in the difference signal, the noise can be reduced—at a price. As stereo channel separation is reduced, the  $L - R$  component becomes smaller and the noise level drops, but the stereo properties of the resulting program are also reduced. When the noise level is equal to that of a mono program, it's because the program is mono! Many car radios, and a few home receivers, have automatic (signal-controlled) channel-blending circuits that maintain acceptable noise levels over a wide range of signal strengths, but often the result is basically mono, not quieter stereo.

There are some other, more effective solutions. Carver tuners and receivers feature a circuit that uses program information in the relatively quiet main signal to synthesize a low-noise difference signal with compatible frequency and amplitude characteristics. Under noisy

conditions the synthesized difference signal smoothly and automatically replaces the actual difference signal. The resulting sound is audibly stereo, and even if not exactly the same as the original program, it is listenable and often nearly as quiet as mono reception.

Another approach, developed by Larry Schotz and available in some products from NAD, Nakamichi, Proton, and others, blends the stereo channels in a *dynamic* fashion controlled by the frequency content and modulation level of the program and the strength of the signal. Although the Schotz system reduces separation together with noise, the blending is inaudible except in its hiss reduction. Not quite in the same category is the application of Dolby B noise reduction to FM broadcasting, which was never widely accepted by consumers and broadcasters.

*FMX is the latest approach to the problem of making the noise level and range of FM stereo equal that of mono.*

The latest approach to the problem of reducing the noise level and increasing the range of stereo FM broadcasts so as to equal those of mono transmissions is FMX, a process developed by Emil Torick at CBS Technology Center. While an FMX-processed broadcast must be decoded at the receiver to realize its potential, the system is entirely compatible with the existing stereo broadcast system and will not interfere with reception by existing receivers. The additional decoding circuits for FMX are expected to have little effect on the cost of new receivers, especially as the economies of mass production are realized. Another advantage of the FMX system, and a very important one, is that because it does not affect the frequency spectrum of a broadcast, it requires no lengthy process of FCC approval.

Like most noise-reduction systems, FMX is a *companding* process. The stereo difference signal is compressed at the transmitter and then expanded at the receiver, re-

### Tested This Month

Realistic CD-2000  
Compact Disc Player  
Denon AVC-500 A/V  
Control Center  
B.E.S. SM 80 Speaker  
Kenwood KVR-A90R  
AM/FM Receiver  
Terk FM 8403 Antenna

# LIGHT YEARS CLOSER TO REALITY.

## SONIC HOLOGRAPHY TRANSFORMS EXCITING NEW PROGRAM SOURCES AS WELL AS FAMILIAR OLD ONES INTO TRULY LIFELIKE EXPERIENCES.

When Bob Carver set out to redefine the stereo listening experience through Sonic Holography, he was really rebelling against the limitations of the stereo phonograph record. At the time his remarkable invention first started astounding audio critics and music lovers, vinyl discs were the musical standard.

If Sonic Holography can breathe life into even your oldest records, imagine what it will do for CD's, VHS Hi-Fi and other exciting new stereo sources.

Now there are at least five major audio/video breakthroughs which further expand Sonic Holography's potential to bring more excitement and realism into your life.

These innovations include the Compact Audio Disc, noise-free stereo FM, AM Stereo, Stereo television broadcasts and stereo Hi-Fi video formats.

Each provides the Sonic Hologram Generator in selected Carver preamplifiers and receivers with a chance to redefine the width, breadth and depth of the traditional stereo sound field — while using your existing speakers.

### WHAT SONIC HOLOGRAPHY DOES.

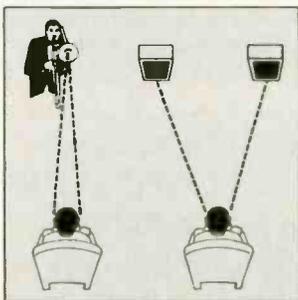
Watch a 13" black and white TV. Now see a movie in 70 millimeter.

Listen to your favorite musicians on a transistor radio. Now sit three rows back from the stage at a live concert.

These are not exaggerations of how much more dimensional and realistic Sonic Holography is than conventional stereo. The most experienced and knowledgeable experts in the audio industry have concurred. Julian Hirsch wrote in *Stereo Review*. "The effect strains credibility—had I not experienced it, I probably would not believe it." *High Fidelity* magazine noted that "...it seems to open a curtain and reveal a deployment of musical forces extending behind, between and beyond the speakers." According to Larry Klein of *Stereo Review*, "It brings the listener substantially closer to that elusive sonic illusion of being in the presence of a live performance."

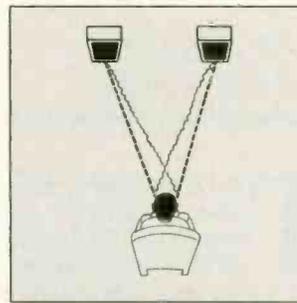
### HOW SONIC HOLOGRAPHY WORKS.

When a musician plays a note, the sound occurrence arrives separately at your left and right ears. Your brain analyzes the difference in these sound arrivals and tells you exactly where the sound is.

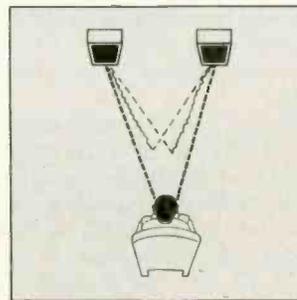


Conventional stereo tries to duplicate this process by using two speakers to send a different version of the same sound occurrence to each ear. In theory, this should "trick" your

brain's psychoacoustic center into placing the musician on a limited sound stage between your speakers. If — and only if — each speaker can be only heard by one ear.



The problem is, these different versions of the same sound also cross in the middle of your listening room, so left and right ears get both left and right sound arrivals a split second apart. Stereo imaging and separation are reduced because both speakers are heard by both ears, confusing your spatial perception.



The Sonic Hologram Generator in the Carver 4000t, C-9, C-1 and Carver Receiver 2000

solve this muddling of sound arrivals by actually creating another "sound." This special impulse cancels the objectionable second sound arrival, leaving only the original sound from each loudspeaker.

The result is a vast sound field extending not only wider than your speakers, but higher than your speakers as well. Sounds will occasionally even seem to come from behind you! It is as if a dense fog has lifted and you suddenly find yourself in the midst of the musical experience. Or, as the Senior Editor of a major electronics magazine put it, "When the lights were turned out, we could almost have sworn we were in the presence of a live orchestra."

### CARVER CD AND TUNER INNOVATIONS EXTEND THE POSSIBILITIES.

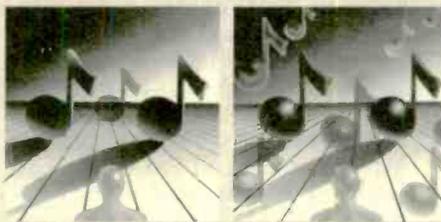
Any stereo source can be transformed from monochromatic flatness into vibrant three-dimensional reality with Sonic Holography.

Compact discs afford vastly increased dynamics, frequency response and freedom from background noise. Yet their potential is trapped in the 2-dimensionality of conventional stereo. Sonic Holography can surround you with the drama and impact of digital. (And the Carver Compact Disc Player with Digital Time Lens sound correction circuitry can enhance your listening experience even further).

Thanks to the Carver Asymmetrical Charge-Coupled FM Stereo Detector, FM stereo broadcasts can be received with vastly increased fidelity. Hiss and interference-free, any signal, from chamber music to live rock concerts,

can take on an astonishing presence and dimension through Sonic Holography.

The new Carver TX-11a AM/FM tuner delivers AM stereo broadcasts with the same dynamics and fidelity as FM. A perfect source for the Sonic Hologram Generator. Think of it: AM can actually become a three-dimensional phenomenon through Carver Technology!



### SONIC HOLOGRAPHY PUTS YOU INSIDE THE VIDEO EXPERIENCE.

More and more people are discovering what theaters discovered some time ago: Audio makes a huge contribution to the realism of video. Still, it has taken the incredible, near-digital quality of VHS and Beta Hi-Fi to make the marriage of audio and video truly rewarding. Now even rental movies fairly explode with wide frequency range, dynamic impact and conventional stereo imaging.

Add the steady emergence of stereo TV broadcasts by all three major networks of prime time programming and special broadcasts, and you have fertile ground for the added realism that only Sonic Holography can deliver.

Unlike so-called "surround sound" a Sonic Hologram Generator puts you into the middle of any stereo soundtrack, (stereo, Hi-Fi stereo, broadcast stereo or even simulcasts). It psychoacoustically expands the visual experience with life-like sound that envelops you in the action.

Once you've heard Sonic Holography with a good video tape or LaserDisc, you'll never go back to mere stereo again.

### ENHANCE YOUR SPACIAL AWARENESS WITH FOUR CARVER COMPONENTS.

The patented Carver Sonic Hologram generator circuit is available on two preamplifiers, our largest receiver and as an add-on component. Each can transcend the limits of your listening (and viewing) room. Each can add the breathtaking, spine-tingling excitement that comes from being transported directly into the midst of the musical experience.

Before you purchase any component, consider just how much more Carver can enrich your audio and video enjoyment. And then visit your nearest Carver dealer soon.



The Carver Sonic Holography quartet. Pictured from left to right is the 4000i Preamplifier, the C-9 sonic Hologram Generator, the Receiver 2000 with remote control and the C-1 Preamplifier.

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storing the original information together with a 20-dB noise reduction. The result is full stereo, but with a noise level essentially the same as in mono.

Since the sound produced by a non-FMX tuner would be seriously degraded if the transmission were received without expansion, it is necessary also to transmit the normal, uncompressed difference signal, exactly as it presently exists without FMX, for full compatibility with receivers lacking FMX decoding. The uncompressed difference signal is also needed to regulate the expansion process in the FMX tuner circuit. In order to transmit both the normal and compressed difference signals without altering the transmission bandwidth, they are separately modulated and transmitted in *quadrature*, that is, 90 degrees out of phase.

In addition, an identification (ID) pilot signal of 10 Hz is added to the compressed difference signal at a very low modulation level, 1 percent versus 9 percent for the 19-kHz multiplex pilot signal added to the uncompressed signal. Just as the 19-kHz pilot is processed in the receiver to switch on the stereo multiplex circuits and light the stereo indicator, the FMX ID tone switches the receiver to the appropriate decoding mode and can also activate an FMX indicator light. All these signals are summed and used along with the program to modulate the FM carrier frequency.

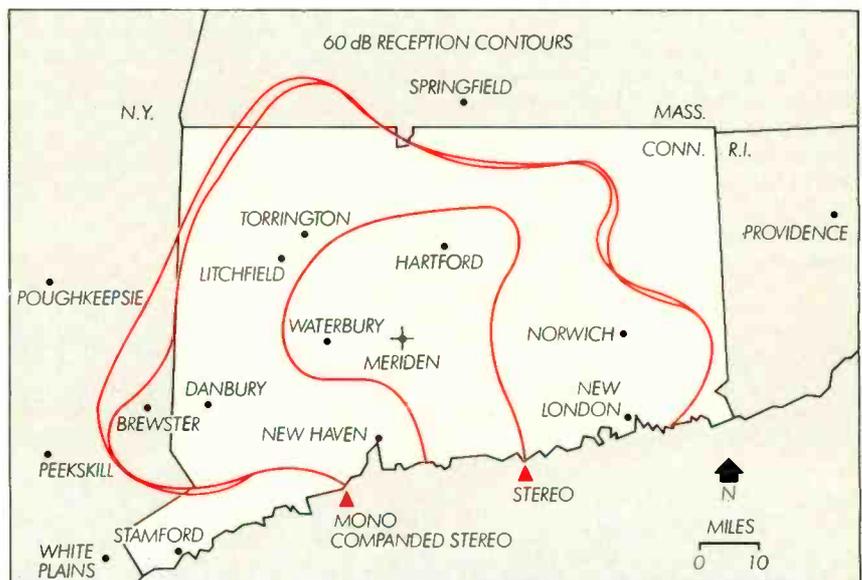
Space does not permit a description of how the novel FMX companding system works, but it is worth mentioning that it avoids many of the disadvantages of more conventional companding systems. The FMX technique minimizes "tracking errors" (analogous to Dolby tracking errors in tape recording) when the compressed difference signal is expanded at the receiver; such errors can severely reduce stereo channel separation. Moreover, broadcasters using the system will not have to reduce their program modulation level to accommodate the extra quadrature information.

CBS Technology Center has been testing the FMX system for over a year with the cooperation of public radio station WKRT in Meriden, Connecticut. Signal-quality meas-

urements made along ten routes extending radially from the transmitter showed that the reception area of stereo signals with a 60-dB S/N was increased from about 1,200 square miles to 4,800 square miles with FMX. By the time you read this, it is expected that stations in Boston and Phoenix will also be transmitting with FMX. Until now, CBS has been modifying standard FM tuners for the tests, but an FMX-equipped receiver will be introduced this spring by NAD. It is probable that other broadcasters and receiver manufacturers will join the FMX camp in the near future.

tions the improvement with FMX was, as expected, slight, but it was usually audible in careful listening.

When we simulated a weak signal with truly unlistenable stereo (mono was acceptable but hissy), FMX produced usable stereo quality. An interesting simulation of car stereo "picket fencing" was created by modulating the signal level at an infrasonic rate. The familiar "swish-swish" effect was set to the point where there was little listening enjoyment, but FMX reduced it to a slight annoyance that most people could easily accept in their cars. In every case stereo reception with



Tests showed that the reception range for noise-free FM stereo using the FMX companding system was close to mono—and double that of ordinary stereo.

On a recent visit to CBS Technology Center, I heard an in-house demonstration of the FMX system using a laboratory transmitter (the program source was a CD player) and a modified FM tuner. The signal strength of the transmission could be adjusted over a wide range, and FMX could be switched on or off. The demonstration was most impressive, and the results were exactly as claimed for the system. With the signal level set so that the program was listenable in stereo but with audible hiss, switching to FMX resulted in essentially noise-free reception, and there was no discernible further improvement in the noise level when we switched to mono. Under strong signal condi-

FMX was subjectively clean, undistorted, true stereo.

Although FMX has not yet been established in the marketplace—indeed, most of the public has not even heard of it—it seems highly probable that its acceptance will grow rapidly as it reaches a wider audience. FMX involves only a modest cost to the broadcaster, much less than the conversion to stereo did, and ultimately a negligible cost—a few dollars at most—to the consumer, and it provides substantial benefits to both parties with no disadvantages that I am aware of. I predict a successful future for what may be the most important advance in FM broadcasting since the introduction of stereo. □

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SD-25A, we dramatically enhance contrast by tinting both. Every bit as important, a highly regulated switching power supply and black-level stabilizer create a dramatically wider video-dynamic range.

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sophisticated hi-fi system. There's a fixed output for recording; a Surround Sound output; and for your hi-fi there's a fixed output, a variable output for remote volume control, and there's even a separate sub-woofer output.

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PHOTOS BY DAVID KELLEY

## REALISTIC CD-2000 COMPACT DISC PLAYER

*Julian Hirsch, Hirsch-Houck Laboratories*

**R**ADIO SHACK'S Realistic CD-2000 is an inexpensive CD player with most of the operating features of more expensive models. The light, compact CD-2000 measures about 12 $\frac{5}{8}$  inches wide, 12 inches deep, and 3 $\frac{1}{4}$  inches high, and it weighs only 8.6 pounds. Its front-loading, motor-operated disc drawer opens and closes at the touch of a button. Operating controls are conventional positive-action pushbuttons.

When a disc is loaded, the bright white status display can be switched to show its total number of tracks or total playing time. Once the PLAY/PAUSE button is pressed, the display shows either the current track number (and index number, if any) or elapsed playing time of the track. In the pause mode, two red rectangles appear in the display.

Any part of a disc can be reached in a few seconds by pressing the track and index buttons until the desired numbers appear in the display window. Up to fifteen tracks can be programmed for playback in any order, but there is no index pro-

gramming. The REPEAT button can be used to replay an entire disc, a programmed sequence, or a defined segment. The CD-2000 can be operated by an external timer. Price: \$259.95. Radio Shack, Dept. SR, 1500 One Tandy Center, Fort Worth, TX 76102.

### Lab Tests

The audio output from the 0-dB (maximum-level) 1,000-Hz bands of our test records was 2.12 volts, with the channel levels matched within 0.1 dB. The frequency response was slightly different in each channel. In the left it dipped 0.4 dB in the 8,000- to 10,000-Hz range and rose 0.4 dB at 17,000 Hz. The right-channel response dropped to a plateau of -0.7 dB between 8,000 and 14,000 Hz and fell to -1.8 dB at 20,000 Hz. Although these figures do not represent as flat a response as from most CD players we have used, the worst overall variation was a mere +0.4, -1.8 dB from 20 to 20,000 Hz.

The channel separation ranged from 94.5 dB at 100 Hz to 72.5 dB

at 20,000 Hz. The phase shift between channels was 5 degrees at low frequencies and rose to 90 degrees at 20,000 Hz, indicating the use of a multiplexed D/A converter shared between the channels. The ringing on a square-wave output showed that the low-pass filters were of analog form. The small differences between the left- and right-channel filters were evidently responsible for our measured frequency-response differences between the channels. The A-weighted noise level from the CD-2000 was a low -98.8 dB relative to a 0-dB output, and its harmonic distortion was a constant 0.0032 percent at levels from 0 to -20 dB.

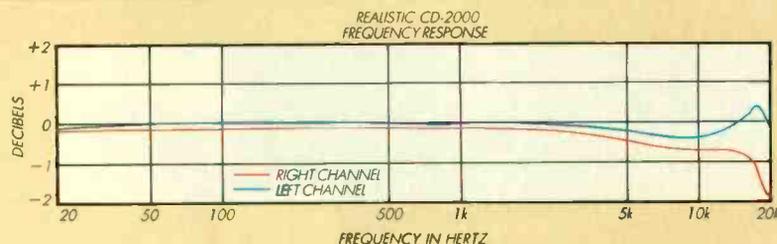
*Any part of a disc can be reached in a few seconds, up to fifteen tracks can be programmed for playback in any order, and the entire disc, a programmed sequence, or a defined segment can be repeated.*

Our calibrated Philips error-tracking test disc showed that the CD-2000 could play the largest (800-micrometer) black dots on the surface layer of the disc without

## FEATURES

- Front-loading CD player with motorized disc drawer
- At start-up, switchable display shows total number of tracks or playing time of disc; during play, display shows track and index numbers or elapsed time of track
- Usable with external timer
- Skip to start of current or next track
- Audible fast scan in either direction
- Programming of up to fifteen tracks in random order
- Repeat track, defined phrase, or entire disc

*The audible equivalent of much more expensive CD players in all the most important respects, the Realistic CD-2000 also has just about all the operating features most people will ever want.*



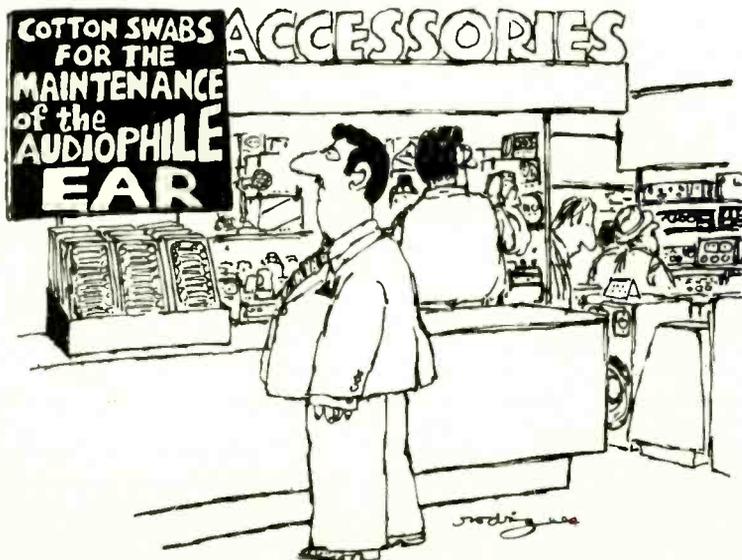
## LABORATORY MEASUREMENTS

**Maximum output level:** 2.12 volts  
**Total harmonic distortion at 1,000 Hz:** 0.0032% at 0, -10, and -20 dB  
**Frequency response:** +0.4, -1.8 dB from 20 to 20,000 Hz (see text)  
**Signal-to-noise ratio:** 98.8 dB (A-weighted)  
**Cueing time:** 2 seconds

**Channel separation:** 90 dB at 1,000 Hz; 72.5 dB at 20,000 Hz  
**Impact resistance:** sides, C; top, C  
**Cueing accuracy:** A  
**Defect tracking:** tracked largest surface-level defect (black dots) on Philips TS4A test disc; tracked 700-micrometer information-layer damage; simulated fingerprint, pass

audible mistracking, and, like every other player we know of, it had no problems with the simulated fingerprint. However, the information-layer defect section, consisting of wedge-shaped damaged areas, could

only be played up to the 700-micrometer level. At 800 micrometers there were a few brief drop-outs, and at the maximum level (900 micrometers) the machine stuttered and hung up.



## Comments

Even though some of the measured characteristics of the Realistic CD-2000 do not quite match those of the best, and considerably more expensive, CD players we have tested, they must be interpreted with an appreciation of their significance. In all of the most important respects—noise, distortion, cross-talk, and flutter—this player is the audible equivalent of others whose measurements appear to surpass it.

The CD-2000 is not a “stripped-down” model. It has just about all the operating features most people will ever want, and the information display tells you all you need to know about a disc and what the player is doing, although you won’t get it all simultaneously. The absence of a wireless remote control is another difference between the CD-2000 and many more expensive players, though it’s a nicety that many of us are capable of living without. The Realistic CD-2000 is a very practical CD player at a most attractive price.

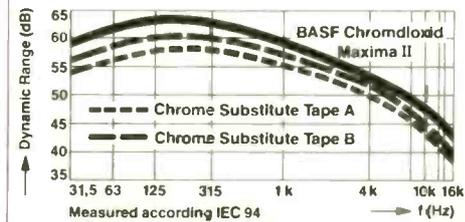
**Circle 140 on reader service card**

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CIRCLE NO. 15 ON READER SERVICE CARD



## DENON AVC-500 AUDIO/VIDEO CONTROL CENTER

*Julian Hirsch, Hirsch-Houck Laboratories*

**D**ENON'S AVC-500 A/V control center provides a number of control functions analogous to those found in stereo integrated amplifiers. It has input/output connections and switching, dubbing, and signal-processing facilities for up to three VCR's, or two VCR's and a video-disc player, as well as one high-level mono or stereo audio-only source such as a cassette deck or a CD player. It can deliver the selected video program to an external monitor and line-level audio signals to external amplifiers or powered speakers. The AVC-500 also includes a built-in power amplifier rated to deliver 25 watts per channel into 6-ohm loads from 20 to 20,000 Hz with no more than 1 percent total harmonic distortion. The amplifier can be used to power either normal (front) stereo speakers or rear-channel ambience speakers.

Signal-processing capabilities include a video enhancer to sharpen picture details, a dynamic-range expander, stereo-simulation circuitry for use with mono programs, and a surround-sound feature for adding ambience to stereo programs. In addition, the AVC-500 has a five-band graphic equalizer to vary the audio frequency response as desired. The nominal center frequencies are 63,

250, 1,000, 4,000, and 16,000 Hz, with control ranges of  $\pm 10$  dB. The AVC-500 makes it convenient to replace the audio portion of a video program while dubbing it, substituting the audio input from the TAPE/CD jacks. And its sound-processing features can be used to modify either the original audio program, or its replacement, while listening to or copying a tape.

The Denon AVC-500 is finished in black and resembles a typical integrated stereo amplifier, with pushbutton input selectors, knobs for volume and most other adjustments, and vertical sliders for the graphic equalizer. The front-panel headphone jack is connected to a circuit that automatically silences the speaker outputs when phones are plugged in. The control center measures about 17 $\frac{1}{8}$  inches wide, 11 inches deep, and 3 $\frac{3}{4}$  inches high. It weighs 12 pounds, 6 ounces. Price: \$375. Denon America, Inc., Dept. SR, 27 Law Dr., Fairfield, NJ 07006.

### Lab Tests

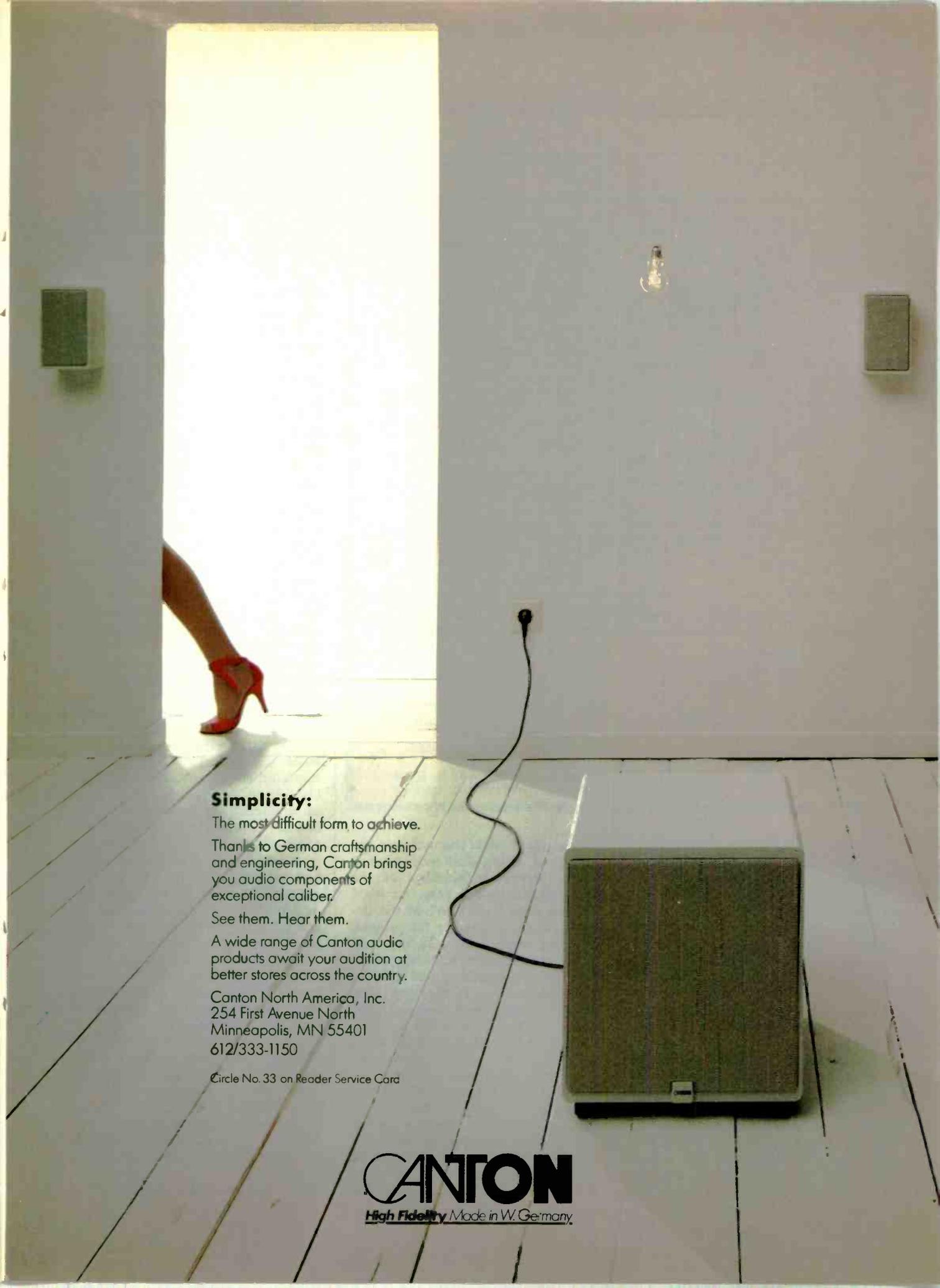
Although the Denon AVC-500 is rated only for driving 6-ohm loads, we also used our standard 8- and 4-ohm load resistors for testing its power-amplifier section. After pre-conditioning, the amplifiers clipped

at 26 watts per channel at 1,000 Hz into 8 ohms, 29.5 watts into 6 ohms, and 27.6 watts into 4 ohms.

Under the same test conditions, the distortion measured less than 0.15 percent up to the clipping point and was almost completely independent of frequency. At the rated 25 watts into 6 ohms, it was typically 0.06 percent from 50 to 8,000 Hz, rising only to about 0.15 percent at 20 and 20,000 Hz. At half power the distortion was about half as much, and at one-tenth rated power it was roughly the same as at full power (a small crossover notch caused the relative percentage of distortion to increase as the power decreased). The 8-ohm performance was quite similar, with slightly higher distortion readings, and the power amplifiers did quite well with the 20-millisecond tone bursts of the dynamic power test.

The graphic equalizer matched its ratings exactly in respect to center frequencies and maximum control range. The dynamic-range expander's properties were not as clearly defined in the ratings, and in any case its effect was slight, principally an overall level increase of about 2 dB when it was switched in and an expansion of about 2.5 dB over a 30-dB range of input levels.

We examined the effects of the surround mode by driving one channel with a single cycle of 1,000 Hz, followed by a long "off" period, and displaying the outputs of both channels on an oscilloscope. In the surround mode, the result was two equal and identical outputs, except that one was 180 degrees out of



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## FEATURES

- Controls playback from up to three video sources (VCR's and video-disc player) and one high-level audio source (cassette deck or CD player)
- Connections for dubbing audio and video in either direction between two VCR's and from third video source to either or both VCR's
- Input from audio cassette or CD can be dubbed onto video tapes along with video program
- Mono/stereo mode switch
- Video ENHANCER switch optimizes picture quality during playback or dubbing
- Audio EXPANDER switch increases dynamic range of audio signals
- Switchable surround-sound enhancement for stereo programs using rear speakers or simulated stereo sound for mono programs; WIDE control adjusts signal processing in both modes
- Five-band graphic equalizer
- Front-panel PROCESSOR COPY switch inserts or bypasses signal-processing circuits for playback or dubbing
- Built-in audio amplifier rated at 25 watts per channel into 6-ohm loads can drive one pair of either rear or main speakers
- Balance and volume controls
- Input level control, with LED indicator, prevents amplifier overload
- Headphone jack
- Rear apron contains audio and video input jacks for three video sources, output jacks for two; one video-monitor output; high-level (tape/CD) audio inputs; stereo and mono audio line outputs for use with external amplifier; audio-recorder line outputs; PROCESSOR OUT switch to connect processing circuits either to the speaker or the line-level outputs; one pair of speaker terminals; two unswitched a.c. outlets

## LABORATORY MEASUREMENTS

- Audio Amplifier**  
1,000-Hz output power at clipping: 26 watts into 8 ohms; 29.5 watts into 6 ohms; 27.6 watts into 4 ohms  
**Dynamic power output:** 39 watts into 8 ohms; 44 watts into 6 ohms; 50 watts into 4 ohms  
**Clipping headroom:** 0.72 dB (6 ohms)

**Dynamic headroom:** 2.45 dB (6 ohms)  
**Frequency response:** +0, -2 dB from 20 to 20,000 Hz  
**Maximum distortion** from 20 to 20,000 Hz at 25 watts output into 6 ohms: 0.15%  
**Sensitivity** (1-watt output): Tape/CD, 92 mV  
**Output noise** referred to 1-watt output (A-weighted): -81 dB

phase with the other. According to Denon, the surround-sound circuit consists of an L - R matrix, with variable mixing of the original left and right front-channel signals into their respective rear channels and also a 30-millisecond time delay. Turning the WIDE knob clockwise decreases the amount of front-channel signals mixed into the rear-channel output. The surround-sound effect was most noticeable at the maximum setting. The surround-processed output can be fed either to an external rear-channel amplifier or to the AVC-500's own amplifier section with an external amplifier for the front speakers.

