

Stereo Review

NOVEMBER 1984 ● \$1.75

HI-FI VIDEO

VCR'S FOR
AUDIOPHILES

HOW TO GET
MOVIE SOUND
AT HOME

NEW TAPES FOR
NEW TECHNOLOGY

THE CULT OF
THE ESOTERIC
CARTRIDGE

GUITAR
CLASSICS



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Technics Linear Tracking and Quartz Drive. If your next turntable gives you less, you're settling for less of a turntable.

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Quartz drive is the most accurate drive system in the world. That means the wow and flutter that plagues conventional turntables is inaudible.

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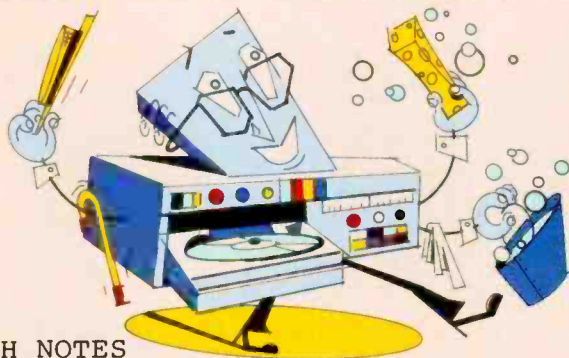
So why settle for less. Explore the entire line of Technics turntables at a dealer near you.

Technics
The science of sound.

by Gordon Sell and Christie Barter

PIONEER CD/VIDEO DISC PLAYER

Early in 1985, Pioneer will begin selling a machine that will play Compact Discs, 8-inch and standard LaserDisc video discs, and LaserDiscs with new digital audio soundtracks in addition to the standard analog soundtracks. The digital signal is frequency-modulated on the lower 2 MHz of the video bandwidth. The player, the CLD-9000, will have four audio output jacks, two for the standard CX-encoded analog LaserDisc soundtrack and two for the output of the CD and digital video-disc circuitry. The drawer-loading machine has a single semiconductor laser pickup, but separate motors for the LaserDisc and CD spindle drives. The CLD-9000 is expected to sell for between \$1,000 and \$1,500. It does not do windows.



TECH NOTES

Magnepan is suing Apogee Acoustics for infringement of its patent for a line-radiator-type ribbon transducer....dbx has ended distribution of dbx-encoded records and tapes; watch for them in close-out bins....The CBS/Sony Compact Disc pressing plant located in Terre Haute, Indiana, is expected to be in production by the time you read this....Pioneer has just halved the price of its LD660 LaserDisc player to \$299.95 in an effort to stimulate sales of the new 8-inch, \$10.99, music video LaserDiscs....Radio Shack's new catalog includes a stereo TV/SAP receiver for \$140 and a Beta Hi-Fi

VCR for \$600....The 3M Company predicts 50% of U.S. households will have a VCR by 1990.

FROM THE LENNONS

The last televised interview of John Lennon has been released on a cassette by Karl Home Video of Newport Beach, California, with interviews of Lisa Robinson, the journalist, and record producer Jack Edwards, taped the day after Lennon's death in 1980. The Lennon interview was taped in 1975 by the Tomorrow Show's Tom Snyder. The suggested retail price is \$29.95....Atlantic Records has signed Lennon's son by his first marriage. Julian Lennon's first album for the label, "Valotte," reached stores in mid-October.

FAVES WITHOUT FAVORITISM

Mobile Fidelity Sound Lab, known for its carefully remastered audiophile pressings of pop/rock classics, has taken a plunge into opera. The two initial releases, as recordings, are themselves classics of the 70's--Herbert von Karajan's La Bohème and Sir Georg Solti's Carmen, both originally released by London. But Mobile Fidelity has been careful, too, in taking no sides in the great-tenor contest. Each of these recordings stars one of the world's greatest two. Luciano Pavarotti is the Rodolfo in La Bohème, and Placido Domingo is the Don José in Carmen.

SONY PORTABLE CD PLAYER

It weighs 1½ pounds, is about 5 inches square and 1½ deep, and it will play a Compact Disc with a sound quality equal to full-size players. Sony says the player will be in stores in time for Christmas and will sell for around \$300. The as-yet-unnamed player (a source says it will use the suffix 'man') has a headphone jack and standard line-level audio output jacks via which it can be connected to any audio system.

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Stereo Review

Bulletin	1
Editorial	6
Letters	8
New Products	15
Audio Q&A	20
Technical Talk	24
Popular Music	87
Classical Music	99



EQUIPMENT

Hi-Fi VCR's: State of the Art 51

A gallery of video cassette recorders with sound so good it rivals the digital Compact Disc / by *Fred Petras*



How to Get That Movie Sound at Home 58

With Dolby Stereo and a few pieces of equipment, you can make your living-room couch the best seat in the theater / by *Ralph Hodges*

Equipment Test Reports 29

Hirsch-Houck Labs test the Yamaha C-80 preamplifier and M-80 power amplifier, the Technics RS-B100 cassette deck, the Polk SDA Compact Reference speaker system, the Pioneer P-D70 Compact Disc player, and the AKG K4 stereo headphones

Tape Wins Again 64

Manufacturers of audio and video tape meet the challenges of new technology / by *Ian G. Masters*

Esoteric Phono Cartridges 68

Precious substances and exotic designs add to the mystique of audio for the connoisseur / by *Daniel Sweeney*

The Sound of Movies 56

A critic's choice of ten top sonic spectaculars / by *Louis Meredith*

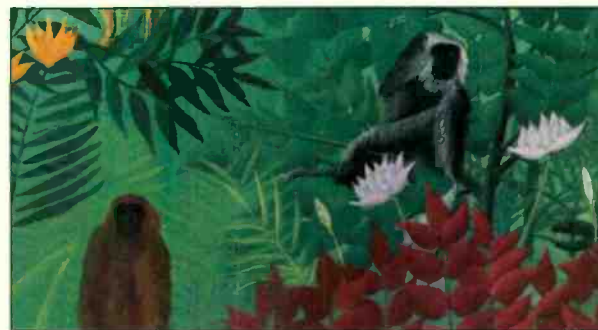
MUSIC

Guitar Classics 74

An informal survey of recent recordings by today's guitarists / by *William Livingstone*

Record Makers 77

The latest from Linda Ronstadt, Georges Cziffra, Bruce Springsteen, and the National Gallery of Art, the Cars on hi-fi video, J. S. Bach's hits, the King's Singers, and more



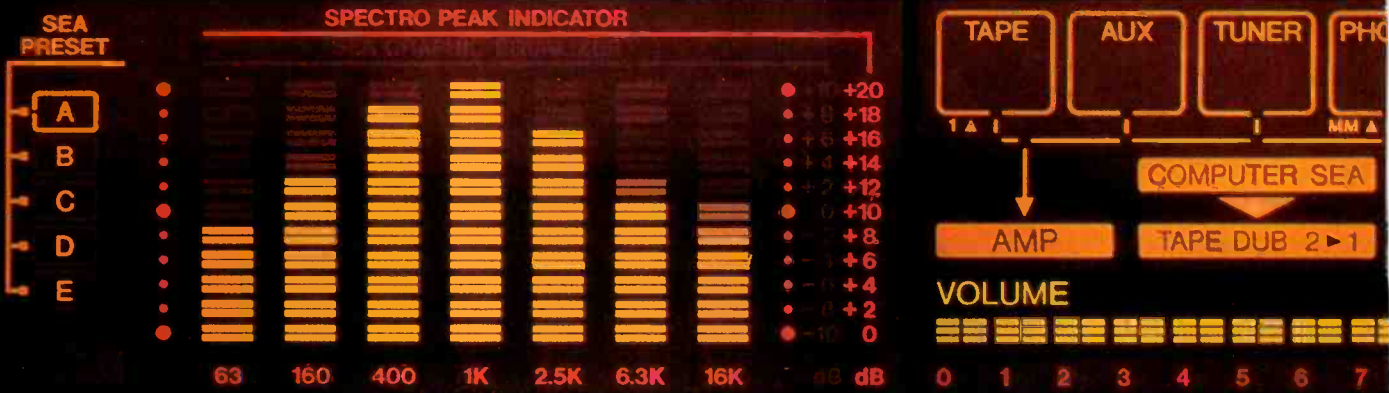
Best Recordings of the Month 81

Mahler's First Symphony, Ray Charles, Schubert's Lieder, Lindsey Buckingham

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of high fidelity components is known throughout the world for technological brilliance and painstaking craftsmanship.

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In a further refinement, JVC engineers opted for an LSI to handle electronic switching for both channels at

seven different control frequencies. The result—electrical loss and tonal

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ADVANTAGE: A TUNER AS SMART AS A COMPUTER

SPECIFICATIONS	
AMPLIFIER SECTION	
Output Power	
100 Watts per channel, min. RMS, both channels driven into 8 ohms, from 20Hz to 20kHz, with no more than 0.007% total harmonic distortion.	
Signal-to-Noise Ratio (*66IHF/DIN)	
Phono—80dB/66dB	
Video/Aux/DAD/Tape—100dB/67dB	
RIAA Phono Equalization	
± 0.5dB (20Hz -20kHz)	
S.E.A. SECTION	
Centre Frequencies—63, 160, 400, 1k, 2.5k, 6.3k, 16kHz	
Control Range— ± 10dB	
FM TUNER SECTION (*78 IHF)	
50dB Quieting Sensitivity	
Mono—14.8dBf Stereo—38.3 dBf	
Signal to Noise Ratio (IHF-A Weighted)	
Mono/Stereo—82dB/73dB	

The R-X500B puts an advanced microcomputer in charge of the digital synthesizer tuner and references it to the accuracy of a quartz oscillator, making it highly versatile and easy to use. The microcomputer lets you pre-set 15 AM and 15 FM frequencies, scan them all for 5 seconds each, read out aerial signal strength in 5dB increments, plus much more.

ADVANTAGE: JVC

It is the attention to engineering detail and craftsmanship evident in the R-X500B which separates every JVC hi-fi component from all others. JVC makes changes in design for the sake of improvement. Not just for the sake of change. And the result is the difference between excellent and average. See, and hear, this difference at your nearest JVC dealer.



by William Livingstone



With conductor Leonard Slatkin

The Video Message

IN the late Seventies, when pre-recorded video cassettes were first offered to the public, I sometimes asked retail dealers what their best-selling item was. The answer was invariably the movie *Patton* with George C. Scott. The number-two slot was occupied by one or another of the then-current X-rated pornographic films—*Deep Throat*, *The Boys in the Sand*, *Every Inch a Lady*, and so forth.

A couple I knew at that time were trying to establish a video production company. Their projects included recitals by distinguished jazz and cabaret singers and an elaborate freeze-frame catalog of all the slides of great paintings in a local university's art appreciation files. But the only one of their programs that did well was a rock concert by Todd Rundgren, and their company has since disappeared.

It seemed for a while then that home video would not be much different from broadcast television. People would tape their favorite shows and buy prerecorded cassettes of the most popular kind of music and movies that might offer more violence and sex than the networks could get away with. Those who were curious about X-rated movies but did not care (or dare) to go to the usually sleazy theaters where they are shown could contemplate in the privacy of their own homes the works of Linda Lovelace,

Harry Reems, and similarly talented performers.

In only a few years, however, the public has shown that, given a choice, it does not want just sex and violence. Best-selling movies on video in recent months have included such varied fare as *The Big Chill*, *Raiders of the Lost Ark*, *Terms of Endearment*, *A Hard Day's Night*, and *The Right Stuff*.

At the top of the charts there are also cartoon anthologies of Mickey Mouse and Donald Duck as well as fitness tapes by Jane Fonda and Debbie Reynolds. Music videos with widest appeal have been those by such artists as David Bowie, Duran Duran, Michael Jackson, Billy Joel, and Rod Stewart.

With more homes equipped with video hardware, suppliers of video discs and prerecorded tapes have been able to diversify and offer programs for a few minority tastes. In its Beta 45 series Sony has released some jazz, a museum documentary on LaserDisc is described in "Record Makers" (page 78), and Pioneer Artists, Video Arts International, and Kultur are adding to the video catalogs of classical music.

While nothing can replace the immediacy of live performance, the video medium has the advantage of a kind of intimacy that is impossible in the concert hall or opera house. I attended Luciano Pavarotti's concert in Madison Square Garden in August and then saw a TV rerun of the concert a few days later. Oddly, the closeups made it more exciting on TV. This is true to some degree in the Metropolitan Opera's first Pioneer video-disc releases.

In addition to intimacy, a great benefit of home video is the freedom of choice it has given us. You are free to determine the artistic level of what goes on your screen. You choose whether it is *Sorority Sweethearts*, *Hot Trash*, and *Talk Dirty to Me* or *Romancing the Stone* and *Greystoke—the Legend of Tarzan* or the Metropolitan Opera's performances of *Lucia de Lammermoor* and *Don Carlo*.

Time and technology have disproved Marshall McLuhan's claim that "the medium is the message." The program is the message, and the video medium leaves the programming up to you. □

Stereo Review

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Stereo Review

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LETTERS

Video Updates

I am continually dismayed and puzzled by the negative reaction of some of your readers to test reports of video equipment with hi-fi sound reproduction capabilities. With my recent purchase of a Sony SL-2710 I was able to replace both my cassette deck and reel-to-reel deck, retaining all the conveniences and getting better performance than either one could deliver. Please keep the updates on video hi-fi equipment coming.

MARK PATTERSON
Virginia Beach, Va.

Systems Analysis

To Mr. Sell and his "Systems" section, a failing grade! When this department was called (properly) "Installation of the Month," you featured items worth merit. I always looked forward to it to see how stereo enthusiasts used their ingenuity and imagination to improve or set up their equipment.

In February 1984 you showed a sound room an audiophile had *constructed*, using materials and plans the rest of us would not have thought of. In November 1983 there was a carpenter who used his talent to render his equipment cabinetry tastefully in wood.

What happens when this interesting department turns into "Systems"? In June a woman lacking in imagination simply puts out her Amex and purchases an audio cabinet and a full Denon system. She runs speakers into her dining room! How ingenious! In July a banker with money to burn purchases a couple of extremely expensive

components and brags about his \$10,000 projector. Money Green? Kudos to the interior decorator this man *hired* to set up the system for him. And the last straw, in September a producer simply gives an audio dealer carte blanche to renovate his limo.

Choosing the more inventive and imaginative entries could make this an interesting and instructive department again. I value the hobbyist over the credit card pusher.

LONNIE VEAL
Brooklyn, N.Y.

Kosher Club

I would like to point out an error to the noodniks who wrote the Record Makers column for September. Any shmo who's kosher can see that Oy George did *not* do *Yes, I Really Want to Hurt You* on the Rhino Records "Kosher Club" EP. He actually did *Be True to Your Shul*, the second tune on the disc. As for Gefilte Joe, it should also be mentioned that he's one of the few Jewish senior citizen solo artists (if not the only one) on the pop music scene. These oversights are an outrage to all devotees of American Hebrew rock everywhere.

TODD J. NIQUETTE
Kaukauna, Wis.

Legitimate Verdi

Your mini-review of Verdi's *Alzira* (September) states that all of his stage works are available on records from legitimate sources. Please advise me of legitimate sources for *Oberto* and *Jeru-*

salem. Pirate tapes exist for both, very poor mono in the case of *Oberto*, good mono for the Italian version of *Jerusalem*, and good stereo for the French version of the latter, but where are the legitimate recordings?

CHARLES N. HUBBELL
Kenmore, N.Y.

We consider Jérusalem a revised edition of I Lomdardi, which is available on Philips and Hungaroton. A recording of Oberto on the Italia label (three discs ITL 70001) with Simon Estes in the title role is listed in the June 1984 edition of the Gramophone Classical Catalogue from England. Our colleagues at the Gramophone assure us that it is not a pirated recording. Tower Records in New York, which normally carries this Oberto, was out of stock when we called to check. William Violi, a New York dealer in opera records, did not have it in stock but says he will order it from Italy for anyone who wishes to buy it. His address is 1231 60th St., Brooklyn, N.Y. 11219.

The Anatomy Lesson

I just opened my September issue to the "Record Makers" section where I found a picture of a nearly nude woman getting her body painted. Oh no, I thought, if my mom sees this, she'll make me cancel my subscription! I'm only sixteen and just learning about both stereos and women. Please, you guys, concentrate on the stereo part, and I'll look elsewhere for more reliable information on the female anatomy.

JAY HADLEY
Newport, Oregon

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From the Hirsch-Houck Test Report,
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Majority Opinions

Regarding your article "Enhancing Digital Sound" (September 1984) a Joel Cohen is quoted as saying that most middle Americans "have no standard of reference because they've never heard live music." Who does this man think he is? I'm sorry to inform Mr. Cohen that we "middle Americans" are not living in a cultural void situated in an economic wasteland. We've all heard live music and lots of it: symphony concerts, park concerts, rock concerts, itin-

erant musicians, jazz groups, singers, choirs, etc. I know of no one, rich or poor, who has not heard live music of one form or another in his lifetime, even if it is only a church choir and an organist. Mr. Cohen's statement is the most elitist, arrogant, thoughtless, and aggravating declaration I have ever read in your magazine.

RANDY C. SCHRAMM
Cincinnati, Ohio

In his article "The High End Horizon" (August 1984), Thomas Gillett insults half of the world's population with

his constant slurs against women. Where did Mr. Gillett get the idea that all audiophiles are men? His remarks about "little old ladies with shaky fingers" is bad enough except that he fails to mention that old men, or anyone at any age, can have shaky fingers—especially people who are angry after having read dumb articles in *Stereo Review*.

ANTHONY MAULDIN
Lewisville, Tex.

Up the Tubes

In "The High End Horizon" (August 1984) it was mentioned that "Extreme high frequencies may be rolled off with some tube designs so that they sound less 'harsh.'" It is interesting to note, however, that the Counterpoint SA-5 tube preamp pictured has response extending out to 88 kHz, a full two octaves further than the most highly touted digital audio record/playback systems.

Prematurely rolling off high frequencies will not lead to sonic sweetness. It simply sounds dull.

J. MICHAEL ELLIOTT, *President*
Counterpoint Electronic Systems, Inc.
San Diego, Calif.

Big Beef

I find your new format both attractive and exciting. I believe it helps *STEREO REVIEW* to look like the high-quality magazine it is. One thing I have noticed only recently is that you are beginning articles in the front and center of the magazine and finishing them in the back. This really gets on my nerves! Do you know what a pain it is to start reading an article, then have to find the rest of it in the back, read it, then find your original page over and over, article after article? Your readers and I do not need this aggravation. Please stop!

CHRIS MARTIN
Miami, Fla.

No Beef

What I see in your "Letters" column makes me think everyone writes in to bitch about something or other. Well, I'd just like to say that whatever you pay Charles Rodrigues for his cartoons can't possibly be enough. His work always delights me.

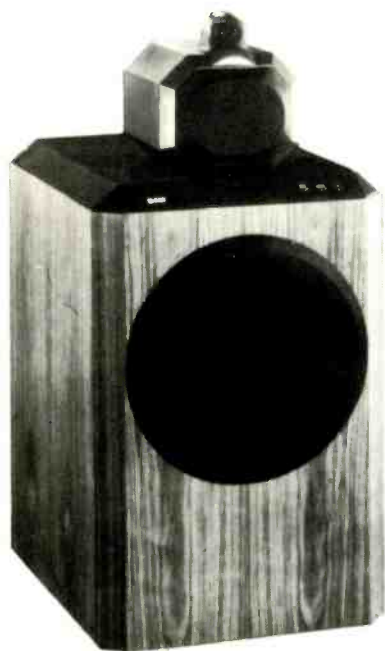
Also, because of your equipment test report on the Carver Receiver, I now have one and I enjoy it immensely. I have no complaints whatsoever.

STEVEN C. FORD
Chatham, N.Y.

I finally read an article that makes sense to me! "Where's the Bass?" (September 1984), by Julian Hirsch, finally got through my head what the purpose of speakers is all about!

DON ROBINSON
Bellevue, Wash.

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CBS, Capitol, EMI, Polygram

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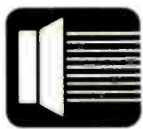


Why didn't they sound like that in the showroom?

The effects of environment on speaker performance.

by John Carter

Chief Engineer



As an experienced audio enthusiast, you've spent numerous hours in hi-fi dealerships listening to speakers. But when someone asks "Which speakers sound best?" you're not always sure what to say. You have an opinion, but you know that speakers don't sound the same at home as they do in the showroom.

Two key factors contribute to this variation—room acoustics and speaker placement. As the accompanying graph shows, different environments significantly vary the frequency response of a speaker system. The largest variance typically occurs in the mid-bass region, as evident on the graph by the large discrepancy in response between 70 Hz and 200 Hz. This discrepancy is a direct result of the placement of the speaker relative to the wall behind it.

Variations in frequency response, combined with other complications, present a formidable problem to the speaker buyer. The logical question to ask is "What can be done to help simplify speaker evaluation in a showroom?"

To simplify evaluation, you must first limit the conditions under which speakers are compared. Have speakers which interest you placed in the same relative location you'll use at home. There's no sense auditioning a speaker on a showroom shelf if it's going to be used on your living room floor. Also, compare speakers at the same relative volume level. Otherwise, the louder (more efficient) speaker will sound better, even if it isn't. Finally,

set the tone controls on the demonstration amplifier to neutral. This will provide you with your most accurate comparison.

Once the conditions are set, you can begin to evaluate speakers. But as we've already seen, frequency response, a crite-

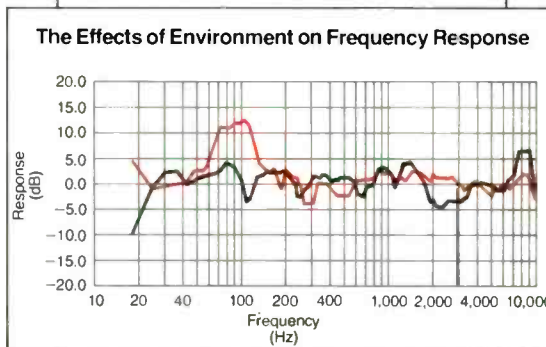
constant. Since FM noise covers a wide bandwidth, you can make a general determination of the sound distribution, without worrying about the effect of the showroom on a particular frequency.

3. Lifelike Spaciousness. This is not quite as subjective a judgment as it seems, if you make the evaluation with your eyes closed. While you'll be able to localize various instruments, a good system will make it hard for you to localize the enclosures. The music should seem to originate from an imaginary stage, much larger than the enclosures themselves.

All Bose® Direct/Reflecting® speaker systems are designed to meet these criteria. But since the criteria are derived from live performance, you can use them to evaluate any speakers. They'll help you select a system which delivers solid performance in the home, not just in the showroom.

For more information on Bose products and a list of authorized dealers, write: Dept SR, Bose Corporation, The Mountain, Framingham, MA 01701.

John Carter holds an M.S. in Electrical Engineering from M.I.T.



The two curves show the frequency response of the same speaker system in two different rooms. Key reasons for variations in response are room acoustics and speaker placement.

rior often used for evaluation, varies too widely from room to room to provide adequate information for comparison. This emphasizes the need for a set of audible criteria which indicate desired speaker performance, yet remain relatively constant between the showroom and the home. At Bose, we've invested many years researching live performance, and as a result, have developed such a set of criteria:

1. Stereo Throughout The Listening Room. To test for this, stand in front of one enclosure, and try listening to the other one. If you only hear one speaker in the showroom, you'll probably only hear one at home.

2. Even Sound Distribution. To test for this, listen to interstation FM noise over a pair of speakers, and walk around the room. The level of noise should remain



NEW PRODUCTS

Hafler

Available both in kit form and fully assembled, Hafler's DH 120 amplifier uses two MOSFET's per channel for thermal stability, making protection circuitry unnecessary. Less drive current is required, and, according to the manufacturer, the MOSFET capability for fast switching allows faster response to musical transients. On the rear panel are controls for left and right levels, a stereo/mono switch, and main and auxiliary speaker outputs. A switch on the rear panel changes the conventional signal to one "producing a dramatic ambient sound effect."



The DH 120 is made using precision-tolerance capacitors, high-quality metal-film resistors, and glass-epoxy circuit boards. Left and right thermal-protection devices shut off the unit in case of overheating. The amp is rated at 62 watts per channel from 20 to 20,000 Hz into 8 ohms with less than 0.009 percent total harmonic distortion. Price: \$299 assembled; \$240 in kit form. David Hafler Co., Dept. SR, 5910 Crescent Blvd., Pennsauken, N.J. 01809.