The operation of the simulated-stereo feature was quite different. To test it we drove both channels with the single 1,000-Hz pulse. The

output from each channel was the amplified pulse, followed after a short interval by another of the same shape. In this case the WIDE control varied the level of the delayed signal, relative to the original one, in a range from -22.5 to +11 dB. However, in the left channel the delayed signal was in phase with the main signal, while in the right channel its polarity was reversed. The delay was from 1.3 to 1.4 milliseconds. The processing is intended to enhance mono signals heard from the regular front speakers.

The AVC-500's audio sensitivity, measured through the TAPE/CD input, was 92 millivolts for a reference output of 1 watt into 8 ohms, and the A-weighted noise level relative to that output was -81 dB. With the INPUT LEVEL knob at its normal

maximum setting, the internal circuits overloaded at 1.6 volts, as indicated by the flashing LED next to the knob. If overload occurs, turning down the control will enable the unit to withstand input signals of any level.

## Comments

In general, the Denon AVC-500 met or surpassed its performance specifications. The performance of a product like this is best judged subjectively, however. Therefore, we connected it between a VCR and a monitor, with a pair of 8-ohm bookshelf speakers driven by its amplifiers.

The video ENHANCER control did improve the apparent crispness of the picture, and without the unnaturally high contrast that sometimes accompanies this process. The audio EXPANDER produced a considerable volume increase, subjectively much greater than the couple of decibels we measured, but it did not seem to affect the dynamics to any significant degree. The simulated-stereo effect was like most phase-shifting systems we have heard; it can make a mono signal more interesting to listen to, but it is not likely to be mistaken for stereo by anyone who has heard the real thing.

The surround-sound feature was more satisfactory, especially with surround-sound-encoded programs. Used in moderation, it lent a sense of ambience to the sound, with enough "liveness" to distinguish the result from the simulated stereo sound and even from the unmodified stereo program. The graphic equalizer seemed to be as effective as any five-band equalizer can be and probably more so than a two- or three-range tone-control system.

The Denon AVC-500 can make things easier for the audio/video enthusiast who does a significant amount of video-tape copying, if only by eliminating the tedious changing of cable connections involved in using two or three VCR's. And if you do audio dubbing on your video tapes, this unit can also simplify your task. It is a versatile component whose ultimate utility is likely to be determined largely by the ingenuity and particular needs of the user.

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## B.E.S. SM 80 SPEAKER SYSTEM

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HE SM 80 is the latest addition to the line of hi-fi loudspeakers made by Bertagni Electroacoustic Systems, Inc. (B.E.S.). The SM 80, the least-expensive B.E.S. speaker, employs the same unique construction as the company's other models. Its principal radiating surface appears to be an almost flat plastic diaphragm, roughly oval in shape and measuring about 8½ x 14 inches, mounted on a rigid cast-metal frame. The driving voice coil and magnet assembly are suspended over the center of the diaphragm on a metal bridge. A similar magnet/voice-coil structure for the tweeter is mounted at the upper left of the frame. Since the front grille is opaque and not removable, we could not see the tweeter diaphragm (or the front of

the woofer diaphragm), but the magnet structures were visible through the rear grille.

Because it uses the radiation from both sides of the diaphragms to create a "wrap-around sound" quality, the B.E.S. SM 80 should be installed a few feet in front of a wall. The manufacturer suggests experimenting, however, with unorthodox positioning such as having one or both speakers at right angles to the listener. The SM 80's planar diaphragms radiate equally from both front and back. In its normal free-standing position, it has a nearly omnidirectional horizontal polar pattern (actually, a figure-8) with output nulls at each side. The system's frequency response is rated as 60 to 19,000 Hz ±3 dB, and its nominal impedance is 8 ohms. The

crossover between the woofer and tweeter takes place at 1,500 Hz.

The SM 80 stands upright on an oak-veneered wooden base that is 14 inches wide and 9 inches deep. The speaker proper is 15 inches wide, 24 inches high, and 4 inches deep. Its front and rear are covered with dark-brown cloth, and the sides are finished in simulated-oak vinyl veneer. Each speaker unit weighs about 18¼ pounds. Price: \$330 per pair. B.E.S., Inc., Dept. SR, 12753 Moore St., Cerritos, CA 90701.

### *Lab Tests*

We placed the B.E.S. SM 80 speakers about 3 feet from the wall behind them and 6 to 8 feet apart, though their locations did not seem to be at all critical. The room-response curve was somewhat irregular in the lower midrange, and the bass output dropped off rapidly below 76 Hz. Although the response curves from the left and right speakers (measured on axis and 30 degrees off axis, respectively) differed by 7 to 10 dB over much of the audio range above 1,000 Hz, they had similar shapes. For our close-miked woofer-response measurement we placed the microphone at the center of the lower grille.

The bass response sharply peaked at 76 Hz and dropped to a plateau about 10 dB lower in the 130- to 400-Hz range. Above 400 Hz it became very ragged, possibly because of interference between soundwave components radiating from different parts of the large bass

*The high end of the B.E.S. SM 80 sounded strong, with a tendency toward brightness, and the bass was surprising. Overall, the speaker sounded larger than it is, probably because of its wide dispersion characteristics.*

diaphragm. The bass output fell precipitously—about 30 dB per octave—below 76 Hz. The bass and room-response curves spliced easily, with some guidance from our

quasi-anechoic FFT response measurements. The speaker also had a distinct peak between 200 and 300 Hz that showed up in both the FFT and room-response measurements. B.E.S. supplied us with response curves run on our test samples, and in spite of the very different test conditions, they matched ours closely. From our composite curve, the response was  $\pm 4$  dB from 270 to 18,000 Hz, with peaks of 10 or 11 dB at 250 and 76 Hz. The speaker's effective bass-response limit was about 50 Hz.

The FFT measurements not only confirmed the validity of the room-response measurements but also showed the same polar-response changes, with relatively little difference in frequency response between the on-axis and 45-degree off-axis measurements but a substantial change, typically about 10 dB, in overall output level. The phase characteristics of the speaker were quite good, with a group-delay variation of  $\pm 0.4$  millisecond over most of the range from 1,500 to 23,000 Hz. The response irregularities that we found at several frequencies showed up, however, in the group-delay readings as sharp peaks of at least 2 milliseconds at 14,000 to 15,000 Hz, 9,000 Hz, and below 1,000 Hz.

## FEATURES

- Two-way speaker system with 1,500-Hz crossover
- Planar, polymer diaphragms radiate in all directions
- Rated for use with amplifiers delivering from 5 to 75 watts per channel
- Oak-veneer base, vinyl trim
- Dark-brown grille cloths on front and rear

The SM 80 was quite sensitive—our 91-dB measurement surpassed its rated value by 3 dB. When we drove it with 2.5 volts (which corresponds to a 90-dB sound-pressure level at 1,000 Hz), the bass distortion was very low from 100 down to 50 Hz, increasing from 0.28 to 2 percent over that range. The output fell off so rapidly below 50 Hz, however, that we could not make measurements at lower frequencies. The speaker's impedance curve was among the flattest we have measured, between 5 and 6 ohms from 20 to 1,000 Hz except for a rise to 10 ohms at 76 Hz and to 6 ohms at 250 Hz—the latter coinciding with the sizable resonant output rise at that frequency. Impedance dipped to a minimum of 3.1 ohms at 5,000 Hz, returning to 5 ohms at 20,000 Hz.

Pulse tests of the speaker's power-handling ability revealed that it distorted with inputs of 223 watts (into 5.5 ohms) at 100 Hz and 600 watts (into 6 ohms) at 1,000 Hz. Our amplifier clipped at 640 watts (into 3.9 ohms) before the speaker's output showed any significant distortion at 10,000 Hz. Clearly, the SM 80's rated maximum/minimum-power recommendations (75 and 5 watts, respectively) are very conservative, especially since it is fuse protected.

## Comments

Any speaker that radiates over a wide angle is likely to produce irregular frequency-response curves in our FFT quasi-anechoic measurements because of interference from late-arriving boundary reflections (analogous to the multipath reception of FM signals). Nevertheless, such speakers usually sound much better than one might expect from looking at the response curves. The B.E.S. SM 80 was no exception. For the most part it sounded much like the contours of its room-response curve would suggest, with an additional sense of spaciousness derived from its dipolar radiation pattern.

There was a noticeable "chestiness" in the sound of this speaker corresponding to its accentuated lower-midrange output. Its high end was strong, with a tendency toward brightness consistent with its somewhat ragged high-end response measurements. The bass was surprising: it seemed much stronger than one would expect from a speaker with a 50- or 60-Hz cutoff, but this was probably an effect of the strong peak at 76 Hz.

Overall, the B.E.S. SM 80 sounded larger than it is, probably because of its wide dispersion characteristics. After a short period of listening to it, it was easy to accept its colorations as normal since they were never overbearing or unpleasant. Undoubtedly, some people will like the sound of the SM 80 and others will not, but that can be said about almost any speaker, regardless of price. My advice is the same as usual: listen before you buy. Among speakers selling for \$330 a pair, the B.E.S. SM 80 holds its own very well.

**Circle 142 on reader service card**



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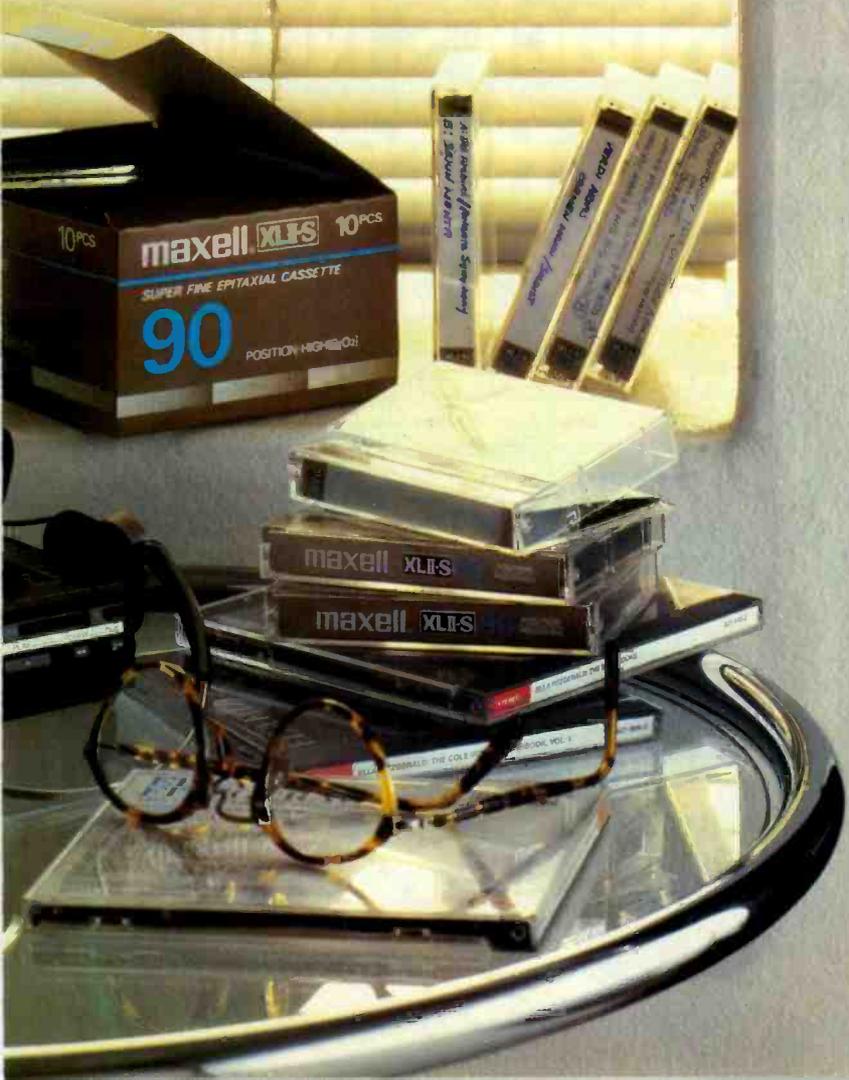
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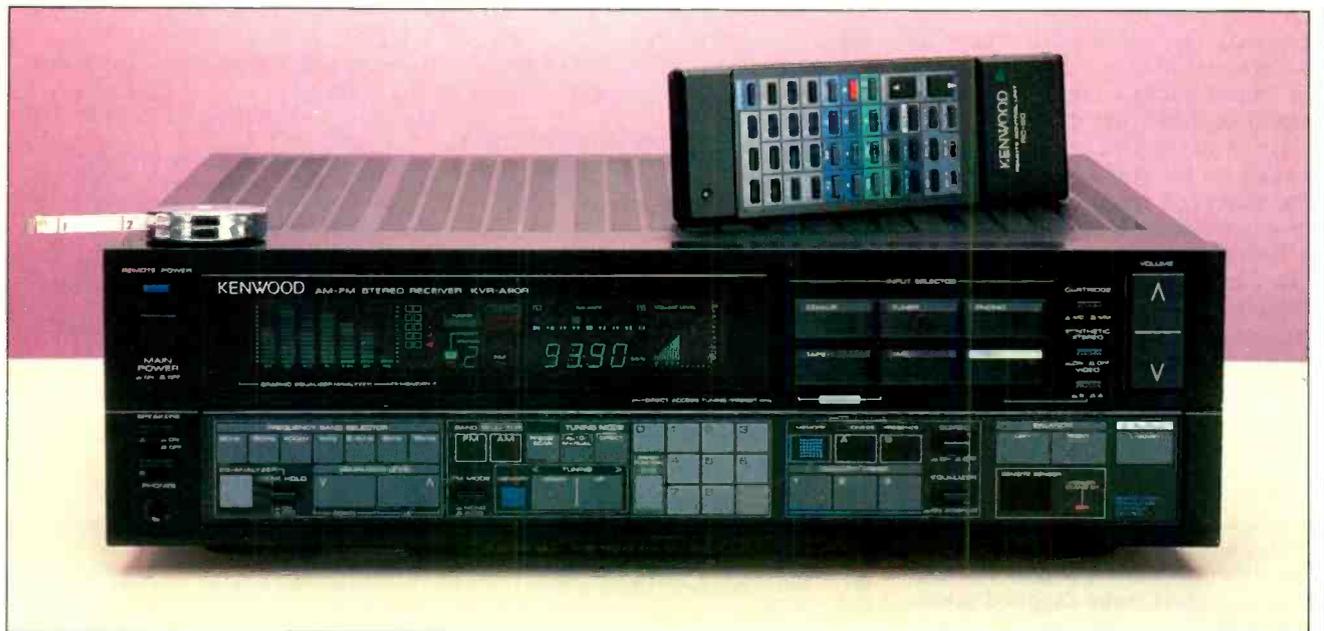
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## KENWOOD KVR-A90R AM/FM STEREO RECEIVER

*Julian Hirsch, Hirsch-Houck Laboratories*

**K**ENWOOD'S new KVR-A90R stereo receiver offers some video control features in addition to its digital-synthesis AM and FM tuners and extensive audio control facilities. The amplifier section is rated to deliver 70 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.007 percent total harmonic distortion. It also carries a secondary rating of 80 watts per channel into 8 ohms from 40 to 20,000 Hz with no more than 0.03 percent distortion. The receiver comes with the RC-90 forty-two-function remote control.

Perhaps the most strikingly unusual aspect of the Kenwood KVR-A90R is its front control panel, which uses membrane keys, like those found on some calculators, instead of buttons for most of its control functions. Pushplates are used for the input selectors and the volume adjustments, which step in 2-dB increments. A direct tuning feature, supplementing the usual scanning mode, allows any station to be selected by simply keying in its frequency. If desired, the frequency

can be stored in one of twenty preset memories (there are ten membrane keys, each switchable to either of two memory banks). Each preset also recalls the appropriate AM or FM band.

The blue-white and red fluorescent indicators on the large display panel show most aspects of the receiver's operating status at a glance. In the tuner mode, the frequency is displayed in large numerals together with the band, the preset number (if applicable), the FM mode (stereo or mono), and whether manual or automatic tuning has been selected. If another input source is selected, its name replaces the frequency readout. Symbolic graphs show the relative settings of the volume and balance controls. When one of the volume buttons is pressed, the tuned frequency or input identification is replaced by numbers showing the amount of attenuation.

The display also indicates the operating status of the KVR-A90R's built-in seven-band digital graphic equalizer and spectrum analyzer, controlled by a group of membrane

keys at the left of the panel. Initially, the equalizer display consists of seven short horizontal line segments joined at the center of an amplitude scale spanning a range of  $\pm 12$  dB in 2-dB steps. Each line segment corresponds to the center frequency marked below it—60, 150, 400, 1,000, 2,400, 6,000, and 15,000 Hz. Membrane keys are used to select a frequency band for adjustment. Pressing a key causes its corresponding line segment to blink on and off, and two additional keys are used to boost or cut the response, moving the line up or down, by 2 dB at a time. Each band can be set separately to form the desired response "shape."

The selected equalization can be inserted into the program signal path, stored in one of three preset memories, or channeled to the Tape 2 recording outputs. In addition to the three user-selectable EQ characteristics, there are two internally set curves identified as LOUDNESS and PRESENCE. The EQ display can also be switched to function as a seven-band real-time spectrum analyzer with approximately two-octave filter bandwidths. A switchable peak-hold mode briefly retains the highest reading in each band.

One or two VCR's can be connected to jacks in the rear of the receiver. A small button marked VIDEO selects which VCR's output will be switched through the receiver.

er when the video input selector is pressed. The video output goes to an external monitor, and the stereo or mono audio component of the signal is channeled through the receiver's audio circuits. A small slide switch on the rear apron can be set for stereo or mono playback, and mono programs can be enhanced by a Synthetic Stereo feature. A separate audio program from one of the receiver's other sources can be recorded on a VCR if it is designed for audio dubbing, and both video and audio can be dubbed from either VCR to the other.

The Kenwood KVR-A90R is finished in black with its membrane keys in two shades of gray. The rear apron contains phono jacks for the various inputs and outputs, screw-binding posts for AM and FM antennas, a clip for the supplied pivoting AM loop antenna, insulated connectors for two pairs of speakers, remote-control jacks for compatible Kenwood cassette, CD, and record players, and three switched a.c. outlets. The receiver measures 16½ inches wide, 12¾ inches deep, and 5⅞ inches high, and it weighs about 20 pounds. Price: \$490. Kenwood Electronics, Dept. SR, 1315 Watsoncenter Rd., Carson, CA 90745.

## Lab Tests

The Kenwood KVR-A90R's heat sinks are located inside its cabinet, and the cover above them became quite warm during the hour-long preconditioning at one-third rated power, though it became only slightly warm in normal operation. With both channels driving 8-ohm loads at 1,000 Hz, the output waveform clipped at 90 watts per channel. The 4-ohm power output was 85 watts, and the output into 2 ohms was 128 watts (a protective relay turned off the amplifier before it clipped in the last measurement).

As usual, we based our tests on the EIA amplifier test standard, using the prescribed gain settings. Our distortion readings were slightly higher than the rated 0.007 percent at most frequencies and power outputs. Kenwood's test data for our sample actually showed much lower distortion readings, and when we set the receiver's gain to maximum, the distortion was typically from

- Digital-synthesis AM/FM stereo tuner
- Direct-access tuning with keypad and automatic or manual pushbutton scan tuning
- Twenty station presets, each usable for AM or FM, with preset scan
- Digital volume and balance controls
- Digital seven-band graphic equalizer/real-time spectrum analyzer with peak hold
- Equalizer switchable for program, recording, or bypass
- Memories for three user-selected equalization contours
- Preset LOUDNESS and PRESENCE contours
- Multifunction fluorescent display shows tuner frequency, volume and balance settings, status of all preset functions, equalizer settings, spectrum-analyzer readout

## FEATURES

- Input-selector keys for CD/aux, tuner, phono, tape 1, tape 2, video
- Video button selects one of two VCR's for audio input, video output to external monitor
- Switches two VCR's for dubbing in either direction, viewing, listening, or audio recording
- Switchable stereo synthesis for mono video programs
- Front-panel button selects MM or MC phono-preamplifier operation
- Switchable 20-dB audio muting
- Stereo headphone jack
- Speaker-selector switches for one or two pairs
- Full-function RC-90 remote control supplied; can also operate compatible Kenwood turntables, CD player, and cassette deck if these are connected in rear of receiver

## LABORATORY MEASUREMENTS

### Audio Amplifier

**1,000-Hz output power** at clipping: 90 watts into 8 ohms; 85 watts into 4 ohms; 128 watts into 2 ohms

**Clipping headroom** (relative to rated output): 1.08 dB (8 ohms)

**Dynamic power output:** 105 watts into 8 ohms; 170 watts into 4 ohms; 182 watts into 2 ohms

**Dynamic headroom:** 1.76 dB (8 ohms)

**Harmonic distortion** (THD + noise) at 1,000 Hz into 8 ohms: 1 watt, 0.015%; 80 watts, 0.0125%

**Slew factor:** greater than 25

**Sensitivity** (1-watt output into 8 ohms): MM phono, 0.3 mV; MC phono, 0.024 mV; CD/aux, 19.5 mV (at maximum gain)

**Phono-input overload level:** 127 mV at 1,000 Hz; 115 mV at 20,000 Hz

**A-weighted noise** (referred to a 1-watt output): MM phono, -80 dB; MC phono, -71 dB; CD/aux, -83 dB

**Phono-input impedance:** 47,000 ohms in parallel with 225 pF

**RIAA phono-equalization error:** +0, -0.5 dB from 20 to 20,000 Hz

**Reactive load factor:** 0.8 dB at 63 Hz

### FM Tuner Section

**Usable sensitivity** (mono): 12.5 dBf (2.3 μV)

**50-dB quieting sensitivity:** mono, 14 dBf (2.8 μV); stereo, 36 dBf (34.7 μV)

**Signal-to-noise ratio** at 65 dBf (1,000 μV): mono, 83 dB; stereo, 76 dB

**THD + noise** at 65 dBf (1,000 μV): mono, 0.145%; stereo, 0.14%

**Capture ratio** at 65 dBf: 0.8 dB

**AM rejection** at 65 dBf: 75 dB

**Selectivity:** alternate-channel, 60 dB; adjacent-channel, 4.5 dB

**Image rejection:** 38 dB

**Stereo threshold:** 14 dBf (2.8 μV)

**19-kHz leakage:** -70 dB

**Hum:** < -80 dB (below noise)

**Stereo channel separation:** 37 dB at 100 Hz; 38.5 dB at 1,000 Hz; 37.5 dB at 10,000 Hz

### AM Tuner Section

**Frequency response** (-6-dB points): 32 to 2,400 Hz

0.002 to 0.005 percent. Lower distortion at high gain is a common effect with electronic volume controls. Our higher distortion readings, evidently caused by nonlinearity in the preamp, had little to do with the receiver's power output.

The 1,000-Hz distortion into 8 ohms decreased from about 0.05 percent at 0.1 watt to about 0.007 percent in the 7- to 15-watt range, rising to 0.0125 percent at 80 watts before the amplifier clipped. The distortion curves with 4- and 2-ohm

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loads were similar. Into 8-ohm loads at the rated 70 watts as well as at half and one-tenth rated power, the distortion was a constant 0.01 to 0.013 percent from 20 to 5,000 Hz, rising to only 0.035 percent at 20,000 Hz.

The equalizer's control range was approximately  $\pm 12$  dB, with center frequencies as indicated. Though the system is not as convenient to use as standard tone controls, the ability to store three sets of response curves for instant recall is a strong advantage. The LOUDNESS contour was very moderate in its effects—a boost of about 5 dB at 60 to 70 Hz and 2 dB at 20,000 Hz—and did not vary with the volume setting. It produced pleasing results, however, and never created an unnatural sound quality. The PRESENCE contour was even more subtle, increasing the overall gain by about 1.5 dB across the frequency spectrum, with an additional 2.5 dB in the 1,000- to 3,000-Hz range. It added a perceptible but listenable "forwardness" to the sound.

The phono section's RIAA equalization was among the most accurate we have measured, with an overall variation of about 0.5 dB from 20 to 20,000 Hz. We also made limited measurements on the stereo synthesizer, which is usable only with mono inputs through the VCR jacks. The response of the left channel was unchanged, down 1.5 dB at 20 Hz and 3 dB at 20,000 Hz, and the right-channel output varied smoothly from about +1 to -5 dB over the same frequency range. The phase relationship between the two channels varied continuously with frequency, however, from being in phase to 90 degrees out of phase to reverse phase and so on through several complete cycles between 20 and 20,000 Hz.

Although the FM tuner section fell slightly short of meeting its usable-sensitivity rating, it did achieve the more important 50-dB quieting specification in both mono and stereo. The tuner noise level was very low in mono for inputs above 45 dBf (100  $\mu$ V) and in stereo above 65 dBf (1,000  $\mu$ V), at which levels the distortion readings were very similar for both modes. The channel separation was unusually uniform, between 35 and 38 dB

from 50 to 15,000 Hz. The 0.8-dB capture ratio was outstanding, as was the 75-dB AM rejection. Although we were disappointed in the image-rejection measurement of only 38 dB, it matched the manufacturer's rating. Selectivity, though only fair, also met spec.

## Comments

The Kenwood KVR-A90R is moderately priced and replete with unusual features, many of them potentially very useful. The RC-90 remote control is convenient, too, especially if you have or are considering other Kenwood components. About 30 percent of the remote is devoted to functions of the compatible Kenwood turntables, cassette deck, and CD player that can be integrated with this receiver.

To Kenwood's credit, the KVR-A90R is not advertised as an audio/video receiver, as we have seen done for other products with very similar features. Its video capability is strictly limited to signal switching between a couple of VCR's and a monitor, enhancing a VCR's mono sound with the Synthetic Stereo circuit, and amplifying a video-derived audio signal for playback through a stereo audio system.

The audio section is actually very good, and certainly powerful enough for most reasonable needs in an audio/video system. Also, even though the amplifier is not rated for use with very low speaker impedances, it does a very credit-

able job in that respect as well. The utility of the graphic equalizer depends on your own listening habits and preferences. It is certainly capable of creating a wide variety of response curves, and the EQ-memory feature could be a great convenience. Even the LOUDNESS and PRESENCE contours are reasonably chosen.

The spectrum analyzer conveys little more information than your own ears can provide, but it does no harm. We noted, incidentally, that the analyzer's sensitivity is fixed and not necessarily related to any signal level under the user's control. In other words, it can easily be driven to the top of the scale (and off scale) at modest levels, making its value questionable.

The FM tuner section's performance, though generally quite good—and nothing less than outstanding in capture ratio and AM rejection—is marginal in respect to image rejection, but unless you live close to a major airport, this might not be a real problem. The AM tuner's quality is typical of that provided by stereo receivers.

In short, the overall performance of the KVR-A90R, though not exactly outstanding, is certainly adequate. Any criticisms of the receiver should be viewed in relation to its price. While not inexpensive, it is not a high-priced component by today's standards, and it is attractive, functional, and versatile.

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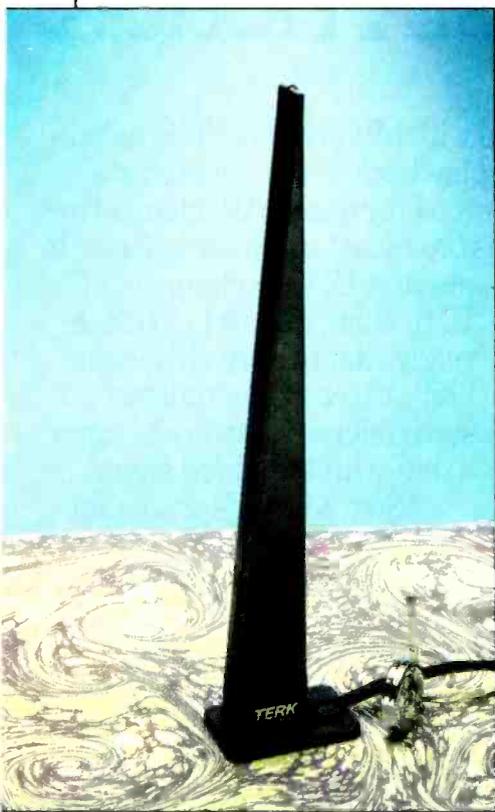
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## TERK FM 8403 ANTENNA

*Julian Hirsch,  
Hirsch-Houck Laboratories*

**T**HE Terk FM 8403, imported from Italy, is an active indoor FM antenna whose built-in amplifier is said to boost received signals by up to 24 dB (sixteen times) before they reach a receiver or tuner. Most people who either cannot or do not wish to install a good outdoor FM antenna use the twin-lead folded dipoles that are furnished with many receivers and tuners. Although these can be reasonably effective—if you are fortunate enough to be able to place them in the optimum location for your favorite station—they are difficult to conceal, and proximity to other objects and even people moving around the room alters their directional pattern and often makes reception of some stations poor or

erratic or even impossible. The difficulty of orienting such an antenna is obvious.

A number of indoor antennas have been offered to the public, ranging from “rabbit ears” to tuned and folded loops that are packaged to harmonize more readily with their surroundings. Most of these antennas are directional and tunable to the specific frequency being received. In general, their gain relative to a dipole is negative; that is, they supply the receiver with a weaker signal than a simple dipole would deliver. The convenience of using such antennas usually compensates for the relative signal weakness, and in reasonably strong signal areas they can be a perfectly satisfactory substitute for a dipole. To the extent that they are directional, they may also be able to reduce multipath distortion.

The Terk FM 8403 is physically unlike other indoor antennas we have seen. A tapered, black-plastic obelisk, 16¾ inches high with a 2¼ x 3½-inch base, it has an integral 75-ohm coaxial signal cable, about 53 inches long, that terminates in an F connector. A supplied 75- to 300-ohm transformer has output lugs that can be connected to the regular antenna terminals of any receiver lacking a 75-ohm F connector. The antenna also has an integral 6-foot a.c. line cord (it can be left energized at all times if desired). Under the base is an adjustment shaft for the internal amplifier, the gain of which can be varied from unity (0 dB) to 24 dB. According to Terk, the antenna has a 0-dB bandwidth of 50 to 150 MHz and is optimized for the FM band.

The FM 8403 is omnidirectional when standing vertically on its base. The product announcement and instruction sheet say that this automatically eliminates multipath interference. Actually, the reverse is true: an omnidirectional antenna is ordinarily a poor choice for a multipath-reception problem. The literature does point out, however, that the antenna is highly directional when it is placed on its side and oriented horizontally like a dipole, suggesting that in weak signal areas the best results can be obtained in this manner.

The Terk FM 8403 has a one-year

warranty and sells for \$79.95. Terk Technologies Corp., Dept. SR, 740 Broadway, New York, NY 10003.

### *Lab Tests*

Lacking the highly specialized facilities required for making accurate antenna gain and bandwidth measurements, we tried to estimate the gain of the Terk FM 8403, relative to a folded dipole, by transmitting a test signal across the laboratory from our signal generator to the antenna. The FM tuner output was connected to our distortion analyzer. We used the “usable sensitivity” level of 3.2 percent distortion plus noise in the tuner output as a reference point for our measurements.

We compared the Terk antenna to two folded dipoles, one horizontal and the other vertical. All three antennas were within 3 feet of each other. The Terk was mounted on a stand that let us position it either vertically or in any horizontal orientation. The transmitting antenna was a horizontal folded dipole about 12 feet from the receiving antennas (much too close for totally valid measurements at these frequencies).

At approximately 88 and 108 MHz (the only reasonably clear frequencies at our location), we measured the generator output needed to produce the reference distortion level in the tuner output with each of the receiving antennas. Although these measurements clearly showed that the Terk FM 8403 (at its maximum gain setting) was not as good as either of the dipoles, the readings were so scattered that we decided to use a more practical criterion for evaluation.

Using each antenna in turn, we tuned across the entire FM band and counted the number of stations that lit the tuner's light (showing that the received signal was greater than the tuner's muting threshold). This test left no doubt about the relative effectiveness of the three antennas. The horizontal dipole received forty-five stations, the vertical dipole received forty stations, and the Terk FM 8403 was able to pull in only thirty-two stations. Although Terk supplies various performance ratings for the antenna, they are not readily interpreted for real-world conditions. Since we

have no facilities for measuring its intermodulation distortion or noise, we based our judgment on the pragmatic criterion of how many stations it received.

### Comments

Past experience with indoor antennas, or any form of undersized antenna, has not led us to expect miracles from them, and we were not surprised by the results of this test. An antenna whose element is not large enough to be tuned to the frequency of the signal is simply not as efficient as a full-sized tunable antenna in supplying an intercepted signal to a tuner's antenna input. Built-in gain helps, but it is certainly no panacea.

Also, we must admit to being put off by the claim that an omnidirectional antenna is inherently free of multipath effects. Multipath distortion arises from external causes—the reflection of a signal

from several objects, causing multiple arrivals at the receiving site at different times. A highly directional antenna can *sometimes* help by discriminating against some of the unwanted signals. To the extent that the Terk FM 8403 is *directional*, it might help, and we confirmed that it becomes quite directional when

*The Terk FM 8403 does a very creditable job in areas served by reasonably strong FM signals.*

mounted in a horizontal position. Unfortunately, the antenna's design does not really lend itself to convenient horizontal orientation.

We suspect that the real benefit of the Terk antenna's omnidirectionality is its apparent lessened susceptibility to interference *within* a room from people walking in front

of the antenna. A human body can act like an antenna element or reflector and induce multipath-like distortion effects. Many hi-fi installations suffer from such problems, and the Terk FM 8403 may help to minimize or eliminate them.

Although we do not consider the Terk FM 8403 an appropriate choice for a weak-signal location, it does a very creditable job in areas served by reasonably strong FM signals. We tried it with a tuner outside the lab and found it to be superior to the B.I.C. Beam Box antenna (a popular model a few years ago, now discontinued and not generally available) that we had been using in that location. And, of course, it will get rid of the tangle of antenna wire found behind many FM tuners and receivers. In any case, it is certainly more attractive than a folded dipole tacked to the wall or to the back of a piece of furniture.

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**N**akamichi's CR-7A is a three-head deck with four motors and a closed-loop dual-capstan drive. It has automatic bias circuits and variable azimuth. Price: \$1,350.



3

# TOP TAPE DECKS

BY CRAIG STARK

*Do lab measurements and listening tests reveal a correlation between price and performance?*

**FRIENDS** often come up to me and say, "I saw your reviews of the X and Y cassette decks, and they both look good to me. But tell me, honestly, is there really a \$250 difference between the X and the Y, and is your Z reference deck really worth twice what the Y costs?"

Such questions can ultimately have only highly personal answers, of course, for beyond certain essentials, with audio components as with houses and cars, worth is an intangible that only an individual can translate into a dollar figure.

Still, my questioners' meaning is clear enough.

When I test a component I measure its objective performance and report on

its features and how useful I found them. Using both prerecorded cassettes and those I have recorded myself, I try to assess the deck's listening qualities, basing my assessments on my general experience with other units and, as an overall check, with my reference deck (a Nakamichi ZX-9). But when several units are tested months apart, subjective reactions to the sound of one deck or another are generally much harder to recall than numbers or tables are to look up.

For this reason, I very much welcomed the task of comparing three cassette decks at the same time, head to head, as it were. The three decks selected for this review offered a particular challenge, for despite a wide price range, with the most expensive being more than three times the price of the least costly, they have remarkably similar features and, as I found, measurements. All are three-head decks, which permit instant comparison between the incoming signal and its recorded

result, and all three decks enable user adjustments to eliminate

the differences among the various brands of cassettes. All three include both Dolby B and Dolby C noise-reduction circuitry, electronic rather than mechanical tape counters and level indicators, switch-selectable FM-multiplex filters, switch provisions for timer-activated recording and playback, and separate left, right, and master record-level controls. All three are front-loading decks with easily removed cassette-well covers that facilitate periodic head cleaning and demagnetizing. And all three decks have separate playback-level controls, a feature too often omitted on cassette decks and one that proved almost indispensable for my comparative listening tests.

The most expensive of the decks tested, the Nakamichi CR-7A (\$1,350), clearly exemplifies a "purist" design approach, as the description of its features in the box on the next page makes clear. Direct-coupled amplifiers are used in its electronics, as is an unusually low-noise head preamplifier. Noise reduction is limited to the classic Dolby B and Dolby C circuits.

The Yamaha K-1020 (\$699) is the only one of the three to include the dbx noise-reduction system in addition to Dolby B and Dolby C. It also includes the Dolby HX Professional servo-bias system to extend the tape's high-frequency capacity.

Like the Nakamichi, the Yamaha does not include microphone jacks, so live recording

**T**ec's V-750, a three-head deck with three motors and a single-capstan transport, has manual bias control, Dolby B and Dolby C, and microphone inputs. Price: \$399.



**Y**amaha's K-1020 has three heads, three motors, and dual-capstan drive. It is the only one of the three decks with dbx noise reduction and Dolby HX Pro. Price: \$699.

MICHAEL CHAN

## NAKAMICHI CR-7A (\$1,350)



**N**AKAMICHI was the first company to produce a three-head cassette deck, and the CR-7A continues in Nakamichi's tradition of innovation. A four-motor deck with closed-loop dual-capstan drive, the CR-7A has such additional refinements as user-adjustable playback azimuth alignment and a sixty-four-step tape-optimization system controlled by a 6-bit microprocessor.

The record and playback heads in the Nakamichi CR-7A are not merely separate elements in a common case but physically distinct units, eliminating the possibility of electromagnetic interaction between them (bias leaking from the record head into the playback head, for example). Each Crystalloy head has its own complete set of azimuth, zenith, and height adjustments, insuring that the head gaps can be magnetically and physically aligned. The 0.8-micrometer playback gap and the 3.5-micrometer record gap are optimum for the tape speed.

Unique to the Nakamichi design is a pressure-pad lifter that pushes the felt pressure pad in the cassette shell out of the way entirely. Pressure pads are required by most cassette decks to insure that the tape and heads remain in intimate contact. Nakamichi's transports are designed to do without this assistance and thereby eliminate a possible source of modulation noise.

The take-up capstan of the CR-7A is direct-driven by a noncogging d.c. servomotor. The supply capstan is belt-coupled, and it is slightly smaller (2.3 rather than 2.5 millimeters in diameter) than the primary (take-up) capstan, which creates a closed loop that simultaneously supplies tape tension to hold the tape against the heads and isolates any irregularities arising from the take-up and supply reel hubs. In addition, differences in the size and mass of the flywheels and the use of dissimilar materials in the transport mechanism prevent the development of reinforcing resonances that would be heard as wow-and-flutter.

A second d.c. motor is used for the reel hubs. A third motor turns a cam system that applies or releases the brakes and engages or disengages the drive system without the customary noise and shock of solenoids. Finally, a fourth motor is used for the automatic playback-head azimuth adjustments.

Since cassette housings are generally not perfect, and since the record heads

on duplicators (or other decks) are not always perfectly aligned, a small degree of azimuth error is present in most recorded cassettes. Azimuth error—a deviation from exact perpendicularity between the tape edge and the magnetic head gap—can cause substantial high-frequency losses during playback. An error of only one-sixth of a degree can cause a 10-dB loss at 20 kHz, for example. To offset the effects of azimuth error in recordings, the Nakamichi CR-7A has a playback-head azimuth adjustment. The adjustment can be performed at any time using a front-panel control or a pair of buttons on the deck's wireless remote control. Relative changes in azimuth are shown visibly on the front panel display, and the user adjusts the control by ear during playback for the audibly best treble performance.

Automatic playback-head azimuth adjustment is also the first step in the microprocessor-controlled calibration process designed to eliminate brand-to-brand (or batch-to-batch) differences among individual cassettes. Other steps include optimization of recording bias and equalization and compensation for the different overall sensitivity of various tape formulations. The entire auto-calibration process takes about 15 seconds, after which the tape is rewound to the point where the process began. The optimized settings for each tape type are stored in memory until you decide to repeat the process.

Like most cassette decks today, the CR-7A will also automatically select the proper bias/equalization settings by tape type for each cassette you insert. Unlike most, however, a manual override is also provided, which permits, for example, proper playback (or recording) of some recent "audiophile" cassettes that use CrO<sub>2</sub>-type tape but are designed for playback with ferric-type equalization.

The electronic counter display on the CR-7A can be set to show elapsed time, remaining time on the side, or conventional tape-counter units. Its level indicators have twenty-four segments per channel, calibrated from -40 to +10 dB, and the peak value can be held in view for 2 seconds if desired. In addition to the regular record-level controls, a two-speed auto fade-in/fade-out system is provided, as are memory rewind/play options, a record-mute button, and a switch-selected infrasonic filter.

would require the use of an external mixer.

The Teac V-750 (\$399) is the lower-priced of two similar models in that company's line. (The other model includes more features—such as an elapsed-time indicator, dbx noise reduction, and more memory functions—and is comparable in features and cost to the Yamaha.) The V-750 has a single-capstan drive system and is also the only one of the three decks to include microphone inputs. Moreover, despite its modest price, its performance indicated that it is very properly included in a review of high-quality decks.

### Lab Tests

The playback frequency response of all three decks was measured using our IEC-standard calibrated BASF test tapes, which cover the range from 31.5 to 18,000 Hz. As the graph on page 00 shows, all three decks were flat within 1 dB through the low and mid frequencies. At the high end, the response of the Teac deck remained flat, dropping off only about 2 dB at the highest frequency. When the playback azimuth control of the Nakamichi was optimized for best treble, it showed a slight rise (again, about 2 dB) in the extreme high frequencies. Results for both decks were completely within normal tolerances.

*Using Dolby C, I judged all three decks to be capable of making dubs of Compact Discs that were virtually indistinguishable from the originals at a reasonably normal listening level.*

As received, however, the Yamaha K-1020 had a treble rolloff of 6 to 8 dB, a clear result either of jolting during shipping or of factory misalignment. A knowledgeable user with a collection of top-quality pre-recorded tapes would suspect something was amiss and take it in for service. But the average user would probably dismiss that degree of loss—on playback of pre-recorded tapes only—as “the limits of what you can expect from mass-produced cassettes.” Having a collection of calibrated tapes, properly demagnetized tiny screwdrivers, and long experience, I took only minutes to realign the head and bring the deck

back into specification (indeed, better than spec). This difficulty with the Yamaha unit, however, gave indirect support for the value of the Nakamichi's user-adjustable azimuth, a feature that permits you to optimize playback instantly and easily for all recorded cassettes without need of any technical paraphernalia.

To provide a uniform basis for comparing the record-playback performance of the three decks, all were tested using exactly the same cassettes, which were bulk erased between each series of tests. The cassettes used were factory-provided "center of the line" samples of TDK AD (ferric), TDK SA (chrome-type), and TDK MA (metal). The overall record-playback responses, both at the IEC 0-dB level and at the customary testing level of -20 dB, are shown in the graphs. At both levels, the Nakamichi deck was flat within 2 dB all the way down to 20 Hz. The Yamaha was down between 3 and 5 dB, still very good performance, and the Teac from 5 to 6 dB, about what one expects at its price. Since few speakers reproduce the lowest musical octave, and few recordings include it anyway, the bass rolloff is not audible in most cases, though the differences among the three decks are characteristic.

At the high-frequency end, the contribution of Dolby HX Pro is evident in the top performance of the Yamaha unit at the 0-dB level. With TDK SA, slight tweaking of the bias controls of the Teac and Yamaha would have resulted in flatter curves at -20 dB, but the deviations shown in the graph were not judged sufficient to warrant adjustments. With metal tape, the frequency responses of all three decks were essentially identical and almost perfectly flat from 60 to 20,000 Hz.

The signal-to-noise measurements on the three decks are shown in the accompanying chart (the A-weighted and CCIR-weighted measurements are the significant ones). With Dolby B and Dolby C the Nakamichi had a slight advantage over the other two units, but the differences (typically 1 to 3 dB) were hardly startling. The Yamaha's dbx circuitry, however, yielded an average 12-dB improvement, clearly far more of an edge.

Similarly, the measured wow-and-flutter figures, all good, speak more eloquently of the decks' similarity than their differences. The

## YAMAHA K-1020 (\$699)

**T**HE Yamaha K-1020 is a three-head, three-motor cassette deck that adds the Dolby HX Professional and dbx systems to the usual Dolby B and Dolby C noise-reduction systems. It also provides such advanced features as user-optimization of recording bias, an elapsed-time tape counter, and dual-speed fast-forward and rewind modes.

Made of long-wearing Sendust, the record and playback heads in the K-1020 are electrically separate though housed in a common physical casing. The tape transport uses a closed-loop dual-capstan system. A d.c. servomotor is used for the capstan drive.

A second d.c. motor is used for the reel hubs themselves. The K-1020 is unusual in having a dual-speed fast-forward and rewind transport. Pressing and then releasing either high-speed button causes normal fast winding, but if the user holds the button down, the winding speed is increased by approximately 50 percent until the end of the reel is near. At that point the transport automatically slows down to permit a gentle stop. Used with the MUTE/SEARCH button, the fast-winding modes automatically search for pauses between selections, at which the machine will stop and commence playback. The K-1020 also contains a third d.c. motor to operate the brakes and the head gate.



The switch-selectable noise-reduction systems offered by the K-1020 include Dolby B, Dolby C, and dbx. The dbx system eliminates the last vestige of hiss from recordings. The deck also includes Dolby HX Professional, a system that extends the high-frequency capacity of cassettes by dynamically varying the recording bias.

The electronic tape counter on the Yamaha K-1020 reads elapsed time directly in minutes and seconds. The record-level indicators, also electronic, use eighteen segments per channel, calibrated from -30 to +20 dB. The unusually high upper limit reflects the inclusion of the dbx system, which extends the permissible input range.

The user-operated bias-optimization system (which Yamaha calls ORBiT) contains its own tone generator and indicator. In addition to left- and right-channel record-level controls, the K-1020 includes a master fader, a playback level control, a switched MPX filter, and the usual memory repeat/rewind options.

## TEAC V-750 (\$599)

**T**HE Teac V-750 is a three-head, three-motor cassette deck with Dolby B and Dolby C noise reduction, user-operated bias optimization, and, increasingly rare these days, front-panel microphone inputs. The record and playback heads are separate units in a common case with head gaps optimal for their functions.

A d.c. servomotor is used to drive the single capstan in the V-750. In order to reduce wow-and-flutter, a separate motor is used for reel take-up and fast winding. A third d.c. motor—once a hallmark only of the most expensive decks—is used instead of solenoids to operate the reel brakes and the head-gate/pinch-roller assembly.

As with most of today's decks, cassettes are inserted into slides on the rear of the V-750's cassette-well door. The well itself is illuminated, and the clear door cover makes for excellent label visibility. Sensors within the cassette well detect the tape type of the loaded cassette (ferric, chrome, or metal) and switch the deck's equalization and bias circuitry accordingly. In addition, the V-750 provides a manual bias control that allows the user to



override the factory settings. Since no tone generator or metering are provided, however, the user must gauge the optimum-bias point by ear.

In addition to the normal pause control, the V-750 includes a record-mute button that permits the user to record a silent space of 4 seconds or longer between selections. Such spaces are used by the V-750's program-counter feature to find the start of recorded selections during fast winding. A memory-rewind/replay feature is also included.

The four-digit tape counter of the V-750 is electronic rather than mechanical, but it indicates hub revolutions only, not elapsed or remaining time. The level indicator registers peak levels on a twelve-segment-per-channel display that is calibrated from -20 to +8 dB. Dolby B and Dolby C noise-reduction systems are switch-selectable, as is the FM-multiplex filter.

# LABORATORY MEASUREMENTS

	NAKAMICHI			YAMAHA			TEAC		
Fast-forward time (C-60, seconds)	69			69/46*			73		
Rewind time (C-60, seconds)	69			69/47*			75		
Speed error	+0.6%			-0.6%			+1.5%		
Wow and flutter (wrms/DIN peak-weighted)	.028%/.048%			.02%/ .055%			.022%/.049%		
Line input for indicated 0 dB (millivolts)	45			37			77		
Line output at indicated 0 dB (millivolts)	900			330			540		
Meter indication at IEC-standard 0 dB	+3			+4			+1		

TAPE: TDK AD (TYPE I, FERRIC)									
	NAKAMICHI			YAMAHA			TEAC		
Distortion (third-harmonic) at IEC 0 dB	0.8%			0.66%/0.04%**			1.25%		
Meter indication at 3% distortion	+6			+7.2/+14.6**			+2.8		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	52.2	57.0	54.5	49.5	56.7	54.2	51.0	55.7	52.9
Dolby B on	60.5	66.5	64.8	53.5	66.0	64.0	59.8	65.6	63.3
Dolby C on	63.4	72.6	74.0	54.0	72.0	72.2	62.6	71.4	72.5
dbx on				74.4	87.6	85.2			

TAPE: TDK SA (TYPE II, CrO <sub>2</sub> -TYPE)									
	NAKAMICHI			YAMAHA			TEAC		
Distortion (third-harmonic) at IEC 0 dB	0.77%			1.25%/0.25%**			1.15%		
Meter indication at 3% distortion	+6.4			+6.2/+13.1**			+3.6		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	55.4	59.9	57.4	49.5	57.9	55.5	54.4	58.4	55.6
Dolby B on	62.1	68.6	67.6	52.5	66.1	65.3	61.6	67.6	65.8
Dolby C on	65.0	75.3	76.4	53.5	73.0	73.3	63.8	74.5	74.7
dbx on				73.9	86.9	84.5			

TAPE: TDK MA (TYPE IV, METAL)									
	NAKAMICHI			YAMAHA			TEAC		
Distortion (third-harmonic) at IEC 0 dB	0.45%			1.1%/0.26%**			1.05%		
Meter indication at 3% distortion	+8.7			+7.0/+13.8**			+4.3		
Signal-to-noise ratios (decibels)	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR	unwtd.	A-wtd.	CCIR
No noise reduction	56.8	61.4	59.0	49.5	58.5	55.9	54.9	58.7	55.7
Dolby B on	64.2	70.6	69.1	53.5	67.5	65.9	62.5	68.0	66.1
Dolby C on	67.2	76.9	78.2	54.5	73.8	74.1	65.0	74.9	75.1
dbx on				78.6	88.4	86.0			

\*with fast-wind button held in (see text) \*\*with dbx at equivalent output level

Teac was atypically good for a single-capstan deck in this respect; the Nakamichi, though well within its specs, was a surprise in that it did not stand out in this measurement. The Yamaha's measurements were about what I would have expected from a well-designed dual-capstan cassette deck.

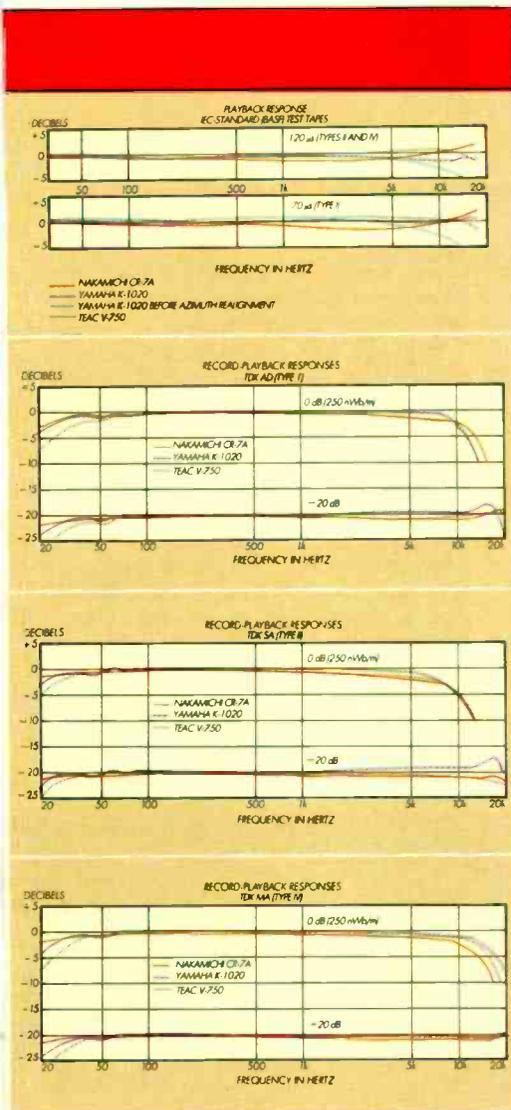
## Listening Tests

Because all three decks are three-head units, individual source-vs.-

tape comparisons were relatively easy to make. All analog copying involves *some* loss of quality, so none of the decks could make absolutely identical copies of wide-range Compact Discs. Nonetheless, using Dolby C noise reduction, I judged all three units capable of making what I would call "virtually indistinguishable" dubs of the originals—close enough, in other words, that if you entered the room with the music playing and the volume at

a reasonably normal listening level, you would be unaware that you were listening to a tape copy rather than the CD original.

To compare the three decks against each other I employed an ABX blind-comparator switching system. With this system you compare two components, A and B, by determining which sounds identical to component X. The identity of X, either A or B, is randomly determined each time by a microproces-



The playback frequency response (top graph) of all three decks was flat within 1 dB through the low and mid frequencies, with slight deviations by the Nakamichi and Teac at the highest frequencies. The Nakamichi had the flattest record-playback response in the lowest octave with all three tape types, but the three decks all had virtually flat response at -20 dB from 60 to 20,000 Hz with metal tape (bottom graph).

sor, which also records your correct and incorrect choices.

In comparisons like these, level differences must be (and were) scrupulously avoided: only a few tenths of a decibel difference almost invariably make the louder unit appear to sound better. Levels were set so that the playback outputs from the three decks were matched for each channel within less than 0.1 dB. Identical metal tape cassettes were used since the decks' measured

frequency responses with metal tape were virtually identical from 60 to 20,000 Hz.

The three decks were tested in pairs, simultaneously recording and playing back various musical selections, including parts of the Schubert *Trout* Quintet (Philips), the Pachelbel Canon (L'Oiseau-Lyre), Bach selections from "The Great Organ at Methuen" (Telarc), the opening of Strauss's *Also sprach Zarathustra* (Philips, on the Technics "Digital Inspection" sampler), and the finale, with cannon fire and bells, of Tchaikovsky's *1812 Overture* (Telarc).

Using Dolby C, I could distinguish no consistent sonic differences between the Yamaha and the Teac decks. Each time I thought I could, I'd find I had guessed wrong as often as right. Again, using Dolby C, there was a consistently audible, though not a startlingly large, difference between either of these decks and the Nakamichi. The differences I heard involved several factors.

For one thing (as our measurements confirmed), there were differences both in the level and frequency distribution of the decks' residual noise. The character of the tape hiss seemed less intrusive with the Nakamichi, both because it was quieter overall and because it had proportionately more bass content and thus sounded less "hissy."

Second, with the Nakamichi unit solo-piano notes seemed to have a clearer, more bell-like ring, and small-ensemble strings seemed to retain their individual identity and definition slightly better. I would relate this effect to the relative lack of what is called "modulation" noise. Unlike tape hiss, modulation noise (often called "noise behind the signal") varies in intensity with the recorded sound itself. Its presence tends to diminish the clarity of the reproduced sound or to add a sonic character often characterized as "graininess" or "grittiness." We have known since the days of open-reel that felt pressure pads used to hold the moving tape against the heads are prime causes of modulation noise, and of the three decks tested the Nakamichi is the only one that does without the pressure pad normally used with cassettes.

The final difference I consistently found with Dolby C was more powerful bass response, as in organ pedals and canon shots, from the Nakamichi than the Teac or the Yamaha. There is little mystery

about this if you look at the frequency-response curves of the three machines below about 60 Hz—that is, in the bottom two musical octaves. Whether this difference could be heard with less than extremely wide-range speakers (I use AR9's) is questionable, however.

*The Nakamichi consistently produced less intrusive tape hiss, and it had a relative lack of modulation noise and more powerful bass response.*

On the other hand, in terms of producing a dead-silent background at very high volume levels, the Yamaha's dbx system took top honors hands down. Dolby C reduces hiss to the point where most people can notice it distinctly only during the silent periods between musical selections, but only dbx can entirely eliminate hiss as an audible factor.

When listening to music with a percussive character (piano or tympani, for example), it was sometimes possible to hear slight variations in the background noise level created by the operation of the dbx system itself. Known as "breathing" or "pumping," the effect is more apparent to some listeners than to others. Current dbx systems like the one in the Yamaha are very nearly immune to audible "pumping," and I was able to detect it only in direct comparisons with the Teac and Nakamichi decks using Dolby C—which allowed ordinary hiss to be perceptible.

### Still a Personal Choice

Among so-called "purist" audiophiles, it is axiomatic that any audible difference carries with it an infinite worth—a proposition I find plain silly. Despite the subtle differences I heard among these three decks, I would not hesitate to recommend any of them. Each is of excellent quality and worth a serious audiophile's consideration.

As for whether there is really a \$300 difference between the Yamaha and the Teac, or whether the Nakamichi is worth almost twice the price of the Yamaha, that's up to you. It depends on how much value you place on the differences in features and performance. As I'd have to say to my inquiring friends, therefore, "You pays your money and you takes your choice." □

# POCKET STEREO

*A round-up of the portable cassette decks and radios that have revolutionized listening habits across the country*

*by Fred Petras*



"Personal portable," "headphone stereo," or "pocket stereo" equipment, call it what you will, has come a long way since Sony introduced the first Walkman about six years ago. Its popularity and wide acceptance are based on an ability to produce eminently listenable stereo sound in an exceptionally convenient, affordable, and usually reliable format.

The current selection of personal portables is somewhat broader than when STEREO REVIEW last surveyed the marketplace in September 1983. The equipment also comes in a greater variety of sizes, with something to fit any shirt, jacket, or coat pocket, and the price range is broader, with models to fit any budget. Configurations range from FM-only stereo radios barely larger than a credit card to units that have dual autoreverse cassette player/recorders with Dolby noise reduction, a

graphic equalizer, and an AM/FM stereo radio. Prices range from as little as \$20 up to around \$350, including the headphones. Discounting is widespread, and the price break can be substantial in large metropolitan areas where retail competition is strong.

High-quality personal portables come from about a dozen major manufacturers, who compete heavily at the lower end of the price range. Thus, you'll see many look-alike models priced only a dollar or two apart. But most suppliers also have one or two higher-performance models that are more distinctive and merit attention by audiophiles. It's best to avoid unknown brand names, especially those that seem intended to suggest reputable, nationally advertised brands such as Panasonic, Toshiba, JVC, Aiwa, or Sony (for instance, "Pan-O-Sonique"). The major brands have

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service networks to back up their products; the unknowns generally don't.

The audio industry is noted for introducing technological advances on a "trickle-down" basis, first in high-priced home components, then in mid-priced equipment, and finally in mass-market gear. That's why we're now seeing in the personal-stereo category more and more of such familiar home-component features as graphic equalizers, Dolby B, autoreverse, dynamic-range expansion, and metal-tape playback equalization (even metal recording-bias settings in a few models).