Circle 120 on reader service card

Magnepan

The SMG-A planar speaker from Magnepan is smaller than many of the company's other designs. With its 370-square-inch planar-magnetic woofer and 58-square-inch planar-magnetic tweeter, the speaker reproduces frequencies from 50 to 16,000 Hz \pm 4 dB. It can be used with amplifiers rated from 20 to 100 watts. Rated sensitivity is 85 dB sound-pressure level measured at 1 meter with a 1-watt input. The impedance is 4 ohms. White, black, or brown grille cloth can be paired with oak, chrome, or brass frames. The enclosure measures 18 inches wide, 48 $\frac{1}{16}$ inches high, and only 1 $\frac{3}{4}$ inches deep. Price: \$450 per pair. Magnepan, Inc., Dept. SR, 1645 Ninth St., White Bear Lake, Minn. 55110.

Circle 121 on reader service card



Stanton

All six cartridges in Stanton's low-mass Epoch II line feature samarium cobalt magnets and aluminum-alloy cantilever tubes coated with a thin layer of sapphire. The cantilever has a rear tie wire that conducts static electricity away from the record, and the sapphire shell strengthens the cantilever while adding very little weight. The stylus is user-replaceable.

Two of the Epoch II cartridges are low-impedance, low-output models said to offer all the advantages of moving-coil designs with none of the disadvantages. For the top-of-the-line HZ9S, the frequency response is given as 10 to 25,000 Hz. The rated output is 0.8 microvolts per centimeter per second. Rise time is less than 10 microseconds. The Stereohedron II stylus tip measures 0.2 x 3.0 mil, and the contact area extends over 80 percent of the groove depth. Tracking force is $\frac{3}{4}$ to 1 $\frac{1}{2}$ grams. Price: \$250. Other models in the line range from \$95 up. Epoch, Division of Stanton Magnetics, Dept. SR, 200 Terminal Dr., Plainview, N.Y. 11803.

Circle 122 on reader service card



Sony

The new integrated amplifier and tuner in Sony's ES series use the company's Audio Current Transfer circuitry. These ACT circuits are said to lower noise and distortion to the levels of digital sound sources. The TA-F444ES amplifier is rated at 80 watts per channel into either 8 or 4 ohms from 20 to 20,000 Hz. Channel separation is given as 95 dB and dynamic range as better than 120 dB. Total harmonic distortion is 0.004 percent into 8 ohms. Price: \$490.

The ST-S444ES AM/FM tuner uses a direct comparator for low noise. It features switchable i.f. bandwidth and displays for tuning status, signal strength, and station frequency. There is a 400-Hz calibration tone and four FM and four AM presets. The signal-to-noise ratio at a signal level of 65 dBf is given as 93 dB in mono, 90 dB in stereo. Price: \$340. Sony Corp., Dept. SR, Sony Drive, Park Ridge, N.J. 07656.

Circle 123 on reader service card

Revox

The Revox B225 Compact Disc player can access any point on a disc in less than three seconds, according to the manufacturer, and an optional full-function remote control operates the B225 as well as all other Revox 200 series components. Besides the fixed output (maximum of 2 volts), there is a variable output for amplified speakers and a variable output for headphones. To facilitate tape dubbing from Compact Discs, the player can produce a calibration tone at the maximum output level. Up to 19 selections can be randomly programmed for playback. The



LCD display indicates the track number, how many selections remain, elapsed time for individual tracks or for the entire disc, programming steps, pause status, and auto stop and loop functions. The weighted signal-to-noise ratio is given as 100 dB from 20 to 20,000 Hz. The pickup is a semiconductor laser, and the sampling frequency is 44.1 kHz. Prices: B225 player, \$1,150; remote control, \$125. Studer Revox, Dept. SR, 1425 Elm Hill Pike, Nashville, Tenn. 37210.

Circle 124 on reader service card

JVC

Combining a total of twelve components, JVC's Crossmedia system is a complete electronic entertainment center that integrates audio and video. Audio components include the A-G90B 80-watt integrated amplifier; T-G90B digital-synthesis tuner; QL-G90B front-loading, linear-tracking programmable turntable; XL-V2B Compact Disc player with two-speed search; KD-WR90 twin-transport cassette deck with Dolby B and Dolby C noise reduction; and the SEA-G90B graphic equalizer. The VS-1B graphic synthesizer displays input levels, spectrum analyses, three-dimensional pop art, or the notes of the



NEW PRODUCTS

melody on the video screen. The VP-100B digital audio processor can record and play back music digitally to and from video cassettes. The S-AV3 three-way speakers are magnetically shielded to avoid interfering with the video image.

The video components are the AV-2010USB 19-inch remote-control color TV, with terminals for external speakers, and the HR-D725U VHS Hi-Fi video cassette recorder, which has playback speeds variable in both directions from one-fortieth to seven times normal speed. Price of the entire Crossmedia system: \$6,000. JVC, Dept. SR, 41 Slater Dr., Elmwood Park, N.J. 07407.

Circle 125 on reader service card

Vector Research



A new line of four Vector Research receivers is headed by the VRX-9100. The amplifier section of the VRX-9100 uses eight output transistors to produce 90 watts of power. Features include digital-synthesis tuning, auto scan, sixteen station presets, midrange control, and video and CD inputs. Price: \$449.95.

A 60-watt receiver with the same features, the VRX-7100, is \$349.95. The VRX-3500 retains the video and CD inputs and offers 40 watts for \$249.95. With analog tuning and 25 watts per channel, the VRX-2200 is \$169.95. Vector Research, Dept. SR, 20600 Nordhoff St., Chatsworth, Calif. 91311.

Circle 126 on reader service card

BES

Instead of conventional drivers, the omnidirectional SM90 speaker system from BES uses a single contoured diaphragm whose various sections each produce a certain range of the audio spectrum. "Acoustic hammers" transfer the voice-coil movement of two dynamic drivers to the diaphragm. A gasket holds the diaphragm to an aluminum frame, which also acts as a heat sink. Designed to completely resist weather, the SM90 can be installed outdoors as well as inside the home. Hardware for ceiling, wall, and floor mounting is included.

Frequency response is given as 40 to 19,000 Hz \pm 3 dB. Nominal impedance is 8 ohms.



The speaker produces a 92-dB sound-pressure level at 1 meter with an input of 1 watt. Dimensions are 25 inches high, 19 inches wide, and 4 1/4 inches deep. Weight is 14 1/2 pounds. Price: \$760 per pair. B.E.S. Inc., Dept. SR, 345 Fischer St., Costa Mesa, Calif. 92626.

Circle 127 on reader service card



JVC

The direct-access capability of the XL-V2 Compact Disc player from JVC enables any track to be cued up in less than 2 seconds, according to the manufacturer. Up to twelve tracks can be programmed for play in any order. The fast-forward and reverse functions operate in two speeds, both with sound. A digital display reveals the track number, time, and program chart. A headphone jack with adjustable level control is provided. Frequency response is listed as 5 to 20,000 Hz \pm 0.5 dB. Total harmonic distortion is given as 0.0025 per cent measured at 1,000 Hz. Price: \$750. JVC of America, Dept. SR, 41 Slater Drive, Elmwood Park, N.J. 07407.

Circle 128 on reader service card

Koss



Music Pals earphones by Koss fit inside the outer ear, making a connecting headband unnecessary. The reinforced L-type plug is said to reduce strain on the cord and increase its durability. Microthin polyester diaphragms, 13.5 mm in diameter, enable a rated frequency range of 20 to 20,000 Hz. The Music Pals come in a hard carrying case with a clip for attaching it to a belt or pocket. Total harmonic distortion is rated at less than 1 percent, and sensitivity at 100 dB sound-pressure level is 1 milliwatt. Rated impedance is 32 ohms. Price: \$16.99. Koss Corp., Dept. SR, 4129 North Port Washington Ave., Milwaukee, Wis. 53212.

Circle 129 on reader service card

KEF

The KEF 104/2 speaker has a unique bass system made up of two woofers that are mounted in acoustic-suspension subenclosures in the top and bottom of the main bass cabinet. Both woofers face upward and operate in push-pull fashion. The woofer magnets are rigidly connected by a nonferrous alloy bar to cancel vibrations in the drivers' chassis. Their entire output is radiated through a round 5-inch duct in the front of the cabinet. The two midrange driver assemblies are fixed directly to the front of a subenclosure mounted on the front of the bass cabinet, with their magnet systems bolted to the rear of the subenclosure. Between the two midranges is a ferrofluid-cooled soft-dome tweeter. Load-matching elements in the crossover network are said to make the impedance flat and resistive from 20 to 20,000 Hz. Price: \$1,600 per pair. KEF, Dept. SR, 695 Oak Grove Ave., Menlo Park, Calif. 94205.

Circle 130 on reader service card

Harman Kardon

Two new belt-drive turntables from Harman Kardon feature a "floating" suspension system. A counterweight opposite the tone arm balances the sub-chassis on which the motor/platter and tone-arm assembly are mounted. Both turntables have a straight tone arm that lifts automatically at the end of an LP, a speed control on the front panel, detachable cables, gold-plated phono jacks, acoustically inert platter mat, disc stabilizer, and a wood base with adjustable feet.

The T-65C (shown) has a heavier platter, a weight-and-wire antiskating mechanism, and a lateral balancer for the tone arm. It has a wow-and-flutter spec of 0.025 percent (weighted); rumble is rated at 70 dB. For the T-55C, the figures are 0.035 percent and 68 dB. Prices: T-55C, \$375; T-65C, \$575. Harman Kardon, Dept. SR, 240 Crossways Park West, Woodbury, N.Y. 11797.

Circle 131 on reader service card





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CIRCLE NO. 11 ON READER SERVICE CARD

NEW PRODUCTS

ADS



The ADS Atelier C3 cassette deck records at two speeds, the conventional 1 7/8 inches per second and a double-speed 3 3/4 ips for improved dubbing of digital Compact Discs. The three-head deck uses a frequency-generator servo-controlled direct-drive capstan motor for minimum wow-and-flutter. It has Dolby B and Dolby C noise reduction and bias/equalization settings for all four tape types. Two-color LED signal meters display the level of the equalized signal that is put on the tape instead of the level of the unequalized incoming signal. An illuminated drawer for the cassette, which opens and closes at the touch of a button, also contains the bias/equalization and noise-reduction controls. Price: \$799. ADS, Dept. SR, One Progress Way, Wilmington, Mass. 01887.

Circle 132 on reader service card

EPI

All three models in EPI's LSR series of car cassette/receivers feature autoreverse, separate bass and treble controls, four speaker outputs with fader, switchable tape equalization, radio sensitivity switch, and preamp outputs. The least expensive unit, the manually tuned LSR-12 (\$219.95), automatically adjusts high-frequency separation to suppress noise in weak signals. Dolby circuits reduce noise on cassettes. The LSR-12 is rated to produce 12 watts per channel into 4 ohms with less than 0.8 percent distortion.



The LSR-22 adds station scan, a digital clock, electronic tuner with digital display, and Dynamic Noise Reduction. It has presets for twelve stations. Specified power output is 7.5 watts per channel into 4 ohms with less than 0.8 percent distortion. Price: \$259.95.

The top-of-the-line LSR-32 (shown) is rated for an output of 12 watts per channel into 4 ohms with less than 0.8 percent total harmonic distortion.

Twelve stations can be programmed into its memory, and it has two automatic tuning modes. It also has Dolby noise reduction. Price: \$369.95. Epicure Products, Dept. SR, 25 Hale St., Newburyport, Mass. 01950.

Circle 133 on reader service card



Proton

Proton has added a digital tuner, an integrated amplifier, and a cassette deck to its home audio line. The black components are styled to match the company's video products. Schotz noise reduction in the Model 440 tuner is said to reduce the noise in all FM broadcasts, removing hiss as well as lessening distortion. Also featured are twelve station presets, dual-direction station search, and an output-level control. Stereo signal-to-noise ratio is given as 75 dB and total harmonic distortion as 0.4 percent. Price: \$270.

The 20-watt high-current integrated amplifier, Model 520, contains a flexible phono section for various kinds of cartridges and a circuit that gently limits waveforms to prevent harsh clipping. A bass/EQ button boosts output 10 dB at 42 Hz. Tuner, phono, video, or DAD inputs can be selected. Frequency response is given as 20 to 20,000 Hz \pm 0.1 dB. Price: \$200.

The Model 720 two-head cassette deck has soft-touch controls, Dolby B and Dolby C noise reduction, microphone inputs, an MPX filter, and a balance control. Frequency response with ferric and chrome tape is given as 30 to 17,000 Hz \pm 3 dB, extending to 18,000 Hz with metal tape. Price: \$240. Proton Corp., Dept. SR, 737 West Artesia Blvd., Compton, Calif. 90220.

Circle 134 on reader service card

Micro-Acoustics

Micro-Acoustics' 830 CSA cartridge uses a CSA ("cutting stylus analogue") stylus, which is essentially elliptical with a flattened leading edge like the cutting stylus that carves the groove in a master disc. The cartridge's beryllium cantilever is directly coupled to the electret transducer, which is said to shorten response time to musical transients,



and it has independent suspension and damping systems.

The 830 CSA comes with a set of three removable weights to vary the weight of the cartridge from 2.5 to 4.0 grams if necessary. Each weight is 0.5 grams and fits inside a hinged compartment in the top of the cartridge. Specifications include a frequency response of 5 to 20,000 Hz \pm 0.75 dB, tracking-force range of 0.7 to 1.4 grams, and rise time of 4.5 microseconds. Price: \$335. Micro-Acoustics Corp., Dept. SR, 99 Castleton St., Pleasantville, N.Y. 10570.

Circle 135 on reader service card

Miller & Kreisel

Two SX-4 satellite speakers are linked to the VX-4 subwoofer in M & K's newest three-piece speaker system. Each satellite has two 5-inch midrange drivers and two 1-inch soft-dome tweeters. The tweeters are mounted between two free-standing posts, which is said to result in



a very open sound. Power handling is rated for 200 continuous watts per channel, and impedance is 4 ohms. Sensitivity is rated as 87 dB sound-pressure level at 1 meter with a 1-watt input. The frequency response is given as 65 to 22,000 Hz \pm 3 dB. Two sets of inputs on the satellites allow the user to choose between "warmer" and "brighter" sound. Two additional high-frequency contours permit a flat response beyond 20,000 Hz or a gradual slope to soften excessive brightness.

With its internal 50-watt amplifier, the VX-4 subwoofer can be driven with either the high-level output of a power amplifier or the signal from a preamplifier or crossover. The driver is a 12-inch cone. The low-pass filter is adjustable from 50 to 125 Hz. A separate level control allows matching the VS-4 to satellites of any sensitivity. Frequency response of the subwoofer is 35 to 125 Hz \pm 3 dB. Price of the three-piece system: \$795. Miller & Kreisel Sound Corp., Dept. SR, 10391 Jefferson Blvd., Culver City, Calif. 90230.

Circle 136 on reader service card

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Stereo Review Magazine

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CIRCLE NO. 26 ON READER SERVICE CARD

AUDIO Q. & A.

by Larry Klein



Car Speaker Testing

Q *I'm wondering why you don't publish reviews of car speakers. Is it because the standards are different?*

REY REYES
Arleta, Calif.

A What standards? Several years ago I served as vice-chairman of an Electronics Industries Association Speaker Standards Committee. For a year or so I witnessed some of the finest minds in the speaker industry struggling to put together a standard that would enable manufacturers to measure speaker systems in a consistent and meaningful way. Ideally, such measurements would then find their way into product specification sheets that would enable consumers to make meaningful comparisons between speakers. What happened is that so little progress was made in generating a speaker standard that the committee members finally gave it up as a close-to-impossible task and turned their attention to other product categories that were more susceptible to standardization.

In a nutshell, the problem was this: There is no basic agreement on the fine details of what a speaker should do—so it is impossible to construct a standard that measures and specifies how well it does it. Each test lab and manufacturer has its own notion of how measurements should be made. At times these disparate notions produce numbers that seem to agree and perhaps even correlate with how the speaker sounds.

Until now, I've been discussing complete systems, not individual "raw" drivers such as are conventionally sold for installation in car stereo systems. Add to everything I've said the fact that a "raw" speaker's performance can be measured meaningfully only when there is a known enclosure behind it and while it is radiating into a known environment in front of it. Given that both

these factors are unknown in the vast majority of car speaker installations, we have not been able to devise a test that will generate meaningful numbers or universally valid practical results.

In regard to buying advice, which I assume is the basis of your question, the best that I can offer is that the makers of good car stereo electronics almost always back them up with good speakers. And that the makers of good home speaker systems are also likely to produce good car speakers. Speakers with unknown brand names, although they may physically resemble the better-known brands, are unlikely to sound as good.

Replacement Grilles

Q *The manufacturer of my five-year-old speakers is out of business, and the foam grilles are crumbling like dry cookies. Is it possible to buy replacement grilles?*

DOUGLAS ALDERMAN
Waterford, Conn.

A Yes. The 1984 Radio Shack catalog shows a 17 x 23½-inch replacement foam grille on page 31. If that's not large enough for your speakers, you could make your own grille assembly by wrapping grille cloth (listed on the same page) around a thin plywood or fiberboard frame with appropriate openings cut out for the drivers.

Load Capacitance

Q *This cartridge-load capacitance business is driving me nuts. I have two different phono cartridges with different recommended loads, 100 and 250 picofarads. I want to match these requirements as best I can by soldering capacitors in the right place. I understand that I should add up the tone-arm wiring capacitance, the record-player cable capacitance, and the preamplifier input capacitance and make up the difference in recommended load using external capacitors. What type of capacitor should I use and of what voltage and tolerance? And where should I solder it, in line with the ground or the hot lead?*

TOMÁS MOJER
Fajardo, P.R.

A Today's phono cartridges are, in general, somewhat less sensitive to capacitive loading than many people believe. The normal values supplied by your turntable and preamplifier are probably close enough to your cartridge's requirements that you are not likely to hear a sonic benefit from more or less capacitance. Nevertheless, if you still want to try a higher capacitance for the cartridge requiring 250 picofarads, the easiest way to add capacitance is



Video Skulduggery

We've made a strange arrangement to bring you this new Emerson \$699 front loading VHS video recorder with remote control and 14 day, 3 event programmable recording. It's yours for just \$378, but the fur is going to fly.

We didn't sell our soul. And, we didn't do anything wrong. But, we have an incredible price on a feature laden VHS video cassette deck that will give you years of automated video enjoyment.

Here's the scam. Emerson's Western Regional Sales Manager, Gary, knows that DAK sells over two-thirds of our products outside his territory.

So, we can sell thousands of decks without really affecting his other western sales. On the other hand, we do affect total sales in the midwest and east, and they get no credit for the DAK account.

Now Gary, who says he isn't competitive with his counterparts in the midwest and east, offered us an incredible price on his new super automated VHS deck. But he threw in two catches.

We had to run it nationally, and print his name in our catalog. Well, for Gary's price, we offered to print his name on every box we shipped east of the Rockies, but he said he didn't want to start a war.

So, look how we all win. Gary gets his name in the catalog (plus a lot of recorders sold outside his territory).

DAK wins because we get to offer this incredible recorder to you at a price that is sure to make us your electronics hero.

And you win, because you get everything from electronic tuning, to two week programming, to remote control, to one touch timed recording & more, for \$378.

Here's our part of the bargain. 'Gary Stines is a wonderful and knowledgeable person'. Now, on to the recorder.

HERE'S WHAT YOU GET

From the moment you put a video cassette into the front loading slot and see it automatically drawn into the recorder, you'll appreciate the quality of this machine. And, look at all the convenience features that it has.

THREE SPEEDS. You can record and play back, not in just 2, but in all 3 speeds for 2, 4, and 6 hour recordings (8 hours with the new thin tape).

ONE BUTTON TIMED RECORD. Just touch the 'OTR' button once, and the recorder will record for 30 minutes with a countdown timer showing the action.

Touch it twice for an hour, and so on for up to two hours. This is really neat if you are leaving the house and you want

to record a show you are watching without having the tape run for 6 hours.



3 EVENT/14 DAY PROGRAM CAPABILITY. You can select any 3 programs over a two week period to record.

So, if you're going on vacation, you can keep up with weekly series while you're gone, even on different channels.

The timer is extremely easy to use. All that you have to think about is whether you want to record this week or next.



And, as one of the programmable functions, you can set it to record at the same time, the same channel, every day. You'll record shows you miss when you're out, shows that you want your children to see at a more appropriate time, and important events that you'll want to keep.

Plus, with this recorder, just push a button and you can watch one show on your TV while you record another.

ELECTRONIC TUNING THE WAY YOU WANT IT. This recorder's synthesized tuner can tune in VHF channels 2-13 and UHF 14-83. But, what's really special is that you can put any 16 of them in any order you like at any time.

ASSORTED EXTRAS. There's still-frame that automatically releases after 5 minutes to protect your tape, and both forward and reverse high speed search. When the display isn't showing the 24 hour time of day or future programmed recording instructions, it becomes an electronic digital counter.



10 FUNCTION WIRED REMOTE CONTROL. The remote lets you change channels, start and stop the recorder,

record and pause. You can even use forward and reverse high speed search.



The recorder will set you free. You'll watch TV when you want, not when the networks put shows on. The recorder is backed by Emerson's limited warranty.

ENJOY VIDEO FREEDOM RISK FREE

Hook your antenna to this recorder, and this recorder to your TV. It takes less than 5 minutes. But, you'll enjoy total control of your TV viewing from now on.

If you're not 100% satisfied with the incredible picture quality or the automated functions, simply return it in its original box within 30 days for a refund.

To order your Emerson Programmable Remote Control VHS Video Cassette Recorder, risk free with your credit card, call toll free or send your check, not for Emerson's suggested \$699 price, but for just \$378 plus \$9 for postage and handling. Order No. 4162. CA res add tax.

Now you can watch last night's midnight show at dinner, or tonight's dinner show at midnight. And, thanks to east-west rivalry, it's yours for just \$378.



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8200 Remmet Ave., Canoga Park, CA 91304

11304

with extra lengths of phono cable. Note that both channels of your cartridge must be similarly loaded. Use the kind of phono leads that come with a plug on one end and a jack on the other, and install them in series with the existing leads from your turntable. Such leads are available in 3- and 6-foot lengths at Radio Shack stores and elsewhere. You can use several such leads in series, if need be, to build up the desired capacitance. The only problem with this is that there is no standard value of capacitance per foot of added cable. You'll have to rely on your ears to tell you

when you've added enough capacitance.

If you want to add capacitors, a 10 percent tolerance, low-voltage, ceramic-disc type will do. One capacitor, whose value is determined in the way suggested in your letter, should be wired across the phono-input jack (from hot to ground) of each channel. If necessary, the required value can be built up by wiring several capacitors in parallel (across each other). If you don't like rewiring your equipment (and possibly voiding the warranties), solder the capacitor(s) across a phono plug, plug the

phono plug into a two-jack-to-one-plug Y connector, plug the turntable lead into the other jack, and then plug the Y connector into the phono input of your amplifier. Good luck—but I doubt you'll hear enough of a difference to make the effort worthwhile.

FM Readjustments

Q I've been told that as a result of normal handling during shipment most new FM tuners have been shaken out of adjustment and need realignment. Is that true?

WILLIAM MULVEY
New Canaan, Conn.

A Once upon a time, long ago when electrons in FM sets traveled through vacuum tubes rather than solid-state devices, there was a real problem such as you describe. It wasn't just the instability of the tube characteristics that caused the difficulty, but the large i.f. transformers and other coils whose internal tunings would be shaken out of adjustment by the impact and vibration of shipping.

Today, the tuned-circuit parts used with transistors and IC's are not only miniaturized, but many are fixed-tuned crystal or ceramic elements and never need alignment. They are almost completely immune to the effects of shock and vibration. That is not to say that there may not be some manufacturing adjustments that could benefit from later "touchup," but to claim that most tuners reaching the consumer are in need of alignment sounds to me like some dealer is offering an extra—and usually unnecessary—service.

Digital Density

Q I guess this question is a bit out of the ordinary, but because I am highly interested in computers it means something to me. If the digital output of a Compact Disc were to appear on a computer printout, how many lines of printout would one second of the CD's output produce?

ANTHONY L. MARTINS
Weston, Ontario, Canada

A Technical Editor David Ranada tells me that for each second of CD playback there are 44,100 digital-audio samples per channel. Each sample contains 16 bits of information, or the equivalent of 2 bytes, so the two audio channels produce 4 bytes per sample. There are thus 176,400 (44,100 x 4) bytes per second. If each byte is equivalent to one printed character or numeral and one line of text is 80 columns (characters) wide, that gives us 2,205 lines of "text" for each second of CD playback. Given an average count of 66 single-spaced lines per page, a second of CD playback would produce almost 33.5 pages of text. And an hour's play would produce over 120,240 pages.

Now that's what I call high-density storage!

The New NAD 7140 Digital Stereo Receiver.