The latest wrinkles that may soon be widely adopted are remote control (available in two Aiwa models), solar-power operation (in a radio from Mura), and dual transports (in cassette players from Panasonic and Sony). Of course, inherent in all pocket-stereo equipment is an in-

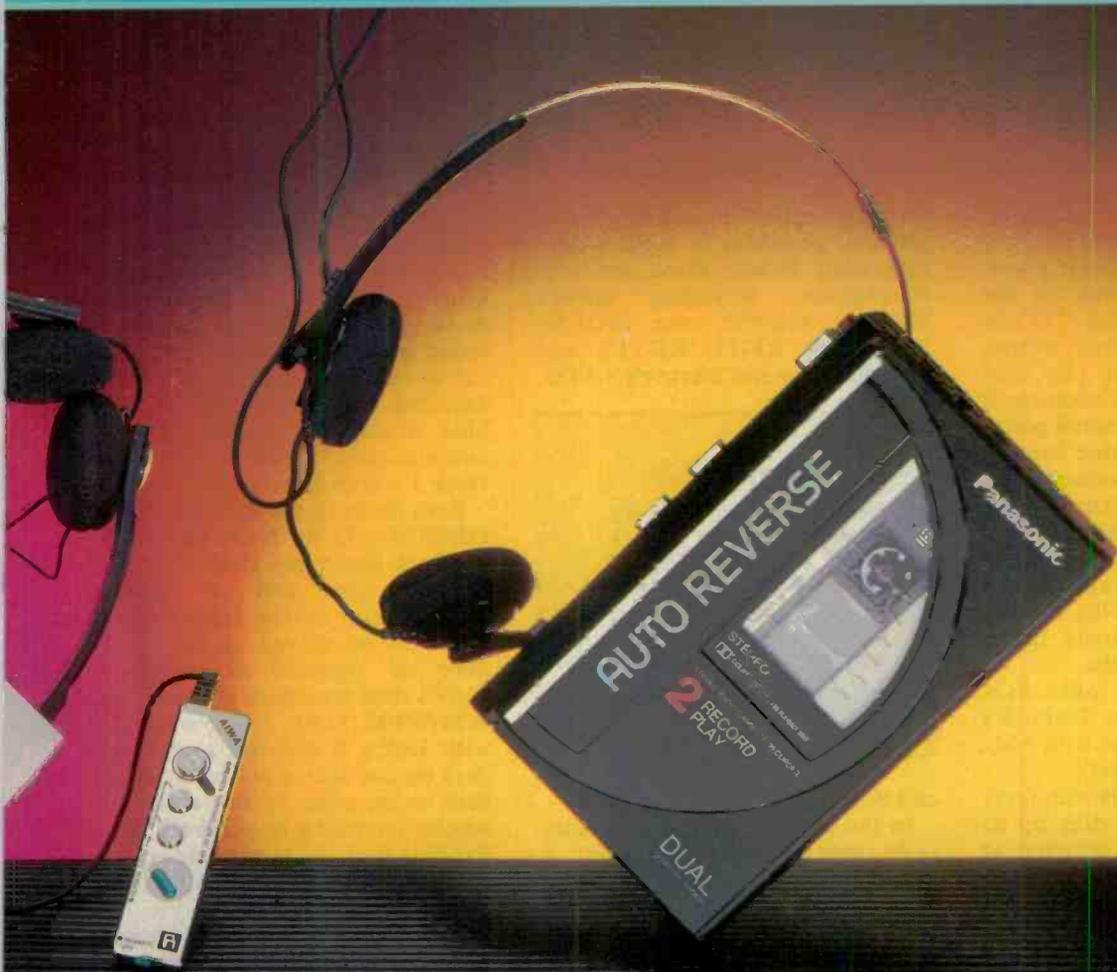
credible degree of miniaturization, which seems ever advancing to new levels of compactness, as in today's "credit-card" radios and cassette players little bigger than the cassettes themselves.

### Cassette Decks

A major trend in personal-size cassette players and recorders in 1986 is the increasing use of built-in graphic equalizers. The initial offerings were limited to three frequency bands—low, midrange, and high—but three companies now have models with five-band equalizers.

Toshiba's KT-4075 (\$130), an AM/FM stereo radio/cassette player, offers  $\pm 10$  dB of tone adjustment centered at 100, 300, 1,000, 3,300 and 10,000 Hz. The autoreverse deck also includes Dolby B, an anti-rolling mechanism, and auto stop, and there are LED indicators for tape direction and FM ster-

*Toshiba's KT-4075 radio/cassette player (below, far left), \$130, and Aiwa's HS-G500 cassette player (center, \$110) offer handy five-band graphic equalizers, and Panasonic's RX-HD19 cassette player/recorder (right, \$200) has an AM/FM tuner pack and twin cassette wells. All three have autoreverse and a wide range of other features—the Aiwa even has a remote control.*





## SHOPPING STRATEGY

**S**HOPPING for a personal stereo also means shopping for a store with a wide product selection and patient salespeople willing to let you perform certain tests on the equipment before you buy.

The ideal cassette player/recorder has a stable tape-drive system and minimal wow-and-flutter. With a portable, it's easy to check for these in a store. Just shake, twist, and turn the player while it's playing a cassette, first gently and slowly, then vigorously. If the sound wavers significantly when the player is handled gently, avoid that unit. To insure that a set will function well while you're jogging, hold it at your side as you briefly run in place on the sales floor. If the sound fades in and out or "wobbles" in any way, don't buy.

Even the highest-priced portables may exhibit some sound degradation when handled roughly, but they will play properly under ordinary circumstances. Essentially, choose a player that is least affected by motion when playing on the go. Ideal for such testing are cassettes recorded with music that is totally familiar to you. The best music for a test tape is solo piano since it quickly reveals transport inadequa-

ties. The players most likely to pass your "torture" tests are those with so-called "anti-rolling" mechanisms, a feature well worth its extra cost.

Even if you don't listen to music at loud levels, your cassette player's amplifier should be able to handle the brief peaks on well-recorded cassettes without distortion. To evaluate this quality, use fresh batteries (four AA and four AAA alkaline cells will cover most needs) and a cassette recorded with various test tones or solo flute, clarinet, or similar music. With the headphones positioned off your ears to protect them against high volume levels, slowly turn up the player's level control until you hear the music distort. The sound level should be very loud before any distortion is audible.

You'll need a high-quality cassette recording and a set of high-quality dy-

namic headphones, such as those meant for home use, to determine how well a player reproduces the full tonal range. Be sure you are totally familiar with how the cassette sounds on a home audio system so you'll have a valid listening reference. After connecting the headphones (you may need an adaptor plug), listen carefully and compare what you hear with your aural memory of the music as played on the home system. The closer it comes to the reference sound, the better.

A test to determine the inherent signal-to-noise ratio of a portable player can be conducted with a blank tape that has a nonmagnetic leader. The background noise level of the tape is the reference noise level to which you will compare the noise levels of players under consideration. Fast-wind the blank cassette so that only about a minute of tape is left to play, then press the play button and turn the volume level up high. The hiss you will hear is a combination of the player's noise level and the background noise of the tape. As the magnetic tape changes to nonmagnetic leader, the noise level will drop noticeably. The greater the drop, the lower the inherent playback noise level of the player.

eo. The headphones are collapsible for easy carrying.

Aiwa's HS-G500 cassette player (\$110) offers equalization in the same five bands as the Toshiba along with Dolby B, autoreverse, anti-rolling, rewind/auto play, and metal-tape capability. In addition, it is said to be the first personal portable to have a wired remote control, a feature of particular value to joggers and those who carry their players in a closed bag. Another Aiwa model with remote control is the HS-J500 (\$170), an autoreverse player/recorder with Dolby B, anti-rolling, an AM/FM stereo radio, and twin headphone jacks.

The third model to offer five-band equalization is Unitech's Mini-2010 cassette player with AM/FM stereo tuner pack (\$60).

Sharp has three models with four-band equalization providing up to 10 dB of boost or cut centered at 100, 500, 2,000, and 10,000 Hz. The top-of-the-line JC-790 (\$149.99) is an autoreverse cassette player with a built-in AM/FM stereo tuner, Dolby B, and a fast-playback system (1.3 times normal speed) for quick

review of speech recordings. Other personal portables in various configurations feature three bands of equalization, including Sanyo's MGR80, MGR70, and MGP30, Panasonic's RF-111, RF-110, and RX-1930, General Electric's 3-5435,

*Pocket stereo prices range from as little as \$20 to around \$350, including headphones. Discounting is widespread, and the price break can be large.*

and Sony's WM-F18.

In the deluxe, multi-use category is Panasonic's RX-HD10 (\$200), a dual-transport cassette player/recorder with an AM/FM stereo tuner pack. It features an ingenious folding design in which the two cassette wells open out like flaps for insertion of cassettes or the tuner pack.

Deck 1 is for playback only, but Deck 2 can either play tapes or record from the tuner pack or a cassette in Deck 1. A single-motor drive system insures the same tape speed in both transports, and they can be synchronized with a Synchro Dubbing Start feature. In the dubbing mode, the motor shuts off automatically when the tape in Deck 1 comes to an end.

Both decks in the Panasonic RX-HD10 have Dolby B and metal-tape playback capability. Deck 2 has autoreverse also, and the reverse-mode selector enables sides A and B either to be played consecutively once or repeated continuously. Sony's dual-transport portable, the WM-W800 (\$180), is also equipped with Dolby B and has a playback deck on one side, a playback/record deck on the other. It can be used for regular recording or playback, as a dubbing deck, or to play sides consecutively from separate tapes in its two wells.

Audiophiles seeking component-level sound quality in a personal portable should consider Sony's deluxe WM-D6C Professional cassette



When conducting this test, use the same blank tape and headphones for all players, and set the volume at the same subjective level while the magnetic part of the tape is playing. Be sure that the player's equalization switch (if it has one) is in the correct position to match the test tape, and if the set has Dolby noise reduction, turn it off for the test. To check the Dolby circuits, play a properly encoded tape with the Dolby switch alternately on and off. The background noise should be substantially less when the switch is on.

Most portable FM radios use the headphone cord as an antenna. To test reception quality under varying signal conditions, move around in the store while listening to the radio. Orient the headphone cord in various directions and note whether reception quality suffers. Compare the models you're considering in terms of how many stations they can receive clearly with minimum distortion. A good feature is a stereo/mono control that automatically switches to mono when stereo reception is poor, but make sure that when the set switches to mono the background noise drops noticeably.

Ease of operation is important to your enjoyment of a personal portable.

In your evaluations, check for smooth, hassle-free movement of the controls, paying particular attention to the tuning knob. Can you zero in on a station precisely without breaking a fingernail? If you can't, reject that model. Also look for models that can easily be operated with one hand, a mark of good human engineering.

If you intend to "wear" your personal portable using a belt clip, carrying case or cradle, or an arm band, make sure that its orientation is sensible and that it fits your body contours. Be careful of models that clip to your belt horizontally; they may protrude awkwardly compared with vertically oriented sets. Make sure that the carrying or attachment devices do not obstruct controls and operation.

If you use your personal portable often or for long listening sessions and have a choice of battery types, buy the alkaline. They'll cost substantially more than standard or carbon-zinc batteries, but they'll last far longer and deliver a more consistent power level over a longer period. To get the freshest batteries possible, buy them at a store that does a brisk business. For the utmost in operating economy for on-the-go use, consider buying a battery charger

and rechargeable nickel-cadmium batteries. If you usually use your portable at home, in the office, or in other stationary applications, the most economical way to operate it is with an a.c. power adaptor, available as an option for virtually all models.



recorder. Its many features include Dolby C as well as Dolby B, a quartz-lock transport speed control, an LED record-level indicator, a pitch control, and bias/EQ selection for normal, chrome, and metal tape. It lists for \$350, possibly the highest price for any personal-stereo product on the market.

### Radio Anywhere

There's a trend toward smaller and smaller one-piece, combination radio/headphone portables. For example, Toshiba's FM-only RP-2030 (\$60) weighs a mere 1.7 ounces without the single AAA battery it needs to operate. A folding headband makes it easy to slip into a pocket. Panasonic's FM-only RF-H5A (\$63) weighs 1.9 ounces without the two AAA batteries it needs, and it also comes with a collapsible headband. Sony's SRF-FM2 (\$40) is a 3.6-ounce FM radio that sports a flexible whip antenna. It can operate for 17 hours on one pair of AA batteries. Other truly miniature models are the Toshiba RP-2020, the General Electric 7-1285, and the Sanyo RP80.

Called "the world's smallest Walkman," Sony's SRF-201 (\$75 with battery charger) is an FM-only radio the height and width of a credit card but slightly thicker at 1/8 inch. It weighs only 1.2 ounces including its two Ni-Cad batteries. Like most

*It's best to avoid unknown brands and stick with reputable, nationally advertised ones, which have service networks to back up their products.*

pocket radios, its antenna is built into the headphone cord. Panasonic's near credit-card-size radio is the AM/FM stereo SoundCard RF-H25, which plays for 5 hours on one charge of its built-in Ni-Cad battery (\$100 including charger).

Mura's Sun Stepper (\$40) is said to be "the only stereo radio on the

market today which is powered by the sun and requires no batteries." The AM/FM radio comes with two brightly colored removable jogging straps and a shirt-pocket clip to accommodate active users such as joggers and bicyclists.

Music lovers who want to hear their favorite sounds outdoors no matter what will appreciate the weather-resistant personal portables from Toshiba and Sony. While not totally waterproof, the headsets will defy moisture if you wear them while jogging in the rain, skiing, shooting rapids, or engaging in other open-air activities (don't take them scuba-diving, though). Toshiba's RT-KS1 (\$150) is a deluxe AM/FM/cassette player that features Dolby B, autoreverse, anti-rolling, auto shutoff, metal/chrome-tape capability, and folding headphones. Sony offers the WM-75 Walkman Sports (\$130), the tape-only WM-75 (\$100), and the FM-only shirt-pocket-sized SRF-5 (\$65).

### Accessories

While most personal portables offer good sound through their sup-



Sony's WM-D6C (\$350) features Dolby B, Dolby C, quartz-lock transport speed control, an LED record-level indicator, pitch control, and bias/EQ selection for normal, chrome, and metal tape.



plied headphones, you can often get even better sound by using better-quality headphones from manufacturers who specialize in these products. You may experience "price-tag shock" when you learn that some models cost more than the radio/cassette player you plan to use them with, but extended listening will reveal the advantages of the pricier headsets.

You can listen to high-quality headphones for several hours without experiencing "sound fatigue," an effect that may occur after only an hour or so with the headphones supplied with most portables. You'll also hear nuances, especially in classical music, that may not have been apparent from listening with the set's original headphones. Deluxe stereo headphones are also generally more solidly constructed, with headbands that are easier to adjust, earpieces that fit better, and connectors that are less likely to break or loosen.

Another way to expand your listening pleasure from a personal portable is with miniature loudspeakers that attach to the radio/cassette player for a "big" sound. Pana-

sonic's RX-S38 (\$120) comes with two detachable battery-powered minispeakers, enabling the AM/FM/cassette player/recorder to function both as a portable with the supplied headphones and also as the center of a micro home audio system. Each speaker has a 2½-inch driver and an LED power/battery indicator. Four AA batteries power the speakers, and two AA's operate the radio/cassette deck. Other features include one-touch recording, autoreverse, metal-tape playback, chrome/normal-tape recording and playback, cue-and-review, pause control, and a stereo microphone input.

Other manufacturers offer accessory speakers that can be used with any personal portable. Mura's Sound Stepper (\$40) is a compact portable speaker outfit that consists of two powered mini-speakers in a nylon carrying case with shoulder strap. There's a center compartment for a personal portable and room for some cassettes. The two-way speakers have 3½-inch woofers and 1¼-inch tweeters, and they operate either on four C cells or with an optional a.c. adaptor. An essentially

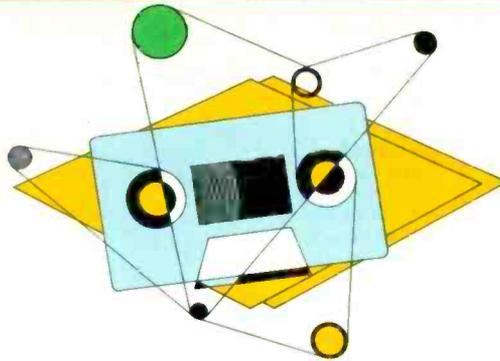
similar system is available for the same price under the Unitech brand name.

Bose's RM-1 RoomMate amplified speaker systems (\$260 per pair) are designed to make personal portables operate somewhat like full-size audio systems when they're not being carried around. The speakers each contain a 4½-inch full-range driver and measure 6 x 6 x 9 inches. One of them contains an equalized stereo amplifier that operates on house current; the inputs connect to the headphone jack of any personal portable. The speakers can sit on a shelf or table, or optional mounting arms can be used to clamp them to a desk, the headboard of a bed, or the top of a bookcase.

### *Music to Go*

Even with just the supplied headphones, name-brand personal portables produce surprisingly good sound from increasingly small packages. Audiophiles may belittle the sound as "mid-fi" (or worse), but it seems certain that people will continue to enjoy hearing what they want, when they want it, wherever they happen to be. □

# BLANK TAPE BUYING GUIDE



BY WILLIAM BURTON WITH RICHARD KRUEGER AND WENDY SCHAUB

**C**ASSETTE tape is the primary audio recording medium, much more popular than the larger open-reel and the smaller microcassette formats. This guide includes the three main formats of audio tape—cassette, open-reel, and microcassette—plus the odd minicassette and eight-track cartridge.

All the information given here, including the suggested retail prices, was provided by the

manufacturers. Because of the competitiveness of the blank-tape market and the shifting relationship of the dollar and the Japanese yen, the prices given are subject to change. The actual prices in the stores are set by the dealers, but the manufacturers' suggested prices can serve as guidelines for making comparisons.

The names and addresses of blank-tape manufacturers can be found on page 68.

## BASF

### Metal IV Cassettes

Metal-particle tape for Type IV/metal settings.  
ME-IV C-120 ..... \$7.79

### LH Maxima I Cassettes

Ferric tape with high MOL for increased S/N and low distortion.

90 min ..... \$2.79  
60 min ..... \$2.19

### Chromdioxid Maxima II Cassettes

High-density chrome formulation, precision shell.

C-90, 90 min ..... \$4.79  
C-60, 60 min ..... \$4.59

### Chromdioxid Extra II Cassettes

Pure chrome for lowest noise, high output.

90 min ..... \$3.59  
60 min ..... \$2.89

### LH Extra I Cassettes

Ferric position. Extended S/N over entire frequency range.

90 min ..... \$1.89  
60 min ..... \$1.59

### Ferro LH Open-Reel Tape

Open-reel ferric tape for general recording.  
7" Reel, 1,800 ft ..... \$9.19

### Ferro Super LH Open-Reel Tape

Back-coated, clear leader ferric tape.  
7" Reel, 1,800 ft ..... \$11.99

### Chrome EE Open-Reel Tape

Back-coated chrome tape for EE-capable decks.  
7" Reel, 1,800 ft ..... \$19.69

## CERTRON

### Endless Cassette

30-sec endless cassette.  
EC-30 ..... \$4.99

## Microcassette

M-60, 60 min ..... \$3.99

## UX I Cassette

Normal-bias premium tape.  
UX-90, 90 min ..... \$3.99

## DENON

### HDM Metal Cassettes

Featuring ultra-fine pure metal particles, an ultra-wide window, and cleaning leader.

HDM-90, 90 min ..... \$6.50  
HDM-60, 60 min ..... \$5.00

### HD8 High-Bias Type II Cassettes

All HD tapes feature a hybrid of metal particles and cobalt-doped ferric. Includes an ultra-wide window.

HD8-90, 90 min ..... \$4.75  
HD8-60, 60 min ..... \$3.75

### HD7 High-Bias Cassettes

Cobalt-doped ferric Type II cassettes with ultra-wide window.

HD7-90, 90 min ..... \$4.00  
HD7-60, 60 min ..... \$3.00

### HD6 High-Bias Cassettes

High-bias Type II cassettes with ultra-wide window.

HD6-90, 90 min ..... \$3.25  
HD6-60, 60 min ..... \$2.50

### DX4 Ferric Normal Cassettes

Normal-bias cobalt-doped ferric Type I tape with ultra-wide window.

DX4-90, 90 min ..... \$4.00  
DX4-60, 60 min ..... \$3.00

## FUJI

### FR Series Metal Cassettes

Metal-coated tape with tensilized polyester base; designed for metal bias, 70- $\mu$ sec EQ; packaged in hinged plastic box.

FR (C-46), 46 min ..... \$5.75

FR (C-60), 60 min ..... \$6.35  
FR (C-90), 90 min ..... \$8.60

### FR-II Series Cassettes

Chromium-dioxide cassettes with tensilized polyester base; designed for Type II/CrO<sub>2</sub> bias, 70- $\mu$ sec EQ; packaged in hinged plastic box.

FR-II (C-46), 46 min ..... \$3.95  
FR-II (C-60), 60 min ..... \$4.35  
FR-II (C-90), 90 min ..... \$5.95

### FR-I Series Cassettes

Ferric formulation with tensilized polyester base; designed for ferric/normal/Type I bias, 120- $\mu$ sec EQ; packaged in hinged plastic box.

FR-I (C-46), 46 min ..... \$3.95  
FR-I (C-60), 60 min ..... \$4.35  
FR-I (C-90), 90 min ..... \$5.95

### DR Series Cassettes

DR (C-46), 46 min ..... \$2.35  
DR (C-60), 60 min ..... \$2.75  
DR (C-90), 90 min ..... \$3.80  
DR (C-120), 120 min ..... \$5.30

### GT-II Series Cassettes

High-bias, 70- $\mu$ sec EQ. Heat-resistant tape, shell, and plastic case. Dual-spring pressure pad.

C-46 ..... \$4.95  
C-60 ..... \$5.45  
C-90 ..... \$7.45

### GT-I Series Cassettes

Normal-bias, 120- $\mu$ sec EQ car audio cassette with heat-resistant tape, shell, and clear plastic case; tensilized polyester backing.

GT (C-46), 46 min ..... \$4.45  
GT (C-60), 60 min ..... \$4.95  
GT (C-90), 90 min ..... \$6.95

## IRISH

### High Output Cassettes

Precision shell, ferric cassette in Norelco box.  
XR-90, 90 min ..... \$2.70  
XR-60, 60 min ..... \$2.10

# BLANK TAPE

## Low-Noise Cassettes

Precision shell, ferrous cassette in Norelco box.

LN-90. 90 min	\$2.15
LN-60. 60 min	\$1.75
LN-30. 30 min	\$1.50

## JVC

### ME-PII Cassette Tape

Metal-particle tape with high magnetic density and high particle acicularity for high MOL.

C-90. 90 min	\$16.95
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### DA7 High-Bias Cassette Tape

Tape combines two layers of high-energy cobalt-treated particles.

C-90. 90 min	\$7.45
C-60. 60 min	\$5.25

### DA3 Normal-Bias Cassette Tape

Normal-bias tape, designed for recording music; has two layers of magnetic coating; one with high coercivity and one with high magnetic flux density. Requires 120- $\mu$ sec EQ.

C-90. 90 min	\$6.95
C-60. 60 min	\$4.75

### F1 Cassette Tape

Popular series. Low noise, normal bias.

C-90. 90 min	\$3.95
C-60. 60 min	\$2.95

## KONICA

### Metal Cassette Tapes

60 min	\$5.49
90 min	\$6.79

### GM-II High-Bias Cassette Tapes

60 min	\$2.99
90 min	\$3.59

### GM-I Normal-Bias Cassette Tapes

60 min	\$2.99
90 min	\$3.59

### ML Normal-Bias Cassette Tapes

60 min	\$1.89
90 min	\$2.59
120 min	\$3.29

## LASER BY SWIRE MAGNETICS

### Laser XL Cassettes

Normal-bias ferric cassettes with extra low noise. For voice or music.

C-120. 120 min	\$2.49
C-90. 90 min	\$1.89
C-60. 60 min	\$1.49
C-45. 45 min	\$1.39

### Laser UHD-I Cassettes

Normal-bias ferric cassettes with high-energy, high-density formulation.

C-90. 90 min	\$2.59
C-60. 60 min	\$1.99

### Laser UHD-II Cassettes

High-bias ferric cassettes with high-energy, extended frequency response.

C-90. 90 min	\$2.59
C-60. 60 min	\$1.99

## LIGHT SUPPLY

### Ferric Cassettes

Ferric cassettes with 120- $\mu$ sec EQ. Digital ready with NR. Said to have very high resolution of treble.

C-120 Concert Length. 120-minute cassette	\$5
Four C-120 Cassettes	\$15

## MAXELL

### Metal Cassettes

Metal bias/EQ.	
MX-46. 46 min	\$3.79
MX-60. 60 min	\$4.39
MX-90. 90 min	\$5.89

### XLII-S Epitaxial Cassettes

High-level bias; 70- $\mu$ sec EQ.	
XLII-S60. 60 min	\$3.59
XLII-S90. 90 min	\$4.59

### XLI-S Epitaxial Cassettes

Normal bias; 120- $\mu$ sec EQ.	
XLI-S60. 60 min	\$3.59
XLI-S90. 90 min	\$4.59

### XL-I Epitaxial Cassettes

Normal bias; 120- $\mu$ sec EQ.	
XLI-60. 60 min	\$2.99
XLI-90. 90 min	\$3.69

### XL-II Epitaxial Cassettes

Chrome type; high-level bias; 70- $\mu$ sec EQ.	
XLII-46. 46 min	\$2.99
XLII-60. 60 min	\$3.09
XLII-90. 90 min	\$3.69

### UDS-I Normal-Bias Cassettes

Features phase accuracy shell, frictionless slip sheets. Quin-Lok hubs, cleaning leader.	
UDS-I-46	\$2.19
UDS-I-60	\$2.39
UDS-I-90	\$3.09

### UDS-II High-Bias CrO<sub>2</sub> Cassettes

Features phase-accuracy shell, frictionless slip sheets. Quin-Lok hubs, cleaning leader.	
UDS-II-46	\$2.19
UDS-II-60	\$2.39
UDS-II-90	\$3.09

### UR Normal-Bias Cassettes

UR-46. 46 min	\$1.39
UR-60. 60 min	\$1.49
UR-90. 90 min	\$1.72
UR-120. 120 min	\$2.59

### Microcassettes

Normal bias.	
MC-46UD2PK (2 per card)	\$5.59
MC-60UD2PK (2 per card)	\$5.89

### Open-Reel Tapes

#### XLII Open-Reel Tapes

Designed for use with EE-tape-capable decks.	
XLII 35-90. 1,800 ft	\$15.89
XLII 35-180. 3,600 ft	\$43.39

#### XLI Back-Coated Open-Reel Tapes

XLI 50-60B. 1,200 ft, 7" reel	\$10.19
XLI 50-120B. 2,500 ft, 10.5" reel	\$30.89
XLI 35-90B. 1,800 ft, 7" reel	\$11.99
XLI 35-180B. 3,600 ft, 10.5" reel	\$33.49

#### Ultra-Dynamic Open-Reel Tapes

UD50-60. 1,200 ft, 7" reel	\$8.29
UD50-120. 2,500 ft, 10.5" reel	\$26.29
UD35-90. 1,800 ft, 7" reel	\$8.59
UD35-180. 3,600 ft, 10.5" reel	\$26.59
UD25-120. 2,500 ft, 10.5" reel	\$10.79
UD18-180. 3,600 ft, 10.5" reel	\$11.69

## Accessories

MR-10. 10.5" precision metal reel, NAB hub	\$13.49
MR-7M. 7" precision metal reel, standard hub	\$8.29
PR-7. 7" plastic reel, standard hub	\$3.09

## MEMOREX BY MEMTEK

### CDX II High-Bias Cassettes

Metal tape for high-bias (Type II) setting. Superior tape for recording CD's or other digital sources at high-bias, 70- $\mu$ sec setting. Greater headroom for distortion-free reproduction at significantly higher recording levels than conventional high-bias tapes. New permanent reference-cassette mechanism shell.

C-90	\$4.99
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### HBX II High-Bias Cassettes

High-performance ferric/cobalt tape for use at high-bias 70- $\mu$ sec setting. Higher MOL's, greater sensitivity compared to standard high bias and CrO<sub>2</sub> tapes. New permanent reference-cassette mechanism.

HBX II High Bias C-90	\$3.79
HBX II (type II) C-60	\$2.99

### HB II High-Bias Cassettes

Premium tape for high-bias 70- $\mu$ sec EQ position. Improved low-end MOL, greater sensitivity, permanent reference cassette mechanism.

HB II High-Bias C-90	\$3.29
HB II (Type II) C-60	\$2.59

### MRX I Normal-Bias Cassettes

Premium normal-bias tape. Full lifetime warranty.

C-120	\$3.99
C-90	\$2.99
C-60	\$2.39
C-45	\$2.19
C-30	\$2.09

### db Series Cassettes

Quality normal-bias tape for general recording of voice or music. Full lifetime warranty.

C-90	\$2.49
C-60	\$1.99

### Metal IV Cassettes

Pure metal formulation for better high-frequency performance.

C-90	\$6.39
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### Microcassettes

MC-60 Metal Music-Micro. Pure metal tape formulation. 60 min.	\$7.19
MC-60 MRX Music-Micro. For recording music at "normal" setting. 60 min.	\$3.99
MC-60 MMC Dictation-Micro. Dictation microcassette for general-purpose recording. 2 cassettes per card	\$3.72

## NAKAMICHI

### ZX Reference Cassette Tape

Metalloy (metal-particle) formulation for recording on metal-compatible decks only; features ultra-high coercivity and retentivity for improved distortion and MOL; 70- $\mu$ sec EQ.

ZX-C60. 60 min	\$6.50
ZX-C90. 90 min	\$9.00

### SX II Reference Cassette Tape

Double-coated ionized cobalt and ferric-oxide formulation. CrO<sub>2</sub> bias and EQ (70  $\mu$ sec).

SXII-C60. 60 min	\$5.85
SXII-C90. 90 min	\$8.00

### SX Reference Cassette Tape

Single-coated ionized cobalt and ferric oxide for





mulation; high coercivity permits use of CrO<sub>2</sub> bias and EQ (70 μsec) for 4-5 dB better signal-to-noise ratio.

- SX-C60. 60 min ..... \$4.00
- SX-C90. 90 min ..... \$5.85

**EX II Reference Cassette Tape**

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

- EXII-C60. 60 min ..... \$3.70
- EXII-C90. 90 min ..... \$5.40

**PDMAGNETICS**

**High-Grade Line**

Audio cassette line with choice of three particle formulations; clear 5-screw shell. Recording specs as compared (+ or -) to appropriate IEC reference tape.

**500 Crolyn HG Cassettes**

Chromium dioxide, Type II. MOL +1.5 dB, sens +0.5 dB, S/N +2.5 dB at 315 Hz; S/N +2.5 dB at 10,000 Hz. Coercivity 500 oersteds; retentivity 1,900 Gauss; squareness ratio .85.

- 90 min. Overall thickness 12 microns ... \$3.99
- 60 min. Overall thickness 18 microns ... \$2.59

**Quality Line**

One high-bias and two normal-bias audio cassette tapes matched to IEC standards. Recording specs as compared (+ or -) to appropriate IEC reference tape.

**500 Crolyn**

High-bias chromium-dioxide tape designed for quality cassette decks. MOL +1.5 dB, sens +0 dB, S/N +2.0 dB at 315 Hz; S/N +1.0 dB at 10,000 Hz. Coercivity 500 oersteds; retentivity 1,900 Gauss; squareness ratio .85.

- 90 min. Overall thickness 12 microns ... \$3.19
- 60 min. Overall thickness 18 microns ... \$2.09

**Tri-Oxide Ferro**

Normal-bias tape designed for home, car, and portables. MOL +0.5 dB, sens +0 dB, S/N +1.0 at 315 Hz; S/N -0.5 dB at 10,000 Hz. Coercivity 350 oersteds; retentivity 1,550 Gauss; squareness ratio .83.

- 90 min. Overall thickness 12 microns ... \$2.99
- 60 min. Overall thickness 18 microns ... \$1.99

**QUASAR**

**MT462M Microcassettes**

46-minute metal-bias microcassettes in twin pack ..... \$9.50

**MT90A Microcassettes**

Angrom tape microcassettes ..... \$9.50

**MT602 Microcassettes**

60-minute normal-bias microcassettes in twin pack ..... \$5.00

**REALISTIC**

**Supertape Metal Cassettes**

- 44-961. 90 min ..... \$6.99
- 44-960. 60 min ..... \$5.99

**Supertape High-Bias Cassettes**

- 44-941. 90 min ..... \$4.39
- 44-940. 60 min ..... \$3.69

**Supertape Gold Cassettes**

- 44-923. 120 min ..... \$4.99
- 44-922. 90 min ..... \$3.79
- 44-921. 60 min ..... \$2.79
- 44-920. 45 min ..... \$2.59

**Low-Noise, High-Output Cassettes**

- 44-604. 120 min ..... \$3.49
- 44-603. 90 min ..... \$2.79

- 44-602. 60 min ..... \$1.99
- 44-601. 30 min ..... \$1.59

**Concertape Cassettes: 3-Packs**

- 44-614. 120 min ..... \$4.99 ea.
- 44-613. 90 min ..... \$3.59 ea.
- 44-606. 30 min ..... \$1.99 ea.
- 44-607. 60 min ..... \$2.59 ea.

**Concertape Cassettes: Singles**

- 44-620. 90 min ..... \$1.25 ea.
- 44-605. 60 min ..... \$.88 ea.

**Open-Reel Tape**

- 44-1880. 7-inch reel, 3,600 ft ..... \$11.49
- 44-1877. 7-inch reel, 1,800 ft ..... \$6.49
- 44-1878. 7-inch reel, 1,200 ft ..... \$5.79
- 44-1872. 5-inch reel, 900 ft ..... \$3.99

**Low-Noise Open-Reel Tape**

- 44-766. 7-inch reel, 3,800 ft ..... \$7.99
- 44-758. 7-inch reel, 2,400 ft ..... \$6.49
- 44-754. 7-inch reel, 1,800 ft ..... \$5.49
- 44-752. 5-inch reel, 1,200 ft ..... \$3.99
- 44-753. 5-inch reel, 900 ft ..... \$2.99
- 44-734. 3-inch reel, 225 ft ..... \$1.49

**All-Purpose Budget-Price Concertape**

- 44-1018. 7-inch reel, 1,800 ft ..... \$2.49

**Mini-Cassettes**

- 44-633. 30 min ..... \$2.89

**Microcassettes**

- 44-644. 2.4 cm/sec. 90 min. .... \$6.95
- 44-640. 2.4 cm/sec. 60 min. .... \$3.49

**Supertape 8-Track Tape**

- 44-843. 90 min ..... \$3.99
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Normal-bias ferric-oxide cassette featuring im-

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# BLANK TAPE

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Normal bias; 120- $\mu$ sec EQ; precision mechanism.

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# JONI MITCHELL

BY ALANNA NASH

*"I'm sure you can't say that all handicaps can be overcome by spirit, but I really believe that a lot of them can."*



FBFI ROBERT'S

**R**OBERTA JOAN ANDERSON was an athletic nine-year-old when the polio epidemic hit western Canada in 1952. By the time she got out of the hospital, her spine "looked like a freeway after an earthquake," and the muscles in her back and right leg were so withered that the doctors said she'd never walk again. The nine-year-old, however, had other plans.

"The fact of the matter is that I was, I am, crippled from it, but I just pretended like it wasn't there," says Anderson, who grew up to become Joni Mitchell, one of popular music's most significant singer-songwriters. "I got through my youth and my teens without any real problem—never missed a dance. I'm sure you can't say that all handicaps can be overcome by spirit," she adds, chain-smoking her third Camel of the interview, "but I really believe that a lot of them can."

Mitchell's indomitable "spirit" was

called on to perform another near miracle last year, when, after a decade of low-to-moderate sales and quirky, avant-garde experimentalism, the singer decided to resurrect her career with an all-out, Big Business push, *à la* Tina Turner. Predictably, most of the record industry had about the same prognosis for her success as the long-ago doctors had for her dancing.

But Mitchell ignored industry doubts, the same way she'd discounted the effects of polio, and went on to produce "Dog Eat Dog," a beautifully crafted and intelligent appraisal of American culture in decline. Released toward the end of last year, the album had critics somewhat divided. Some put it on their "year's best" lists, while others, expecting perhaps her acoustic or jazz-pop formats of old, quarreled with its modern, synth-rock, audio-effect framework. Most reviewers, however, see it as a relentlessly inventive collage of sound, rhythm, and lyrics and an album that ranks with

# JONI MITCHELL

"Blue" and "Court and Spark" as a milestone in Mitchell's eighteen years of recording.

As a result, Mitchell, at forty-two, is doing something she's always refused to do, and that is to go out and personally hawk an album. In the flesh, she is something of a surprise. Her blond hair is no longer folkie-long and straight but medium-short and curly. Wearing a black beret, a black jumpsuit with purple stripes, and short, black, lace-up boots, she is both beatnik and brainy, charming and offbeat, with a strong Canadian accent. She is also quicksilver—open, giddy, polite, even vulnerable one moment, and very, very cool the next as she stands with her arms folded, smoke-smoke-smoking that Camel and watching the video for *Good Friends*, her first single off "Dog Eat Dog."

The funny thing, she says, sipping black coffee at the Warners Bros. Records office in New York, is that after all these years of invisibility she finds she loves talking to people, even the press—doing as many as ten interviews in a row on one banner day. "I'm in promo mode," she explains with a wide smile. "I want people to know the record is there."

With her first album, in 1968, twenty-five-year-old Joni Mitchell appeared to be a bell-bottomed folkie with a poetic eye and a sure knack for storytelling. Her songs grew musically more ambitious

with each album, and her singing likewise grew confident and daring. By the time of "Blue" (released on the Reprise label in 1971), her fourth album, Mitchell had developed into a startlingly mature writer, fusing intensely intimate lyrics with emotional melodies in the contemporary folk tradition.

It was her fifth album, "Court and

*Mitchell surveys the general state of things and finds rampant moral decay: government intervention in private lives, Yuppie materialism, and the frightening symbiosis of politics and religion.*

Spark" (1974), however, that really showed what she could do. No longer content to stay within the narrow confines of acoustic folk music, Mitchell ferreted out a complementary clutch of jazz-pop musicians (led by Tom Scott) who understood the unorthodox chords she employed in her open tunings on the guitar. Full of emotional rushes, romantic surges, and tight but well-paced music, "Court and Spark" (on Asylum) was a thrilling synthesis of rock, pop, and jazz, an album that assured Mitchell's position in the annals of popular music.

From her most widely hailed effort, however, Mitchell spiraled down with "The Hissing of Summer Lawns" (1975), in retrospect a brilliant album but ahead of its time. Universally drubbed for its use of polyrhythms, Burundi drums, modality, and unconventional song structure, the album began a commercial decline from which Mitchell is only now recovering.

"Hissing" was followed by "Hejira" (1976), a jazz-laced album of romantic introspection; "Don Juan's Reckless Daughter" (1977), a wandering collection of formless jazz; and "Mingus" (1979), a tribute to jazz great Charlie Mingus, which brought her scorn and ridicule from both jazz and pop circles.

Three years ago, Mitchell tried again, with "Wild Things Run Fast." The album won back some of the old fans with a pop, rock, and jazz orientation that was reminiscent of her early Seventies work. But if anyone thought she was about to repeat herself, they did not know Joni Mitchell very well. Her next album would take a 180-degree turn, from musings on love and romance to Mitchell's most overtly political statement yet.

"Dog Eat Dog" is an angry album, one that fairly *seethes* with outrage as Mitchell surveys the general state of things and finds rampant moral decay: government intervention in private lives, Yuppie materialism, Moral Majority censorship, Star Wars sensibility, and the frightening symbiosis of politics and religion. These subjects may seem light years away from Mitchell's best-loved work—confessional, highly personal songs of romance, self-obsession, and delusion—but in truth all of the new songs do have autobiographical roots.

The tone of the album comes from two experiences. The first involves an "unfair" California state tax levied in 1982 against Mitchell and nine other musicians who had artistic-control clauses in their recording contracts. The levy demanded 15 percent of Mitchell's income between 1972 and 1976 in back taxes. "Now I know firsthand what it is to be dealt an injustice by the government," says Mitchell, who has retained her Canadian citizenship. "I got my advance [on a new five-year Geffen recording contract], and the state of California

Mitchell, shown here with singer Richie Havens, is both charming and offbeat.



CLAUDIO LEIMAN/RETNA

said, 'Thank you very much. That's exactly what you owe us.' I'm telling you, it was like finding out that Daddy goes to hookers."

At about the same time, Mitchell married bassist Larry Klein (she was divorced from Detroit folk singer Chuck Mitchell in the late Sixties) and settled in for a "normal American year, spending a lot of

*"Writing is very confronting work. A misunderstanding or a need to comprehend something within yourself drives you to sit up all night. It's only rewarding when the muse coughs up something right."*

time at home, watching a lot of television." In fact, Mitchell says, she would have called the album "Songs of a Couch Potato" except for the seriousness of her message. Believing now that "the government is crooked," she was horrified at what she saw on her screen: an undeniable swing from the liberal, progressive Sixties and Seventies to a decade of right-wing conservatism and repression, best exemplified by the televised sermons of Jerry Falwell and Jimmy Swaggert. "The government," she concluded, "is now in league with the fundamentalists."

When it came time to record, however, Mitchell worried that the times were too superficial for such an album. "In a way," she said, "I don't blame people. It's a period of escape, like the early Fifties were, although for a different reason. Even the cause-mindedness, to me, has a more frivolous nature now than it did in the Sixties. I mean, with the causes this time you've got albums for them flashing on the screen," she says, laughing. "So on one level, it's just a great party time. Like my manager said, 'I don't know about these songs, Joan. Don't you have anything about sex and parties?'"

Mitchell left her long-time manager, Elliot Roberts, toward the end of the project and signed with Peter Asher because Roberts was "too busy" with his enormous stable of clients. But she also admits that Roberts, concerned with her loss of

power in the industry, pressured her to bring in a co-producer—something she had not had to do since her debut album.

In the end, British electronics wizard Thomas Dolby came in as a "color assistant," sharing producer's credit with Mitchell, Klein, and engineer Mike Shipley on all but three songs. The recording sessions, for the album lasted from February to September.

"This was one of the most difficult albums I ever had to make," she says, knitting her eyebrows. "I had never done any kind of work with a committee where, instead of just going with my natural enthusiasm for something, there were four strong opinions to consider—and a lot of opposition. But frequently, because of the delay and irritation, just like sand in an oyster, a pearl was born."

Some of the shiny, austere sounds on the album—the percussive whir of a cigarette machine on *Smokin' (Empty, Try Another)* or the street ambience of a burglar alarm on *The Three Great Stimulants*—have been criticized as "aural flash." But there is an appropriate uneasiness to this music, the effects lending the lyrics a power they would not have on their own. Better still, the electronics never diminish Mitchell or her material.

So far, with "Dog Eat Dog" selling well and bringing her back to center stage, the rest of Mitchell's life is on track too. "Marriage frees me up in a lot of ways. I feel mated," she says, pointing out that "Dog Eat Dog," for all its foreboding, is bookended by songs about friendship and love, a continuing source of optimism for her. "Relationship," she deems, "is everything."

Just the same, she says she still finds it difficult to express happiness in her music. "I'm a melancholy Nordic, you know. Midnight Sun in all the genes. Writing is very confronting work. A strong emotion—either a misunderstanding or a need to comprehend something within yourself—drives you to sit up all night to plumb the depth of your being. It's only rewarding when the muse coughs up something that has the right sound, as well as confirmation and content. When that happens, or when you get lucky in the studio, man, there's



ANN SUMMA/RETNA

not another job in the world you would want.

"Sometimes I start to feel that the gods are smiling," she says, sounding a lot like Roberta Joan Anderson from Saskatchewan. "To a certain degree I have to feel that there are forces at work beyond me." □



### "Dog Ect Dog"

Joni Mitchell (vocals, Fairlight CMI, keyboards); Larry Klein (Fairlight CMI, keyboards, basses, synthesizer programming); Thomas Dolby (Fairlight CMI, keyboards, synthesizer programming); Mike Landau (guitars); Vinnie Colaiuta (drums); Michael Fisher (percussion); other musicians. *Good Friends; Fiction; The Three Great Stimulants; Tax Free; Smokin' (Empty, Try Another); Dog Eat Dog; Shiny Toys; Ethiopia; Impossible Dreamer; Lucky Girl.* GEFEN 24074-1 \$8.98, © 24074-4 \$8.98, © 24074-2 no list price.

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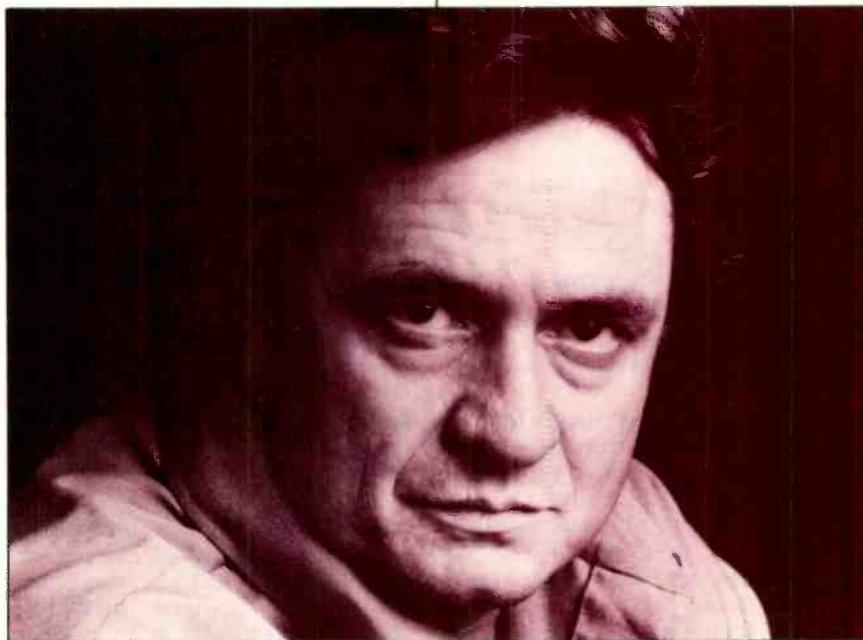


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# BEST OF THE MONTH

*Stereo Review's critics choose the outstanding current releases*

## JOHNNY CASH: WEATHERING THE STORM



Cash: shelter from the rain, hope for the rainbows

**T**HE problem with rainbows, of course, is that you have to wait out a thunderstorm to get one, and even then there's no guarantee it'll show up. On his new album, "Rainbow," Johnny Cash, who has seen his share of rain and rainbows alike, takes shelter with a varied assortment of pent-up characters who've been weathering the storm so long they've nearly forgotten what it's like when it's clear but hold out hope for rainbows just the same.

There's the truck-stop waitress who turns surly when someone points up her small act of kindness, the unwed father who can't be bothered, the lonely mistress who puts on new stockings for her sad, shamed lover, and the devastated executive who finds that it's hard on Easy Street sometimes.

This is, in effect, a songwriter's

album, and any listener would be hard put to find a finer passel of songs. A number of them have lain around awhile, mellowing with age and becoming classics even though they haven't been heard all that much. One of the two Cash originals, *You Beat All I Ever Saw*, dates back twenty years, to when he and Waylon Jennings shared a Nashville apartment; *They're All the Same* is a tune Willie Nelson wrote

knows, the characters in the songs, he hovers slightly above them, like the narrator in Thornton Wilder's *Our Town*, so as not to block our own connections with them. For an album about solemn subjects, there is an abundance of humor here too, both inherent in several of the songs and in Cash's appreciation for the irony that weaves its way into almost any situation. With the music, then, comes a portrait of the artist as . . . well, if not a young dog, a middle-aged one who doesn't pretend to understand life, but who accepts it as it comes, with splendor and squalor, justice and inequity, and, certainly, rain and rainbows.

Alanna Nash

**JOHNNY CASH: *Rainbow*.** Johnny Cash (vocals, guitar); June Carter Cash, Waylon Jennings, Paul Davis, (background vocals); Marty Stuart (guitar, mandolin), vocal and instrumental accompaniment. *I'm Leaving Now; Here Comes That Rainbow Again; They're All the Same; Easy Street; Have you Ever Seen the Rain?; You Beat All I Ever Saw; Unwed Fathers; Love Me Like You Used To; Casey's Last Ride; Borderline (A Musical Whodunit)*. COLUMBIA FC 39951, © FCT 39951, no list price.

## SPECTACULAR RESPIGHI FROM RICCARDO MUTI

**R**ICCARDO MUTI has gone all out for drama and a "big sound" in his new Philadelphia Orchestra recording, for Angel, of the three famous symphonic poems in Respighi's Roman cycle: *The Pines of Rome, The Fountains of Rome, and Roman*

Muti: in his element



for Cash back in the 1960's; and *Casey's Last Ride* comes from the box of songs Kris Kristofferson dropped in Cash's yard by helicopter fifteen years ago.

Musically, "Rainbow" covers everything from Cash's trademark ticky-tack guitar/rockabilly sound to the show-tune underpinnings of *Easy Street*, the folk stylings of John Prine (who contributes *Unwed Fathers*), and the country-rock of John Fogerty's *Have You Seen the Rain?* It presents Cash as an artist who's above categorization in popular music and, surprisingly, as a singer who has improved so much through the years in intonation and in the nuances of expression that you could chart his growth on paper.

Still, there is a decidedly detached point of view at work in this album. While we never doubt for a moment that Cash understands, or even

*Festivals*. And the producers have backed him up with awesome recorded sound from Memorial Hall in Philadelphia's Fairmont Park. They have even managed to get all three pieces on a single LP without interruptions for turnover—*Pines* and *Fountains* fit on one side, and the second side is allotted to the *Festivals*.

With *The Pines* and *Festivals*, Muti is wholly in his element, and the orchestra players give their utmost. The readings are marked by fine details as well as plaster-cracking dynamics, especially aided by the pedal register of the Memorial Hall organ. The climactic moments of the sections "Pines Near a Catacomb" and "Pines on the Appian Way" are standouts. My only criticism of the *Pines* recording is that the opening of "Pines Near a Catacomb" virtually cuts into the closing reverberations of "Pines of the Villa Borghese."

The more spectacular episodes of *Roman Festivals* can only be described as mind-boggling in this performance. Never have I heard the "Circenses" section, with its evocation of the Roman mob and of Christians being thrown to the lions, realized in more gruesomely graphic fashion. There is an almost feverish exaltation in the "*Il giubileo*" section as the pilgrims catch sight of the Holy City. And while I would have liked more poetry in Muti's treatment of the echoing horn calls and jingling processional bells in "*L'ottobrata*," the concluding "*La befana*" with its evocation of Epiphany festivities at the Piazza Navona is one gorgeous riot of color from start to finish—a dazzling demonstration of orchestral and sonic virtuosity.

Charles Dutoit's Montreal Symphony recording of these works on

*Dylan: enduring contributions*

London is still a formidable competitor. It, too, is blessed with excellent sonics, and Dutoit responds more fully than Muti to the poetic aspects of the music, especially in *The Fountains*, where Muti's read-seems a bit perfunctory—for example, in the haunting sunset finale. Nevertheless, the Angel LP is a real demo-quality recording, and the CD version, when it is released, should be spectacular. *David Hall*

**RESPIGHI:** *The Fountains of Rome; The Pines of Rome; Roman Festivals*. Philadelphia Orchestra, Riccardo Muti cond. ANGEL ● DS-38219 \$11.98, © 4DS-38219 \$11.98.

## SUMMING UP BOB DYLAN: AN IMPRESSIVE "BIOGRAPH"

**B**OB DYLAN's "Biograph" is the kind of career retrospective you'd expect to be devoted to somebody who was already dead—an almost daunting five-record collection of greatest hits, rarities, and legendary unreleased material packaged to a fare-thee-well with a gorgeous illustrated booklet that includes terrific notes by Cameron Crowe and comments from Dylan himself about nearly every track. Dylan is, of course, very much alive and kicking, but despite the memorial air that hangs over the project, it's a nearly flawless tribute to an artist who deserves no less.

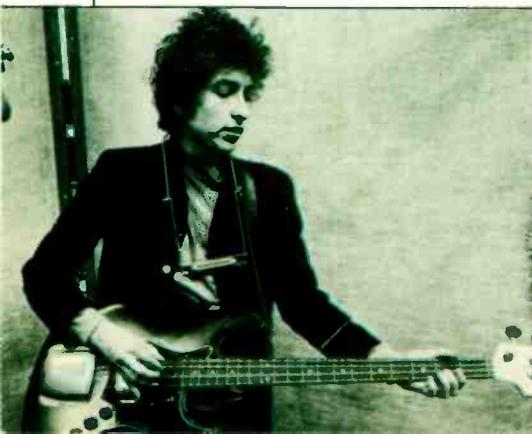
The meat of the anthology is the previously unreleased songs, most of which are already known to fans from bootlegs, though they have rarely sounded as good as they do here thanks to a swell digital remastering job. It's all but impossible to pick favorites among them. Some will favor the acoustic tracks—a haunted solo version of *Visions of Johanna*, a gorgeously controlled reading of the poignant *Percy's Song*—while others, like me, will gravitate to the rockers, particularly the numbers recorded live in England with the Band during the same tour that produced the famous Al-

bert Hall bootleg. But there isn't a cut here that is less than interesting, either as a window into Dylan's compositional method or simply as music.

The more familiar above-ground material has been chosen with exemplary care. The performances span Dylan's entire recording career, from a spectacular solo blues version of *Baby Let Me Follow You Down*—you can almost hear the extraordinary young talent bursting out of him—to overlooked selections from Dylan's Born Again period that it may be time to reassess.

The set is intended, of course, to reaffirm Dylan's status as a major pop *auteur*, a status that his admittedly spotty work of the last several years has tended to obscure. Some may see in its release a tacit acknowledgment of the artist's decline. On the basis of the contents, however, such speculation is pretty much irrelevant. "Biograph" clearly represents as substantial a body of work as anybody working in or around rock-and-roll has ever produced. If Dylan never records another note, his contribution, on the evidence of what's here, will likely endure for as long as people listen to pop music. And though five records of anybody's musical output may seem like a lot to digest, you'll probably have no trouble at all. Is it too early to declare this 1986's Record of the Year? *Steve Simels*

**BOB DYLAN:** *Biograph*. Bob Dylan (vocals, guitar, harmonica, piano); other musicians. *Lay Lady Lay: Baby, Let Me Follow You Down: If Not for You; I'll Be Your Baby Tonight; I'll Keep It with Mine; The Times They Are A-Changin'; Blowin' in the Wind; Masters of War; Lonesome Death of Hattie Carroll; Percy's Song; Mixed-Up Confusion; Tombstone Blues; Groom's Still Waiting at the Altar; Most Likely You Go Your Way; Like a Rolling Stone; Jet Pilot; Lay Down Your Weary Tune; Subterranean Homesick Blues; I Don't Believe You (She Acts Like We Never Have Met); Visions of Johanna; Every Grain of Sand; Quinn the Eskimo; Mr. Tambourine Man; Dear Landlord; It Ain't Me, Babe; You Angel You; Million Dollar Bash; To Ramona; You're a Big Girl Now; Abandoned Love; Tangled Up in Blue; It's All Over Now, Baby Blue; Can You Please Crawl Out Your Window?; Positively 4th Street; Isis; Caribbean Wind; Up to Me; Baby, I'm in the*



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# BEST OF THE MONTH

*Mood for You; I Wanna Be Your Lover; I Want You; Heart of Mine; On a Night Like This; Just Like a Woman; Romance in Durango; Señor (Tales of Yankee Power); Gotta Serve Somebody; I Believe in You; Time Passes Slowly; I Shall Be Released; Knockin' on Heaven's Door; All Along the Watchtower; Solid Rock; Forever Young.* COLUMBIA CSX 38830 five discs, © C3K 38830 three CD's, no list price.

## SINOPOLI'S SPLENDID NEW "RIGOLETTO"

**T**HERE are four stars in the new Philips recording of Verdi's *Rigoletto*. Conductor Giuseppe Sinopoli is one of them. The orchestral playing under his exact direction is one of the special pleasures of the performance, revealing many subtleties of



Gruberova: a ravishing Gilda

the score. Rarely, in fact, do you hear a *Rigoletto* in which Verdi's markings are so carefully observed. That is not to say that the performance lacks intensity. Sinopoli is an artist with considerable powers of concentration, but he allows this opera to "breathe" on its own in a finely molded reading informed by keen observation of the characters and dramatic situations. Everything we need to know or feel is right there in the music, and the oom-pah-pah rhythms cease to be "hurdy-gurdy Verdi" and become the life pulse of the whole opera.

The other three stars of this *Rigoletto* are the three principal singers, led by Renato Bruson in the title role. His big, warm voice pours out with seemingly endless technical resource and committed emotional identification with his character. Edita Gruberova captures Gilda's guilelessness with unusual purity of tone. Her ravishing floated pianissimos and effortless coloratura help to make the duet between Gilda and Rigoletto in Act I, Scene 2, a high point of the performance. And Neil Shicoff makes an appealing Duke—if, indeed, the Duke can ever really be appealing—singing the role with a smooth style and a suave sense of character.

Of the other solo performances, Robert Lloyd's richly sung and menacing Sparafucile, Brigitte Fassbaender's convincing Maddalena, and Kurt Rydl's stentorian, fateful Monterone deserve special mention, but the cast is strong throughout. The chorus sings with fine accuracy and expression. The *piano* choral passages suggest real conspiratorial evil, and the *bocca chiusa* humming in Act III eerily evokes the malevolence of the storm on this murderous night.

In all, then, this is a carefully prepared new performance of a masterpiece we have come to take for granted. It respects the genius of the composer; it is movingly sung by artists who bring technical mastery and dramatic conviction to their roles; and it is conducted by a man who can faultlessly juggle its highly varied, you might even say Gothic, range of passions—lust, greed, tenderness, and hate. The accompanying notes include an interesting essay on the opera, and the libretto is offered in four languages. Enthusiastically recommended.

Robert Ackart

**VERDI: *Rigoletto*.** Renato Bruson (baritone), Rigoletto; Edita Gruberova (soprano), Gilda; Neil Shicoff (tenor), Duke of Mantua; Robert Lloyd (bass), Sparafucile; Brigitte Fassbaender (mezzo-soprano), Maddalena; Kurt Rydl (bass), Monterone; others. Chorus and Orchestra of the Accademia Nazionale di Santa Cecilia, Giuseppe Sinopoli cond. PHILIPS 412 592-1 three discs \$29.94, © 412 592-4 three cassettes \$29.94, © 412 592-2 two CD's no list price.

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### POPULAR

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- **VLADIMIR HOROWITZ IN LONDON**. RCA RCD1-4572. Taped live at the Royal Festival Hall in May 1982.
- **JANÁČEK: *Lachian Dances; Idyll***. Conlon. ERATO ECD-88095. "Charmers" (September 1985).
- **LEHÁR: *The Merry Widow***. Schwarzkopf; Matačić. ANGEL CDCB-47177 (two CD's). A welcome update of the lovable 1953 recording.
- **LEONCAVALLO: *Pagliacci***. Domingo, Stratas, Pons; Prêtre. PHILIPS 411 484-2. Original soundtrack of the Zeffirelli film.
- **SCHUBERT: *Symphony No. 9***. Furtwängler. DG 415 660-2. One of several treasurable reissues from the Fifties, including a Brahms First and a Bruckner Fourth.
- **VERDI: *La Traviata***. Cotrubas, Domingo, Milnes; C. Kleiber. DG 415 132-2 (two CD's). "Undoubtedly one of the best of all recorded versions" (May 1978).



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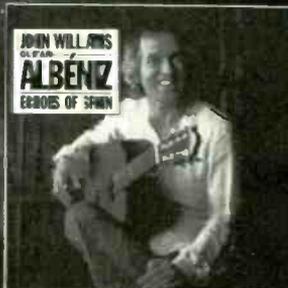
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*Discs and tapes  
reviewed by  
Robert Ackart  
Richard Freed  
David Hall  
Stoddard Lincoln*

**ADAMS: *Harmonielehre*.** San Francisco Symphony Orchestra, Edo de Waart cond. NONESUCH ◉ 79115-1 \$10.98, © 79115-4 \$10.98.

Performance: *Expressive, heartfelt*  
Recording: *Spacious*

New music that is enjoyable to hear is a rarity. New music with depth of expression is still harder to find. John Adams has taken minimalist techniques to a new level of sophistication and shaped them into a highly personal musical language. With its appealing orchestral colors, Mahlerian expressive range, and impressionistic delicacy, *Harmonielehre* is the most significant new orchestral piece by an American composer in recent years.

Edo de Waart conducts the San Francisco Symphony in an insightful performance. The first-desk musicians play their solos with lyrical warmth, and Adams's carefully polished orchestral colors receive elaborate attention from all of the players. The entire orchestra has a wonderful sense of ensemble that enables them to execute Adams's effects not only with a high degree of accuracy but also with the emotional effects he intended. For example, in the slow movement Adams makes masses of sound emerge from a misty background and recede while other masses also emerge and fade away. Each block of sound uses a different ensemble with a different set of colors, so the performers must jump quickly from one grouping to another.

The LP came with a coating of finely powdered paper clinging to it, but after a thorough cleaning it was surprisingly free of surface noise on the first play. Robert Hurwitz produced the album, and engineer John Newton recorded the work with a wonderfully open, minimal-mike style. The orchestral image is spacious and has an unusually strong sense of stage depth. Despite its seductive quality, however, the recording technique doesn't capture all the detail I would have liked to hear. The overlapping loops of rhythmic and melodic fig-



## HAITINK'S VAUGHAN WILLIAMS

**B**ERNARD HAITINK is recording with the London Philharmonic again, this time for Angel and in unexpected repertoire—the *Sinfonia antartica* of Ralph Vaughan Williams. This is, in fact, a work we would hardly “expect” from any conductor except one involved in a complete cycle of the Vaughan Williams symphonies. The power and conviction in Haitink's performance must make anyone who hears it hope that Angel will decide to go for the whole cycle, for it certainly leaves no doubt about the suitability of the conductor and the music to one another.

If the *Antartica* would seem an odd choice with which to launch such a project, it seems an even stranger one to stand as the sole representative of this composer's symphonies in the discography of any conductor. This seventh of Vaughan Williams's nine symphonies has not been among the most favored of his works in concert performances. To some commentators, it represents a falling-off in quality after the imposing heights (and depths) attained in its three immediate predecessors. Haitink's recording could change all that, for he makes an astonishingly strong case for the work, stronger even than the late Sir Adrian Boult managed in either of his two recordings of it.

What an experience Haitink makes of this music! It is more than a matter of mere authority; it is one of almost mys-

tic spiritual response—the very sort of thing so often missing in Haitink's unarguably committed but by no means consistently convincing Shostakovich cycle on London. Whether you accept the *Antartica* as a symphony or insist it is really a symphonic poem, its drama, poignancy, and overall noble and original character add up to fascinating listening, and each time one is drawn back to it by this extraordinarily sympathetic account the fascination deepens rather than thins out.