"Take one part Schotz tuner wizardry, lots of dynamic headroom and the bargain price, and you get one h--- of a receiver."

(Stereo Review Magazine)

Nearly twice as sensitive in FM stereo as other receivers. 50 dB stereo quieting sensitivity is typically only 22 μ V, and maximum stereo quieting is 80 dB.

Exclusive NAD impedance selector to deliver maximum power into any speaker impedance.

Soft clipping reduces the harshness normally heard when an amplifier is over driven. The sound remains clear and musical, rather than becoming distorted.



Bass EQ circuit augments the deep-bass response of speakers while infrasonic filter preserves maximum power for music.

Dynamic Separation circuit maintains full subjective stereo separation while improving the quieting of weak stereo signals.

High-current output stage, able to deliver peak currents greater than 30 amperes for precise control of voice coil with speaker impedances as low as 2 ohms.

The 7140 represents the best value in a receiver in NAD's history. Rated at 40 watts per channel with 3 dB of IHF dynamic headroom, this powerful new receiver is able to deliver twice its rated power (80 watts/channel) over short peaks. Add to this NAD's unique Dynamic Separation circuit, bass EQ and remarkable sensitivity and you have a product that Julian Hirsch of Stereo Review Magazine calls "unmatched at its price."*

*Suggested retail is under \$500. Prices may vary according to dealer.
For more information on the NAD 7140 and a list of dealers, send us the coupon below.



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ADDRESS _____

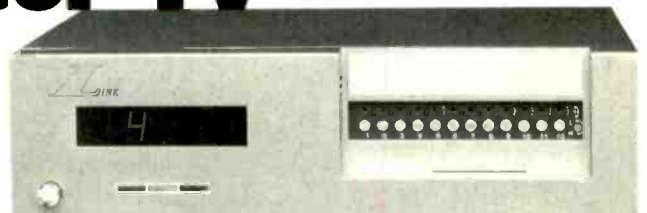
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NAD (USA), INC., 675 Canton Street, Norwood, MA 02062

CIRCLE NO. 31 ON READER SERVICE CARD



Computer TV



Wait till you experience the vibrant color and fine detail you'll see when you watch TV on your own computer's color monitor. These new TV tuners let you use your computer's monitor when you're not computing.

It's hiding. You've probably got the best color TV you've ever seen sitting right behind your computer.

If you've ever tried to look at computer graphics or text on a conventional TV, you know how hazy and muddy the picture can be. You just don't get the clarity and detail you see on a monitor.

The picture is sharper on your computer monitor because it is designed to have more lines of resolution than a conventional TV in order to display the fine detail required by the computer.

SO, WHAT IS RESOLUTION

The easiest way to visualize what an increase in resolution can do for your TV picture, is to compare the pictures in your newspaper to the pictures in a magazine.

The pictures in a newspaper are composed of lines of 65 dots per inch of resolution. A magazine's pictures contain 120 dots per inch. The difference in picture quality is like day and night.

While computer monitors vary in their exact resolution, they have significantly more lines of resolution than standard TVs and therefore you'll see an incredibly more detailed vibrant color picture.

GREAT IDEA

If you have a color monitor on your desk or in your den, why have a TV too? With these inexpensive tuners, you can have an incredibly sharp TV by simply making use of the expensive super high resolution monitor you already own.

My son added one of these tuners to the computer in his bedroom and threw out his old B/W TV. So, this tuner saved me from buying him the \$300 color TV he had wanted for his birthday.

I've added a tuner to one of the 5 computers at my desk (yes, as president of DAK it really does take 5 full size computers to do my job), and now I have entertainment and news, in color, without having another screen at my desk.

Just look at the back or front of your monitor. If there's a single RCA jack that says video, you're ready to go.



Now for the sound. Most monitors have an identical looking jack that says 'Audio'. If yours does, you're all set. If it doesn't, just plug the audio into any 'aux' input on your stereo, or even into a clock radio.

There's a convenient switch that lets you switch from TV to computer without ever touching a cable again. There are both VHF and UHF inputs to the tuner. The world of TV will be at your command.

The tuner operates on standard 110V AC. Your computer may be on or off when you watch TV. You can be assured of the quality, because the tuners are made by Link, the computer specialists. They're backed by a limited warranty.

ENJOY SUPER-SHARP TV RISK FREE

Just imagine sitting back and enjoying brilliant TV images floating across your computer's screen. You'll be amazed at the detail that emerges from the screen.

Just plug your computer's output into the tuner and the tuner into your monitor. Add your antenna, and away you go.

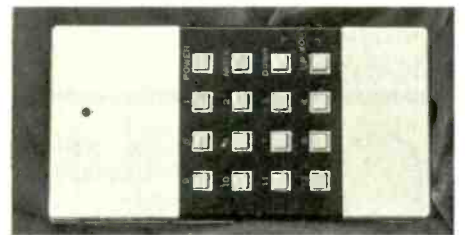
The rotary tuner is great for watching TV from the same seat from which you operate your computer.

Just set it on top of your monitor and flip its front panel switch from PC to TV. Then, turn to the channel you want and enjoy a startlingly vibrant TV picture. It receives VHF 2-13 and UHF 14-83.

The all electronic remote control tuner is really special. The remote sits on the front panel for normal use, but lifts off for total control up to 20 feet away.

The electronic tuner can be set to receive any 12 channels you desire. Just adjust the tuning elements exposed in

the picture above to suit your taste. Then you'll have complete freedom of movement and an incredible picture. It receives VHF 2-13 and UHF 14-83.



But look at this. It's not in its specs, but I can tune it to midband cable channels 14-24. So, while we aren't offering it as cable ready, it tunes in my cable channels, and if they're not scrambled, it should tune in yours too.

Try one of the tuners risk free. If you don't see the sharpest, clearest most vibrant picture you've ever seen, simply return the tuner in its original box within 30 days for a courteous refund.

To order a Computer Monitor Tuner risk free with your credit card, call toll free or send your check for DAK's incredible breakthrough price of just \$88 (\$4.50 P&H) Order No. 4141 for the Rotary Tuner. Or, send just \$119 (\$4.50 P&H) Order No. 4142 for the Electronic Remote Control Tuner.

Enjoy breathtaking color TV by using the expensive, super-sharp color monitor you already own. Save the expense of a new TV that can't compare with the TV that you practically already own.



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by Julian Hirsch



How Important Are Measurements?

OBJECTIVE testing, testing that relies on using instruments to measure the electrical and acoustical characteristics of audio components, has come in for some severe criticism over the years. Some audiophiles question the validity of objective testing, basing their arguments on what they see as a lack of correlation between the test results and what they believe they hear when the components are played. Those of us who make the objective tests are often taken to task by these people for being hopelessly out of touch with *their* perceived reality.

I suspect that many such critics would be surprised to find that I am not at all "anti-subjective." Some thirty years ago, C. J. LeBel, a founder and the first secretary of the Audio Engineering Society, commented to the effect that, "If something measures good and sounds bad, then it *is* bad." That can be extended somewhat to read, "If something measures bad but sounds good, it very likely *is* good"—and we may simply be measuring the

wrong things. I subscribe wholeheartedly to this view.

But let's keep in mind that thirty years ago a lot of the audio equipment being sold and used really was *bad*, even by the standards of that time. The electrical performance of amplifiers and tuners, in particular, were many orders of magnitude worse than anything being sold today, and most transducers (cartridges and speakers) were in no way comparable with the *worst* of today's products, let alone the best. Signal sources were, for the most part, far inferior to today's LP's and cassette tapes. The rumble and flutter of pre-stereo turntables were far greater than we would tolerate from even the mass-market record players of 1984, and acoustic isolation of turntables was still several years in the future. My point is that poor (or at least mediocre) sound was more the rule than the exception and any slight improvement over the norm was instantly audible, even to those unfortunates not blessed with golden ears.

Still, whatever their limitations, correct measurement techniques have the property of repeatability. What I measure today can be confirmed at another time and place by another person. The tests can disclose, within definable limits, *what* a piece of equipment is doing, how closely its performance meets the claims made for it, and how it compares with competing products. That is one of the most important functions of a testing program such as ours, and one that cannot be met by any purely subjective approach except in the unlikely (not to say impossible) event that the individual evaluators are hearing the same programs on the same products in the same environments, have identical hearing abilities with perfect

recall (the acoustic memory of most people is no more than a few seconds), and always have exactly the same responses to what they hear.

Of course, objective testing has a fundamental weakness (some people would consider it a fatal flaw) in that it—by definition—*cannot* convey any information on how something sounds! Listening to music, or anything else, is a totally subjective experience. Since test instruments cannot simulate the mind and nervous system of even a single human being, let alone the entire human race, they have only a limited capacity to describe sound properties. To be sure, many tests have been devised that purport to correlate with what some statistically defined group of people can hear. Such efforts inevitably fail to come to grips with the immense complexity of human response to sounds. Never forget that each of us is an individual, and probably no two people will have the same total response to the same sound.

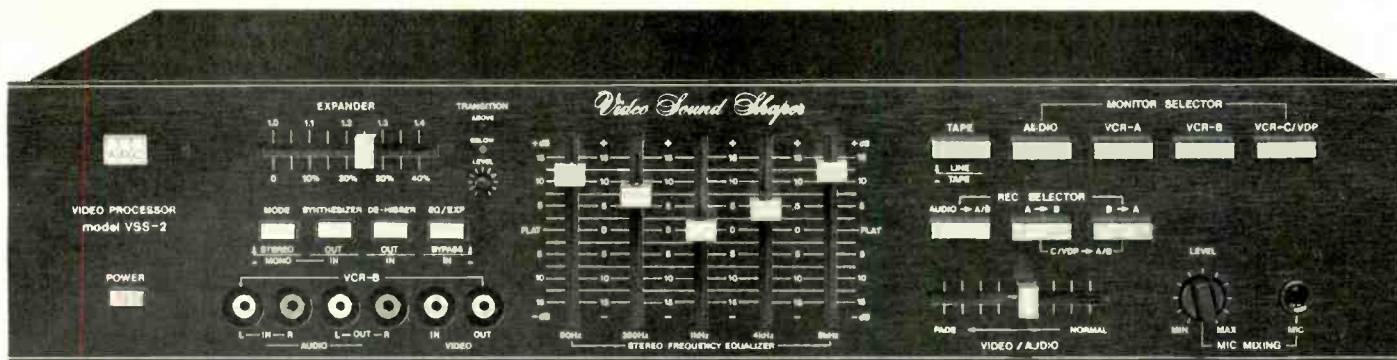
So subjective testing suffers from a fundamental lack of universal applicability, and objective testing falls far short of correlating with any individual's personal response to a given sound. Does this mean that we should choose only one of these methods, or perhaps discard both of them? Hardly! To me, it seems most sensible to use both, adopting the strongest aspects of each while being aware of its limitations so as to avoid forming glaringly erroneous conclusions. The key ingredient of the process is *common sense*, a rare commodity not necessarily found in either school of evaluation.

In my experience, the most absolute and dogmatic opinions expressed on the merits (or lack thereof) of the sound of any hi-fi product are those least likely to have any validity. This does not necessarily rule out such opinions—they *might* be correct—but they should certainly be taken with a few grains of salt. To some extent, a similar situation exists in the world of measurements, but I find that extreme performance claims are almost always made without substantiation, so that despite the trappings of objectivism, they are no different from purely subjective opinion.

As an illustration of what I con-

Tested This Month

*Yamaha C-80 preamplifier
and M-80 power amplifier
Technics RS-B100 cassette
deck
Polk SDA Compact Reference
speaker system
Pioneer P-D70 CD player
AKG K4 stereo headphones*



TV/Video Sound Detonator

Create startlingly live sound out of thin air for your TV and video. Experience the stunning sonic difference that a Dynamic Range Expander, a Stereo Synthesizer and a Graphic Equalizer can bring to your TV and video listening. Plus, you can dub both the audio and video between 3 video devices.

It's not there. No matter how good your TV or your video cassette recorder(s) may be, most broadcast video sound just doesn't contain anywhere near the quality you'd expect to hear from even a modest component audio system.

Simply using good equipment isn't enough. The sound of broadcast video and most video cassettes cannot be brought to life with the conventional equipment you'd use in an audio system.

After all, when you want to improve the sound in an audio system, you are simply emphasizing hidden sounds that are muffled or overwhelmed in the music.

But for broadcast TV and video cassettes, the high quality sound is not transmitted. There's no hidden sound to find.

So, in order to obtain high quality audio, the sound needs to be electronically enhanced (created).

Clues from the sounds that are in the music need to be identified and are then used to actually recreate sound that will bring your video to life.

ADC's enhancing TV/Video Sound Detonator doesn't just bring out the hidden life in your TV and video cassette sound. It actually creates new sonic elements in the sound to bring you a startling illusion of sonic brilliance.

It can provide this sonic enhancement while you're dubbing tapes or if you are simply watching TV or video cassettes.

SO, WHO NEEDS IT?

You'll be amazed at the effect you'll experience with simple things. You'll actually sense an actor walking across a room. A gun shot will startle you.

Waves breaking on a beach will almost make you smell salt air. And music, wait till you hear the music.

You'll be enraptured by the musical sound tracks, even on something as mundane as a weekly series.

The combination of sight and sound can be incredibly powerful. You become part of the experience. It's like sitting in the 10th row of a movie theater.

So, if you own one, two, or even three video cassette decks, or if you want your TV viewing to be a living experience, ADC's Enhancing TV/Video Sound Detonator will excite your senses.

IT'S A CONTROL CENTER

You'll have complete control of your components. You can connect three separate video sources, A, B and C. They can be video recorders, disk players, or with our special cable (included), even the

earphone output from your TV.

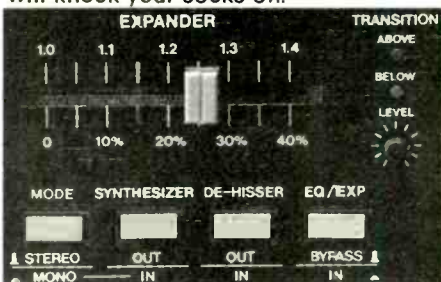
You can copy both the audio and video parts of the signal (yes, there are video jacks too) from A to B and from B to A. Plus, you can copy from C to A or B.

Plus, there is a set of audio in and out jacks and a mike input lets you mix your voice into any of the outputs.

And, look at this. There's a front panel fader which lets you fade both the audio and the video in or out for really professional quality copies.

Finally, there are master line in and out jacks which you use to interface this component to your stereo system's tape monitor circuit or an 'aux' input.

Either way, once it's connected, you'll hear sound from your video devices that will knock your socks off.



IT'S AN EXPANDER

Live performances produce about 90 db of dynamic range. Dynamic range is the difference in volume between the loudest and softest sounds.

TV and video average about 40-50db, and the best audiophile records reach only 60-65db.

The horizontal slider switch in the picture above gives you a variable increase from 0 to 40% in dynamic range. So, when your sound is loud, it will thunder. And when it's soft, it will whisper.

Imagine a gun firing and a pin dropping and you'll have the idea. The sound isn't simply loud or soft, it's the range of the difference that's enhanced.

You'll experience lifelike realism never before possible outside of a recording studio or at the live event itself. And, for music, the difference is astounding. In fact, the best attribute of the new CD audio disks is their dynamic range.

A STEREO SYNTHESIZER TOO

Nothing is as boring or detrimental to lifelike sound as lack of sonic placement. ADC has literally made synthesized stereo an art form.

Switch in this circuit and the music

will envelop you. Your music will spread out and you'll lose the single point unrealistic sound effect.

IT'S AN EQUALIZER

An equalizer is just about the most important improvement you can make in an audio system. But, with normal TV/video sound, even the most limited stereo can outperform the video signal source.

But once you engage the circuits in this enhancer, the equalizer can take over and dramatically improve your sound. It will really add fullness, richness and excitement to the music. And, even if you have an equalizer in your system already, you can pre-equalize the TV video sound to match the rest of the components in your system.

AND THERE'S MORE

There's a De-Hisser which removes the hissing sound sometimes encountered in broadcasts or from tape hiss.

There's a stereo/mono switch so that this unit can accommodate standard video monaural audio. Or, it can handle stereo video cassettes or even the new stereo TV when it becomes available.

It is 17 1/2" X 3 1/2" X 1 1/4". And, it's backed by ADC's limited warranty.

MAKE YOUR VIDEO'S SOUND COME TO LIFE RISK FREE

Just plug your video equipment into the ADC's Enhancer and the Enhancer into your stereo system.

You'll have a thundering expansion, a breathtaking stereo effect, and full rich sound. Plus, you'll have switching and dubbing the easy way. If you're not 100% satisfied, simply return it in its original box within 30 days for a refund.

To order ADC's TV/Video Sound Detonator with A Dynamic Range Expander, A Stereo Synthesizer, An Equalizer, A De-Hisser and Complete Selection and Mixing, risk free with your credit card, call toll free. Or, send your check, not for ADC's \$400 suggested retail price, but for only \$249 plus \$8 for postage and handling. Order No. 4161.

Make your home into the finest movie theater. Experience your TV and Video Cassettes, don't just watch them.



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sider an application of common sense to interpreting measurement data, consider an amplifier whose distortion is (say) less than 0.01 percent up to its rated power output. That rating could apply to many of today's amplifiers. Now, suppose its manufacturer comes out with a "new" circuit configuration and claims a maximum distortion of 0.002 percent, which is by no means impossible or even very difficult to achieve with today's technology. So far, we have no argument with the claim. Then, however, the new model is said to sound *much* better than the former version, to say nothing of its current competitors.

This has an impressive ring to it until you realize that even 1 percent distortion is unlikely to be heard if you're listening to music, 0.1 percent allows a huge safety margin, and 0.01 percent is bordering on ridiculous overkill (though there is nothing *wrong* with that caliber of performance). You can probably guess what my reaction would be to such a claim, which comes along only too frequently. That manufacturer (or, to be charitable, his marketing department or advertising agency) has just lost a good share of his credibility with me because of the unjustifiable exaggeration of his claim.

Maybe the new amplifier *does* sound different from the old one (not "better," which is an undefined subjective term). If so, you can be sure that the difference is *not* strikingly great unless one of the two products being compared is seriously deficient in some respect. And almost certainly the difference is not directly related to the reduction in distortion.

I have attended press showings of such "improved" products. Where the manufacturer has been courageous (or foolhardy) enough to present an A-B comparison against last year's amplifier, neither I nor most (if not all) of the others present have been able to hear any difference. Incidentally, I have always wondered if the few people who claim to hear these and similarly subtle effects really have "golden ears" or are suffering from the Emperor's New Clothes syndrome.

I don't wish to reopen the "great speaker cable controversy" that grew out of STEREO REVIEW's tests last year, but it was surely one of the major teapot tempests to come along in my memory. Just keep in mind, if you will, that there are good technical reasons why some amplifiers may react to some degree to the capacitance and inductance of the load, including the output cable,

and any cable with significant resistance will affect the frequency response of the signal reaching the speaker. However, these are usually *extremely small* effects. And even if some people, under some conditions, can detect the difference between two cables in an A-B comparison, my reaction is a resounding "So what?" No reasonable person can possibly claim (or, more to the point, *prove*) that the magnitude of such a difference justifies the commotion being made over their supposed advantages.

It seems sensible to use both objective and subjective evaluation, adopting the good aspects while being aware of the limitations.

Still, the subjective/objective polarity remains, and no doubt will continue to be with us, as long as people insist on endowing hi-fi sound reproduction with mystical qualities. The cable controversy is an excellent example of a situation where the performance of the components *can* be measured with considerable accuracy, and where the subjective effects are amenable to standard double-blind tests and statistical analysis. Yet, the faith of a true believer will not be shaken, even though (perhaps *because*) there is virtually perfect agreement between theory, measurement, and controlled subjective tests.

These matters will never be settled to everyone's satisfaction, but let's try to keep them in perspective. Subjective and objective tests are both important. Indeed, the suitability of a product or system for you must inevitably rest on a subjective judgment. Unfortunately, no one but *you* can make that judgment, since I have no way of knowing what your brain does in its processing of the information it receives from your ears. All I can tell you in our test reports is what the product actually does, in an electrical or acoustical sense, and very little about how it sounds. I am afraid that most of those who do try to tell you exactly what it sounds like are playing games with words. □



"... You say that's a 75-watt monophonic tube amplifier and it's \$3,500? Hmmmm . . . Would you have something with less power, say 15 or 20 watts, monophonic with tubes, but for a lot more money?"

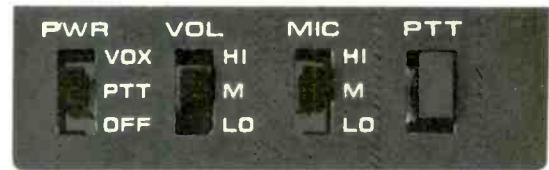


PRICE SLASHED

DAK has sold over 20,000 of these incredible communication devices for \$49.95.

NOW JUST \$29.95

Use Order Number 9810 (\$3 P&H). See Below.



Think Speak Plus

On the job, on the field or on the road. Now you can talk and listen 'hands free' at a new breakthrough price. Plus, there are now special units for motorcycle helmets with an intercom and FM radio reception.

SWAT Teams use them. So do quarterbacks and firemen. Now you too can talk and listen to people near and far, totally hands free, while you are jogging, sailing, skiing, hiking or riding a motorcycle.

Both at work and at home, this unique communications system, with a range up to 1/2 mile, will let you keep in touch.

NOT A WALKIE TALKIE

This is no toy. The Think Speak is totally automated. When you speak, a special voice activated circuit (VOX) automatically engages the transmitter so that you are broadcasting. When you stop speaking, it will automatically return to 'stand-by' to await a reply.

It is virtually noise free because it uses a quartz crystal locked dual conversion superheterodyne communication circuit that operates on 49mhz with FM.

So, your communication won't sound like a CB or an AM radio. You'll speak and hear with the full power and clarity you'd expect from an FM radio station.

HERE'S WHAT IT IS

You wear the Think Speak just like a personal stereo. There's an adjustable headphone that you wear on either your right or left ear. The other ear is clear to hear the outside world for safety.

In the helmet versions, the headband comes off and the earphone attaches inside. The mike and antenna attach to the outside with quick release velcro.

A flexible boom microphone lets you speak normally while you transmit. The entire shaft of the boom mike is adjustable and will retain any position you set.

The voice activation circuit has a 3 level sensitivity switch. If you're riding a motorcycle or breathing hard while you jog, you can set the sensitivity to low so that you won't transmit in error.

If you are hunting or fishing and you can't talk much over a whisper, you can

set the sensitivity to high. Plus, the headphone has a 3 level volume control too.

In addition to the VOX voice operated circuit, you'll have 'PTT' which means Push to Talk. When you want to talk, you just push the PTT button.

This is a really great feature when you want to whisper very quietly below the threshold of even the high sensitivity setting of the Voice Operated Circuit.

You may be into surveillance or photographing wildlife. When you can only whisper, you'll especially appreciate the super quiet FM reception of this system.

The motorcycle version adds a plug-in 2nd headset for your rider (included), and an intercom/internal switch which lets you talk to and listen to your rider. You'll still be in contact with the outside world and will receive communications.

SOME SPECIFICS

You can expect long battery life from a standard 9V battery (not included). The antenna is conveniently clipped to the headband for normal use. For full range use, the antenna pops up.

The system operates on the 49 mhz band using FM, so you shouldn't be bothered by any other radio transmissions as you are with CBs and Walkie Talkies.

The transmission output is a full RF of 10,000uV/m @ 3 meters max. No FCC licence is required. And, the FM hum and noise is almost good enough for a high fidelity system at 40db min. The case clips to your belt, and is 4-9/16" X 2 1/4" X 15/16" for the standard unit and 4 3/8" X 3" X 1 1/8" for the motorcycle unit.

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All three systems are electrically identical. So, if you're a pitcher, you can talk to your catcher or the coach. If you're on a loading dock, you can talk to the man in the truck or on the forklift.

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All three units are totally interchangeable, sound identical and will both transmit to and receive from each other. A minimum of two Think Speaks are required for communication.

When you think out loud, people will listen. Try a Think Speak risk free today.