Haitink of course draws first-rate playing and singing from his forces; they are recorded with exceptional vividness and great care as to balances. Sheila Armstrong and the fine chorus are positioned in such a way as to project the most convincingly otherworldly effect. Direct Metal Mastering is a further enhancement for the LP, and I expect that the CD, when it appears, will quickly become a demonstration item. Whether it leads to a full cycle or not, this superb recording can only make the composer's admirers exultant—and it may well increase their number.

*Richard Freed*

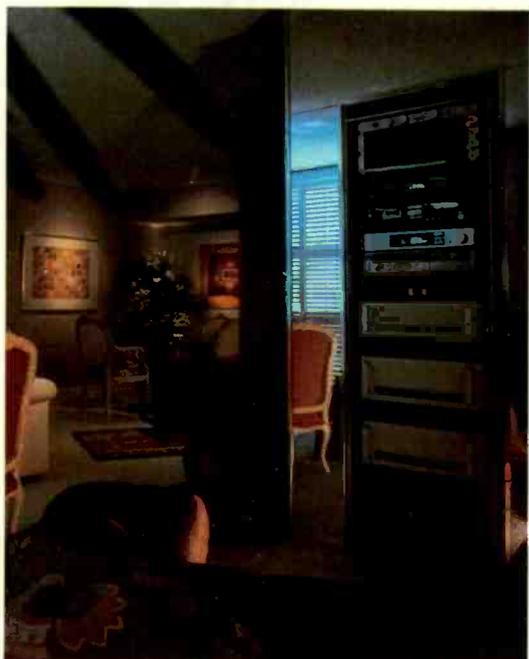
**VAUGHAN WILLIAMS: *Sinfonia antartica* (Symphony No. 7).** Sheila Armstrong (soprano); London Philharmonic Choir; London Philharmonic Orchestra, Bernard Haitink cond. ANGEL ◉ DS-35821 \$11.98, © 4DS-35821 \$11.98.

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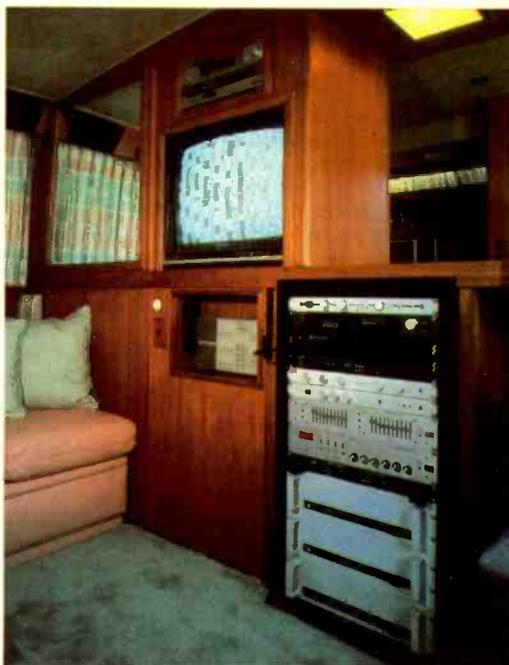
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ures pyramided on top of each other need to be clearly audible. I want to hear those cross-currents of conflicting rhythms. They are intrinsically beautiful, and I would sacrifice some of the spaciousness of the hall sound to hear more of the score's details.

*Harmonielehre* captures the spirit of our times with poetic expression. The anxiety provoked by the possibility of nuclear doom is an important part of the work, but so too are hope and the triumph of the human spirit. Adams conveys these thoughts with the most pleasing palette of orchestral sounds I've heard in a long time. *Harmonielehre* is a work that should find a welcome place in the symphonic repertoire. *Steve Birchall*

**BACH: Brandenburg Concerto No. 2, in F Major.** **TELEMANN: Concerto for Trumpet in D Major.** **TORELLI: Concerto for Trumpet in D Major.** **HAYDN: Concerto for Trumpet in E-flat Major.** Maurice André (trumpet); Philharmonia Orchestra, Riccardo Muti cond. ANGEL Ⓢ DS-38220 \$11.98, Ⓢ 4DS-38220 \$11.98.

Performance: *Brilliant*  
Recording: *Splendid*

There are certain performers one admires for the way they handle their instruments, their sheer virtuosity, overlooking all questions of musical style. Maurice André is such a performer. His playing is so dazzling throughout this album of concertos that it really doesn't matter what he plays or whether he makes much distinction between the Baroque and Classical idioms. André's approach fits the Haydn best, as you can see in the cadenza to the first movement. Riccardo Muti's support is offered in the same spirit, giving a consistent style to the collection. *S.L.*

**BACH: Six Partitas for Harpsichord (BWV 825-830).** Kenneth Gilbert

(harpsichord). **HARMONIA MUNDI HMC 1144/46** three discs \$38.94, Ⓢ HMC 40.1144/46 three cassettes \$38.94.

Performance: *Thoughtful*  
Recording: *Fine*

An adherent of authentic performance practice, Kenneth Gilbert offers a reading of the magnificent Bach partitas that is scrupulous in all things—articulation, ornamentation, rhythmic alterations, registration, observance of repeats, and order of movements. He eschews brilliance and focuses on the structure of the music, which is illuminated by a keen use of rubato at key points. These are thoughtful performances of the highest integrity. *S.L.*

**BRAHMS: Cello Sonatas: No. 1, in E Minor, Op. 38; No. 2, in F Major, Op. 99.** Yo-Yo Ma (cello); Emanuel Ax (piano). RCA Ⓢ ARC1-7022 \$10.98, Ⓢ ARE1-7022 \$10.98, Ⓢ RCD1-7022 no list price.

Performance: *Distinguished*  
Recording: *Excellent*

The opening of Brahms's E Minor Sonata in this recording by Yo-Yo Ma and Emanuel Ax suggests an abundance of gorgeous sound but a shortage of liveliness. This impression is soon corrected, however. The natural momentum may not be discernible in the opening bars, more ruminative here than in some other performances, but it is tellingly evident throughout the remainder of the movement—as it is, indeed, throughout both sonatas. Along with all that gorgeous sound, there's as much drama here as Brahms put into these works, with "no color added," a quality that gives this issue more appeal than the same duo's Beethoven recordings on CBS. Here we get both a thoroughly developed mutuality of approach and a sense of vivid spontaneity. In short, these distinguished, very handsomely

recorded accounts of the Brahms cello sonatas can stand beside the finest previous recordings. *R.F.*

**BRAHMS: Violin Sonatas: No. 1, in G Major, Op. 78; No. 2, in A Major, Op. 100; No. 3, in D Minor, Op. 108. Scherzo in C Minor; Hungarian Dances Nos. 1, 2, 7, and 9 (arr. Joachim).** Itzhak Perlman (violin); Vladimir Ashkenazy (piano). ANGEL Ⓢ DSB-3952 two discs \$23.98, Ⓢ 4DSB-3952 two cassettes \$23.98.

Performance: *Burnished gold*  
Recording: *Excellent*

Vladimir Ashkenazy and Itzhak Perlman have given us some splendid chamber-music recordings on various labels since their first collaboration some sixteen years ago. These two strong personalities seem to find pleasure in adapting to each other's style—never in terms of bigger and better virtuoso effects but always in pursuit of the fullest realization of the music at hand. Their new Brahms set strikes me as the most treasurable entry in their joint discography so far, and probably the most persuasive integral set of the three violin sonatas from any source. The more inward and contemplative passages are explored with the most affecting poignancy, and there is certainly no want of fire or drive in the more spirited sections. The overall impression is the aural equivalent of burnished gold—an impression enhanced by the rich, beautifully balanced recording.

Side four brings some enchanting fillers in the form of the C Minor Scherzo and Joseph Joachim's piquant transcriptions of four of the Hungarian Dances. Charming as these are, though, they add up to a very short side. The three sonatas alone would fill a single CD, and I hope that's how Angel will package them in that format. *R.F.*

(Continued on page 84)

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# RECOG

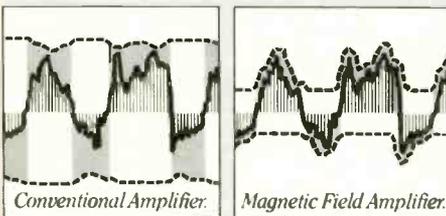
## Why the Carver M-500t Magnetic Field Power Amplifier has helped begin an industry trend and how it has stayed ahead of its inspired imitators.



Twice in the last decade, Bob Carver has taught the high fidelity industry how to make amplifiers that give you better performance and value. Both times his bold lead has attracted followers. Still, as evidenced by the current release of the M-500t, Carver sets standards yet unequalled in the audio community.

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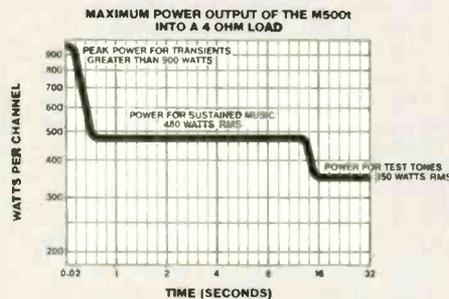
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The gulf between the two power ratings represents Bob Carver's insistence that amplifier design should fit the problem at hand. That problem is reproducing music with stunning impact, not simply satisfying a sine-wave test which doesn't even include speakers or sound sources. Hence the seeming gulf between the two ratings.

Bob reasoned that since music is composed of three basic types of power waveforms, those types of waveforms are what an amplifier should be designed to satisfy.



The Carver M-500t delivers massive power at three important output levels.

First there are instantaneous peak transients – the sudden smash of cymbals, drums, or the individual leading edge attack of each musical note. While these waveforms last less than 1/100 of a second, they form the keen edge of musical reality which must be present if you are to realize high fidelity. Though momentary, they also demand a tremendous amount of amplifier power.

Directly following instantaneous transients are combinant musical crests of demand that come from multiple instruments and their harmonics. These long term power demands may last up to several seconds but usually come and go in less than a second. And yet they can tax anything but an exceptionally powerful amplifier.

The third type of power demand is represented by the average power contained in the music, and is approximately one third to one half of the FTC continuous power rating.

At extremely high output current levels, the Carver M-500t not only delivers over 700 watts of instantaneous peak power for instantaneous transients, but can deliver over 600 watts

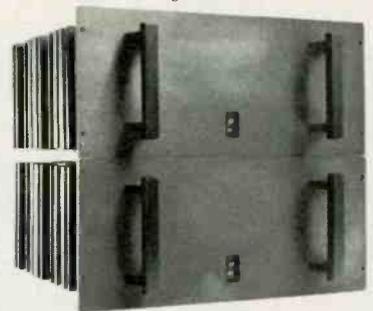
RMS of long term power for demands lasting up to several seconds. The M-500t provides more power, more current and more voltage than any comparably priced amplifier ever offered.

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Figure 1



This \$7,000 pair of esoteric amplifiers figure significantly into the heritage of the M-500 "t" version circuitry.

Figure 1 above shows a \$7,000 pair of ultra-esoteric mono amplifiers. No expense was spared on their admittedly magnificent but still conventional design and construction.

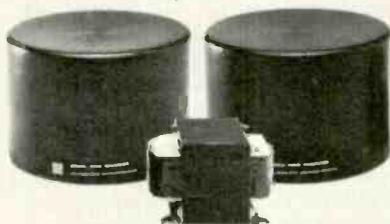
Figure 2 shows the massive toroid output transformers contained in these prestigious audiophile designs. At 10% regulation, their output current is  $\pm 50$  amperes.

All conventional amplifiers are condemned to using this type of design.

# ATION.

Figure 2 also shows the patented Magnetic Field Coil employed in the Carver M-500t. Its output current is  $\pm 100$  amps at 10% regulation!!!!

Figure 2



Over 40 pounds of toroid coils put out half the current of a single six pound, four ounce Magnetic Field Coil.

## DISTINGUISHING FEATURES OF THE CARVER M-500t.

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**CAVALLI: Xerse.** René Jacobs (countertenor), Xerse; Judith Nelson (soprano), Amastre; Jeffrey Gall (countertenor) Arsamene; Isabelle Poulenard (soprano), Romilda; Jill Feldman (soprano), Adelanta; John Elwes (tenor), Ariodate; Dominique Visse (countertenor), Elviro; Agnès Mellon (soprano), Clito; others. *Concerto Vocale*, René Jacobs cond. HARMONIA MUNDI HMC 1175/78 four discs \$51.92, © HMC 40.1175/78 four cassettes \$51.92, © HMC 90.1175/78 four CD's no list price.

Performance: *Superb*  
Recording: *Superb*

The plots of early Venetian operas are so complex that they are best explained by charts. But try to imagine Xerse, King of Persia, and his brother, Arsamene, both in love with Romilda, who is only in love with Arsamene. Then add Amastre, Xerse's determined fiancée, and Adelanta, who will do anything to secure either of the brothers as a husband. To this mélange throw in a roomful of comic servants, tutors, confidants, ambassadors, and generals as well as a saucy page boy and whirl them all through a plot that ranges from *commedia dell'arte* to serious drama, providing marvelous entertainment along the way.

Francesco Cavalli, the master of Venetian opera, was inspired by Nicolo Minato's wonderful libretto to write one of his finest scores. With pacing like a spoken drama, the music moves swiftly as recitatives, arias, and ariosos flow into each other, perfectly capturing every situation, whether serious or comic.

René Jacobs has accomplished a brilliant restoration of Cavalli's score, and he leads a performance that is excellent in every respect. Jacobs himself is superb as Xerse, and Jeffrey Gall is his match as the brother, Amastre. Dominique Visse is a true comic in the Leporello-like part of Elviro—his flower-vending scene is not to be missed. Judith Nelson and Isabelle Poulenard turn in some excellent singing, and Jill Feldman shows Adelanta for the bitch she is. Particularly felicitous is Agnès Mellon as Clito, the Cherubino of the piece, tossing off the coloratura effortlessly and charmingly throughout.

*Xerse* is perhaps the best introduction there can be to the delights of Venetian opera, and this spirited performance, in authentic style, presents the work in the very best light. The recorded sound, too, is absolutely first-rate. *S.L.*

**CHOPIN: Piano Sonata No. 2, in B-flat Minor, Op. 35; Ballades Nos. 1-4.** Andrei Gavrilov (piano). ANGEL ① DS-37669 \$11.98, © 4DS-37669 \$11.98.

Performance: *Eloquent*  
Recording: *Crisp and clean*

This record brought me my first experience of Andrei Gavrilov's Chopin, and it is vastly impressive. These are large-scaled, high-tension presentations,

drawn in bold, brilliant strokes—and yet so cleanly etched and with so much subtle detail that they are never wanting in intimacy or poetry. It is not raw power that gives the playing its dramatic edge but its remarkable momentum, superbly attuned to emotional content. Spontaneity is suggested without a hint of breathlessness, and depth without self-consciousness.

The unlabored dignity of the sonata's much-abused Funeral March is especially striking here. Gavrilov makes no attempt at understatement but seems instinctively to avoid excess. The quiet, reflective middle sections of the G Minor and A-flat Ballades are really caressed with warmth and poignancy, but the caress is at the same time elegant, even aristocratic, for this is the mixture of qualities that gives the music its peculiar character and power. Gavrilov's response to it seems fully and unfailingly convincing throughout the program. While his way may not be the *only* way to play these familiar works, there is not a single bar in any of these performances that does not command the most rapt attention—and reward it handsomely. The piano sound is crisp and clean, ideally focused, and set off to optimum advantage by DMM. *R.F.*

**FRANÇAIX: Piano Concerto; Piano Concertino.** SAINT-SAËNS: *Piano Concerto No. 2, in G Minor.* Ian Hobson (piano); Sinfonia da Camera of Illinois, Ian Hobson cond. ARABESQUE ① 6541 \$8.98, © 7541 \$8.98, © CDZ 6541 no list price.

Performance: *Neat*  
Recording: *Good*

More than fifty years after the first recording of Jean Françaix's Piano Concertino—on Telefunken, with the composer at the piano—this four-movement piece lasting under eight minutes remains a delectable bit of Gallic fluff. The somewhat more extended Piano Concerto, which also had its first recording with Françaix as soloist (Nadia Boulanger conducting), seems a bit long for its content at times, but it is nonetheless debonair and tender by turn and makes for very enjoyable listening. British pianist Ian Hobson, doubling as conductor, delivers neatly turned performances of both works, with digital sound to match.

The Saint-Saëns side offers fine pianism but also the rather thin string tone you'd expect from an orchestra totaling only thirty-three instruments. Tiny ensemble imperfections in the tricky scherzo make me question the wisdom of having the soloist conduct in this work. There are at least three superior recorded versions of the Saint-Saëns, including the one by Cécile Ousset with the City of Birmingham Symphony under Simon Rattle on Angel, but this Arabesque recording is well worth buying for the Françaix pieces alone. *D.H.*

**HAYDN: Trumpet Concerto in E-flat Major (see BACH)**

**KHACHATURIAN: *Violin Concerto* (arr. Rampal); *Spartacus, Adagio* (arr. Galway); *Masquerade, Waltz* (arr. Galway); *Gayne, Sabre Dance* (arr. Galway).** James Galway (flute); Royal Philharmonic Orchestra, Myung-Whun Chung cond. RCA ◊ HRC1-7010 \$9.98, ◊ HRE1-7010 \$9.98.

Performance: *Dazzling*  
Recording: *Mostly excellent*

With the composer's blessing, Jean-Pierre Rampal arranged Khachaturian's lush Violin Concerto as a virtuoso flute vehicle, then recorded it in 1970 with Jean Martinon conducting (the recording is still available, on the budget-priced Odyssey label). The flamboyant James Galway, a pupil of Rampal, has taken on the piece, touching up the solo part here and there and adding his own arrangements of three Khachaturian ballet encores into the bargain. Sonically and in terms of instrumental wizardry, the results are dazzling, particularly in the concerto's finale. Korean-born conductor Myung-Whun Chung provides strong orchestral support with the Royal Philharmonic, which was splendidly recorded in the concerto at the Town Hall in Watford, England. The encore pieces, recorded at CBS studios in London, are less well balanced sonically, with Galway's flute rather glaringly spotlighted at the expense of the orchestra. *D.H.*

**LOEFFLER: *The Death of Tintagiles; Five Irish Fantasies.*** Jennie Hansen (viola d'amore); Neil Rosenshein (tenor); Indianapolis Symphony Orchestra, John Nelson cond. NEW WORLD ◊ NW 332 \$9.98.

Performance: *Top-drawer*  
Recording: *Superlative*

Though born and trained in Europe, Charles Martin Loeffler spent most of his life in America, where between 1891 and his death in 1935 he produced a fascinating body of work. His compositions ranged stylistically from post-Franckian pieces like the *Poem* for orchestra to the quasi-jazz writing in the Partita for Violin and Piano, making it all but impossible to nail down a distinctive Loeffler style. But the best of his music makes for fascinating listening, and he had few peers in handling the resources of the orchestra.

We can be grateful to New World Records for these first recordings of two of Loeffler's major works. *The Death of Tintagiles* (1900) is scored for orchestra with viola d'amore obbligato, the plangent sonority of which is effectively set off against the orchestral fabric. The piece is based on a little puppet play by Maeterlinck, and the narrative element is easy to follow in this performance, especially with the help of Philip Hale's annotation.

The *Five Irish Fantasies* had their beginning in 1906-1907 when Loeffler set two poems by Yeats for piano and voice. In 1920, possibly stirred by the establishment of the Irish Free State, he

added two more Yeats poems and one by William Heffernan, then superbly orchestrated the whole sequence. Three of the wonderful settings were premiered in 1922 by John McCormack with the Boston Symphony. Tenor Neil Rosenshein projects all of them here to brilliant effect, and his genuine Irish timbre fits the songs, imbued with an authentic flavor worthy of Arnold Bax or Peter Warlock.

The Indianapolis Symphony plays with great spirit and passion under John Nelson's direction, and the Circle Theatre in that city makes for an ideal

recording locale. The sound has bite, body, and wide range. An outstanding production in every way. *D.H.*

**MAHLER: *Symphony No. 9, in D Major; Symphony No. 10, in F-sharp Major, Adagio.*** Vienna Philharmonic Orchestra, Lorin Maazel cond. CBS ◊ 12M 39721 two discs, ◊ 12T 39721 two cassettes, no list price.

Performance: *Coolly controlled*  
Recording: *Very good*

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STEREO REVIEW MARCH 1986 85

Schwann could be ranked as "distinguished," and whether this new one by Lorin Maazel and the Vienna Philharmonic should be admitted to that exalted company depends on your taste. Do you want the work played with superheated passion? Or do you prefer a cooler approach, one that marks the symphony as a precursor, in many respects, of the more intellectual works of Alban Berg? Maazel's reading falls into the latter category.

You could virtually copy out the score as you listen to the superb Viennese players under Maazel's direction in the first movement of the Ninth, which also bespeaks a remarkable recording job on the part of the CBS production crew. No locale is specified, but the airy ambience of the upper orchestral register suggests the Konzertverein rather than the Sofiensaal. The *Ländler* second movement is brisk and precise, with a minimum of tempo contrasts. The savage *Rondo-Burleske* seems a bit tame here, but the weirdly atmospheric sonorities and thematic transformations of its later portions are superbly carried off. The great final slow movement is the most effective, with glorious string playing and a very careful work-up to the major climax, which is shattering in its impact. The chamber-music textures at the close are perfection.

The remarkable first movement of the Tenth Symphony, the only part of the work that Mahler himself brought to substantial completion, gets a somewhat more impassioned reading here than the Ninth. Unexpected, however, is Maazel's handling of the two mighty dissonant chords that make up the climax. I hear no shriek of agony here but something rather more solemn, heralding the inexorable approach of Death after the manner of the "death knell" climax in the first movement of Bruckner's Eighth. All in all, this release offers a different and provocative view of Mahler that should certainly stimulate some healthy rethinking of the Mahler aesthetic. *D.H.*

**MENDELSSOHN: *A Midsummer Night's Dream: Overture, Op. 21; Incidental Music, Op. 61.*** Kiyomi Toyoda, Yukie Ohkura (soprano); Tokyo Metropolitan Symphony Chorus and Orchestra, Peter Maag cond. DENON © 33C37-7564 no list price.

Performance: *Poetic*  
Recording: *Excellent*

Peter Maag's 1957 recording of the overture and half a dozen numbers from Mendelssohn's magical score was outstanding in its day and is still listed in Schwann, but a new recording has come from an unexpected source—with surprisingly good results. The Tokyo Metropolitan Symphony seems to be a much more polished body of players here than in some of its early Denon recordings, and the Japanese sopranos are altogether surprising in their felicity of phrasing and nicely intelligible English pronunciation. Maag himself



Yakar: wonderful Mozart

brings to the performance the same flair for Mendelssohn's romantic ardor and delicacy of musical utterance that he did in 1957. The recorded sound is excellent and atmospheric. *D.H.*

**MOZART: *Così fan tutte.*** Rachel Yakar (soprano), Fiordiligi; Alicia Nafe (mezzo-soprano), Dorabella; Gosta Winbergh (tenor), Ferrando; Tom Kraus (bass), Guglielmo; Georgine Resick (soprano), Despina; Carlos Feller (baritone), Don Alphonso. Chorus and Orchestra of the Drottningholm Court Theatre, Arnold Ostman cond. L'OISEAU-LYRE ● 414 316-1 three discs \$29.94, © 414 316-4 three cassettes \$29.94, © 414 316-2 three CD's no list price.

Performance: *Stunning*  
Recording: *Great*

The miracle of Mozart's *Così fan tutte* is the ensemble writing, and the strength of this recording's cast lies in its ensemble singing. Each voice, too, suits its character perfectly. Rachel Yakar's spinto easily encompasses Mozart's cruelly wide leaps and is capable of a superb legato. Alicia Nafe's rich mezzo-soprano supplies just the right amount of contrast to differentiate the two sisters. Georgine Resick, a fine light soubrette, wisely refrains from the kind of vocal distortion in her playing of the mock doctor and lawyer that would make repeated hearings of the recording painful. Gosta Winbergh's tenor is wide open and fresh sounding, Tom Kraus supplies the contrasting virile bass for a forceful Guglielmo, and Carlos Feller is the perfect foil for Resick's Despina. In the ensembles they all sing like instrumentalists, with razor-sharp rhythmic precision and a sense of balance and interplay that creates a fine blend but at the same time affords individuality to each character. Above all, the performance is spirited, and the recitatives fairly bubble.

Conductor Arnold Ostman paces the music with a sensitivity that always

allows for expansive lyricism, taut histrionics, or rollicking farce as appropriate. The sound of the authentic instruments, combined with the singers' authentic, eighteenth-century vocal production and articulation, is striking in its clarity. It's wonderful to hear Mozart's subtle and ingenious touches of orchestration and the delicate balance he achieved between his vocal and instrumental forces. Recorded at the Drottningholm Court Theatre, a small hall that has a pit for thirty musicians and an auditorium that seats only 450 people, this is a true chamber performance in a perfect ambience. *S.L.*

**RESPIGHI: *The Fountains of Rome; The Pines of Rome; Roman Festivals*** (see Best of the Month, page 73)

**SAINT-SAËNS: *Piano Concerto No. 2*** (see FRANÇAIX)

**TELEMANN: *Trumpet Concerto in D Major*** (see BACH)

**TORELLI: *Trumpet Concerto in D Major*** (see BACH)

**VERDI: *Rigoletto*** (see Best of the Month, page 76)

**WAGNER: *Tannhäuser.*** Klaus König (tenor), Tannhäuser; Lucia Popp (soprano), Elisabeth; Waltraud Meier (soprano), Venus; Kurt Moll (bass), Hermann; Bernd Weikl (baritone), Wolfram; others. Chorus and Orchestra of the Bavarian Radio, Bernard Haitink cond. ANGEL ● DSC-3982 three discs \$35.98, © 4D3S-3982 three cassettes \$35.98, © CDCC-47295 three CD's no list price.

Performance: *Low-keyed*  
Recording: *Good*

This latest recording of the so-called original Dresden version of Wagner's much-altered opera *Tannhäuser*, while musically sensitive, seems too small scaled. The climaxes are not impulsive enough, and the work's dramatic sweep is incompletely realized. Most curious, however, is the casting. Why did Lucia Popp even consider undertaking the role of Elisabeth? Although she does convey the youthful purity of Wagner's heroine, she turns in a vocally bland performance.

Klaus König fares somewhat better as Tannhäuser, but though his account is musically accurate, it is not stirring. I remained unconvinced of his passionate involvement with Venus or his emotional conflicts with regard to Elisabeth. As Venus, Waltraud Meier is more convincing, but she has an unsettling vibrato at the top of her range. Both Kurt Moll and Bernd Weikl are more than equal to their assignments.

Despite these reservations, the recording has merit. Bernard Haitink's conducting is sensitive and detailed without being fussy, and he imbues the performance with a satisfying unity. The recorded sound is good too. *R.A.*

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- SONY SLH-400** \$459.95  
 •SUPER BETA Hi-Fi Recorder  
 •Stereo Tuner  
 •Wireless Remote
- BETA  
 SANYO VC7250 Super Beta Hi-Fi Remote \$379.95  
 SANYO VC7500 Hi-Fi Stereo-Tuner Rem. \$429.95  
 SONY SLH600 Super Beta Hi-Fi Stereo-Tuner \$649.95
- VHS  
 HITACHI VT86 Hi-Fi Cassette Remote \$499.95  
 JVC HRD410 4-Head 10-Function Remote \$339.95  
 PANSOCH PV135 4-Head Cable Remote \$319.95  
 PANSOCH PV145 4-Head Hi-Fi Remote \$379.95  
 PANSOCH PV1740 Hi-Fi 210 Bev.4-HS \$899.95  
 RCA VLT600 Hi-Fi Cable 14-Day 4-Event \$529.95

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- SONY WM-F18** \$69.95  
 •AM/FM Cassette Walkman  
 •Auto Reverse, Dolby NR  
 •3-Band Equalizer
- PANSOCH RSX35 FM Cass. Dolby Metal \$74.95  
 SANYO MR866 AM/FM Stereo Cassette \$29.95  
 SONY WM18 Auto-Reverse Metal Tape \$39.95  
 SONY WM75 Water-Resistant Dolby Air \$74.95  
 SONY WMDC Pro-Walkman Dolby B/C Rec. \$249.95  
 SONY WMDC2 Ultra-Dolby B & C NR \$149.95  
 SONY WMF101 AM/FM Cass. Dolby Metal Tape \$89.95  
 SONY WMF75 Water-Resistant AM/FM Cass. Dolby \$99.95  
 SONY WMW800 Double-Walkman Dolby \$149.95

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 •M15 Stereo Broadcasts
- ADC V200 Video Enhancer \$69.95  
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 •Soft-Touch Controls  
 •Manufacturers Suggested Retail Price \$129.95
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 •Soft-Touch Controls  
 •Manufacturers Suggested Retail Price \$329.95
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 JVC T-120 \$4.29  
 MAXELL T-120 OR L-750 \$4.69  
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 RCA T-120 \$4.49  
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- Dolby® B, C, DBX, timer, start switch, HD heads.



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Akai HX-A301	139.95
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Technics SLJ-2

- Direct Drive Linear Tracking Quartz Turntable 109.95



Technics SLBD-1	54.95
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Akai AP-A201	69.95
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NEW: ortofon

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- Frequency response 20 to 20,000
- Elliptical styles
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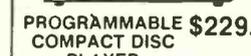


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DT-15P	39.95
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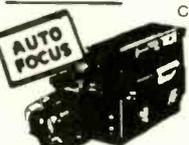
- PROGRAMMABLE \$229.95 COMPACT DISC PLAYER



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SCOTT 959DA	299.95
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ALL-IN-ONE VHS VIDEO CAMERA 1099.95  
Autofocus Camera  
Includes: Battery charger battery hand grip.

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VLT 650 Hi-Fi	699.95
CLC 020 Small Wonder	637.95
CLC 025	579.95
CKC 021	689.95

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TEAC EQA 20	99.95
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Technics SH-8055	229.95
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DM-1800	289.95
DM-1150	139.95
DM-1650	209.95

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T-120	4.79
T-120HGX	5.99
T-120 GOLD	7.99
TDK	
SA-90	1.69
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Akai AT-A301	CALL

### SONY

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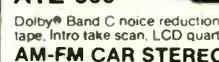
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Smith Corona SE-200SR	289.95
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Panasonic RKT-35	249.95
Panasonic RKT-40	309.95
Canon Typewriter 5 Deluxe	135.95
Canon Typewriter 6	199.95
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WMF-75	109.95
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WMF-18	79.95
WMF-12	44.95
WMF-75	89.95
Aiwa HSJ-400	119.95
WMDC2	139.95
WMDC6	239.95
SRF-201	69.95
WA-200	129.95
SRF-5	49.95
WM-II	29.95
Aiwa HS7-200	89.95
Aiwa HSF07	89.95

### JENSEN



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AM-FM CAR STEREO	\$259.95
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RE-980	189.95
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RE-960	189.95
EQA-5000	89.95
RE-940	159.95
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RE-900	129.95
SANYO	
FTE-50	All night illumination Dolby® B & C. AM SS 9.5 watts per channel, fader, clock, auto reverse. AM SS music search \$189.95
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FTE-20	149.95
FTU-45	119.95
FTE-30	139.95
FTU-55	129.95
FTE-40	169.95
FTU-42	119.95
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FTU-52	134.95
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J3023 6 1/2" triax	75w 69.95 pr.

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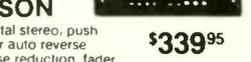
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### CONCORD CAR STEREO

HPL-122R 10-watts per channel, digital quartz, Dolby® separate base treble, metal tape, etc. \$189.95

### BLAUPUNKT TUCSON



AM-FM digital stereo, push button tuner auto reverse \$339.95  
Dolby® noise reduction, fader  
AM-FM CAR STEREO

Frankfort	119.95	Sacramento	279.95	
Seattle	179.95	Washington Sq.	439.95	
Richmond	219.95	New Yorker Sq.	519.95	
Manhattan	219.95	BPA-415	89.95	
Asper	SQR 24	219.95	BPA-430	209.95

### Clarion 8500R

Digital AM-FM stereo tuner auto reverse tape separate base and treble	139.95
8925RT	239.95
8400RT	149.95
8900RT	229.95
8300R	139.95
8800RT	189.95
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8725RT	189.95
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8625RT	179.95
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JENSEN JCX300 JENSEN 6"x9" Triax 150 watt 3-way car speakers \$69.95 pair

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20 day return policy: All returns must be phoned in for prior authorization and must be received within 20 days from receipt of original shipment. All products must be returned in original factory packaging, clean and unscratched along with blank warranty card. Do not tape, or deface manufacturer's original cartons. Shipping and handling charges not refundable. Pictures are for illustration only, and do not represent the product exactly as shown. Rainchecks available upon request. All prices reflect manufacturers rebate.

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

**ASIA:** *Astra*. Asia (vocals and instrumentals). *Go*; *Voice of America*; *Hard on Me*; *Wishing*; *Rock and Roll Dream*; *Countdown to Zero*; and four others. GEFLEN 24072-1 \$8.98, © 24072-4 \$8.98.

Performance: 100% recycled  
 Recording: Good

If you seek safety and security when buying records, you'll love "Astra." Every note has been pretested and proved effective on albums by Toto, Journey, Loverboy, or the Moody Blues. From the lyric sheet, it seems that half the songs on this deeply mediocre record are about nuclear Armageddon, and half are about love. I challenge anyone to listen to the album blindfolded and tell me which are which. Okay, so Asia isn't the most original band in the world—but the guys play their guts out for their fans, right? Then what does John Wetton mean when he sings, in *Rock and Roll Dream*, "When I see the faces from the limousine, no chance of our survival." Hey, fans, that's you. M.P.

**BIG DADDY:** *Meanwhile . . . Back in the States*. Big Daddy (vocals and instrumentals). *I Want to Know What Love Is*; *Always on My Mind*; *Sussudio*; *Dancing in the Dark*; *I Just Called to Say I Love You*; *Girls Just Wanna Have Fun*; and eight others. RHINO RNLPL-854 \$8.98, © RNC-854 \$8.98.

Performance: Priceless  
 Recording: Very good

"Meanwhile . . . Back in the States" continues the charming conceit of Big Daddy's first album—that the band is an authentic bunch of Fifties rockers, imprisoned for twenty-four years by Communist rebels, who now play contemporary songs in the only style they know. It may be a one-joke act, but it has a surprising resonance. In fact, the group's demolition jobs on such recent hits as Prince's *Purple Rain* or Foreigner's *I Want to Know What Love Is* manage to show just how slight these songs are and at the same time make them far more exciting than the originals. Whether you call it art, satire, or even a taxi, this is very funny stuff. Exhibit A is the *Duke of Earl* treatment given to Cyndi Lauper's *Girls Just Want to Have*

## MIAMI VICE, THE MUSIC



Glenn Frey (center) with Don Johnson and Phillip Michael-Thomas

**A**LTHOUGH cop shows are not my favorite TV fare, the splendid MCA album of music from *Miami Vice* makes it easy to see why that series has become such a hit. Indeed, the music is one of the stars of the show, accompanying every calculated action, underscoring every snippet of laconic dialogue. While the particular vocal artists featured on the album—Phil Collins, Tina Turner, Glenn Frey, Chaka Khan, and Grandmaster Melle Mel—were nowhere in evidence the few times I tuned in to *Miami Vice*, they come across louder and more impressive than life on the album. Moreover, the recording lets us hear them in glorious stereo sound, something far beyond the capabilities of most television sets.

The unifying musical thread on the album and the series is the work of Jan Hammer, who composed and performs the theme music and connective instrumental material. His five tracks here weave a sonic tapestry that throbs with excitement. This is music that could not have been created before the advent of synthesizers and heavily amplified electronic effects. It is the music of "now" at the peak of its intensity, yet it is steeped in such a solid musicality that the effects always seem to serve some fundamental aesthetic purpose.

The same level of excellence is maintained in the vocal tracks. Among the

best are Glenn Frey's *You Belong to the City* with its stalking, insistent pace, Phil Collins's haunting *In the Air Tonight*, which builds to an eruptive climax, and Grandmaster Melle Mel's thunder-voiced recitation of *Vice*. Mel is a master of the staccato cadences of rap, and there is a lot of heavy meaning in his rhythmically accented allusions to prostitution, mob extortion, and the failures of our criminal-justice system. For those who have ignored rap, this track would be an ideal place to begin developing an appreciation of it as an art form.

I also cannot pass over the contribution of Tina Turner, whose performance in *Better Be Good to Me* is fully equal to her hit *Private Dancer*. Overall "Miami Vice" is not only a good album—it's probably the best compilation of its type since the soundtrack from *Saturday Night Fever* helped to breathe new life into the record industry a few years ago. Phyl Garland

**MIAMI VICE.** Music from the television series. Jan Hammer: *Miami Vice Theme*; *Miami Vice*; *Flashback*; *Chase*; *Evan*. Glenn Frey: *Smuggler's Blues*; *You Belong to the City*. Chaka Khan: *Own the Night*. Phil Collins: *In the Air Tonight*. Grandmaster Melle Mel: *Vice*. Tina Turner: *Better Be Good to Me*. MCA MCA-6150 \$8.98, © MCAC-6150 \$8.98, © MCAD-6150 no list price.

*Fun*, but I'm also much taken with the Eddie Cochranesque runthrough of the Pointer Sisters' *Jump* and the *Be-Bop-a-Lula* treatment of Michael Jackson's *Billie Jean*. In fact, there isn't a dull moment or a misfire gag on the whole

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record. I hope these guys keep turning out albums like this forever. S.S.

**ANGELA BOFILL:** *Tell Me Tomorrow*. Angela Bofill (vocals); vocal and instrumental accompaniment. *Generate Love; Tell Me Tomorrow; Midnight Shine; I Don't Wanna Come Down (from Love); First Time*; and four others. ARISTA AL8-8396 \$8.98, © AC8-8396 \$8.98.

Performance: *Quality pop*  
Recording: *Satisfactory*

Whether or not you care for the songs she sings, you have to credit Angela Bofill for a consistently high level of performance and the distinctive way she uses her voice—a lusty, full-bodied instrument that she projects in a direct, vibratoless manner. The best songs are usually the ones she writes herself; the only trouble with this album is that there aren't enough Bofill originals. The outstanding cut is one she wrote with Alan Palanker, the simply magnificent *I Don't Want to Come Down (from Love)*. It is marked by the interesting modulations that characterize Bofill's writing style, and she sings it from the depths of her soul. Second place goes to the catchy title track, *Tell Me Tomorrow*. The rest is forgettable apart from her meticulous performances. P.G.

**BRONSKI BEAT:** *Hundreds and Thousands*. Bronski Beat (vocals and instrumentals). *Heat Wave; Why; Run from Love; Hard Rain; Small Town Boy; Junk; Infatuation/Memories\*; Close to the Edge\*; I Feel Love Medley\*; Cadillac Car\** (\*on cassette only). MCA MCA-39038 \$6.98, © MCAC-5678 \$8.98.

Performance: *Bright, lively*  
Recording: *Very good*

Anyone old enough to remember the first British Invasion may be unable or unwilling to admit it, but pop music is nearing the end of another British-inspired era, one of pop's most interesting, important eras—the age of club music. With virtually no airplay, synth-pop and New Romantic groups like the Human League, OMD, Flock of Seagulls, Haircut 100, Spandau Ballet, Soft Cell, Heaven 17, and others set the cool tone and kinetic rhythms that have dominated urban night life for nearly five years. As creative forces in pop music, however, these groups are losing some of their influence.

Bronski Beat was a late arrival. The group's 1985 debut album, "The Age of Consent," brought together some of the main strands of the club sound—layers of contrapuntal synth over a strong disco beat, Latin and African rhythmic embellishments, and a campy sense of swing and drama. Vocalist Jimmy Somerville was the emotional center of Bronski Beat, but he has now left to form a duo called the Communards. The group's sudden breakup thus becomes something of a symbolic milestone.



COLUMBIA RECORDS

Djava: *Brazilian bittersweets*

"Hundreds and Thousands" is essentially an alternative version of "Age of Consent" made up of remixes and previously unreleased tracks. Fully representative of Bronski Beat's strengths and weaknesses, the music has remarkable rhythmic verve and displays an imaginative shuffling of styles, from Jazz Age swing to machine-age Giorgio Moroder dance music to African drum music. There's also a melodramatic inclination that leads the group to stretch some of its tunes way beyond anyone's normal attention span.

The remixes—of *Heat Wave, Why, Smalltown Boy*, and *Junk*—aren't radically different. *Heat Wave* now has an annoying tape of an aerobics class as an introduction, and the other tunes are elongated with added instrumentals and dub effects. But the effect is brighter and livelier than on "Consent."

The new tracks—*Infatuation/Memories* and *Close to the Edge*—don't add much luster to the Bronski legacy. There's really too much music and not enough interesting material on the cassette, and most of the second side drags. Still, either the LP or the tape makes a nice memento of what night life was like at its best in the first half of the Eighties. M.P.

**JIMMY BUFFETT:** *Last Mango in Paris*. Jimmy Buffett (vocals, guitar); vocal and instrumental accompaniment. *Everybody's on the Run; Frank and Lola; The Perfect Partner; Please Bypass This Heart; Gypsies in the Palace*; and five others. MCA MCA-5600 \$7.98, © MCAC-5600 \$7.98.

Performance: *Full spectrum*  
Recording: *Very good*

Jimmy Buffett long ago forged his reputation as the Ultimate Party Animal, permanently anchored off the hazy coast of Margaritaville. While the image of Buffett the witty, whimsical tune-

smith has lingered through the years, making him the self-appointed "spokesman for the bald-spot generation," his new album shows him capable of a full range of emotions, the second half revealing the tender, wistful side of the devilish rogue at work on side one.

Some of the songs are overlong, such as *Gypsies in the Palace*, about how the housesitters tear up the place while the boss is out on the road. Others, such as *Please Bypass This Heart*, a country takeoff on ticker surgery, strain the patience. None, however, fails in the way of charm, and several, including *Desperation Samba (Halloween in Tijuana)*, quietly stir the soul. Altogether, a lively and lovely little offering. A.N.

**JOHNNY CASH:** *Rainbow* (see Best of the Month, page 73)

**DJAVAN.** Djava (vocals); instrumental accompaniment. *Lilas (Lilacs); Luz (Light); Esquinas (Corners); Sina (Fate)*; and five others. COLUMBIA FC 39973, © FCT 39973, no list price.

Performance: *Appealing*  
Recording: *Very good*

The Brazilian composer-singer-guitarist Djava made his North American debut two years ago at the Kool Jazz Festival in New York City, and I recall how he ignited his audience in Avery Fisher Hall. He stood onstage in a blue light—a lean, handsome, brown figure in white with dreadlocks cascading over his shoulders—and sang music rich with the bittersweet melodies and African-derived rhythms of Brazil, with instrumental textures that hinted of U.S. pop. Djava's particular brand of fusion had already, in fact, won him star status in his own country.

Much of Djava's instant appeal comes across on this album, his first U.S. release. A great deal of that appeal stems from the plaintive quality of his voice, which seems to convey the meaning of his Portuguese lyrics even if we are unable to understand a word. Fortunately, translations are provided, and they reveal the lyrics to be sensitive, imaginative, and laced with irony. Unfortunately, the arrangements, some by Djava himself, are at times so heavily laden with pop clichés that the distinctiveness of his style is diluted.

Djava is at his best here on *Sina (Fate)*, which has a sweet Caribbean lilt to its rhythms; *Luz (Light)*, where he engages in some quite effective scatting; and *Liberdade (Freedom)*, which is affectingly lovely in a classic, haunting Brazilian style. And there are a few unexpected treats tucked into the grooves, including an earnest alto-saxophone solo by Ernie Watts on *Iris* and the expressive harmonica of Stevie Wonder on *Samurai*.

While the album fails to convey all the excitement of Djava in concert, it should serve to introduce him to the American market, where his almost-new sound will undoubtedly attract many fans. P.G.

**BOB DYLAN: *Biograph*** (see Best of the Month, page 74)

**ELTON JOHN: *Ice on Fire***. Elton John (vocals, piano); vocal and instrumental accompaniment. *This Town; Cry to Heaven; Soul Glove; Nikita; Too Young*; and five others. GEFEN 24077-1 \$8.98, © 24077-4 \$8.98.

Performance: *Eltonic*  
Recording: *Sterile*

After fifteen years of his singular brand of rocking, it's too much to expect something new from Elton John. "Ice on Fire" is filled with everything but surprises. Bernie Taupin (or just "Taupin," as the liner notes and label credits now refer to him) has been writing lyrics again, and, as usual, he sounds annoyed. Everyone is out of work, and there's not a faithful woman on the planet. I wish he'd cheer up.

Elton John's ability to attach a tune effortlessly to whatever Taupin has written remains intact. Fortunately, the tunes Elton zings off are inappropriately cheerful and energetic now and then. Still, there are too many maudlin ballads and too few ivory-bangers here for my liking. One bright spot is *This Town*, which inexplicably cranks up a rousing horn section for a song about a dying mill town. Another is a ribald, barroom rocker called *Wrap Her Up* (al-

though, with all due respect, Mick Jagger could have done this better). And *Tell Me What the Papers Say* hits a nice groove somewhere between the Doobie Brothers and the Pointer Sisters. The rest of "Ice on Fire" is about as much fun as divorce court. M.P.

**RAY PARKER JR.: *Sex and the Single Man***. Ray Parker Jr. (vocals, drums, bass, guitar, keyboards); vocal and instrumental accompaniment. *Girls Are More Fun; Good Time Baby; Everybody Wants Someone; One-Sided Love Affair; I'm in Love*; and three others. ARISTA AL8-8280 \$8.98, © AC8-8280 \$8.98.

Performance: *Heavier on rock*  
Recording: *Good*

In recent years Ray Parker Jr. has veered away from the subtle and melodic r-&-b-based style that brought him to prominence as a producer as well as performer. These days he relies more on songs with heavy-handed rhythms that are fine for dancing but often leave something to be desired when heard in a quieter setting. "Sex and the Single Man" is cut from that pattern, and it has lots of good-natured hijinks like *I'm a Dog*, which is exactly what it says it is. Parker is careful to change the pace occasionally, as in the buoyant and catchy *Girls Are More Fun* and the softer *One-Sided Love Affair*, but on the

whole, this album will appeal mostly to the perpetual-motion crowd. P.G.

**PETER ROWAN: *The First Whippoorwill***. Peter Rowan (vocals, guitar); Alan O'Bryant (guitar, tenor vocals); Sam Bush (mandolin, vocals); Bill Keith (banjo); Richard Greene (lead fiddle, vocals); Buddy Spicher (harmony fiddle); Roy Huskey, Jr. (bass). *I'm Just a Used to Be; I Believed in You Darling; Sweetheart You Done Me Wrong; I Was Left on the Street; Goodbye Old Pal*; and seven others. SUGAR HILL SH-3749 \$8.98, © SH-C-3749 \$8.98.

Performance: *Lovely*  
Recording: *Nice*

Before his long-ago days with Sea Train and Earth Opera, Peter Rowan spent two years as one of Bill Monroe's Blue Grass Boys. Today, some twenty years later, Rowan has established himself as one of the leaders of the New Acoustic Music scene in Nashville, and his current album is both a celebration of the contemporary revitalization of bluegrass music and a tribute to the man who gave Rowan his start, since almost all of the twelve tunes are Monroe originals. Joining Rowan on the vocals and instrumentals are other former Monroe "pupils," now big-name instrumentalists on their own. The picking, done mostly in the classic Monroe style, is

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beyond criticism, and the vocals are expressive, soaring, and, on the title cut especially, highly evocative. I would have preferred more driving energy in the lead vocals, where Rowan has occasional trouble staying clean, and a little more of a contemporary feel overall. But that is nitpicking. The old man should be proud. *A.N.*

**SADE: *Promise*.** Sade Adu (vocals); instrumental accompaniment. *Is It a Crime?; The Sweetest Taboo; War of the Hearts; Jezebel; Maureen;* and four others. PORTRAIT FR 40263, ©FRT 40263, no list price.

Performance: *Classy*  
Recording: *Very good*

If there hadn't been a Sade, pop music would have had to invent her. The remarkable, meteoric success of her first album, "Diamond Life," had a lot to do with our desperate need to be seduced—not by the terrifying video-age eroticism of Madonna or Annie Lennox or the derelict charm of Cyndi Lauper, but by a woman with . . . well, class. "Promise" doesn't have quite the edge "Diamond Life" had, but it's likely to win new devotees nonetheless, chiefly because it's very much like that debut—a collection of cushiony, soft-focus soul, jazz, and Latin settings for Sade Adu's translucent, expressive, fragile vocals.

Only a transcendent performer can reinvent the familiar and make an audience feel as though it's experiencing something for the first time. Ten years ago Sade's kind of pop-jazz was the signature of Creed Taylor's CTI jazz label—and ten years ago it was unforgivably unhip. Now here we are in 1986, thrilling to the muted trumpet and cocktail-piano-and-bass accompaniment as Sade shifts back and forth between the timid, vulnerable phrasing of *Is It a Crime?* and the aching, girl-from-Ipanema-on-a-suicide-jag cry of *War of the Hearts*.

While Sade's voice is a soothing instrument, it's no powerhouse, and on

"Diamond Life" it was frequently multitracked to add depth. There's less of that on "Promise," which settles into a slower, less demanding tempo early on and pretty much stays there. It's a moodier record and has a tendency to drift, but these are minor quibbles with what is an altogether pleasant listening experience. It may even be safe for me to pull my Jackie Cain and Roy Kral records out of hiding. *M.P.*

**SIMPLE MINDS: *Once Upon a Time*.** Simple Minds (vocals and instrumentals). *Once Upon a Time; All The Things She Said; Ghost Dancing; Alive and Kicking;* and four others. A&M VIRGIN SP 5092 \$8.98, © CS 5092 \$8.98, © CD 5092 no list price.

Performance: *Hard-hitting*  
Recording: *Excellent*

"Once Upon a Time" is one of the best power-rock albums since Billy Idol's "Rebel Yell." After toiling in relative obscurity (at least to Americans) through ten albums without making a dent in the U.S. charts, Simple Minds stumbled into the No. 1 slot with a song they didn't even write, *Don't You (Forget About Me)* from the filmed atrocity *The Breakfast Club*. Their last two records, hailed by the critics, were produced by Britain's Steve Lillywhite, but it's taken Jimmy Iovine (Bob Seger, Tom Petty) and Bob Clearmountain to get Simple Minds' focused yet fiery sound on record.

Ironically, under Iovine's direction Simple Minds sounds remarkably like a somewhat more disciplined, less strident version of U2, Lillywhite's best-known project. In fact, "Once Upon a Time" so strongly suggests both U2 and Idol that it comes as a bit of a revelation—the two groups are hardly soulmates. The difference is that Simple Minds makes technically polished, gut-wrenching power rock without striking a pose—political, pornographic, or otherwise. Vocalist Jim Kerr comes off as a Glaswegian tough, and guitarist

Charles Burchill backs him with slicing rhythm riffs, while Michael MacNeil's piano is frequently called on to restore order.

Strong, anthemic melodies and a driving, layered rhythm section make at least five songs from "Once Upon a Time" candidates for the charts, including *Sanctify Yourself, Alive and Kicking, Oh Jungleland, All the Things She Said,* and *Ghost Dancing*. Here's betting all five make it. *M.P.*

**SPANDAU BALLET: *The Singles Collection*.** Spandau Ballet (vocals and instrumentals). *Gold; Lifeline; Round and Round; Only When You Leave; Instinction; Highly Strung; True;* and eight others. CHRYSALIS FV 41498, © FVT 41498, no list price.

Performance: *Uneven*  
Recording: *Squeezed a bit*

If you were British, this collection of charted singles by England's second-biggest-selling band (behind Duran Duran) would be a great gift for your fourteen-year-old sister. In any case, it's a pretty good sampler of songs by a group that has kept getting better, even if its New Romantic sound is on the outs. I'm not sure I understand the song sequence here, which jumps around from year to year and album to album, but if your system is equipped to play selected tracks, you can trace Spandau Ballet's development in order from the overwrought early hits, like *To Cut a Long Story Short* and *She Loved Me Like a Diamond*, to the arch sophistication of *Round and Round* and *Highly Strung*. There's also an astonishing sixty-eight minutes of music on the LP, with no significant distortion. *M.P.*

**10,000 MANIACS: *The Wishing Chair*.** 10,000 Maniacs (vocals and instrumentals). *Can't Ignore the Train; Just As the Tide Was A-flowing; Scorpio Rising; Lilydale; Everyone a Puzzle Lover;* and eight others. ELEKTRA 60428-1 \$8.98, © 60428-4 \$8.98.

Performance: *Haunting*  
Recording: *Excellent*

Here's a quirky, at times haunting little album by what appears to be an uncommonly smart little band fronted by Natalie Merchant. Merchant has an enchantingly pure voice that will remind you of Sandy Denny, as well as a nicely poetic way with words ("Pardon the drapery language I chose," she says wistfully in one song). The Maniacs are difficult to pigeonhole stylistically, veering among New Wave eccentricity, the neo-Byrdsian stylings of R.E.M., and a Celtic folk sound that recalls Fairport Convention. Their songs are personal, thoughtful, and uncommon, dealing with such noncommercial subjects as walking in cemeteries, escaping small-town life, and the Cherokee Indian perspective on President Andrew Jackson. Yet none of it seems at all precious.

Produced by Joe Boyd with a lovely

*Simple Minds: technically polished, gut-wrenching power rock*



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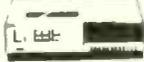
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sonic sheen that never becomes obtrusive, "The Wishing Chair" is one of the nicer surprises to have crossed my turntable this year, and you should hear it. Picks to click: the atypical near-metallic rocker *My Mother the War* and a simply gorgeous version of an obscure traditional tune called *Just As the Tide Was A-flowing*. S.S.

**JANE WEIDLIN.** Jane Weidlin (vocals, guitar); other musicians. *Blue Kiss*; *Goodbye Cruel World*; *Sometimes You Really Get on My Nerves*; *Somebody's Going to Get into This House*; and seven others. I.R.S. 5638 \$8.95.

Performance: *Too slick*  
Recording: *Very good*

Jane Weidlin was the cutest of the Go-Go's, and on the basis of the inner-sleeve photo included on this debut solo album, she has grown into her looks to the point where she is now almost dropped-dead gorgeous. A similar metamorphosis has affected her music in a less fortunate way, however. Whereas her Go-Go's work was adorably rough-edged (*Our Lips Are Sealed*, for example), these new songs have a case of terminal glamour. Produced to a fare-thee-well by several hands (including ex-Psychedelic Fur Vince Ely) and overdressed in all the usual state-of-the-art electronic stylings, Weidlin's songs now address such weighty subjects as nuclear war. But since they are rendered in her trademark Betty Boop-as-Valley Girl voice, the effect is often unintentionally funny. There are some attractive pop noises here (*Blue Kiss* among them), but mostly it's a disappointing release. S.S.

**HANK WILLIAMS: On the Air.** Hank Williams (vocals, guitar); instrumental accompaniment. *Moanin' the Blues*; *I Can't Help It (If I'm Still in Love with You)*; *Neath a Cold Gray Tomb of Stone*; *I'm So Lonesome I Could Cry*; and eight others. POLYDOR © 827 531-1 \$8.98, © 827 531-4 \$8.98.

Performance: *Spirited*  
Recording: *Excellent restoration*

Hank Williams has been dead for thirty-three years now, but lately he's had the kind of exposure most living artists would die for. The latest entry in a series of "new" Williams releases is "On the Air," a compilation of live radio appearances Williams made from 1949 to 1952. As on the 1984 companion album, "Rare Takes and Radio Cuts," the recordings were lovingly restored by Alan Stoker of the Country Music Foundation, who cleaned up the sound from the sixteen-inch transcriptions and original 78-rpm lateral-cut discs without imposing any artificial "enhancements" or fake-stereo rechanneling. The fidelity, which varies from cut to cut, is surprisingly superior to the earlier release, but the real thrill is both the intimacy and the raw emotional intensity the live-radio format affords.

"On the Air" gives us a relaxed and close-up portrait of Williams, who

comes across as an easygoing, folksy hillbilly boy instead of a stiff and distanced legend. People who remember attending his concerts say Williams completely demolished his audiences, and the energy he pumped into his live radio performances, plus the personality at work as he jovially introduces most of these cuts, offers a hint of what those concerts—and Williams—were really like. Overall, a delightful LP, and, with two previously unissued performances of *Moanin' the Blues* and *Wedding Bells*, a treasure for true Hank Williams fans. A.N.

**WINDJAMMER: Windjammer III.** Windjammer (vocals and instrumentals); other musicians. *You're the One*; *So Hard*; *I Thought It Was You*; *It's Too Late*; *She's a Dance Machine*; and five others. MCA MCA-5614 \$8.98, © MCAC-5614 \$8.98.

Performance: *Familiar*  
Recording: *Very good*

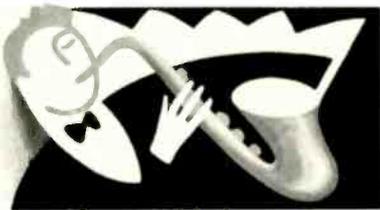
From their nautical outfits to the sound of their music, the vocal-instrumental soul quartet called Windjammer obviously has borrowed some of its inspiration from the Commodores, especially now that the wind has been taken out of the sails of that veteran group with the departure of Lionel Richie. Windjammer is a closely knit group that's capable of generating a great deal of funky energy as well as some listenable music when they want to. "Windjammer III" mostly offers pleasant but undistinguished dance music in the current style, but the lovely ballad *So Hard* is given such a shimmering rendition that it redeems the album. P.G.

**BOBBY WOMACK: So Many Rivers.** Bobby Womack (vocals); vocal and instrumental accompaniment. *I Wish He Didn't Trust Me So Much*; *Oh Baby*; *Don't Leave Home Without It*; *Got to Be with You Tonight*; *Whatever Happened to the Times*; *Only Survivor*; and five others. MCA MCA-5617 \$8.98, © MCAC-5617 \$8.98.

Performance: *Wonderful*  
Recording: *Very good*

Bobby Womack is undoubtedly the old smoothy of rhythm-and-blues. While so many veteran singers have buried their talents under a barrage of electronic effects and faddish noise, Womack has remained true to his art, emphasizing sweet melody and deep expressiveness. "So Many Rivers" shows how he's lasted for so many years. Sometimes you can detect in his style the get-down, gut-tugging qualities of an Otis Redding, especially when the rhythms are strutting, as on the title cut, but even when the tempo cools Womack can seize the emotions, as on a soul ballad like *Got to Be with You Tonight*. His lyrics are adult, in the positive sense of the word, as in the ironic *I Wish He Didn't Trust Me So Much*, and the arrangements offer sophisticated support without being intrusive. P.G.

# JAZZ



**JOHN BLAKE:** *Twinkling of an Eye*. John Blake (violin); vocal and instrumental accompaniment. *Dat Dere; Ocean Walking; La Verdad; Con Alma;* and three others. GRAMAVISION 18-8501-1 \$9.98, © 18-8501-4 \$9.98.

Performance: *Mixed strokes*  
Recording: *Excellent*

Violins seem to be "in" again. They have been on the jazz scene since the early days in New Orleans, when ragtime bands employed them, but only a handful of players have made their mark playing jazz violin. Now it appears that this old instrument is enjoying a new life in jazz as a voice of fusion, which may be because its sound is often emulated on synthesizers or because today's violinists often plug their instruments into synthesizers.

John Blake's violin has been heard with saxophonists as diverse as Archie Shepp and Grover Washington, Jr., but he has been at his best with higher-caliber musicians like Jay Hoggard and Cecil McBee. "Twinkling of an Eye" is his own album, and it's an unabashedly commercial effort that blends some horrid numbers in the Les Baxter vein (like Blake's own *Genesis*) with performances that show him to be a musician deserving of better material. *Con Alma*, a hauntingly beautiful Dizzy Gillespie composition, falls in the latter category. Here Blake's talent really shines through the veil of blandness that mars this album. C.A.

**CHARLES MINGUS:** *The Complete Candid Recordings*. Charles Mingus (bass); other musicians. *Folk Forms No. 1; Original Faubus Fables; Stormy Weather; Vasserlean; Body and Soul; Mysterious Blues; Lock 'Em Up;* and ten others. MOSAIC MR4-111 four discs \$37 (postpaid from Mosaic Records, 197 Strawberry Hill Ave., Stamford, CT 06902).