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YAMAHA C-80 PREAMP AND M-80 POWER AMP

Hirsch-Houck Laboratories



FEATURES

C-80 Preamplifier

- Continuously variable loudness control
- Two-band parametric equalizer
- Tone-control bypass switch
- Switchable infrasonic filter
- Low-noise, Zero Distortion Rule moving-coil pre-preamplifier
- Moving-magnet section with current-noise reduction circuit and extended high-frequency RIAA response
- Adjustable cartridge loading
- Volume control reduces amplifier residual noise as it attenuates the signal
- Connections and switching for two tape decks
- Separate record-out selector allows monitoring one source while listening to another
- Two outputs, one of which is phase-inverting
- Level-mute switch
- Separate digital audio disc input
- Headphone jack on front panel
- Six a.c. outlets, five switched
- Optional rack-mount adaptor

M-80 Power Amplifier

- Auto Class A output circuits for low-distortion amplification of low-level signals
- Class AB operation for transient peaks
- Zero Distortion Rule amplification to cancel crossover distortion and transistor nonlinearity
- High dynamic output power
- High-capacity electrolytic power-supply capacitors
- Connections and switching for three pairs of speakers
- Speakers can be operated in any combination
- Independent level controls for each speaker
- Wide-range, peak-reading, LED power-level meters with switch to show power readings with 2-, 4-, or 8-ohm speakers
- Heavy-duty speaker connectors receive heavy-gauge audiophile speaker cable
- Optional rack-mount adaptor
- One unswitched convenience outlet

used to reduce noise and distortion in its phono input stage.

The M-80 is an extremely powerful amplifier, differing from most (especially those of Japanese origin) in having ratings for driving loads as low as 2 ohms. Among its special features is a switchable "Auto Class A Power" circuit that is supposed to operate the output transistors in Class A (for minimum distortion) at low power levels and make an imperceptible transition to Class AB as more power is required. Both the M-80 and the C-80 employ what Yamaha calls "Zero Distortion Rule" circuits, apparently a combination of feedback and feed-forward techniques that, in theory, can reduce distortion to zero.

The Yamaha C-80 is 17 1/8 inches wide, 15 inches deep, and 3 3/4 inches high. It weighs 15 pounds. The M-80, 17 1/8 inches wide, 16 3/4 inches deep, and 6 1/2 inches high, weighs a little over 50 pounds. The price of each unit is \$750. Yamaha Electronics Corp., USA, Dept. SR, 6660 Orangethorpe Ave., Buena Park, Calif. 90620.

Lab Tests

We tested the C-80 preamplifier while driving a standard IHF load (10,000 ohms in parallel with 1,000 picofarads). As the data in the table show, its output clipped at a very high level, and at any output up to the clipping point the 1,000-Hz distortion was extremely low. The frequency response of the C-80 was ruler-flat over most of the audible range, and its RIAA phono equalization was not affected significantly by the presence of the cartridge inductance at the phono input.

The phono input impedance in the moving magnet (or MM) mode measured 48,000 ohms at 1,000 Hz, though it could not be modeled by a simple parallel combination of a resistance and capacitance. The phono (MM) input overloaded at safely high levels over the entire audio-frequency range.

The parametric tone controls of the C-80 proved capable of response modifications far exceeding the ability of conventional tone controls. Each (bass and treble) has three adjustments: level (boost or cut over a ± 12 -dB range, with a

FROM the top of Yamaha's "Natural Sound" line of audio separates come the C-80 preamplifier (Yamaha prefers to call it a "control amplifier") and the M-80 power amplifier. They can be purchased and used separately, but their all-black finishes harmonize, and the preamp can be stacked on top of the power amp. We tested them together, and they

performed very well indeed.

The Natural Sound line combines highly sophisticated circuit design, for minimum distortion and noise, with some unusual control features. The C-80 has at least two of them: parametric tone controls and a continuously variable loudness control with an unconventional response characteristic. Yamaha literature also emphasizes the special circuitry

TEST REPORTS

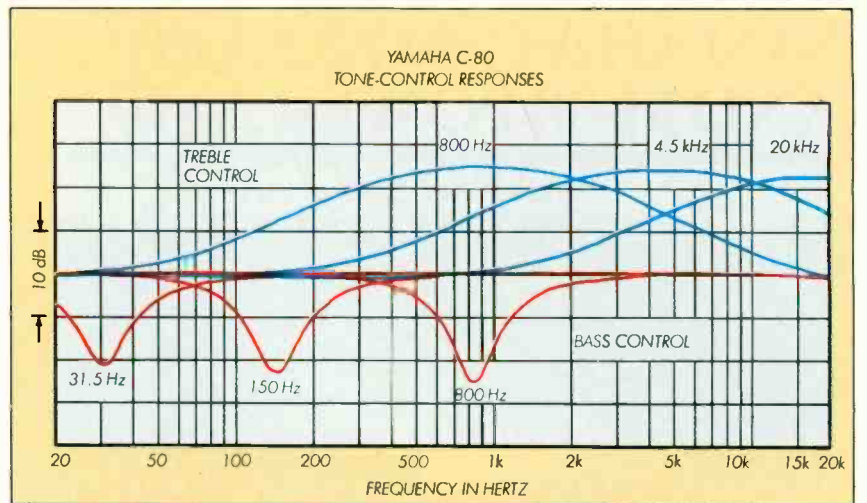
flat-response center-detented position), center frequency (continuously variable over a range of 31.5 Hz to 800 Hz for the bass control, and from 800 Hz to 20,000 Hz for the treble), and "Q" or bandwidth. The bandwidth parameter, adjustable from 0.3 to 3, varies the width of the affected portion of the spectrum.

We made several response plots to measure the limits of the controls' effects. The graph shows the treble control's maximum boost at maximum bandwidth when dialed to frequencies of 800, 4,500, and 20,000 Hz and the bass control's maximum cut at minimum bandwidth when dialed to 31.5, 150, and 800 Hz. The C-80 tone controls can easily simulate the action of conventional tone controls as well as giving a near-infinite variety of other response curves not obtainable with any but parametric controls. The audible results are solely up to the patience and listening judgment of the user.

At the loudness knob's maximum setting, the response is flat and the volume control can be set for the loudest level at which one expects to listen. As the loudness setting is reduced, the overall level goes down but the sound remains solid and well balanced, without a trace of the heaviness added by almost every other loudness control we have used.

The M-80 power amplifier, as its weight of over 50 pounds implies, is not an amplifier to be taken lightly. Its top became very hot (above the internal heat sinks) during the one-hour preconditioning and the following high-power tests, but it was no more than moderately warm in normal use.

The M-80's power performance into 8-ohm loads was quite impressive, but the really special qualities of the amplifier became more apparent when we drove lower impedance loads. For example, its dynamic headroom into 4 ohms was no less than 3.78 dB, with short-term power getting up to 787 watts per channel.



Finally, we came to the 2-ohm measurement, the nemesis of so many amplifiers. It wasn't even practical to drive both channels simultaneously into 2-ohm loads, since this overloaded our 15-ampere test-bench power system! Driving one channel, the clipping power was 612 watts, and the dynamic power was a staggering 1045 watts. The amplifier was stable when driving reactive simulated speaker loads and the standard IHF reactive load.

Given Yamaha's emphasis on the low-distortion circuitry of the M-80, we should not have been too surprised at the results of our distortion measurements. They were indeed difficult and time-consuming to make, since the 1,000-Hz THD of this amplifier (driving 8-ohm loads) was less than 0.0025 percent up to the clipping point, and typically well under 0.001 percent. Even with 4-ohm loads the distortion never exceeded 0.01 percent, and with 2-ohm loads it rose from less than 0.001 percent at a few watts to 0.02

percent at 300 watts and 0.15 percent at 400 watts.

Interestingly, we could measure no difference in distortion when we switched on the "Auto Class-A" circuit, even at low power levels of a watt or less. We did not make any measurements of the illuminated power indicators except to verify that in their PEAK mode they held the highest reading for an indefinitely long period (many minutes), and that the LOAD buttons changed the indicator sensitivity by approximately the correct amount to read the power into loads of 2, 4, or 8 ohms.

Comments

It is difficult to take exception to any aspect of the performance of the Yamaha C-80 and M-80. By and large, they come as close to being ideal audio signal amplifying components as any we have seen (and heard).

The attention to detail in these products is impressive. Every signal

HIRSCH-HOUCK LAB MEASUREMENTS

■ C-80 Preamplifier

Sensitivity for 0.5-volt output: Aux, 52 mV; Phono (MM), 0.75 mV; Phono (MC), 0.035 mV

Signal-to-noise ratio [referred to 0.5 volt, A-weighted]: Aux, 76 dB; phono, 74 dB

Phono (MM) overload input: 160 to 180 mV

Phono (MM) input impedance [1,000 Hz]: 48,000 ohms

Preamplifier maximum output at clipping (1,000 Hz): 9.1 volts

Distortion at 1,000 Hz: Less than 0.0028% from 0.1 to 8 volts output

Tone-control range: ± 12 dB, center frequencies adjustable from 31.5 to 20,000 Hz

RIAA equalization error: 20 to 20,000 Hz $+1$, -0.5 dB

■ M-80 Power Amplifier

Frequency response: $+0$, -0.3 dB from 5 to 20,000 Hz; -3 dB at 80,000 Hz

1,000-Hz output power at clipping: 332 watts into 8 ohms, 462 watts into 4 ohms, 612 watts into 2 ohms

Dynamic power output (20 milliseconds duration): 486 watts

into 8 ohms, 787 watts into 4 ohms, 1045 watts into 2 ohms

Clipping headroom: 1.23 dB (8 ohms); 1.46 dB (4 ohms)

Dynamic headroom: 2.9 dB (8 ohms); 3.78 dB (4 ohms)

Maximum distortion from 20 to 20,000 Hz, 250 watts output: 0.006%

Sensitivity [for 1-watt output]: 100 mV

Signal-to-noise ratio [referred to 1 watt, A-weighted]: 100 dB

Slew Factor: Greater than measurement limit of 25

TEST REPORTS

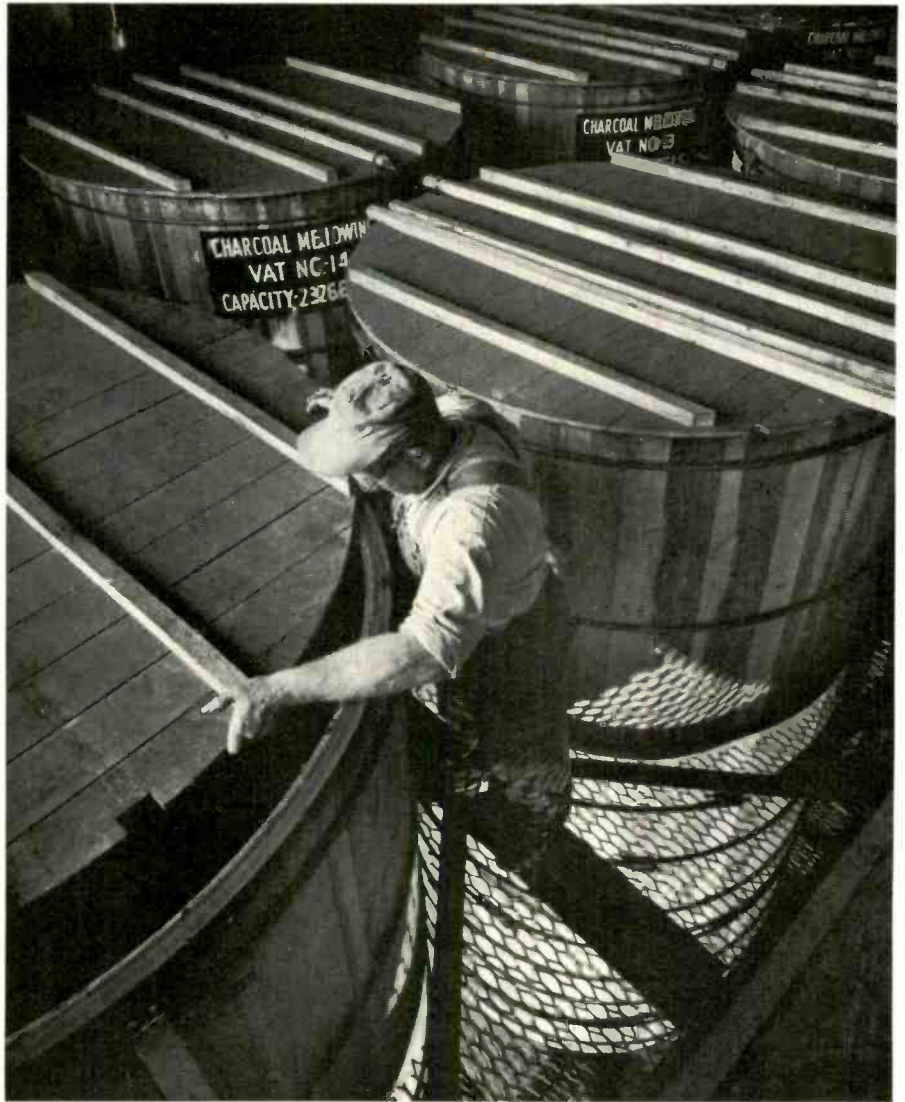
connector is gold-plated, as are the plugs on the twin shielded cable supplied with the C-80 for connection to the M-80. All the controls operate with smoothness and precision as well as electrical silence. Surprisingly, although Yamaha makes a point of the ability of the speaker connectors to accept oversized, heavy-duty speaker wires, they cannot be used with the Monster Cable Xterminator plugs or standard banana plugs. Also, we cannot understand why the M-80 had a "Auto Class-A Power" switch at all. There could be no conceivable reason to switch off a circuit that produced the benefits claimed for this one. However, since we found no measurable or audible changes in distortion (or anything else) when this button was pressed or released, the point is moot.

There are even fewer nits to pick concerning the C-80 preamplifier. It is a superb unit, as undaunting in appearance as any we have seen when its hinged panel is closed, yet as versatile as any when it is open. And it sounded great. The loudness compensation was far and away the best we have used, so ideal in its operation that more than once when listening at very low levels we were surprised to hear solid organ or drum sounds in the low bass that should not have been audible at those levels. Some other loudness controls might also have made these sounds audible, but they would have left their mark in the form of intolerably unnatural voice quality. But the action of the Yamaha circuit is really undetectable except when it is doing what it is meant to do. Outstanding!

For some people, the parametric tone controls may be even more important. For our part, even using conventional tone controls involves more "fiddling" than we care for, so these controls would probably get little from us. For the inveterate "knob twiddler," however, the C-80 should be an ideal choice.

Even the price of these units, though hardly insignificant, is far from the stratospheric levels of many high-end components. These Yamaha "Natural Sound" components are well worth their price in today's market. □

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TECHNICS RS-B100 CASSETTE DECK

Hirsch-Houck Laboratories

ASIDE from offering three noise-reduction systems (Dolby B, Dolby C, and dbx), three heads, and a dual-capstan transport, Technic's RS-B100 includes some "hidden" features in its circuitry. While they may not have immediately obvious sonic advantages, they indicate the extent to which the Technics designers have pondered the problems of cassette recording.

For example, every analog recorder introduces quite extensive phase shifts to the signal (these come mainly from the record and playback equalization circuits). The RS-B100 is unique among home cassette decks we have examined in that it contains phase-compensation circuits to correct for these phase shifts. If nothing else, the circuits permit much more accurate recording and playback of square waves. The manufacturer's literature says the effects of the phase compensation become more audible when tapes are copied since the cumulative phase distortion is drastically reduced. Other circuit features of the RS-B100 include a direct-coupled playback amplifier



FEATURES

- Three-head, dual-capstan design with direct-drive capstan motor
- Dolby B, Dolby C, and dbx noise-reduction systems
- Phase-compensated circuits for improved phase linearity
- User-adjustable tape sensitivity and bias controls used in conjunction with built-in 400/12,000-Hz oscillator
- Amorphous-alloy record and playback heads
- Quartz-regulated motor-speed control
- Automatic source/tape switching with manual override
- Tape counter reads either tape revolutions or remaining time
- Eighteen-segment fluorescent peak-reading/holding level display
- Rack-mount adaptor
- Music Select finds and plays start of next or current track
- Front panel headphone jack
- Output level control
- Optional remote control with cable
- Switchable FM multiplex filter

utilizing dual FET's (field-effect transistors) for lower noise.

The separate record and playback heads of the RS-B100 allow the user to make instant quality comparisons between source and tape. They also enable the use of appropriately different head-gap widths for recording (2.5 micrometers) and playback (0.8 μ m). Both head elements are contained in a single case and

are made from an amorphous (non-crystalline) metal alloy that combines extremely good magnetic characteristics with high wear resistance. The tape transport uses a direct-drive d.c. servomotor to turn the leading capstan, which is belt-coupled to a trailing capstan of a different size. The dual closed-loop capstans isolate the tape from any additional wow/flutter-producing

sources as it crosses the heads. A separate d.c. motor turns the reel hubs, and a third is used to position the head block.

The cassette well has better rear illumination than do most, and its clear door (removable for head cleaning) affords a full view of the cassette label and the amount of tape remaining on the side. Detectors

HIRSCH-HOUCK LAB MEASUREMENTS

Fast-forward time: 87 seconds (C-60)

Rewind time: 89 seconds (C-60)

Speed error: none measurable

Dolby tracking error: +1.5, -0 dB with Dolby B; +2.5, -0 dB with Dolby C

Wow-and-flutter: 0.024% wrms, 0.034% DIN peak-weighted

Line input for indicated 0 dB: 50 mV

Line output at indicated 0 dB: 0.61 volt

Meter indication at IEC-standard 0 dB: +1 dB

■ **Tape used:** TDK AD (Type I, ferric)

IEC 0-dB distortion: 0.45% (0.09%

with dbx at equivalent output level)

Meter indication at 3% third-harmonic distortion: +9 dB (1.7% at +20 dB with dbx)

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	55.9	61.0	58.5
Dolby B	62.6	70.2	68.6
Dolby C	65.0	75.5	77.0
dbx	86.0	93.0	90.2

■ **Tape used:** TDK SA-X (Type II, chrome-equivalent)

IEC 0-dB distortion: 1.1%

(0.28% with dbx at equivalent output level)

Meter indication at 3% third-harmonic distortion: +8 dB (2.4% at +20 dB with dbx)

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	57.1	62.0	59.6
Dolby B	62.6	70.5	69.4
Dolby C	64.5	76.3	77.2
dbx	85.1	92.1	89.5

■ **Tape used:** TDK MA-R (Type IV, metal)

IEC 0-dB distortion: 1.2%

(0.38% with dbx at equivalent output level)

Meter indication at 3% third-harmonic distortion: +8.4 dB (1.5% at +20 dB with dbx)

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	56.1	60.8	58.5
Dolby B	62.5	69.8	68.5
Dolby C	64.5	75.2	76.5
dbx	83.5	90.0	87.0



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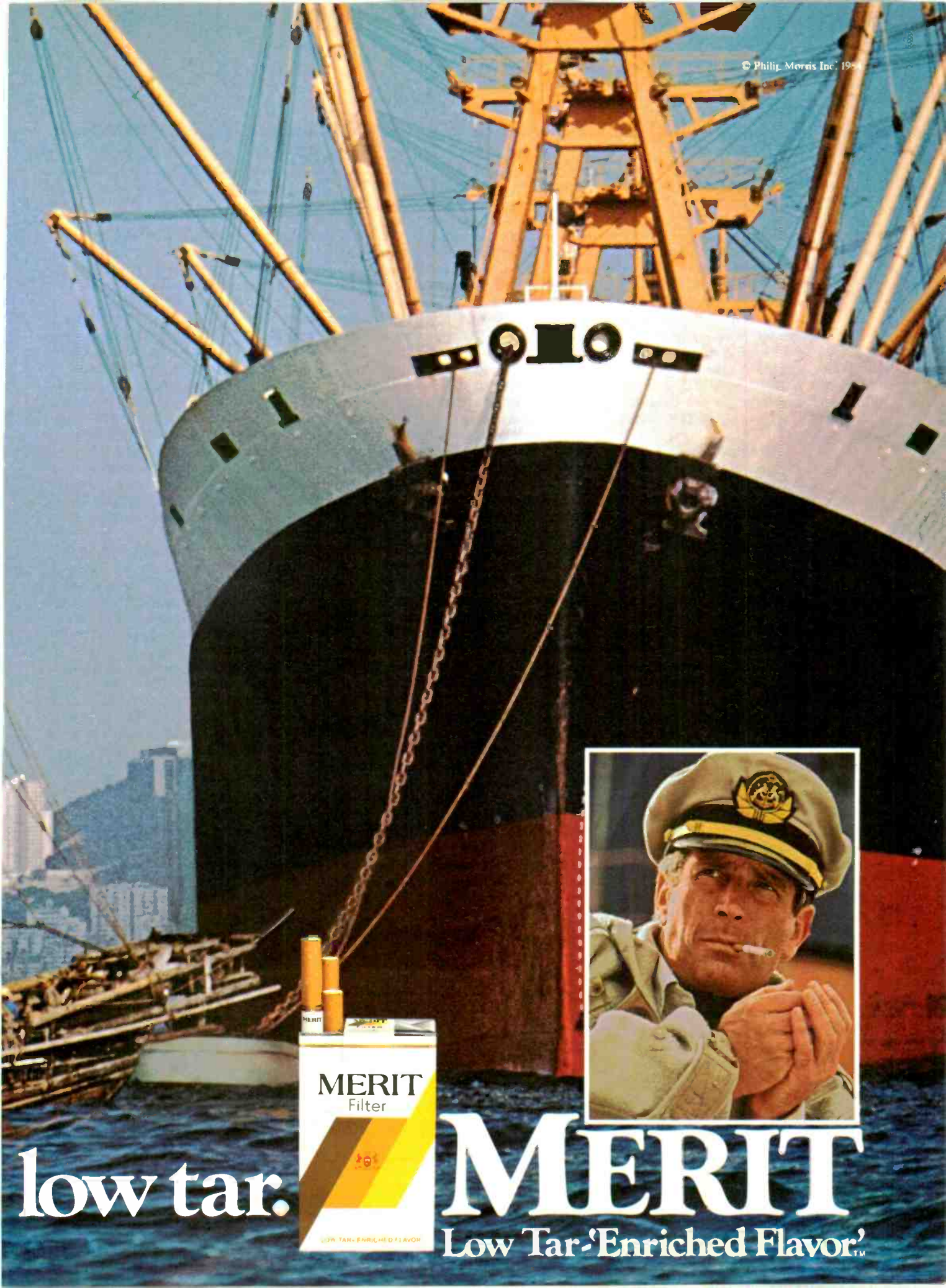
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TEST REPORTS

inside the well automatically switch equalization and record bias for the different tape types. The tape optimization facilities include both 400-Hz and 12-kHz oscillators, for tape-sensitivity and bias adjustments, respectively, and while the procedure is being run the resolution of the fluorescent record-level indicators is temporarily increased to show small 1-dB changes. During regular operation the indicators read levels from -40 dB to +18 dB, and signal peaks are held for approximately two seconds to facilitate reading.

The overall dimensions of the RS-B100 are 17 inches wide (19 inches with rack adaptors installed), 3¾ inches high, and 10¼ inches deep. The unit weighs slightly over 12 pounds. Price: \$800. Technics, Dept. SR, One Panasonic Way, Secaucus, N.J. 07094.

Lab Tests

Playback frequency response, checked with our IEC calibrated tapes, showed a slight, smooth dip in the upper midrange (-1.9 dB at 4 kHz) with both the 120-microsecond (ferric) and 70-μs (chrome and metal) tapes. Above this point, however, the 70-μs tape rose steadily to +3 dB at 18 kHz, while the ferric (120-μs) tape dropped slowly to -3.7 dB at the same frequency. From the variations we observed at the highest frequencies of the ferric test tape, we suspect that a combination of tolerances between the tape and the deck resulted in an azimuth error that caused the high-end losses shown. Certainly we did not hear the problem while playing other tapes, and it did not show up in the overall record-playback response curves.

Our sample of the RS-B100 was supplied with the three tapes used in its factory checkout (TDK AD, TDK SA-X, and TDK MA-R), which are representative of today's premium-grade formulations. With these tapes, overall record-playback frequency response, measured at 20 dB below the 250 nanoweber/meter international standard "0-dB" level, was within +1, -2 dB from approximately 32 Hz to 20 kHz, which is extremely good performance. At the IEC 0-dB level, which corre-

sponded to a reading of +4 on the RS-B100's indicators, the advantage of metal tape in high-frequency storage potential was clear: the response at 20 kHz was down by only 4 dB. Indeed, with the Dolby C system in use, response at 20 kHz was flat within 1.5 dB.

Because the dbx noise-reduction system (unlike Dolby) operates as a 2:1 compressor-expander, both distortion at the IEC 0-dB level and headroom up to the 3-percent distortion point (normally used in signal-to-noise ratio measurements) were considerably affected when dbx was used. Even at input/output signal levels above the +18-dB limit of the fluorescent display we could not reach 3-percent distortion with any tape, though at +20 dB the unit's amplifiers gave audible evidence (confirmed by our oscilloscope) of the onset of overload. We used this level, therefore, in our signal-to-noise ratio (S/N) measurements with the dbx system, though it is considerably higher than we would recommend allowing signal peaks to reach (even with dbx). Part of the advantage of using dbx derives from the fact that all of its potential need not be used for hiss reduction: some can be used to lower distortion generally and to increase the high-frequency handling capacity of the tape.