Performance: *Vital jazz*  
Recording: *Excellent*

The Candid label was a short-lived venture over which Nat Hentoff reigned twenty-five years ago. For about a year, Hentoff used his recording budget carefully and wisely to capture some extraordinary sessions, among them two days of recording activity featuring bassist Charles Mingus. If you are a Mingus fan or a devotee of modern jazz, you probably have the original albums released on Candid, or the Barnaby reissues, but don't let that deter you from

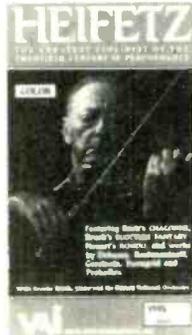
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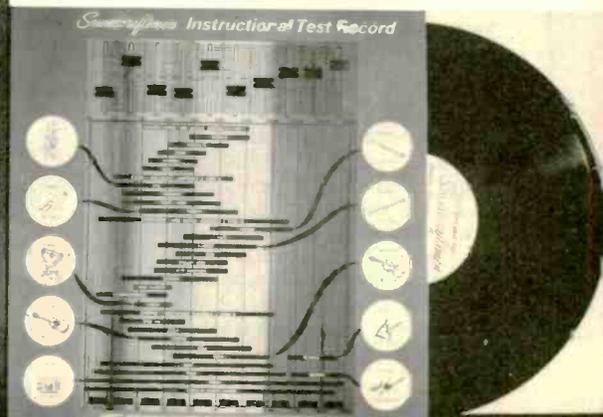
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## SWING REUNION

**I**T was a year ago that they assembled in New York's Town Hall, seven musicians whose names are synonymous with jazz of the unlabored, fiercely swinging kind. There was Benny Carter, the urbane alto saxo-



Red Norvo

phonist-composer-arranger, who that night would record his first vocal in forty-eight years; the suave Teddy Wilson, whose smooth piano style has for years been a hallmark of relaxed swing; Red Norvo, whose mallets in the Thirties heralded sounds to come; guitarists Remo Palmier and Freddie Green, the former playing an amplified instrument and the latter propelling the rhythm section with the bounce and grace he brought to the Basie band. Add George Duvivier's full-bodied bass and former Ellington drummer Louis Bellson's limber percussive work, and you have a stellar septet, a swing band with roots that go deep into the original soil.

From the moment they kicked off with Earl Hines's *Rosetta*, this little bundle of swing was a hit with the audience, and so it ought to be with all who have the good fortune to hear "Swing Reunion," a digitally recorded

Book-of-the-Month Records release that splendidly captures the event. Everybody gets a chance to shine. In fact, it's hard to pick out any highlights from what I can only describe as a perfect concert. The album itself could be a highlight of any record collection.

Chris Albertson

**SWING REUNION.** Benny Carter (alto saxophone); Teddy Wilson (piano); Red Norvo (vibraphone); Freddie Green, Remo Palmier (guitar); George Duvivier (bass); Louis Bellson (drums). *Rosetta; There'll Never Be Another You; Here's That Rainy Day; Swing Reunion; Evening Star; "Porgy and Bess" Medley; Undecided; How High the Moon; Exactly Like You; Star Dust; All That Jazz; I Surrender Dear; E.K.E.'s Blues; On Green Dolphin Street; Body and Soul; After You've Gone; How About You; Polka Dots and Moonbeams; Dancers in Love; What Is This Thing Called Love?; Town Hall Tonight; I Can't Get Started; Lush Life/Take the "A" Train; Avalon.* BOOK-OF-THE-MONTH ● 71-7627 three discs, © 21-7630 two cassettes, © 31-7631 two CD's, no list price.

Benny Carter



looking into this four-record set on Mo-saic. It not only offers all the music on the Candid albums, with superb sound and annotation, but also includes five previously unreleased tracks.

Mingus was a musical rebel, but he had a deep appreciation for and sense of the past. Music was an outlet for his anger and frustration, both of which he had in abundance. His compositions were often forceful personal expressions of outrage, as in his *Original Faubus Fables*, but sometimes he chose to register his protest with gentle sarcasm, as in *Vasserlean*, inspired by a slumming debutante. Mingus crisscrossed musical boundaries in wonderful, flagrant violation of purist laws.

One asset of this collection is that it reflects so many of Mingus's moods, from hysteria to romance, from violence to tenderness, and everything bears his mark. His fertile mind also showed imagination when it came to picking his collaborators. These tracks contain memorable performances by Ted Curson, Eric Dolphy, Charles McPherson, Lonnie Hillyer, and Booker Ervin as well as distinguished members of an earlier jazz generation. When Mingus mingled with the geniuses of jazz past, he showed his respect by bending their way.

This is a box full of exciting jazz, considerably packaged with well-written, informative annotation by Michael

Cuscuna along with reprints of Nat Hentoff's original notes. C.A.

**JACK WALRATH: At Umbria Jazz Festival, Volumes 1 and 2.** Jack Walrath (trumpet); other musicians. *Two in One; John Agar; Blue Moves; Feel No Evil;* and three others. RED RECORD/PSI VPA 182, 186 \$9.98 each.

Performance: *Solid*  
Recording: *Fair remote*

Composer/trumpeter Jack Walrath is probably best known for his three and a half years with Charles Mingus, but he has led numerous groups of his own too. His background also includes a year with Ray Charles and considerable experience with Preston Love's Motown band. Perhaps it is the rhythm-and-blues experience that gives Walrath's music its unpretentiousness and drive.

These two albums on the imported Red Record label feature Walrath's quintet at the 1983 Umbria Jazz Festival—more specifically, I presume from the sound, at the Teatro Pavone in Perugia. One could not ask for a more idyllic setting than this eighteenth-century miniature opera house, which oddly enough provides a perfect frame for these relatively modern sounds. The theater has the intimacy of a club, with tiers of boxes forming an arc in front of the small stage and acoustics that allow a whisper to be heard from every seat.

Lacking the stamp of originality that makes music memorable, these performances are not the stuff of which legends are made, but they constitute an hour and forty-one minutes of solid jazz, richly endowed with admirable solos by all five men. I only wish Walrath's horn had been recorded more in balance with the rest of the group. It is, at times, a bit too prominent. C.A.

**NANCY WILSON: Keep You Satisfied.** Nancy Wilson (vocals); vocal and instrumental accompaniment. *American Wedding Song; Early Morning; We've Got Love; Careless Whisper;* and six others. DENON INTERFACE © 7597 no list price.

Performance: *Good*  
Recording: *Excellent*

When I recently sat down to review a Nancy Wilson video cassette, I could not believe what I heard—her tasteless screams could have turned a hog-caller green with envy. I am happy to report that Wilson is her old self on "Keep You Satisfied," a Denon CD recorded in Tokyo last year. Except for input from veteran Belgian harmonica virtuoso Toots Thielmans, the heavily synthesized accompaniments are by Japanese instrumentalists and vocalists. Superbly recorded, this polite program consists for the most part of uncommon ballads that would go well with candlelight and wine, but Wilson's delivery doesn't give me the goose bumps I so often get when I listen to Sarah, Billie, and Aretha. C.A.

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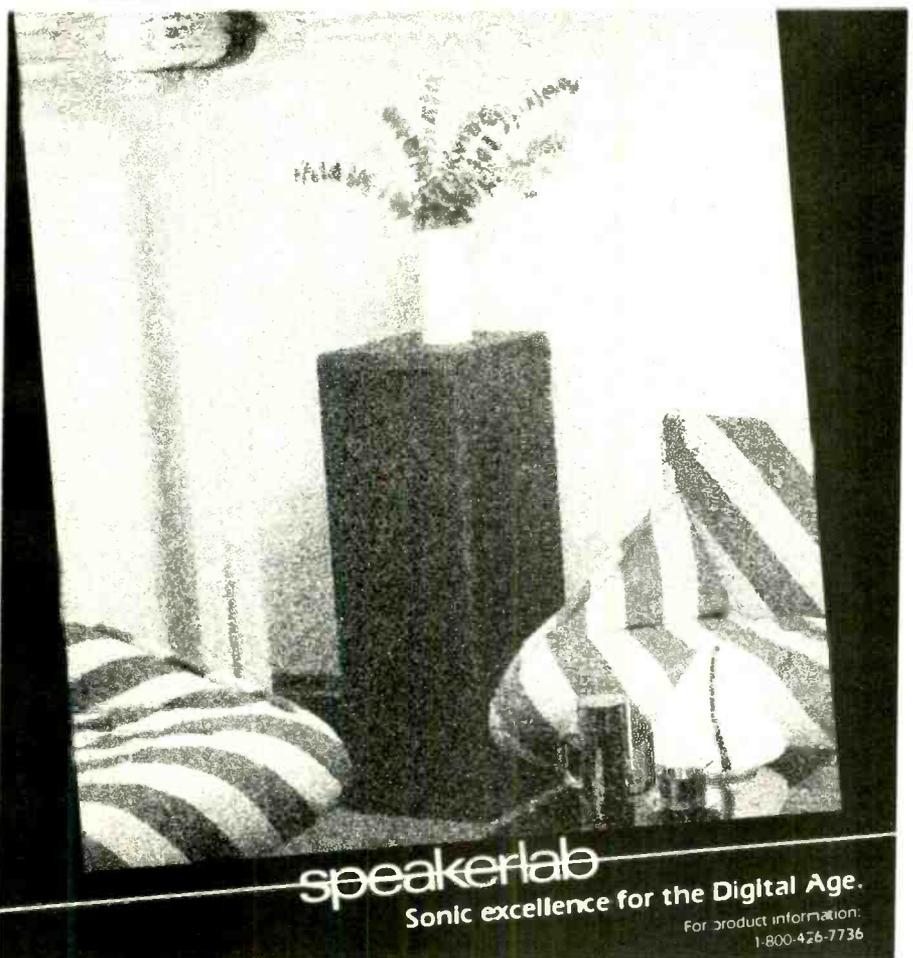
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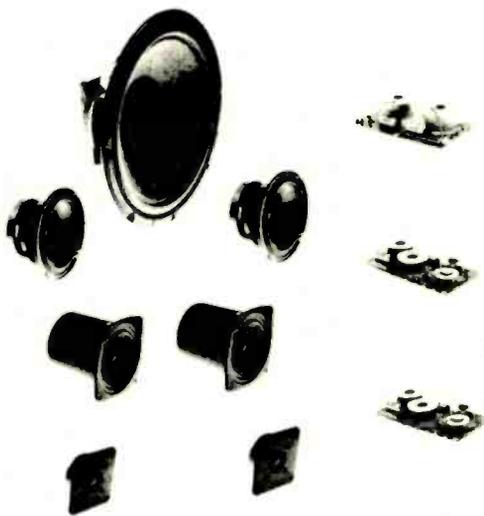
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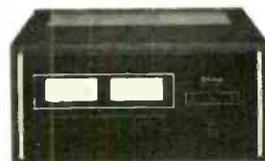
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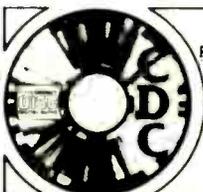
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## MARCH

A hand is shown holding a black remote control in the foreground. The remote has numerous buttons labeled with functions like PHONO, MEMORY, PLAY, TUNER, FM/AM, STOP, POWER, CD/AUX, AV/AUX, TUNING, PAUSE, MONI, MUTE, VOLUME, TUNER AMP, TAPE, and CD. The background shows a room with three black speakers: two smaller ones on a shelf and one larger one on the floor. The lighting is dramatic, with a warm glow from a light source behind the shelf.

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**T**HE Public Broadcasting Service has a triple treat lined up for mid-March. On March 14 PBS will air Stephen Sondheim's musical *Follies* in a concert performance given under the aegis of the New York Philharmonic at Lincoln Center just after Labor Day last year. The all-star cast includes, in alphabetical order, Licia Albanese, Carol Burnett, Barbara Cook, George Hearn, Eric Mills, Phyllis Newman, Mandy Patinkin, Lee Remick, and Elaine Stritch. If you want to prepare yourself in advance, you might pick up the RCA recording produced by Thomas Z. Shepard, who was also responsible for organizing the concert performance.

The following night, March 15, PBS pays tribute to Benny Goodman with a two-hour special covering his sixty-year career. Assisting artists on the program include Red Norvo on vibes, Louis Bellson on drums, Dick Hyman and Teddy Wilson on piano, and Slam Stewart on bass.

Then on March 16 PBS rolls out its annual Gala of Stars, taped earlier this year

at the Vienna State Opera House. The program will spotlight a number of leading opera singers, among them Kathleen Battle, Mirella Freni, Edita Gruberova, Alfredo Kraus, Christa Ludwig, Hermann Prey, Margaret Price, Leonie Rysaneck, Elisabeth Söderström, and Anna Tomowa-Sintow. A special segment will feature an interview with Elisabeth Schwarzkopf conducted by Beverly Sills, who, as usual, serves as host. Music director is James Levine. □

**A**LTHOUGH the liner notes don't say so, the four chamber works assembled under the title "Private Collection" in a new Musicmasters album featuring Benny Goodman are drawn from Goodman's own collection and have never before been available commercially.

Goodman's mastery of the classical clarinet repertoire is often overlooked, especially by his jazz fans, but his interest in music of all kinds and the consummate musician-ship and joy he has shown in



Mills: special Sondheim

playing it earned him our 1982 Mabel Mercer Award.

Included in the two-record Musicmasters set are the clarinet quintets of Brahms and Weber and the clarinet trios of Brahms and Beethoven. Assisting artists are the pianist Leon Pommers and the Berkshire Quartet.

CBS is honoring Goodman



Peter, Paul, and Mary: silver-anniversary special

this year with the release, on a series of Compact Discs, of material from the company vaults dating back to the Forties and early Fifties. Kicking it off, though, is an even earlier recording—of the famous concert that Goodman and his band played at Carnegie Hall in January 1938, which made history as the first event of its kind ever booked there. The original, privately recorded tapes have been digitally remastered and are being released on two CD's.

Following these will be single CD's by smaller Goodman combos and a classical CD compilation containing works that Goodman commissioned from Bartók, Bernstein, Copland, and Gould as well as Stravinsky's *Ebony Concerto* (written for Woody Herman). □

**O**LD folkies never die. They just get specials on PBS. Yes, that's the famed Sixties folk trio Peter (Yarrow), Paul (Stookey), and Mary (Travers), whose upcoming twenty-fifth anniversary will be saluted in a ninety-minute PBS show scheduled to air on March 8. Featuring the group's inimitable

harmonies in the service of such period classics as *Blowing in the Wind* and *Puff the Magic Dragon*, the program will be based on their recent performances at the Tennessee Arts Center in Nashville. A home-video release will follow, probably from MGM/United Artists. □

**D**ON'T point those things at us, Miami Steve Van Zandt and Kiss auteur Gene Simmons seem to be saying, but in reality, the two are merely having a friendly discussion during a taping of comedian Richard Belzer's syndicated radio show. What united the seemingly incompatible E Street Band star turned protest singer ("Sun City") with the apolitical heavy-metal maniac? Music, of course, in this case an all-star guitar version of the old soul classic *The Midnight Hour*. No commercial release is planned, however, and according to our spy who attended the taping, "None should be." We suspect you had to be there. □

**A**ND here's another unlikely all-star twosome: balding guitar hero Mark

Van Zandt and Simmons: an unlikely soul classic



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**Knopfler of Dire Straits** and pugnacious piano man **Billy Joel**. The occasion? A surprise guest appearance by Joel during the finale of the Straits' recent stand at New York's Madison Square Garden. What did the collaboration sound like? According to one ear witness, "like a cross between Dylan's 'Highway 61 Revisited' and Merv Griffin's 'A Tinkling Piano in the Next Room.'" Again, you probably had to be there. □

**VOICES FROM THE PAST:** The so-called Mapleson Cylinders, treasures of the New York Public Library's Rodgers and Hammerstein



**Knopfler and Joel: surprise**

Archives, have been released on LP. Edited and transferred to discs under the supervision of the Archives' recently retired curator (and STEREO REVIEW Contributing Editor) **David Hall**, these early recordings made at the Metropolitan Opera House at the turn of the century capture live performances by such legendary singers as **Nellie Melba**, **Emma Calvé**, **Lillian Nordica**, and **Jean de Reszke**. The originals were cut on wax by the Met's librarian at the time, **Lionel Mapleson**.

The six-record set, on the library's own label, is available for \$100 in the shops at Lincoln Center or from the Metropolitan Opera Guild, 1865 Broadway, New York, NY 10023. If you order by mail, add \$3.50 for postage and handling, and New York State residents should add \$8.25 sales tax as well. □

**T**HE St. Louis Symphony, conducted by **Leonard Slatkin**, has been recording for RCA in recent years but

has just signed an agreement with Angel Records as well. The first release under the new contract will feature the music of **Aaron Copland**. . . **Leonard Bernstein** has signed a new long-term, exclusive recording contract with Deutsche Grammophon. Foremost among the projects DG has lined up for Bernstein is a new Mahler symphony cycle involving three orchestras with which the composer, as conductor, was closely associated—the Vienna Philharmonic, the Concertgebouw of Amsterdam, and the New York Philharmonic. . . **Riccardo Muti** and the Philadelphia Orchestra have received Japan's 1985 Record Academy Award, the country's most prestigious, for their Angel recording of Respighi's three Roman tone poems. . . Finnish conductor **Esa-Pekka Salonen**, principal conductor of the Swedish Radio Symphony, will be recording a Nielsen symphony cycle for CBS Masterworks. . . **Semyon Bychkov**, currently based in the U.S. as music director of the Buffalo Philharmonic, has signed a contract with Philips Records. His first recording for the label will be Shostakovich's Fifth with the Berlin Philharmonic. □

**N**OT all rock stars start out as dishwashers and waitresses. **Sheena Easton's** first job was taking bets at an off-track booking office in Glasgow. And standards of conduct on the premises were apparently high. "The men had to be well behaved around the young ladies," Easton recalls. "Anyone who came in drunk or used bad language was thrown out!" And now she is a rock star. Easton's latest album, "Do You," her sixth for Capitol and EMI America, is her fastest-selling album yet. It went Gold in its first two weeks of release and has yielded two singles—*Do It for Love*, which has enjoyed a healthy life on the pop charts, and the more recently released *Magic of Love*. □

**B**Y the time she was eligible for working papers

**Elaine Paige** wasn't washing dishes either—or taking bets professionally. She was touring the U.K. at



**Easton (top) and Paige: no dishwashing**

the age of sixteen in the musical *The Roar of the Greasepaint—the Smell of the Crowd*.

Paige is best known today, of course, for creating the roles of **Eva Peron** in **Andrew Lloyd Webber's** musical *Evita* and **Grizabella** in his more recent hit *Cats*. (Grizabella's main song is *Memory*, the show's big hit.) Her recordings to date, including the original-cast recordings of these two shows, have therefore mostly drawn on her career in the theater. She's aiming to change all that now with the release of "Love Hurts," an album of ballads on the WEA label.

"This is a collection of some of my favorite love songs," Paige says, "old and new, well known and not so well known. . . I guarantee it's not an album of doom and gloom, but it's a fact that most songwriters are at their best when hurting a little." □

**T**HE operas of **Rossini**, currently enjoying a revival on discs as well as in opera houses here and abroad, have always attracted **Claudio Abbado**. Performances of *The Barber of Seville* that Abbado conducted at the Salzburg Festival in 1968 virtually launched his international career. They were so successful that he was invited to preside over a Rossini cycle at La Scala in Milan, which in turn led to a couple of recordings for Deutsche Grammophon.

Abbado returns to DG and to Rossini with the current release of the composer's *Il viaggio a Reims (The Journey to Rheims)*. Written for the coronation of France's King Charles X at Rheims in 1825, the opera was ignored for over a hundred and fifty years—until 1984, when it was revived under Abbado's direction.

*Il viaggio* has been described as a sort of Franco-Italian *Canterbury Tales*. It has no plot but has to do simply with a bunch of well-heeled travelers, on their way to Rheims for the coronation, who find themselves stranded without horses and nothing much to do but flirt, squabble, and tell tales (or sing songs) until fresh horses arrive. Three hours of glorious music later, of course, they're



**Abbado: Rossini champion**

still waiting. Abbado has another analogy. "It's more like an operatic *Waiting for Godot*," he says. "Rheims never comes." □

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CIRCLE NO. 50 ON READER SERVICE CARD

by Ralph Hodges



## Tape Reversals?

**T**APE as an analog audio medium has been a little eclipsed recently by tape for digital and video applications, and for the first time in memory there are no detectible foreshadowings of "fabulous new" (meaning, usually, a little bit better) cassette formulations in the offing. This temporary lull doesn't mean that your Walkman and Nakamichi are candidates for the attic, however. In the first place, the frenzied work being done on super-short-wavelength technologies can only assist, never impede, the analog cause. In the second, intensive

*Mobile Fidelity Sound Labs sees an advantage in duplicating tapes "backwards," running the master from the end instead of the beginning.*

work, much speculative and some highly imaginative, is being done on the audio cassette by the high-volume tape duplicators, who are riding the cresting popularity of prerecorded product. They have provocative things to report, some of high-end interest.

For example, there is the matter of duplicating tapes "backwards,"

running the master tape to be copied from the end instead of the beginning. The people at Mobile Fidelity Sound Labs tell me that there is an advantage to backward duplication in that, rather than challenging the rise time of the recording system with the sharp leading edges of transients, one attacks each transient "from behind," beginning with its gradually rising reverberant tail. Once the copy has been made, of course, the tape is arranged in the cassette shell so that the music will come out forward when played on the consumer's machine.

As is usual in these cases, the novel technique has its opponents. A source at TDK points out that any recording system unavoidably "rings" (oscillates) a bit when stimulated by a signal, and if a tape is copied backwards, this ringing will wind up being recorded *ahead* of a transient's onset, right out in the open where there is no reverberant tail of sound to mask it. When the tape is played, the effect is said to be that of a spurious pre-echo disfiguring what should be a clean attack.

The middle ground in the controversy is taken by, among many others, Richard Clark of Concept Industries, an innovative duplicating outfit that tries to operate right on the hairy edge of serious audiophile concerns. Clark reports that, after many agonizing appraisals, he has "never been able to determine whether it makes a whole lot of difference whether you record forward or backward." This should cheer the high-speed duplicators, whose equipment is invariably set up to record both forward (for one cassette side) and backward (for the other) in a single pass.

Should this conclusion quiet our panicky wondering about how we can modify our home gear to make backwards tape copies? Not if we choose, as all true high-end audiophiles should, to worry about the *velour effect*. Some believe that, like velvet and velour fabrics, which tend to look and feel different depending on which way they are rubbed, tape can "feel" subtly different to heads and transport guides depending on which way it was coated. The effect presumably arises because the magnetic particles in the coating have had their rear ends

lifted up away from the tape surface as they leave the field of the coating machine's orientation magnet.

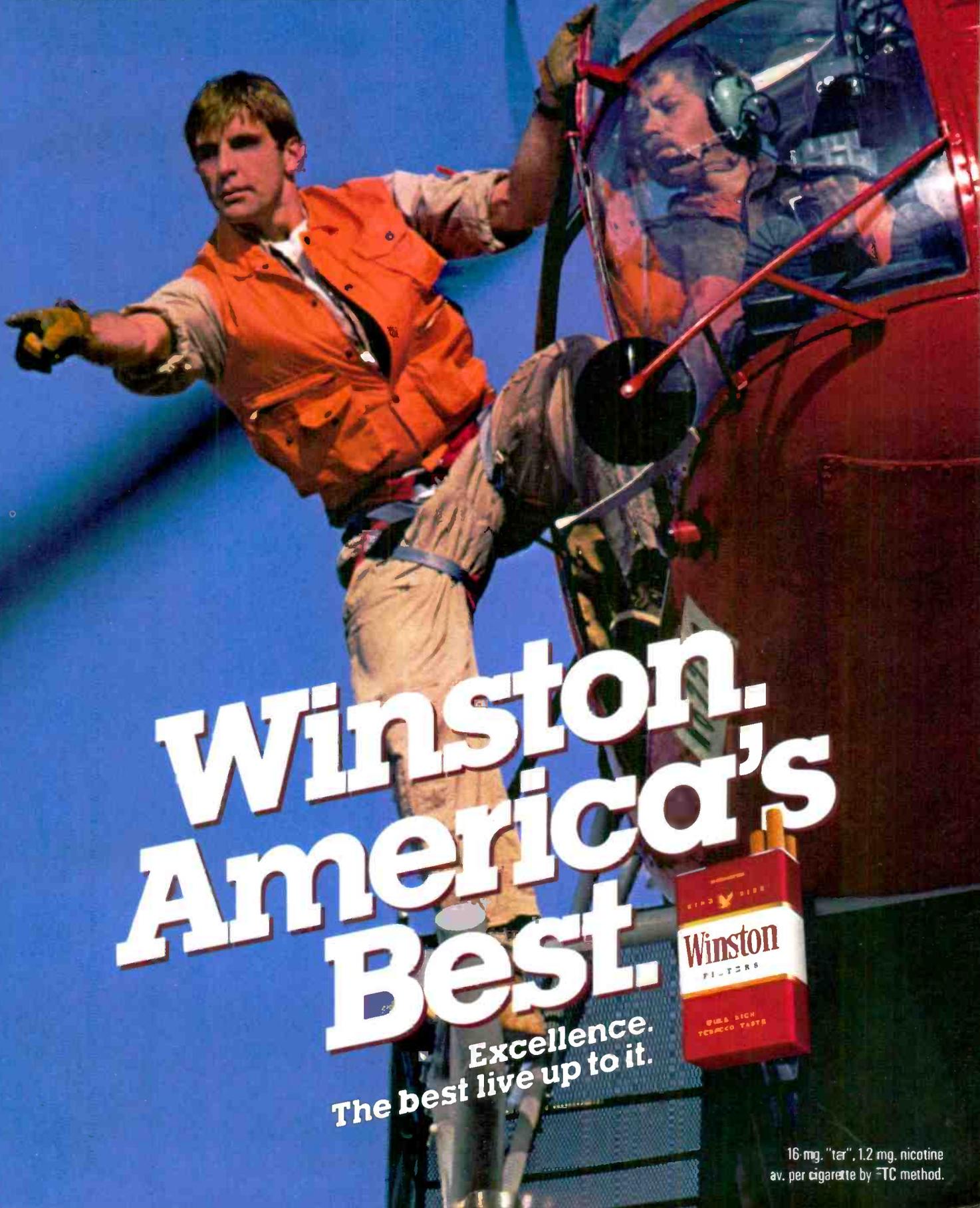
Professional studio tape, intended to be recorded in one direction only, is invariably supplied so that it comes off the reel or hub in the same direction it traveled through the coating machine. Thus, tape

*Some audiophiles believe in a "velour effect" that makes tape "feel" subtly different to heads and guides depending on which way it was coated.*

motion will always be "with the grain." But consumer tape formats tend to be used in both directions, making all of us easy marks for the velour effect on perhaps half of the taped material we record or listen to. Worse, while the "right" direction for studio tape is always known, either by convention or by actual markings, with a cassette—especially a prerecorded one—there is no sure way of knowing which side runs with the grain and which against. A tape pancake taken directly from the slitting operation and loaded on a high-speed duplicator *should* get both its sides recorded with the tape traveling in the optimum direction. Ironically, a painstakingly made audiophile prerecorded cassette duplicated in the shell in real time won't, as a rule. And neither will the cassette you painstakingly record at home.

Catastrophe? Well, not unless you are now bothered by audible velour effect, which should take the form of an increase in modulation noise on one side of cassette recordings. If you are not, you might give some credence to the belief of tape manufacturers that with improved binder materials and production techniques they have put any audible artifacts from velour effect permanently behind us. If you are bothered by the velour effect, then you've acquired another high-end concern to worry about. Take heart, however, because others are worrying along with you, and some of them have sufficient influence to force redress, or bring it about themselves. □

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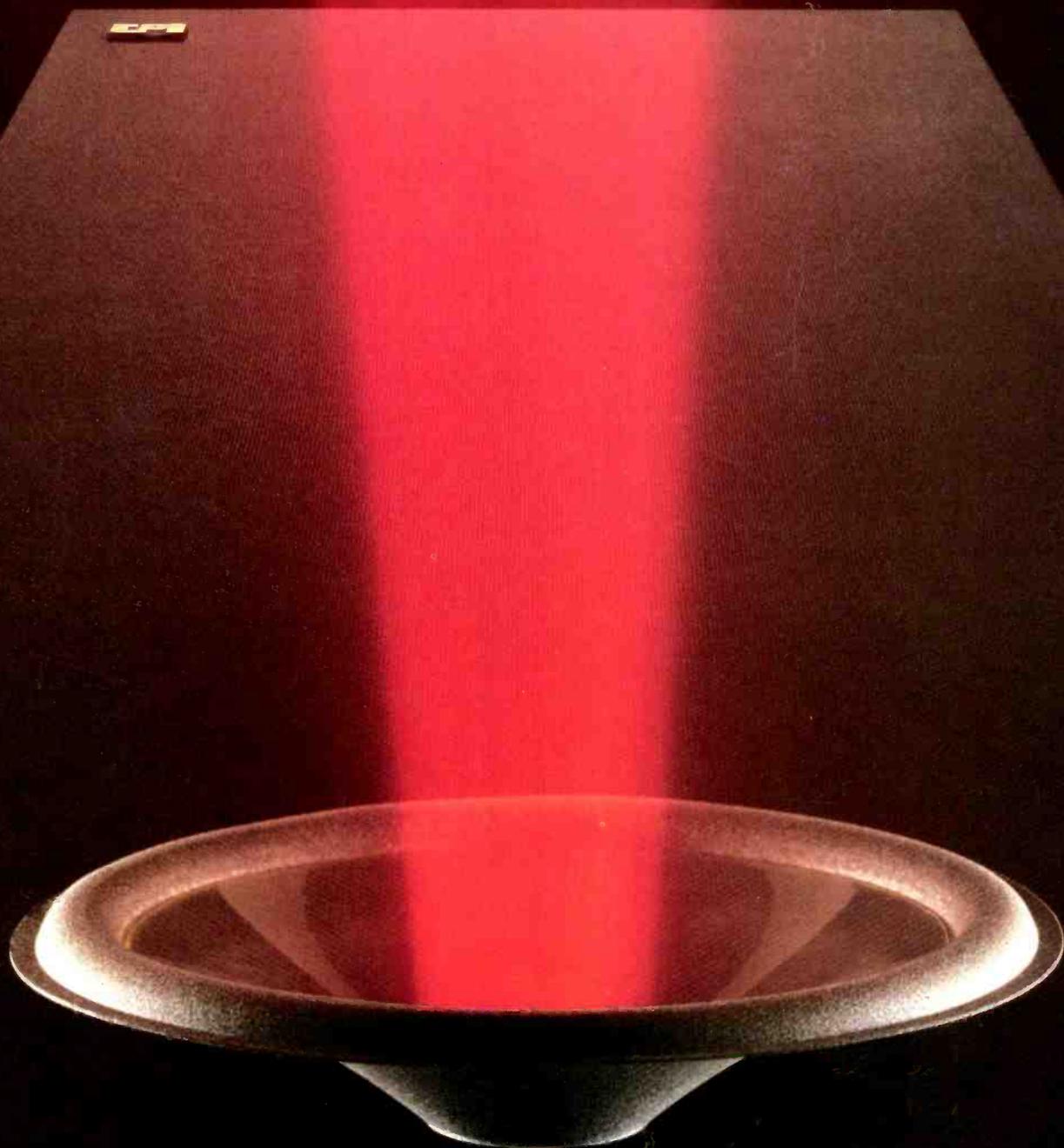
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