The wow and flutter readings on the RS-B100 were extremely low, and speed was exact. Dolby tracking error, measured at -20- and -30-dB levels, was about average, as were the high-speed winding times and line sensitivity.

Comments

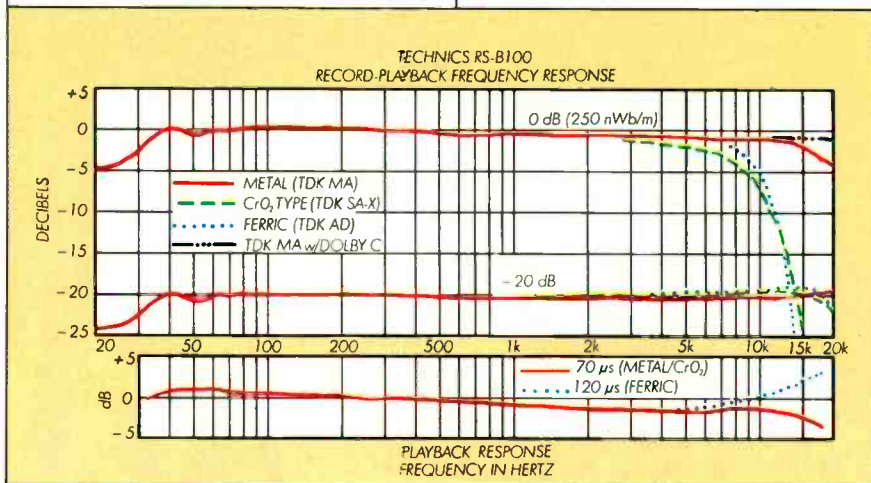
Listening both to prerecorded and dubbed tapes on the RS-B100, we were impressed with the fine musical quality of the sound. Whether this is to be attributed to the special phase-compensation circuitry the deck incorporates, to the low wow and flutter, or to a combination of still other factors is not clear, but what is important is that the upper tones of piano recordings, for example, had an entirely commendable clarity. Moreover, at least with the selections we used, the dbx system manifested no audible "breathing" or "pumping"; it did not have a "sound" different from that of the Dolby C system, though it did provide a lower noise "floor" with very low-level inputs.

In a unit so physically small, it is not possible to make all the knobs as large as one might like, but the size of the main record-level control (both silver and black knobs are supplied) is certainly adequate. One minor caution about the rack-mounting adaptor is in order, however: EIA-standard rack components must all have vertical heights that are a multiple of 1¾ inch, and the RS-B100 is ¼ inch too high to fit a standard equipment opening. With the continuously variable heights accepted by most furniture-type audio racks, however, this is not a problem.

In all, we found the Technics RS-B100 a very fine cassette deck that we can recommend without hesitation.

—Craig Stark

Circle 141 on reader service card



CHECK OUR REFERENCES.

First trust your ears. Then trust the experts. That's a reliable way to judge speaker systems. Especially reference monitors.

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YAMAHA

POLK SDA COMPACT REFERENCE SPEAKER

Hirsch-Houck Laboratories

POLK'S latest use of its Stereo Dimension Array techniques is the SDA Compact Reference System, composed of two "bookshelf" speakers suitable for mounting near a wall as well as on optional free-standing pedestals. Like its predecessors in this series—we tested the first, the SDA-1, a couple of years ago—the SDA-CRS (or SDA Compact, as it is sometimes called) is designed to compensate for the fact that in normal stereo playback each ear hears the sound from both speakers, which inevitably affects apparent channel separation and the stereo image.

Each cabinet of the SDA-CRS contains two independent speaker subsystems, designated as the "stereo" and "dimension" speakers. The SDA system helps each ear to hear only the sound from its corresponding (left or right) speaker by cancelling the sound arriving from the opposite speaker. The cancellation is performed acoustically, by providing a signal shifted in phase and delayed in time by the correct amount to cancel the direct arrival from the opposite speaker.

The primary sound output of the SDA-CRS speakers comes from their "stereo" drivers. The cabinets are designed as mirror-image pairs, with the stereo drivers located at the inner ends of the front panels. The "dimension" speakers, using identical drivers, are located at the outer ends of the speaker's front panels. Sounds intended for the listener's left ear, for example, are radiated not only from the left stereo drivers, but also from the dimension drivers of both speakers, in such a manner that the extra distance from the dimension drivers to the ears provides the delays needed for cancella-



FEATURES

- Two-way system with a 10-inch rear-mounted passive bass radiator, a 6-inch woofer, and a 1-inch dome tweeter
- Second identical woofer and tweeter in each cabinet for spatial dimension control (interchannel crosstalk cancellation), giving enhanced stereo imaging
- Variety of finishes available

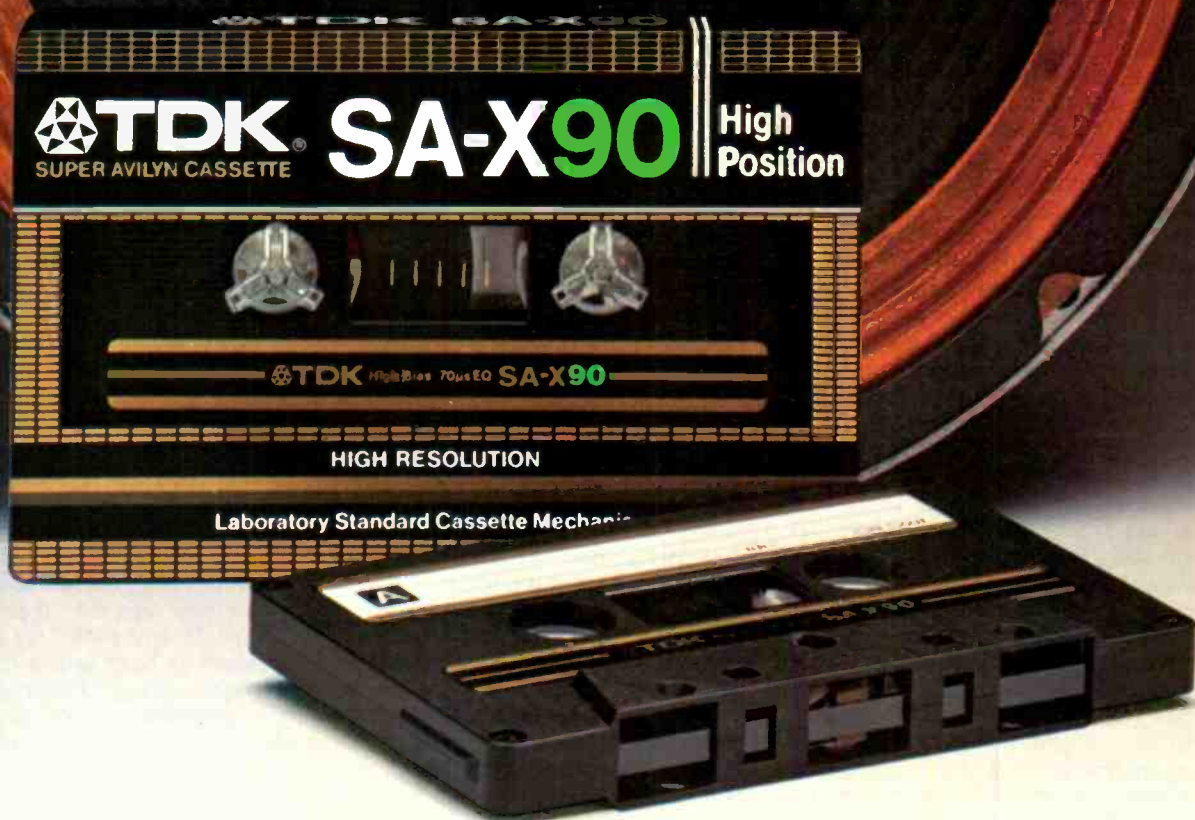
tion. The listener therefore (in theory, anyway) hears a pure left-channel sound only through his left ear and right-channel sound through his right ear.

Each speaker subsystem of the SDA-CRS (the stereo or dimension drivers of one cabinet) is a two-way design, employing a 6-inch woofer and a 1-inch dome tweeter with a 2,000-Hz crossover frequency. In addition, there is a single 10-inch passive radiator in the rear of the cabinet, effective for both woofers in the enclosure and extending the low-bass response of the system. The left and right enclosures are interconnected by a cable that plugs into their rear panels, transferring the signals between them for processing and radiation from the respective dimension drivers. The only limitation on amplifier compatibility is that the amplifier's two

speaker outputs must have a common ground. Almost all amplifiers and receivers meet this qualification, however.

Each cabinet of the Polk SDA-CRS is 20 inches wide, 12¾ inches high, and 9½ inches deep. A protective perforated metal cover over the passive radiator extends another inch behind each cabinet, which should in any case be at least 1½ inches from the wall. Each speaker weighs about 35 pounds. Several cabinet finishes are available: walnut or rosewood vinyl veneers (\$790 per pair), or true oak (shown) or walnut finishes (\$890 per pair). All have a snap-on cloth grille. The input binding posts and tweeter-protection fuses are recessed into the rear panels. There are no level adjustments. Polk Audio Inc., Dept. SR, 1915 Annapolis Rd., Baltimore, Md. 21230.

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Lab Tests

We installed the Polk SDA-CRS speakers near a wall, about 28 inches from the floor, and about 5 feet apart (Polk recommends a spacing of 4 to 6 feet for the best spatial effect). Our room-response measurements were made with the speakers connected to our regular system amplifier, which was driven by a sweeping sine-wave test signal. The preamplifier balance control was turned to drive one channel at a time, and the smoothed output of both channels was plotted on the same graph paper.

It is characteristic of the SDA systems that when only one channel is driven, sound is emitted from all four subsystems (left and right stereo and dimension speakers). However, the output from the "undriven" portions is at a reduced level. The low-frequency response was measured with close microphone spacing, at the driven stereo woofer cone of one channel and at its passive radiator, combining the two curves (corrected for the cone diameters) with the averaged room response.

The composite corrected frequency response derived from these techniques varied less than ± 4 dB from 170 to 20,000 Hz. There was an apparent maximum output at 80 to 100 Hz, below which the bass output fell off gradually. Because our low-frequency measurement (and the manner of its combination with the higher frequencies) is somewhat arbitrary, it cannot define the performance of the speaker in a different acoustical environment. However, it does agree well with the sound we heard from the SDA-CRS in our room. Even with the observed variations, the overall response of the SDA-CRS was ± 6.5 dB from 20 to 20,000 Hz, an impressive achievement for a pair of compact speakers with relatively small drivers.

For our FFT quasi-anechoic response measurements, with the microphone spaced 1 meter from the speaker, we separated the left and right systems and drove only one from the amplifier. The axial re-



sponse was extremely uniform over the measurement range of the IQS analyzer, within ± 2.5 dB from 180 to 15,000 Hz (except for a cancellation dip at 2,500 Hz, which was dependent on the microphone spacing and direction and was not reflected in the total acoustic output from the speaker). The response dropped slightly in the 15,000- to 21,000-Hz range, returning to mid-range levels at 23,000 Hz. The horizontal dispersion of the SDA-CRS was excellent up to 8,000 Hz, and the axial and 45-degree off-axis response curves differed only moderately between 8,000 and 15,000 Hz.

We measured the impedance of a single system, although the actual impedance presented to the amplifier is a function of the dynamic balance of the signals in both channels. The impedance was 20 to 30 ohms in the low bass and 8 to 10 ohms in the 50- to 500-Hz range (except for a rise to 18 ohms at 87 Hz). At higher frequencies, the impedance was typically between 10 and 125 ohms. The woofer distortion, measured separately at the driven and passive cones, was very low (well under 1 percent) from 100 to below 60 Hz, and rose steeply to about 8 percent at 45 Hz. The drive level in this measurement was 4.5 volts, equivalent to a midrange sound-pressure level at 1 meter of 90 dB. It must be realized that under normal condi-

tions, the four speaker subsystems that comprise the Polk SDA-CRS are always operating and sharing the total input power, so that these distortion measurements made on a single subsystem are not necessarily representative of the performance of the complete system in a stereo installation. In all probability the distortion will go *down* in normal use, since the same sound level will be achieved with a lower amplifier output.

Finally, although Polk does not give specific power ratings for the SDA-CRS, we drove one channel with short-duty-cycle tone bursts at 100, 1,000, and 10,000 Hz, observing the waveforms of the driving signal and the acoustic output for the onset of distortion. At 100 Hz, the input signal began to clip at about 228 watts (into 10 ohms, the actual impedance at that frequency). At 1,000 Hz, the acoustic output began to round off ("soft clip") at 200 watts into 14 ohms, and at 10,000 Hz we began to see soft clipping at 28 watts into 12 ohms. These measurements indicate that the Polk SDA-CRS should be compatible with just about any amplifier used in the home provided it is not driven into clipping for more than brief instants (and the tweeter fuses should provide considerable protection against that sort of abuse). In any event, we drove the speakers as hard as our ears would tolerate, with a 350-watt-per-channel amplifier, and they never showed any signs of distress.

Comments

Our measurements confirm that the Polk SDA-CRS is a very good speaker system—with a host of desirable qualities—when it is judged by the same standards one would apply to conventional speakers. But it is *not* a conventional system, and it deserves to be examined for the special sonic qualities that are claimed for it.

We recall the impression that the original Polk SDA-1 made on us:

HIRSCH-HOUCK LAB MEASUREMENTS

Composite frequency response: 20 to 20,000 Hz ± 6.5 dB

Sensitivity: 86 dB SPL at 1 meter with 2.83 volts input (1 watt into 8 ohms)

Impedance: 7.5 to 30 ohms from 20 to 20,000 Hz

Phase coherence: group delay variation from 3,500 to 20,000 Hz,

± 0.5 millisecond

Bass distortion (measured at input level needed for 90-dB SPL output at 1,000 Hz): 0.6% at 90 Hz and 60 Hz, 8% at 45 Hz

Power-handling ability: 100 Hz, 228 watts; 1,000 Hz, 200 watts; 10,000 Hz, 28 watts (see text for details on this test)

TEST REPORTS

The system could provide a dramatic expansion of the sound stage in at least two dimensions, and we found listening to it both intriguing and enjoyable.

The new SDA-CRS is capable of doing much the same thing, but in it there has been a trade-off between spectacular spatial effects and the ability to benefit listeners over a wide listening area. Most spatial enhancers (either electronic or acoustic in their operation) restrict the listener to a narrow range of listening locations in the room in order to work their magic. The larger SDA-1 performed its acoustic sleight of hand for a few listeners at a time, while people well removed from the optimum position had to settle for "only" good stereo sound. The SDA-CRS is less demanding in listener positioning, but in return its extension of the sound stage is somewhat less dramatic than that of its senior relative.

In our tests, we drove the speakers as hard as our ears would tolerate, and they (the speakers) never showed any signs of distress.

Nevertheless, the acoustic manipulations of the SDA system present the listener with a broad sound stage, which usually extends beyond the space between the speaker cabinets and it also seems to have an added sense of depth. These qualities were apparent from any part of the listening room. And we always found the Polk SDA-CRS to be unobtrusive, visually as well as sonically. We listened to the system for hours on end, and it was easy to forget that we were hearing speakers at all. Just the music remained, and it seems to us that this is what hi-fi is all about.

The fact that the SDA-CRS will fit in any room, works as well on pedestals as against a wall (we tried them both ways), and costs less than half as much as the revised SDA-1A says something about its intrinsic merits. It is definitely not "just another speaker."

Circle 142 on reader service card

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CIRCLE NO. 49 ON READER SERVICE CARD

PIONEER P-D70 COMPACT DISC PLAYER

Hirsch-Houck Laboratories

PIONEER'S P-D70 digital Compact Disc player provides a full complement of deluxe programming and operating features. To those commonly found in full-featured CD players (fast scan with audible program, disc, track, and phrase repeat functions, headphone output with volume control, and so on), the P-D70 adds a few of its own.

For example, in addition to allowing cueing by track number, the P-D70 has MIN/INDEX search buttons. Depending on the setting of the DISPLAY control (which also changes the time readouts), the MIN/INDEX controls permit cueing by prerecorded index points and the ability to go forward or back from index point to index point at the touch of a button. These controls also allow cueing by time, though not in the way many players do. Instead of providing direct entry of the time by means of a numerical keypad, the P-D70 advances or retards the playing point in increments of one minute. While this time cueing may seem less sophisticated than full keypad control, in actual use it can be quite useful, especially for cueing into long, uninterrupted, and unindexed classical works.

Perhaps the player's most distinctive feature is its display panel. Large vacuum fluorescent numerals show the number of the track being played and a time indication in minutes and seconds. The time indication can be switched to show several different parameters. Above the time display are two horizontal rows (one per channel) of multisegment level displays driven directly by the digital data. In their PEAK



FEATURES

- Horizontal sliding-drawer design
- Three-beam laser-optical system
- Eleventh-order analog output filters
- Cueing by track, time, or index points
- Fast scan with audible program
- Programmable playback of up to ten selections in any order
- Display can be switched to show current track, index number, total playing time and number of tracks, and total remaining time on the disc
- Level display can be switched to show peak levels or the digital data as decoded from the disc
- Disc, track, or phrase repeat functions
- Headphone jack with sliding level control

mode, these displays respond to peak program levels against a calibrated scan extending from -36 to +12 dB with level markings every 6 dB. In BINARY mode the lights are supposed to represent the actual "2's-complement" digital-audio "words" being decoded from the disc before they are converted to analog form. The scale for this function reads from +54 to +18 dB.

The Pioneer P-D70 is finished in satin silver with gray and black sections for visual interest. It measures 16⁹/₁₆ x 11³/₁₆ x 3⁷/₈ inches and weighs 16 pounds, 9 ounces. Price: \$629.95. Pioneer Electronics (USA) Inc., Dept. SR, P.O. Box 1540, Long Beach, Calif. 90801.

Lab Tests

Testing the Pioneer P-D70 presented no problems once we had read the manual and become familiar with the player's somewhat unconventional programming and display features. Unlike some CD players, the P-D70 could access any

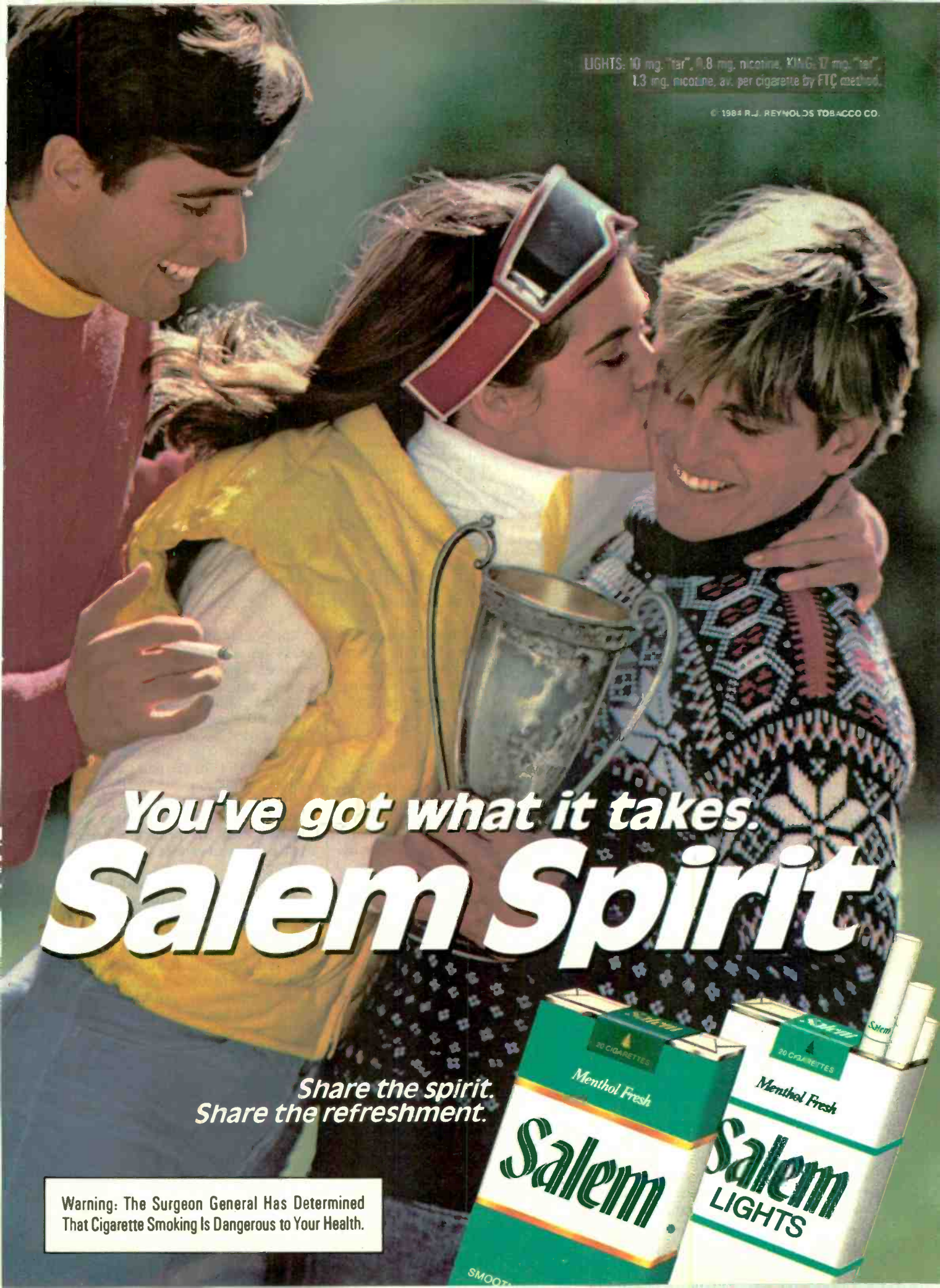
track on our test discs (a limit of 99 is set by the standardized two-digit track-numbering system, but this is far more than will ever be found on a music CD).

It is characteristic of any properly functioning digital reproducing system that the ultimate playback quality will be either virtually flawless or totally useless. Thus, we can expect (and do, in fact, find) that all CD players will be quite closely matched in their frequency response, noise level, distortion, and other measured performance parameters. The P-D70 met these specifications quite handily.

The analog eleventh-order low-pass filtering (as distinguished from the digital or digital/analog types used in some CD players) produced a very smooth, flat frequency response with virtually none of the high-frequency response ripples that we find on many machines. Flat within ±0.1 dB from 20 to 9,000 Hz, the output was down a mere 0.8 dB at 20,000 Hz. The two channels were essentially identical (including

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TEST REPORTS

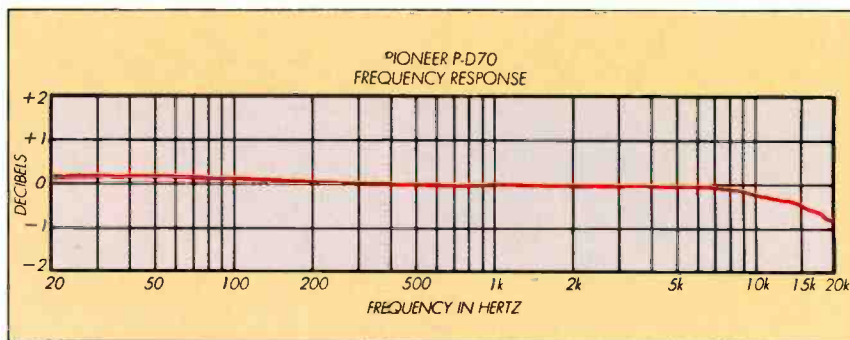
their output levels, which were 1.98 and 1.99 volts at 0 dB. The reproduction of a 1,000-Hz square wave showed a characteristic "ringing" after the leading and trailing edges; this is actually the result of the low-pass filter removing the higher-order harmonics of the signal (unlike digital filtering systems, which produce a similar pattern both before and after the signal transitions). So far as we can tell this has nothing to do with the player's sound quality; we use the test mainly to identify the type of filtering used.

The phase shift between channels reached 90 degrees at 20,000 Hz, indicating that a single D/A converter is switched, or multiplexed, between the left and right channels. Again, this has no audible significance that we are aware of. The flutter reading, as with all CD players, was the residual of our test equipment, about 0.001 percent.

Our measurements of harmonic distortion, intermodulation distortion, signal-to-noise ratio, and channel separation produced outstanding results. The maximum unclipped headphone output from a 0-dB recorded level (rated at 36 milliwatts into 32 ohms) was 7.7 volts into an open circuit, 6.1 volts into 600 ohms (62 mW), and 0.26 volts into 8 ohms (8.5 mW). The headphone volume was fairly good with phones in the 50- to 200-ohm range, but we would suggest using high-sensitivity phones with this player if you want the full effect of a CD's wide dynamic range.

The analog eleventh-order low-pass filtering produced a very smooth, flat frequency response with almost none of the high-frequency response ripples that we usually see.

The Pioneer P-D70 had the excellent error-correction performance of the very best of today's CD players, easily coping with all the calibrated defects on the Philips TS4A test record. It also had very good resistance to physical impact on its sides and better than average on top (over the disc-playing mechanism). The cueing transition from Track 17 to



HIRSCH-HOUCK LAB MEASUREMENTS

Maximum output level: 1.99 volts
Total harmonic distortion at 1,000 Hz: 0.0015% referred to 0 dB; 0.001% referred to -10 dB; 0.0044% referred to -20 dB
Intermodulation distortion: 0.004% referred to 0 dB; 0.009% referred to -20 dB
Signal-to-noise ratio: 97 dB A-weighted
Channel separation: 100 dB at 1,000 Hz; 90.5 dB at 20,000 Hz

Frequency response: +0, -0.8 dB from 20 to 20,000 Hz
Cueing time: 5 seconds
Impact resistance: top, B+; side, A
Cueing accuracy: A
Defect tracking (figures are size of the largest defect successfully tracked): signal-surface damage, 900 micrometers; painted dots, 800 micrometers; simulated fingerprint, pass

Track 18 of the Philips TS4 sampler record (these tracks have no silent interval between them) was perfect, showing no clipping of the opening syllable of the vocalist in Track 18.

Comments

The Pioneer P-D70 showed itself to be at least the equal of any of the latest CD players we have tested. Be forewarned, however, that mastering its unconventional programming system requires careful study of the manual plus some practice.

At first, we looked askance at the need to press a button twenty-five times for direct access to Track 25 (in contrast to simply keying in the digits of the track number). However, even though some of our test records have about forty tracks, they could be entered as rapidly as the button could be pressed, a matter of a few seconds at most.

Less easy to accept is the lack of a memory clearing button for the programming system. It should not be necessary to reprogram in order to play a second CD in the normal "1, 2, 3, . . . 10" playing sequence after programmed playback of the first in an unusual order. It is even more unreasonable that the easiest way to do this resetting is to switch off the power.

Our only other complaint concerns the level display, whose calibrations were so much in error as to be virtually useless. The maximum scale indication on the PEAK display, "+12 dB," corresponded to a -6-dB recorded level according to the CD standard. The indicated "0 dB" was actually -20 dB, and the lowest visible indication, "-36 dB," was really less than -50 dB. The BINARY indications, even more active and colorful than the peak level readings, convey even less useful information.

It should be apparent that, having found nothing less than excellent in the actual performance of the Pioneer P-D70, we are reduced to criticizing very minor points of its control and cosmetic features. Would that this were the case for all the other products we test! The P-D70, which has a handsome, compact exterior, is neither the cheapest nor the most expensive CD player you can buy. Most of the substantive differences between the many CD players we have tested are in their control features, and here the P-D70 stands up well against any of its competitors. It does almost everything one could imagine wanting from a CD player and does it very well. □

Circle 143 on reader service card

ULTRX

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THE SOLID GOLD SOUND

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AKG K4 STEREO HEAD- PHONES

Hirsch-Houck Laboratories

MOST stereo headphones use dynamic drivers, rather like miniature dome tweeters worn on the ears. A few higher-priced sets use electrostatic transducers, in which a very thin membrane forming part of a charged capacitor vibrates in accordance with a varying electrostatic field.

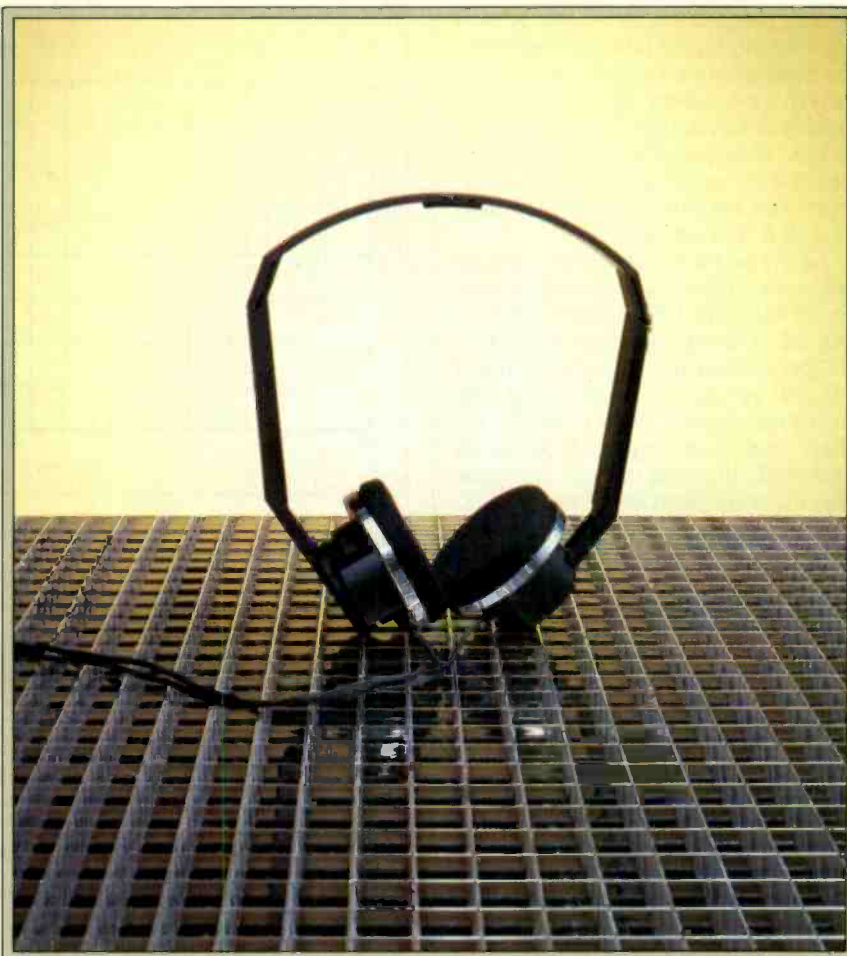
The primary advantage of an electrostatic headphone, like that of an electrostatic speaker, is the sound, especially the smoothness and wide

It had a sweetness at the high end of the spectrum that we found most attractive

range of its frequency response. In addition to being expensive, however, electrostatic headphones used to be heavy or bulky, and normally required a power supply to furnish the high d.c. polarizing voltage setting up the electrostatic field.

Several years ago, AKG introduced a headphone combining a dynamic low- and mid-frequency driver with an electrostatic "tweeter." The K340 (which is still—deservedly—in AKG's product line at \$195) departed from conventional electrostatic headphone design by using an *electret* for the high-frequency driver. An *electret* is essentially a permanently charged capacitor, which in this application requires no power supply or adaptor box and allows the headphones to be driven from a component headphone jack.

The new AKG K4 headphone, like the K340, uses a dynamic low-frequency driver and an *electret* high-frequency element. Unlike the circumaural, sound-isolating K340,



however, the K4 is a lightweight, supra-aural, non-isolating model. Its molded plastic headband is spring loaded so that when the earpieces are pulled down for a good fit, a comfortable yet adequately firm pressure is exerted on the ears and head. When the headphones are removed, the earpieces retract to their shortest setting. They are fitted with nonremovable (as far as we could tell), cloth-covered, foam ear-cushions.

The K4's cord is straight (coiled cords like the K340's are becoming rare nowadays), and it forms a Y junction where it splits to lead into the two earpieces. It is fitted with a molded 1/4-inch-diameter phone plug. A 1/4-to-1/8-inch adaptor is included for using the unit with portable equipment. Other specifications include a nominal impedance of 400 ohms, a power-handling capacity of 200 milliwatts (measured ac-

cording to the DIN 45582 standard), and harmonic distortion no greater than 1 percent. Price: \$99. AKG Acoustics, Dept. SR, 77 Selleck St., Stamford, Conn. 06902.

Lab Tests

Although this report is primarily concerned with the AKG K4 headphones, we also tested a set of K340 phones at the same time. The similarities in their basic design, and the obvious differences in physical construction, suggested that such a comparison might be informative.

The phones were tested on a standard headphone coupler, which simulates a human ear. Because no two ears are alike, and the coupler is not equivalent to any individual's ear, the measured frequency response does not correspond to what any individual can expect to hear from a headphone. This is especial-

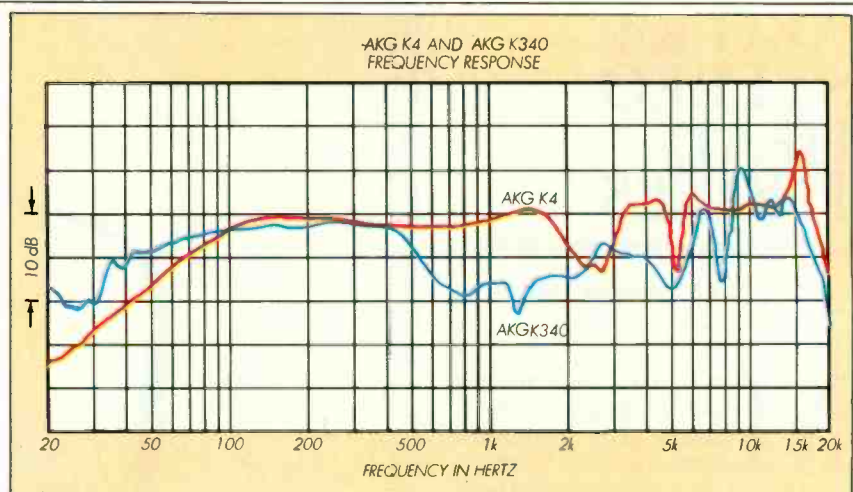
TEST REPORTS

ly true because the coupler's air cavity and the dimensions of a particular headphone cause high-frequency cavity resonances that can create sizable irregularities in the response curve. Coupler measurements can be used for comparing phones, however, and are quite valid at the lower audio frequencies.

As the graph shows, the frequency response of the K4 was almost perfectly flat from 100 to 2,000 Hz, falling off at lower frequencies at a 6-dB-per-octave rate (down by about 16 dB at 20 Hz relative to the midrange level). Above 2,000 Hz there were some dips and peaks, as expected, but the overall response was quite uniform to beyond 15,000 Hz. A direct substitution of the K340 phones in this test showed a stronger bass response (5 to 8 dB above that of the K4 at frequencies below 50 Hz) and a depressed upper midrange between 500 and 5,000 Hz. The highest frequencies were reproduced at about the same level by both phones (which were driven with a 1-volt signal for this test).

The phones had fairly similar impedance characteristics, constant from 20 to 5,000 Hz, with a slight rise in the 10,000- to 15,000-Hz region. The K4's impedance was about 300 ohms, and the K340's was about 400 ohms. Their sensitivities were almost identical in the lower midrange, where each had a flat response and developed a 100-dB sound-pressure level from a 1-volt input.

The remaining part of the measurement was a harmonic-distortion test, at 100 Hz, as a function of drive level. This revealed the most substantive performance difference between the two phones, which was not at all surprising in view of their disparate sizes and construction. The K4 had a distortion of about 6 percent at 1 volt, which rose linearly to 11.6 percent at an extremely loud 10 volts. Both second and third harmonics (at 200 and 300 Hz, respectively) were present, with the second predominating. The larger diaphragm area of the K340 (which requires a smaller excursion for the same output) gave it a clear advantage here. At 1 volt, its distortion was only 1 percent, increasing gradually with level to 4.7 percent at 10 volts. In this case, the predominant



component was the third harmonic.

By our measurement the K4 weighs about 2½ ounces (exclusive of cable). The cable length, from the Y-junction to the plug, is just over 8 feet. In contrast, the K340 weighed about 14 ounces, though it is surprisingly comfortable.

Comments

Although we might have made some fairly good guesses about the relative sound qualities of these two headphones based on our measurements, the only valid way to judge them, either singly or against each other, is by listening.

If we had not measured them, we might have concluded that the larger K340 was somewhat dull and lacking in high-frequency response. But a more careful comparison suggests that the superior smoothness of the K4 at high frequencies, possibly aided by its supra-aural design, was responsible for its delightfully open, airy quality. Unquestionably, it did not have the "bottom end" of the K340, but it did have a sweetness at the other end of the spectrum that we found most attractive. In addition, it seems probable that the diminished output of the K340 at upper middle frequencies (where it was 5 to 8 dB under the level from the K4), combined with its stronger bass, had the effect of making it sound dull and distant by comparison to the K4.

I have been using a pair of AKG K340's for several years, and I have

always considered them to be one of the better-sounding circumaural models. I must point out, however, that the sound of a supra-aural headphone is intrinsically different from that of a circumaural one, regardless of their measured frequency responses. This makes comparing them akin to comparing apples and oranges or, perhaps, oranges and tangerines. Both of them have their strong points. For monitoring during a recording session, a circumaural headphone is a virtual necessity if one is to hear through to the microphones, but for general listening I must admit I generally find supra-aural phones more pleasing.

Each of these AKG phones is an excellent example of its genre. I found the wearing comfort of the K4 to be excellent, although that could be said about many good lightweight headphones. Among circumaural phones, the AKG K340 would rank very high in comfort because of its light weight, well-designed headband, and soft ear-cushions. Lest the high measured bass distortion of the K4 seem to be a flaw, remember that the distortion consisted almost entirely of low-order harmonics, which are not musically objectionable at these very high sound levels and especially in that frequency range. They were never audible in listening tests, even at rather high levels; on the contrary, the clarity and transparency of the K4 were its most striking characteristics.

Circle 144 on reader service card

“Magnavox? You sure?!”



(sigh!) We're not complaining, but it does get monotonous having to tell people it's really a Magnavox every time they see a Magnavox. Like with our innovative Video Camera and Stereo VCR Deck.

The Video Camera, a mere 2.4 lbs., fits into your hand. All you do to shoot is push a button. The camera is so sensitive you can shoot from the light of a birthday candle. The automatic focus guarantees crisp, clear pictures every time.

The portable Stereo VCR recorder, just 7 lbs. with battery, slips out of the docking tuner, connects to the camera and you're ready to shoot anywhere with stereo sound.

For TV use with total remote control, the recorder slips back into the docking tuner. Incidentally, the Magnavox Stereo VCR allows the unattended recording of as many as 8 events during a 14-day period.

Having read this much, you might think you're reasonably equipped to recognize your next Magnavox. Sure.

MAGNAVOX
America's best kept secret.

New from TDK



THE FIRST VIDEO TAPE TO BREAK THE SOUND BARRIER.



Reach a new high in stereo recording

Q Why do I need Hi-Fi video tape?

A The critical demands of today's sophisticated and complex Hi-Fi VCRs require a video tape of equal sophistication. This video tape must be virtually free from dropouts and jitters, have unsurpassed particle density, and deliver unparalleled uniformity and stability in picture and sound quality. Additionally, the cassette transport mechanism must be unerringly precise to insure proper transferring of the Hi-Fi audio, video, and control signals.

Q Why has TDK developed such a tape?

A As the world leader and innovator in home video tape, we knew it was our responsibility to develop the highest quality VHS and Beta video cassettes that would be completely compatible with any Hi-Fi VCRs. Just as we developed a video tape that made six-hour VCRs a reality. And with almost 50 years of magnetic media technology behind us, we knew that we could develop a TDK Hi-Fi video tape that would

deliver the kind of high-quality performance that has become synonymous with our name.

Q How is TDK Hi-Fi Video Tape able to deliver such a critical performance?

A For a tape to deliver excellent audio/video reproduction, it must have—among other factors—excellent signal-to-noise ratios in both chrominance and luminance. TDK has accomplished this by developing new super-refined, Super Avilyn magnetic particles that are thinner, shorter and more uniform than any others currently available. This allows them to be packed more densely for improved audio/video performance.

Q Can you be more specific?

A Our technical specifications show the benefits: Video S/N +4.5dB, chroma +5dB, audio frequency response +2dB, and sensitivity +1dB, compared to our Standard Reference tape. All of this adds up to crystal clear, life-like color reproduction. And with an audio frequency response of 20-20,000 Hz, plus total harmonic distortion of under 0.3% at 7 kHz, you've got to see and hear TDK Hi-Fi on your new Hi-Fi VCR to believe it.

Q What else should I know?

A In addition, TDK developed a new high density/durability binder system which facilitates optimum particle dispersion and delivers the lowest dropout rate in its class. Our ultra-smooth/flat base film and high-conductivity back coating, in conjunction with our super-precision-made SQ shell mechanism (built to tolerances 2.5 times higher than industry standards), provide for the smoothest running performance of any video cassette designed for Hi-Fi VCRs.

Q Can I use TDK Hi-Fi tape for special digital sources?

A Yes. Because of its surface smoothness, superior signal-to-noise ratios and its low modulation level, combined with an ultra-low dropout count, TDK Hi-Fi is ideal for PCM digital recording. With TDK Hi-Fi's unique features, PCM recordings can achieve their full potential.

For the finest in Hi-Fi VCR and PCM enjoyment, there's no better video cassette than TDK Hi-Fi.

TDK
Don't just tape it. TDK it.

HI-FI VCR'S STATE OF THE ART

A gallery of video cassette recorders with sound so good that it almost rivals the digital Compact Disc.



PHOTOS BY RED AXON/QUIP-HANT BACKDROPS

by Fred Petras

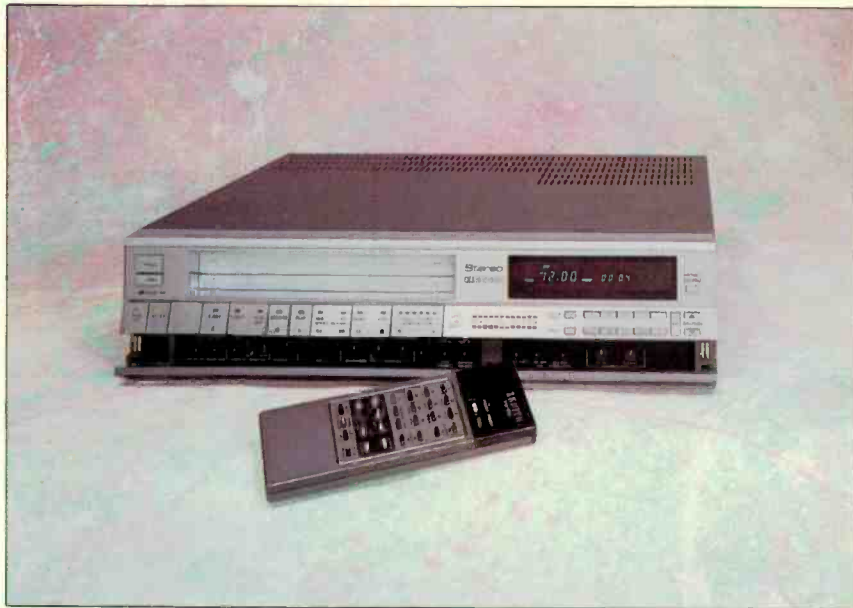
IMAGINE sitting in your favorite easy chair or sprawling on the sofa in your living room, munching on popcorn or sipping a drink, all the while watching a huge TV picture accompanied by hiss-free full-stereo sound as magnificent as you've ever heard from a deluxe audio component system. It's all so realistic you have to keep nudging yourself, thinking that you're actually experiencing a 2001 fantasy. That's the kind of scene you've probably read about in the past year or so, and it was probably described as something you could look forward to some time in the future.

But in this era of high technology the future has a habit of being telescoped into the present, and you need wait no longer to enjoy the full video-sound experience at home. It's possible right now.

What hastened this is the advent of high-fidelity video cassette recorders (VCR's) equipped with Beta Hi-Fi as first developed by Sony

The Panasonic PV-1730 VHS Hi-Fi VCR (\$1,400) has stereo linear audio with Dolby noise reduction and many optional features.

*The Zenith
VR-4000 VHS
Hi-Fi VCR
(\$1,200) has a
stereo linear audio
track with Dolby
and a stereo TV
adaptor jack.*



and VHS Hi-Fi as later developed by JVC. STEREO REVIEW published the first test reports on Beta Hi-Fi in April 1983 and on VHS Hi-Fi in July 1984. These stereo-sound video recording/playback systems are incorporated in thirty-five table-top and portable VCR's from nineteen companies at this writing.

Until recently, the typical VCR offered an audio frequency response at its *fastest* speed of about 70 to 10,000 Hz, dynamic range of 40 to 50 dB, wow and flutter of 0.15 percent, signal-to-noise ratio of around 40 dB (45 dB with Dolby), channel separation of 40 dB, and harmonic distortion of 3 percent. In contrast, today's new hi-fi models are truly that, offering a virtually flat response from 20 to 20,000 Hz, dynamic range of greater than 80 dB,

wow and flutter of 0.005 percent, signal-to-noise ratio of 84 dB, channel separation greater than 60 dB, and harmonic distortion of 0.3 percent.

Some of the older "deluxe" models offered stereo sound, but it was only on a par with that of budget-priced table-top combination "music systems." Today's hi-fi VCR sound—while analog—is virtually in the same league as that of digital Compact Discs (CD's) or of video cassettes recorded on a PCM processor/VCR combination.

Frequency modulation is the key to VCR high fidelity. FM signals are far less prone to noise interference—which is why FM radio transmissions generally sound so good. Both the Beta and VHS Hi-Fi systems modulate the frequency of

high-frequency carriers with two audio signals. But this is the only methodology common to the two systems. They differ markedly in all other respects except the end result, sonic superiority.

In recording on a Beta Hi-Fi VCR the stereo audio FM (AFM) carriers are positioned between the chrominance (color) and luminance (brightness) video signals. The combined video and AFM signals are laid down on diagonal tracks on the tape by two video heads rotating on a drum that is at an angle to the tape. This creates a writing speed of 23 feet per second (an audio cassette's tape speed is $1\frac{7}{8}$ inches per second). To insure compatibility with standard Beta VCR's, an old-style longitudinal *mono* soundtrack and a 60-Hz sync signal are simulta-

*The Aiwa
AV-50M portable
Beta VCR becomes
Beta Hi-Fi with the
addition of a SV-
50M adaptor and
integrated ampli-
fier (\$950).*



neously laid down by stationary heads along the edge of the tape.

VHS VCR's also record video signals using rotating head drums to create diagonal signal tracks on the tape, but their "Hi-Fi" system is totally different. It uses two additional drum-mounted recording heads that are for the audio carriers only. On a VHS Hi-Fi VCR, the audio and video signals are recorded in different layers of the videotape's magnetic coating in a process called "Depth Multiplex" recording. The two-channel frequency-modulated hi-fi audio signal is recorded first, deep into the magnetic coating. Then the video signal is recorded on top of the audio signal in a shallower layer. In playback, the audio signals on the deep layer of the magnetic medium are read through the video information recorded on the surface layer. To help separate the signals, the azimuth angles of the video and audio heads are different. For compatibility with regular VHS machines, a two-channel longitudinal audio track is also recorded along the tape's edge.

The new VCR formats' forte is their superb sound. Their picture quality is largely the same as that of regular VCR's, so don't expect visual miracles when you enter a store to sample what Beta and VHS Hi-Fi video are all about. The big difference is in what you'll be able to hear.

You can already hear a lot with the prerecorded hi-fi video cassettes that are available for purchase or rental. And soon you'll be able to record high-quality stereo TV broadcasts off the airwaves. Last March the Federal Communications Commission cleared the way for multichannel TV broadcasting, and many stations are getting ready to "go stereo" as soon as possible (broadcasting TV stereo sound and, perhaps, simultaneously broadcasting a separate audio channel that can be used for a second language or alternate commentary).

With one exception, Harman Kardon's VCD-1000, currently or imminently available hi-fi VCR's are not equipped to decode stereo TV broadcasts. Some VCR's are "stereo-ready," requiring only an add-on adaptor/decoder that connects to a jack on the VCR to achieve full stereo TV capability. At this writing only a handful of hi-fi VCR's have connections for decoders, namely three Sony Beta models and two VHS units, one from Mitsubishi and one from Zenith.

Harman Kardon's VCD-1000 VHS Hi-Fi VCR contains a built-in stereo TV tuner, permitting direct, stereo TV recording without an accessory decoder. Most future hi-fi models can be expected to include a stereo TV decoder or at least connections for an accessory decoder. Most of the forthcoming stereo TV sets and stereo TV tuners will have line-level stereo audio-output jacks that can be connected to the audio input jacks of a hi-fi VCR. The audio from the stereo TV can then be added to the video from the VCR's tuner and recorded on the tape with no loss of quality. The same method can be used to record an FM simulcast.

Meanwhile, there's quite a selection of prerecorded hi-fi video cassettes to enjoy on a VCR linked to an audio system and to a TV set or



projection TV system at home. Currently there are reportedly more than 450 Beta Hi-Fi titles on the market, including the best-selling music video "Making Michael Jackson's Thriller," as well as such popular movies as *Raiders of the Lost Ark*, *Flashdance*, *Terms of Endearment*, *Silkwood*, and *Tootsie*.

By far the most popular are the short-play music videos, which bring today's performing artists to your home TV screen in a highly satisfying combination of realistic sound and first-rate picture. Sony says there will soon be many more titles available at local stores as a consequence of its new duplicating system, which can process hi-fi (and regular Beta) video cassettes at transfer speeds more than 100 times faster than real-time processes (in

JVC, the company whose engineers invented the VHS Hi-Fi system, has a full-featured one of its own, the HR-D725U (\$1,295).

*The Sony
SL-2700 Beta Hi-
Fi VCR (\$1,500)
has many features
as well as PCM
digital and stereo
TV adaptor con-
nection ports.*



which a 90-minute program requires 90 minutes for duplication).

The VHS Hi-Fi video cassette selection is still quite skimpy, but the situation is improving as video software producers respond to increasing demands for such tapes. RCA, for instance, has created its own production unit to help fill the demand for original music programs. In time, you'll find the selections in VHS Hi-Fi about equal in scope and variety to those of Beta Hi-Fi.

In the works at various movie and TV production houses and recording studios are new approaches to sight-and-sound hi-fi video cassettes. One RCA executive mentioned plans for "long-form programs with a concert base, plus additional conceptual materials; and musical movies with little or no

dialogue, such as *Return to Waterloo*. These programs can take many shapes."

The hi-fi VCR's can also serve as superb audio-only recorders where long programs of fine stereo sound are desired. With VHS units you can record up to eight hours of hi-fi audio on a T-160 cassette, or in the Beta format up to five hours on an L-830 cassette. Interestingly, you'll get the same fine results at all recording speeds.

Depending on where you live and what local discounting practices are, going the hi-fi audio-only route may be as economical as (or even more economical than) recording on audio cassettes. And you'll have sound superior to that of even the best audio cassette (or home-type open-reel) recorders. A check of video

tape prices in the New York metropolitan area reveals a potential for recording VHS Hi-Fi audio for as little as \$1.25 per hour, and you can record for as little as \$1.80 per hour in the Beta format on major top brands of video tape. This compares with about \$2 per hour for the Philips audio cassette format on tape giving nearly comparable quality.

However, while hi-fi VCR's can produce exquisite sound at low tape speed, their ability to do so at any speed hinges on the quality of the video cassettes used. In a number of hi-fi VCR's, a tape with dropouts (signal loss caused by flaking oxide, scratches, or dust particles) can cause the audio FM circuits to malfunction (by losing their lock on the FM carriers). This can result in sound gaps or a sputtering of the

*The Hitachi
VT-88A VHS Hi-
Fi VCR (\$1,195)
has a 14-day timer
and a mono linear
audio track. Its re-
mote control is
standard.*



soundtrack in worst cases. Drop-outs may also cause a VCR to switch automatically to low-fi playback of the longitudinal soundtracks. Our advice—as with all other recording efforts—is to buy only top-quality, “big-name” tapes.

What about sound sources for such recording? The most logical seem to be digital Compact Discs or audiophile recordings of various types. Recording audio with a hi-fi VCR is an excellent way to get a long program such as a full symphony concert or opera into uninterrupted playback form, for sustained musical continuity and enhanced enjoyment. If you copy LP's, you can have the extra benefit of preserving the original discs.

The current and future availabilities of high-tech Beta and VHS Hi-Fi VCR's and stereo TV equipment make buying decisions somewhat more complex than with traditional VCR's and television sets. I suggest that you visit several audio, home electronic, and video stores in your shopping area to look and listen and to learn all you can before making a buying decision. Along the way, pick up as much descriptive literature as you can—product brochures, spec sheets, and so forth.

Then do your “homework.” This will include evaluating your existing audio and TV equipment in terms of adding a hi-fi VCR and eventual stereo TV capability. Can your present audio system reproduce the 20- to 20,000-Hz frequency response and 80-dB dynamic range of hi-fi video sound? A hi-fi VCR can deliver video sound only as good as your audio system permits. Check your system for its weakest element. Perhaps you need a higher-powered amplifier (or receiver) or better loudspeakers.

In considering stereo TV equipment, weigh the benefits of a separate TV tuner and a video monitor rather than a plain TV set. Units that are designed specifically for use in a high-fidelity audio/video system have separate audio and video input and output connections. If stereo TV is in your future as a hi-fi sound/picture source, I suggest that you seek out a specialty audio/video store rather than a department store. Specialty shops generally have more knowledgeable personnel and can give you more help in making the right choice.

While most hi-fi VCR's are somewhat higher-priced than regular models, you can buy a no-frills basic Beta Hi-Fi unit from Sanyo (Model

VCR7200) for \$670. Other Betas range up to \$1,500 for the full-feature Sony Model SL-2700. In the VHS format you'll find a starting price of \$995 in the Akai line on up to \$1,800 for a professional model in the Panasonic line. Lower-priced units are expected next year.

Audio specifications for hi-fi VCR's in each format are almost identical regardless of their price, since they have to meet certain basic qualifications as spelled out by licensors of the two formats. And nearly all have dubbing capability, headphone jacks, front loading, FM-simulcast recording capability, mono record/playback capability for compatibility with regular Beta or VHS VCR's, and stereo or mono record/playback for compatibility with regular units. For easy operation, most have wireless remote



controls, and half of them provide one-touch recording operation.

The hi-fi models have the same arrays of video features as those incorporated in most standard video cassette recorders, and the rule of thumb is that the more you pay, the more features you get. Determine your specific needs in this realm before going out to buy. If you now own a regular VCR, you have a handy reference point as to what you'll want in a hi-fi model.

I'll close with a warning: The difference between the sound of an old-style VCR and a hi-fi VCR is like the difference between a mono FM table radio and a sophisticated stereo component system. Once you've heard a hi-fi tape in a hi-fi VCR through a good audio system, there's no going back. □

*NEC's VC-739E
Beta Hi-Fi
(\$1,200) has a 21-
day timer for eight
events. NEC also
sells a VHS Hi-Fi
VCR, the VC-
N895E (\$1,400).*

THE SOUND OF MOVIES

A critic's choice of ten top sonic spectaculars
by Louis Meredith

MORE and more of my audiophile friends are adding equipment for playing video discs and tapes to their audio installations, and they are discovering to their delight that half the fun of home video is aural. When they tell me about it, I remind them (as tactfully as I can) that I made exactly that statement in these pages last July with a list of ten recommended video movie sonic spectaculars.

If you have only recently expanded your stereo installation to get that movie sound at home and missed or ignored my July article, the movies I recommended were: *Superman (The Movie)*, *Alien*, *Apocalypse Now*, *Saturday Night Fever*, *Forbidden Planet*, *Star Trek: The Motion Picture*, *West Side Story*, *A Star Is Born*, *Raiders of the Lost Ark*, and *Around the World in Eighty Days*. They're still classics, they're still available, and I still recommend them.

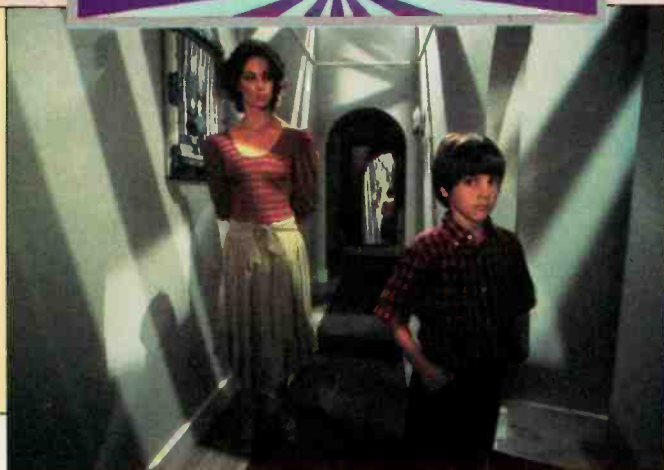
But people keep asking me, "Heard any good movies lately?" So I've made a list that is a pretty representative sampler of the better-sounding video movies released recently. With perhaps one exception, I wouldn't describe any of them as imperishable Art, but they're all respectable genre films, and, frankly, they sound so good I don't particularly care that they're not *Grand Illusion*.

Incidentally, I auditioned each of those on my list on LaserDisc, which for me remains the format of choice, at least until Beta Hi-Fi and VHS Hi-Fi versions become widely available. Regular tape versions of all of them, however, are in the stores.

1. TWILIGHT ZONE: THE MOVIE

(Warner Bros.)

Four directors (John Landis, Steven Spielberg, Joe Dante, and George Miller) contributed episodes to this affectionate tribute to Rod Serling's pioneering TV series. Dramatically, they range from the brilliant (Miller's sequence with John Lithgow's virtuoso freakout-on-the-airplane) to



WARNER BROS.

the saccharine (Spielberg's old-folks-at-the-rest-home vignette), but glueing the whole thing together is a state-of-the-art soundtrack and a nifty score by the extremely underrated Jerry Goldsmith. Warner's home version is, if anything, an improvement over what you saw in the theater, for the simple reason that *Twilight Zone: The Movie* is, of course, a TV show at heart.



WARNER BROS.

2. PINK FLOYD: THE WALL (MGM/UA)

Despite director Alan Parker's best efforts, an effective performance by rock star Bob Geldof, and brilliantly imaginative animation by Gerald Scarfe, this visualization of the Floyd's relentlessly downbeat concept album is a muddled, pretentious, ultimately tedious disaster. The music and sound, however, are another story entirely—whatever your feelings about the score, it is magnificently produced and



MGM/UA

performed, and the LaserDisc version of it is breathtaking. The format's audio capabilities need no better demo.

3. THE DEAD ZONE (Paramount)

Christopher Walken gets psychic powers and then all hell breaks loose in this sci-fi tale directed by David Cronenberg. For now, at least, it is probably the best of all the film adaptations of the works of horror-maven Stephen King. Needless to say, when all hell breaks loose, I prefer it in stereo, especially when it sounds as convincing as it does here.

4. FIREFOX (Warner Bros.)

Clint Eastwood gets his hands on a Russian super-MIG fighter that looks suspiciously like the ship Luke Skywalker schleps around in. The story line may be confusing (is it a cold war thriller? a Space Opera?), but the roof-rattling soundtrack will probably hold your interest.

5. NIGHTSHIFT (Warner Bros.)

Ron Howard's pre-*Splash* sleeper about two morgue attendants running an (ahem) "escort service" is one of my favorite little films of recent years. Besides wonderfully modulated comic turns by stars Henry Winkler and Michael Keaton, there's a lot of rock and r-&-b on the soundtrack, and the LaserDisc sound gives it all a nice velvety sheen.

6. BRAINSTORM (MGM/UA)

Special-effects wizard Douglas Trumbull's sci-fi thriller with the late Natalie Wood is a sort of *This Is Cinerama* of the mind, short on believable plot, long on thrills and roller-coaster rides. Fortunately for all concerned, even on the small home screen a lot of those thrills are realistically supplied by an excellent stereo soundtrack.

7. THE KEEP (Paramount)

Director Michael Mann, whose earlier *Thief* inexplicably featured a

bizarre electro-pop score by German weirdos Tangerine Dream, more recently offered this thoroughly confusing but visually striking combination of World War II action epic and apocalyptic horror film. I haven't the slightest idea what it all means, but, at home, the soundtrack's brilliantly portentous effects have given me nightmares, so I guess somebody did something right.



CBS/FOX

8. GUYS AND DOLLS (CBS/Fox)

One of the nicest fallouts of the popularity of home video has been the restoration of stereo soundtracks for older films, soundtracks that in many cases hadn't made theatrical appearances in years, if ever. Case in point: this new home version of Sam Goldwyn's brilliant production of the Frank Loesser/Damon Runyon classic, which gives you the chance not only to savor Marlon Brando at his peak, but to delight in beautifully balanced stereo versions of some of the classic film musical numbers of all time. An absolute must.

9. EDDIE AND THE CRUISERS (Embassy Home Entertainment)

This moody mystery story of an ahead-of-his-time Dylanesque rock star, who may or may not have died in a 1964 car crash, doesn't quite make it on the dramatic level, but it is evocative in its way, and full of sharp observations about youthful dreams and adult realities. As a bonus, it features a vivid neo-Springsteen score by Jersey Shore favorite John Cafferty. My home version sounds a little compressed compared with the CBS audio soundtrack, but what's here still has enough oomph to give the concert scenes of the *Cruisers* real excitement.

10. SUPERMAN III (Warner Bros.)

Richard Pryor is wasted in a Steppin Fetchit role, and the story line is thin, but director Richard Lester works his usual visual-comedy magic, Christopher Reeve is still endearing, and the soundtrack (including a snippet of a Marshall Crenshaw song!) is as slickly produced as the earlier films in the series, and, on LaserDisc, it is also just as impressive.



CBS/FOX

HOW TO GET THAT MOVIE SOUND AT HOME

by Ralph Hodges

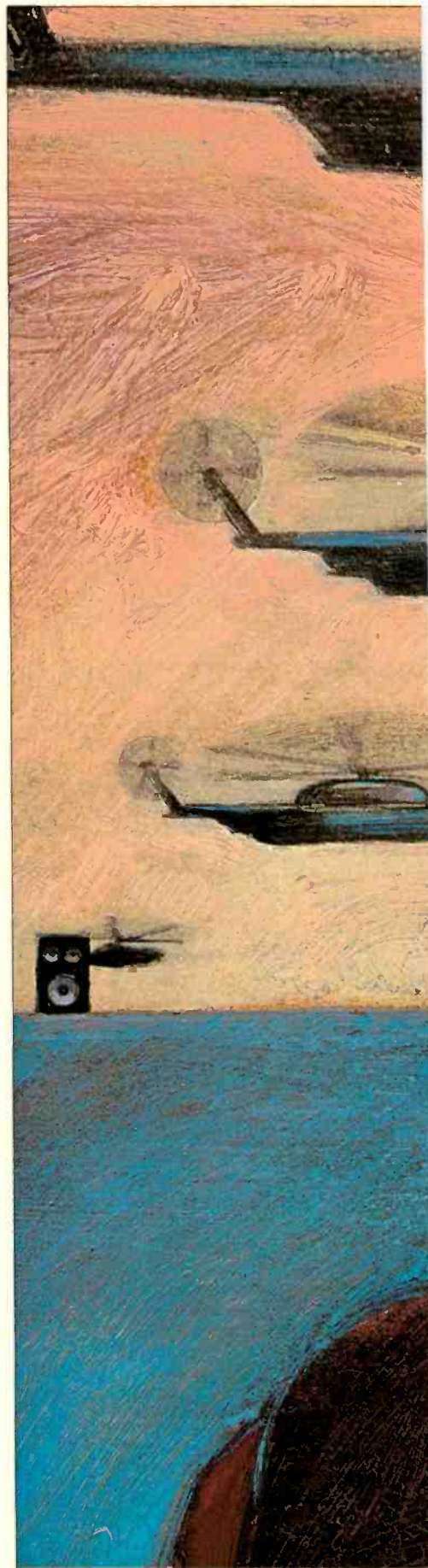
IF you, like me, are devoted to trashy, escapist, big-budget motion pictures in high-tech theaters, you know that a lot of the sound does not come from up front. The action seems to be taking place above your head, behind your back, and in your lap too. The ubiquitous Dolby Stereo soundtracks and their aggressive "surround" channels bombard you from loudspeakers at the sides and rear of the theater. We love it, of course.

But if you also shrink from ticket-line fist fights, lousy seats, soda spills from the balcony, sticky floors, and the entire student body of PS 63 in the eight rows ahead, you can join me in a universal hallelujah. Now you can take all the audio punishment Steven Spielberg and George Lucas want to dish out while sitting in the best seat in the house—your house.

Your good seat has been made possible by the film sound system officially known as the Dolby Stereo SVA 35-millimeter optical format (shortened to "Dolby Stereo" on theater marquees and in this article). Like garden-variety home and movie stereo, Dolby Stereo comes in two tracks, nominally left and right, and it is recorded in optical form on the film. But snuck in there—via a simple phase-matrix scheme—is a single channel of surround-sound information that, extracted by Dolby cinema processors in the theater, gets shunted to the

side and rear speakers (the "surrounds") and provides much of the aural excitement of many Dolby Stereo presentations. Now when a videotape/videodisc manufacturer duplicates a movie with a Dolby Stereo soundtrack, these two tracks, surround information lurking within, are supplied as the master material. Played as stereo the video cassette or video disc sounds like stereo; in mono, it sounds like mono. But—and this is the happy accident—when played through the home-stereo equivalent of a Dolby cinema processor and suitably placed surround-sound speakers, the surround channel emerges, unleashing helicopters in the belfry, star destroyers through the back wall, and all the lease-breaking potential of a hundred intergalactic conflicts.

The Dolby Stereo format, which could as easily be recorded on an LP or audio tape as on film, is as straightforward a piece of analog audio engineering as you'll find today—except for two complications, both of which bear on the matrixed surround information [see Figure 1(a)]. The first is a "diluted" form of Dolby-B noise reduction that is applied to the surround information only before it is slipped into the final two-channel mix via the matrixing circuits. A Dolby cinema processor is equipped to deprocess the B-type encoding once the surround information has been ex-







Three surround-sound processors with different combinations of circuitry. From top to bottom: the Fosgate 101A (with Tate matrix decoding, signal-steering logic, remote control); Pioneer's SP-101 (with delay line, several simulated-stereo settings, multiple level and low-frequency controls); and Phoenix Audio's P-250 (with wide-range delay line and separate surround and center-channel outputs).

tracted from the playback matrix [Figure 1(b)]. The surround signal in the theater thereby benefits from a modest amount of noise reduction (about 5 dB) over and above 10 dB provided by the professional Dolby A noise-reduction system that is applied to the entire soundtrack. (This Dolby A encoding is for theater presentation only; its processing is decoded by video tape/disc manufacturers.)

The second playback complication is an audio delay line through which the surround signal passes before being reproduced in the theater. The most compelling reason for the delay is that many of the audience will find themselves sitting closer to the surrounds than to the front speakers. Therefore, they are likely to hear the surround speakers first (and to localize them as the sound sources even for on-screen action) unless they are deliberately made to sound later. The delay for the surrounds is not present in the soundtrack itself but is supplied, in adjustable lengths and levels, by the in-theater processor. It is also injected, in nominal amounts, when the soundtrack is monitored during mixing, so that the mixer operators can judge what the effect is likely to be when the film is exhibited. In other words, the delay, even though not on the film, is to be considered an intrinsic part of a Dolby Stereo presentation and is anticipated in the mixdown.

The interesting thing about all of this processing is that substantial portions of it can be *missing* during home playback, yet you will still get many of the sonic effects (though perhaps not precisely the ones intended). None of the home cinema-sound processors have all the circuitry contained in the professional model anyway.

What you need for do-it-yourself surround-sound presentations, besides Dolby Stereo encoded soundtracks, are some additional loudspeakers, the amplifiers necessary to drive them, and a decoder that performs some, if not all, of the relevant functions of a professional Dolby cinema processor. Were it not for a lack of noise reduction and delay, many of the four-channel SQ and QS quadrasonic decoders of yesteryear and the so-called Hafler circuit (Figure 2) behave tolerably well as surround-sound extractors. So if you happen still to have one of these components and an extra loudspeaker or two, get them out of mothballs immediately.

ROY SCHNEIDER

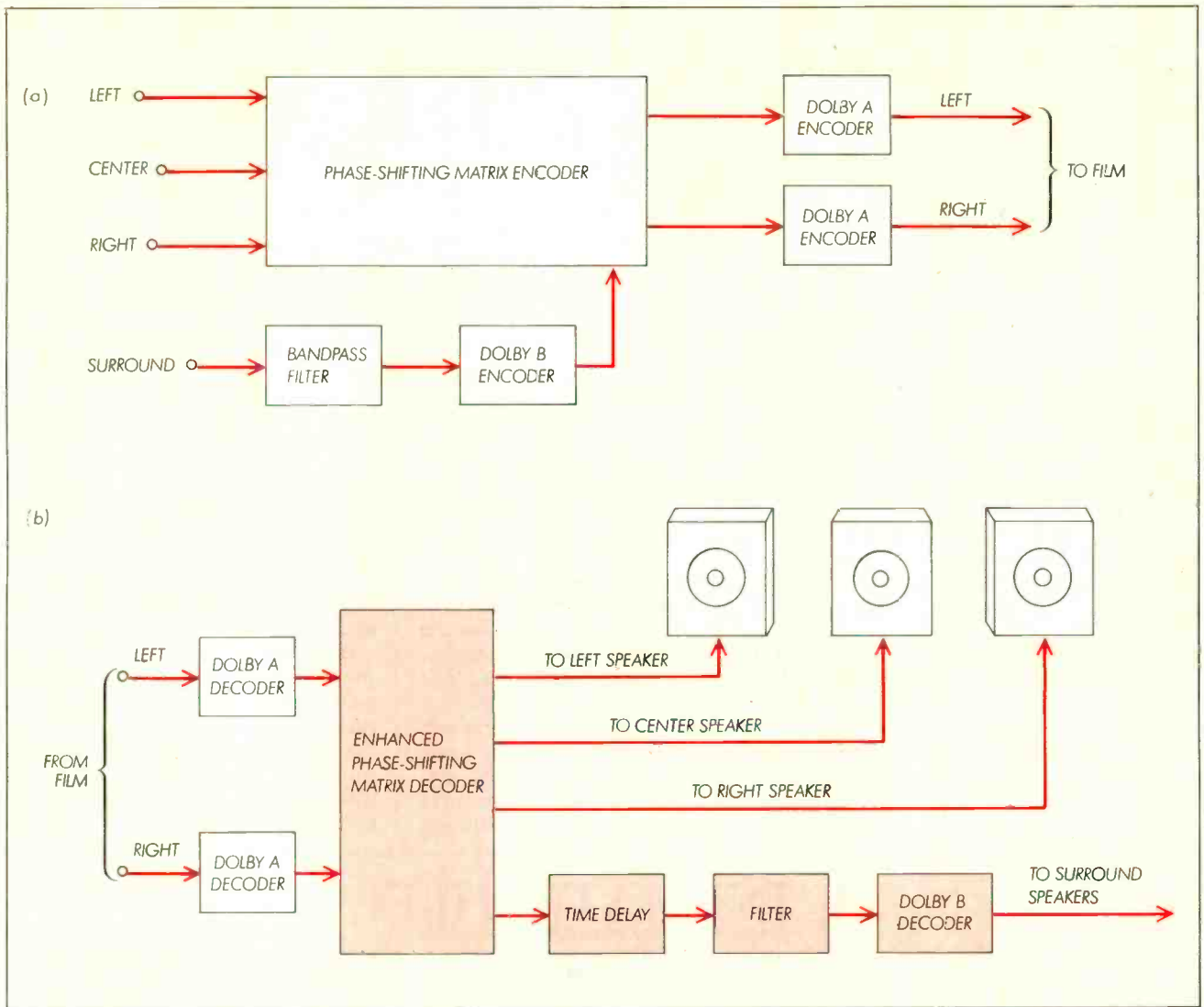


Figure 1. A Dolby Stereo movie-sound encoder (a) encodes the surround channel as a phase-shifted signal within the two optical soundtracks. A theater decoder (b) has Dolby A decoding. Home units have various combinations of the circuits in the tinted areas. The Dolby A encoding is undone by video disc and tape manufacturers.

The new products that were designed with surround-sound extraction in mind have differing combinations of circuits found in the cinema processors. Again, however, none of them have everything. Surround Sound Inc.'s M-360 does have half-strength Dolby B and an adjustable delay for the surround channel, entitling the unit to display the Dolby MP Matrix logo (a newly introduced seal of conformity to Dolby Labs' specifications). But the M-360's matrix decoding circuitry, although matching the basic Dolby scheme, has been simplified and does not have such logic refinements as those used by Dolby to inhibit crosstalk.

The Fosgate 101A employs the same Tate-Audio decoding and sound-steering integrated circuits as the professional Dolby processors, but it does not have quite the same

matrix parameters (Dolby modifies the Tate-IC performance for its own purposes). Dolby B and delay are absent. Phoenix Audio's P-250 has a center-channel output, essential in the theater but perhaps not necessary at home, and a delay line, but the matrix is again simple (though theoretically correct), and there is no Dolby B. Pioneer's SP-101 Synthesized Surround processor has only a choice of derived stereo-surround circuits, a delay line, and several interesting tone controls, but it has no Dolby B or sound-steering circuits. Other surround extractors waiting in the wings seem to be similarly compromised.

But how much does it matter, really? Having the SSI M-360's Dolby B path for the surround signal is nice, particularly since noise does tend to build up in the surrounds. Yet there is so far no practical

means of accurately calibrating a Dolby B circuit in a home processor, and many listeners seem to find the reduction in noise too subtle to be noticed most of the time anyway, especially considering the already high noise level of many soundtrack recordings. Dolby Labs tends to insist on delay even for home units, but it may not always be missed if eliminated.

The Fosgate doesn't exactly follow the Dolby matrix parameters, and in fact develops two surround signals (left rear and right rear) instead of just one. But even at their best, surrounds cannot pretend to anything like precise localization. A shift of a few degrees in angular image positioning amounts to nothing at all; "getting the general idea" is the important thing, and Fosgate's signal-steering logic can contribute materially to that result.

In short, the consensus of those who have taken the plunge into surrounds is that *all* of the extractors, taken individually, deliver heaps of satisfaction with Dolby Stereo soundtracks — when they are set up with careful regard to the manufacturers' instruction manuals and speaker-placement recommendations. There are differences between them, but not necessarily differences that awaken strong preferences. And the differences themselves

may not be easy to put a finger on: a bit more of a feeling of "spaciness" here, a small shift in localization there, and so on.

For the time being, almost everything looks like a safe buy. You can always start with the Hafler circuit, of course. It requires just one or two more speakers (but not an extra amplifier) and associated speaker cable.

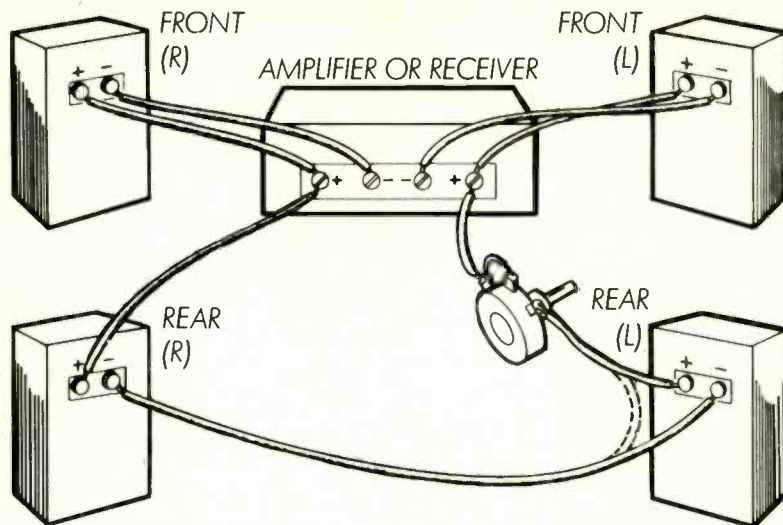


Figure 2. The surround speakers in the "Hafler" hookup are connected in series across the amplifier's positive (+) outputs. You may use only one rear speaker, and the variable resistor (20-50 ohms, 5-10 watts wirewound) is only for when the surrounds end up being too loud.

Surround speakers and their amplifiers should ideally be chosen according to the same criteria as the front-channel speakers and amplifiers—but, of course, you won't take this sensible advice, and neither do motion-picture theaters. Smallish but good speakers that can be hung on the wall suit most home settings—and many theaters—admirably. If you must, make do with one

speaker well behind and not aimed directly at you. But two surround speakers located somewhat above and behind the listening and viewing area are usually more effective and afford more flexibility in placement.

In judging the quality of the surround effect, listen for a thorough and seamless wraparound of the acoustic environment that call for it (as when you are engulfed in the same windstorm, snake-infested jungle, or explosion as the poor wretches on the screen) and for continuity of movement as objects whiz around.

In the end, positioning surround speakers is as much a matter of intuition and common sense as anything else. If the sound in front doesn't join up seamlessly with the sounds to the side and rear, move the surround speakers forward or raise their volume. If the surrounds

CINEMATIC HI-FI

ANY thought given to full-scale reproduction of Dolby-Stereo soundtracks at home immediately raises the question of how it's done in commercial theaters. After all, the name of the game is sonic fidelity, and we have to know what it is we are trying to be faithful to. The accompanying photo, not of a commercial installation but of Lucasfilm's dubbing theater used for the final mixing of cinema soundtracks into the various release formats, reveals many of the answers.

Back lighting of the perforated screen shows the five loudspeakers called for by the original 70-millimeter-film, six-track audio format when it was first introduced. (Most front-channel movie speakers are behind an acoustically transparent projection screen.) Hollywood's thinking at the time the first six-track systems were built was that if you wanted a sound image to appear to come from a particular place on the screen, put a speaker there. So five discrete, full-range, magnetic-soundtrack channels were dedicated to left, mid-left, center, mid-right, and right speakers, with the sixth audio channel driving surrounds out in the

auditorium (built into the walls and invisible in the Lucasfilm studio).

The more recent Dolby scheme for the six-track magnetic format reduced the mid-left and mid-right behind-screen speakers to bass-reinforcement roles only (for frequencies below 200 Hz) to meet sonic demands of modern soundtracks, and today the bass is often further augmented by special subwoofers. In the Dolby Stereo 70-millimeter scheme, then, any audio directional effects to come from the neighborhood of the screen are produced only by the full-range extreme left and right speakers in home-stereo fashion. The center speaker, also operating full-range, insures that dialogue stays centered, even for viewers far off the screen's central axis. According to Lucasfilm technical director Tomlinson Holman (who was also one of the founders of the Apt Corporation), "The use of full-range mid-left and mid-right loudspeakers, particularly if the theater is unequalized, has proven likely to smear the sound image with phase anomalies and erratic spectra."

In adopting Dolby Stereo techniques to 35-millimeter optical soundtracks (used in the vast majority of theaters, and the original source of the sound on

prerecorded video discs and cassettes), it was decided to limit the format to two tracks of information, left and right, and to derive "feeds" for the center, behind-screen system and the surround-channel speakers on the basis of in-phase (center) and out-of-phase (surround) interchannel phase relationships. This is very much what matrix quad decoders of the Seventies did and why they work reasonably well with stereo soundtracks containing an encoded surround channel.

In a schematic sense, therefore, the reproduction of a Dolby Stereo soundtrack at home needn't materially differ from its reproduction in a theater. True, a real movie house will tend to use more surround speakers, but this merely reflects the need to serve a larger listening area and to diffuse the surround channel for those unfortunate latecomers who are forced to sit quite close to one surround speaker. Then there is the center speaker, a tradition and a necessity in the theater, but not usually considered vital to satisfactory results at home. At home, of course, you have the luxury of sitting where you please, and phantom center-channel imaging is usually better to begin with.

are too conspicuous, turn them down or move them back and/or up. And if, in the final arrangement, you can contrive to get the listening area closer to the front speakers than to the surrounds, you may find you can dispense with any delay on the surrounds altogether.

Finally, if you remain uncertain about just what you're supposed to be hearing, and confusion and doubt overwhelm you, go to the movies (in a good Dolby Stereo theater) and pay attention. Be forewarned, however, that not all Dolby Stereo movies have sounds specifically encoded to emerge only from the surround speakers.

The wide acceptance of the Dolby Stereo system has led to a movement in the direction of a "standardized" motion-picture theater, one in which the audio facilities are predictable and acceptable to the point where a film shown in one theater may actually sound something like the same film shown in another. This was literally unheard of even a short time ago, and it can give the impression that with Dolby Stereo movie sound has reached some sort of final development.

Not so. For one thing, Lucasfilm's director of engineering, Tomlinson

Holman, has given fair warning that Lucasfilm is not altogether pleased with surround sound as reproduced by simple distributed-source speaker systems. A few films, beginning with *Apocalypse Now* in 1979, have employed separate left-rear and right-rear stereo surrounds, usually via an elaboration of the Dolby 70-millimeter six-track magnetic format, and interest in such separate surrounds appears to be growing. Holman is not yet among the interested parties ("It can work fine for one or two people ideally seated, but not for a theater-full all over the place"), but he has ambitious other plans, suggesting that the full flower and final fruit of cinema sound are still ahead of us. After all, developments in this field have once again made it possible for us to experience much of the excitement of the theater without ever leaving our living rooms. Certainly the motion-picture theater industry is not going to put up with this situation for very long. What would they do with all those empty, bubblegum-ornamented seats?

And do not get the idea that progress in surround-sound effects is going to be limited to feature motion pictures. If certain portentous re-

ports have any substance, music video and broadcast-TV producers (who now have stereo TV to play with) are also interested. According to Tate-Reber Productions, a Tate Audio affiliate, its version of the old SQ four-channel matrix (providing stereo surrounds) is already at work for such notables as Michael Jackson, Kenny Loggins, Barry Manilow, and the *Johnny Carson Show* (imagine Ed McMahon in stereo!). Furthermore, Tate has a plan whereby a feature-film soundtrack will be mixed from the outset with SQ stereo surrounds for the home-video media, and from *that* will derive the mix for theater releases.

Should all this come to pass, it will give great impetus to the Tate/Fosgate technology: surround-sound entertainment, for better or worse, will be all over your home screen. But what will you do then if you've already purchased another brand of surround-sound extractor? Not to despair. Just as the present Tate decoding scheme does a reasonable job with the Dolby MP matrix, so will a Dolby-type left-minus-right decoder give you something with the Tate SQ productions—until the next major breakthrough at least. □

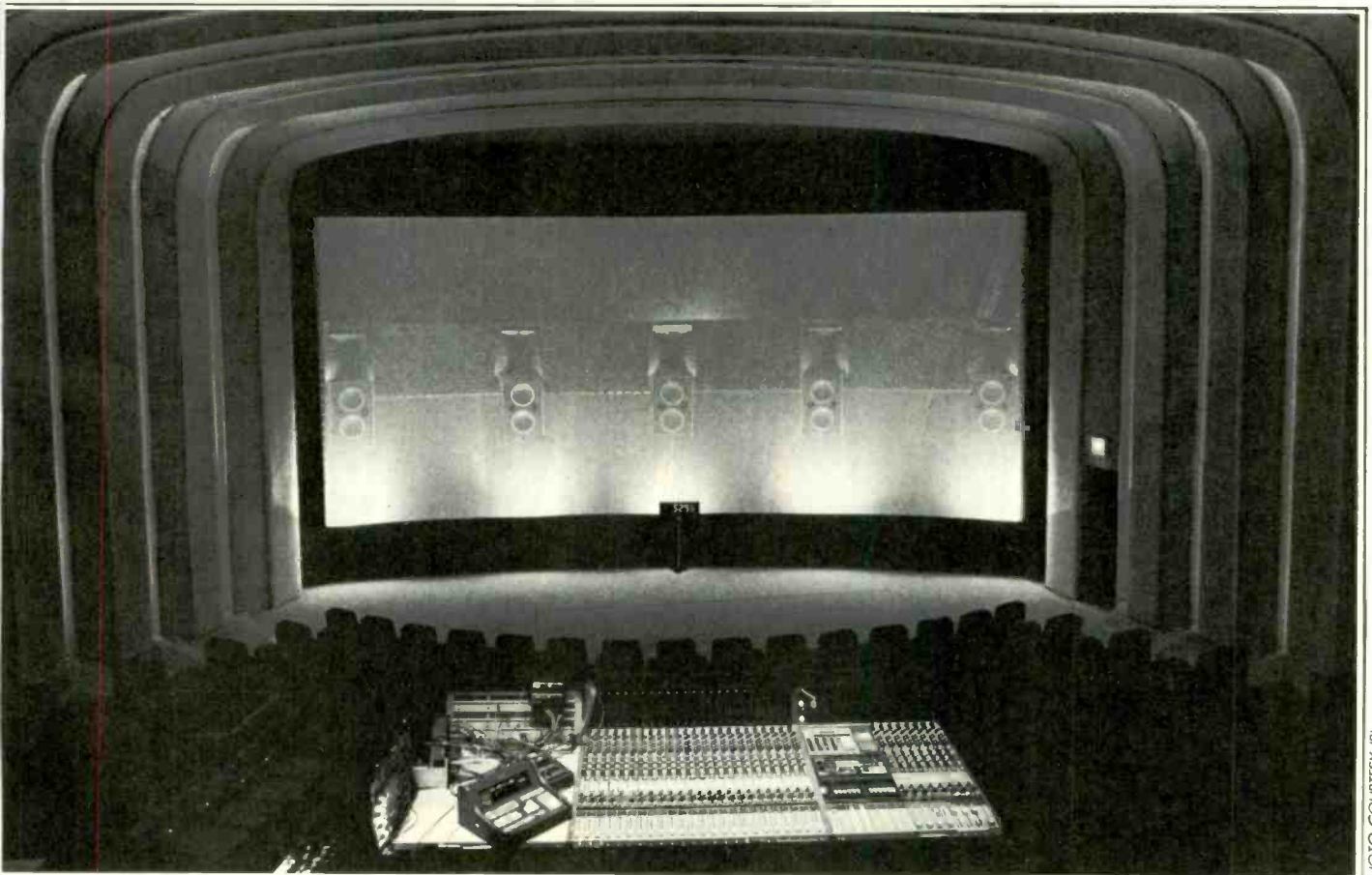
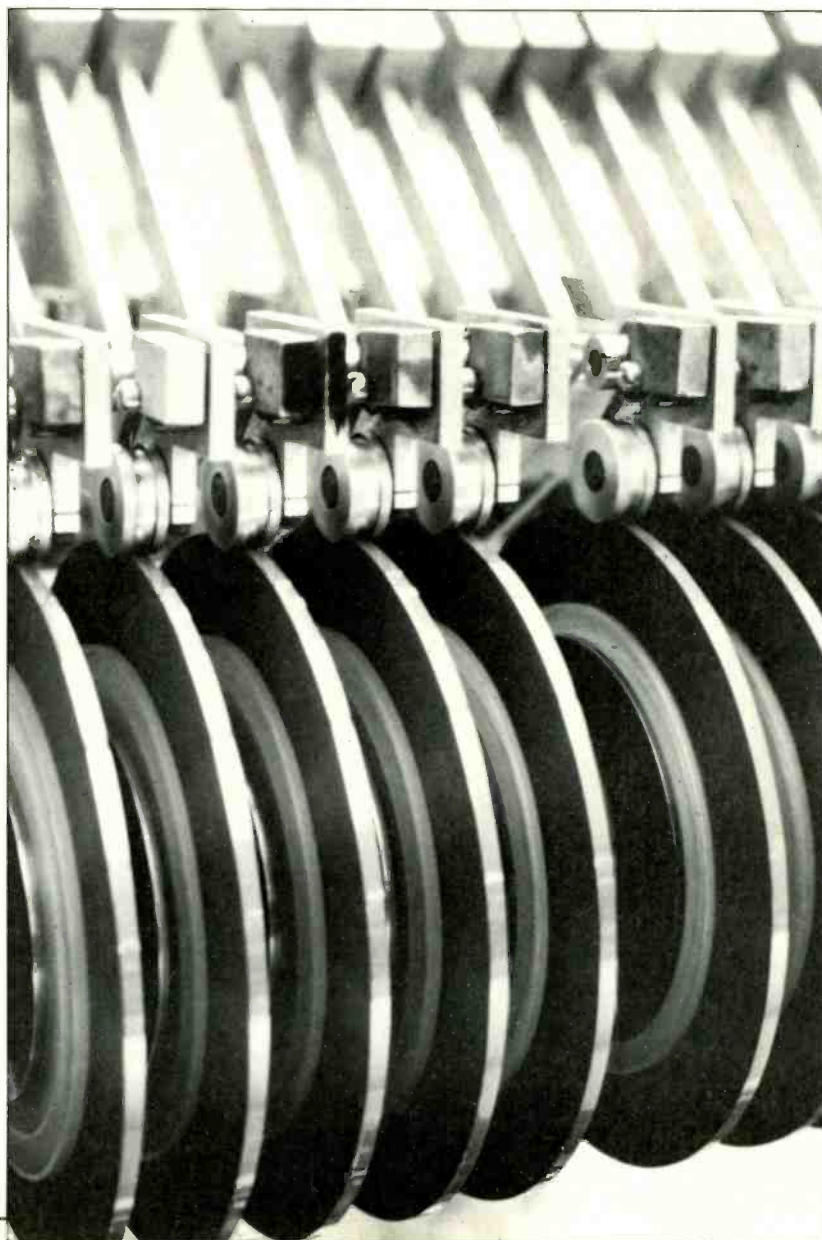


PHOTO COURTESY JBL

TAPE WINS AGAIN

*Manufacturers of audio and video tape
meet the challenges of new technology*

by Ian G. Masters



In tape manufacturing, the magnetic formulation is applied to sheets of the backing material. The sheets are slit to the desired width and wound in "pancakes."

MAGNETIC recording has always held a kind of perverse fascination for me. It's partly because it can be an extraordinarily creative medium at relatively low cost. Prior to the widespread availability of tape equipment in the Fifties, you *could* buy home disc recorders if you really felt the urge to immortalize the noises you or your family made, but they were awkward to use, expensive, and terrible. You could only record for a couple of minutes straight, with no chance for correcting errors or stumbles. Then the disc might give you a dozen plays (on a good day) and was ruined.

Along came tape, which could be erased and re-used if you botched it. And you could edit it with a razor blade and splicing tape—every box of tape had diagrams showing you how. All of a sudden, you could use your \$100 Pentron to make tapes that had a shot at sounding professional. Granted, the sound quality was still pretty miserable in most home equipment, although that had mostly to do with the sort of microphone that came with the recorder, but still the possibilities for audio expression jumped from virtually nil to quite considerable, even if that only meant assembling a bunch of records on tape for a party.

It was in the professional area that tape truly revolutionized audio, however. Many new bits of technology have claimed to revolutionize audio over the years, of course; but magnetic recording has a genuine claim to have done so on several different occasions. In the first place, it made the modern long-playing record possible. Before the advent of tape, music on records came in three- or four-minute chunks that had to be performed perfectly; if not, the whole record had to be scrapped and everything started over. With tape, a perfect recording could be assembled song by song or even note by note, and the final master could be made from the tape. Similarly, in broadcasting fluffs could be edited out and a perfect final product aired. (Of course, one might wonder about all this perfection on an artistic level, but even tape couldn't do much about that.)

A similar revolution was also taking place in television, although it took the engineers a lot longer to figure out how to cram the awesome

amount of information contained in a video signal onto tape. Still, by the mid-Fifties they had done so, and the days of live TV, with all its marvelous goofs, were over. It took another couple of decades for this technology to be available to consumers, but that was inevitable.

These were just the *first* revolutions attributable to tape recording. In the Sixties, more convenient formats extended amateur tape use from the die-hard hobbyists to the general run of music lovers. The American contribution was the four-track (and later the eight-track) cartridge, a development from the broadcast "cart," which allowed playing of music primarily in cars and trucks. At about the same time, Philips in the Netherlands was developing the cassette, which endured where the eight-track did not. Ultimately, this gave rise to the portable stereo, which has profoundly affected not only *where* people listen to music but also how they buy it—for the first time in history, prerecorded tapes are rivaling discs as the preferred way to buy tunes.

Once the video industry found out that home video recording was practicable—they had been trying for a decade and had come up with some truly weird systems—the viewing habits of thirty years changed overnight. Satellite dishes, cable, and videodiscs have played their part in this, of course, but basically it has been another revolution brought on by tape.

But the thing that makes all of this fascinating—to me, at least—is that it is based on a technology that is inherently improbable. The idea of spreading a layer of rust on a strip of plastic (or, earlier, paper) and then being able to record information on it stretches the credulity even now. This crackpot scheme is almost as old as audio, but for the first forty or so years of its existence, nobody could figure out how to do it. The advantages of this type of recording, if it could be made to work, were so attractive, however, that engineers kept fiddling with it until sheer persistence brought success.

Several of the problems of the early developers were relatively easy to solve. Converting a fluctuating audio signal to its magnetic analog was fairly straightforward: simply pass it through a coil with an iron bar in the middle. A magnetic medium

was also close at hand: steel wire that could be moved through the changing magnetic field, picking up a sympathetic field. When the wire was pulled past the coil-and-core assembly (now known as a "head"), it induced in the coil an audio signal that more or less duplicated the original. Simple—and even simpler when the steel wire was replaced by a paper or acetate ribbon covered with ferric oxide (rust).

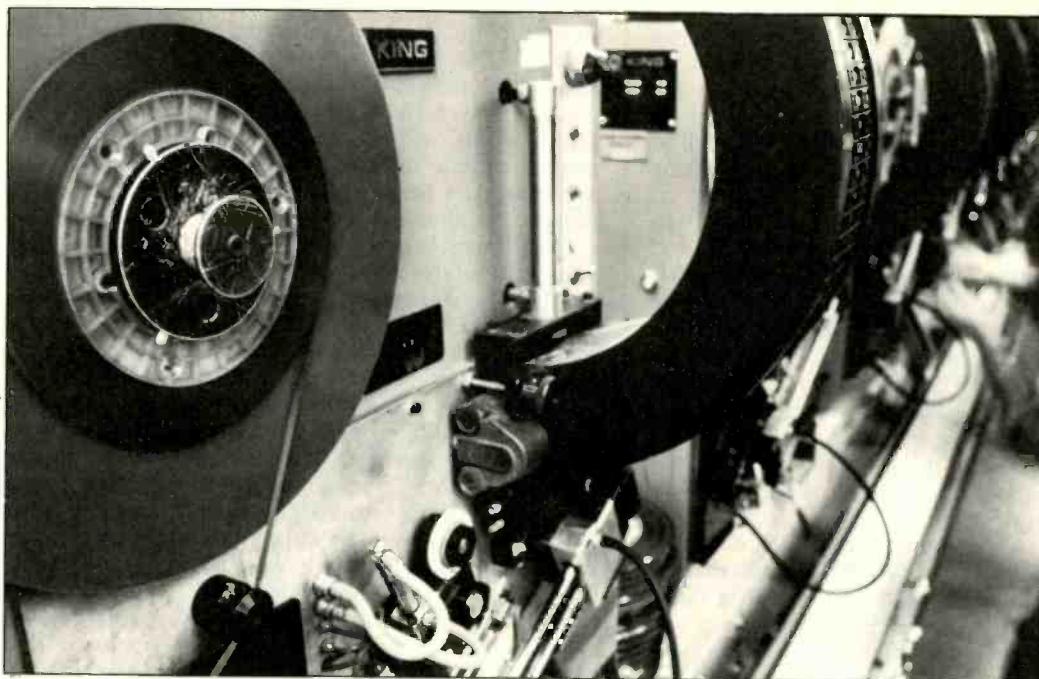
The problem was that, although this system worked, it sounded lousy. Magnetism is not a particularly linear phenomenon, as it turns out, and the audio fluctuations in the coil of the recording head affect the magnetic sensitivity of the tape differently at different levels. Also, extremely low levels (and all audio signals have lots of them) revealed massive amounts of noise, while very high levels distorted like crazy. In between these limits, however, it was found that some magnetic materials had a range in which their response was more or less linear (this is usually portrayed graphically by what is known as a "hysteresis curve," a sort of elongated "S" with a straight bit in the middle).

The trick was to push the signal up to the point where it was out of the low-level noise region without making it so strong that it saturated the tape and caused overload distortion. The solution, first perfected by the Germans in the Thirties, was to add an ultrasonic signal to the audio that would move the whole thing up into the linear portions of the hysteresis curve. Since this signal was several times the highest audible frequency, it did not affect the signal on playback except that it made the whole recording more linear. The technique was known as "a.c. bias," and it made the whole field of high-quality audio tape recording possible.

Having come up with the theoretical answer to tape recording, the early developers had to take several other factors into consideration, and variations in these have constituted virtually all the improvements that have been made in tape ever since.

The first was physical. Magnetic recording deals with extremely small magnetic impulses and very low electrical signal levels, so intimate contact between the oxide and the recording and playback heads

The pancake of tape is threaded onto a loading machine and automatically spliced to the leader of the empty cassette. It is then wound to the length desired.



can affect the final product profoundly. Missing bits of oxide, called "dropouts," are the most extreme of the physical glitches that can occur, so an effective glue (called a "binder") had to be found that would keep bits of oxide from falling off. This also kept the heads and tape guides from acquiring a build-up of oxide particles that could effect the sound deleteriously in all sorts of ways. Similarly, the combination of oxide, binder, and tape base had to be extremely smooth, as any lumps would move the oxide sporadically away from the head. Within the oxide itself, the size, orientation, and distribution of the magnetic particles determines the amount of information that can be contained in a given length of tape, so a great deal of work has gone into ever-finer milling of the magnetic material and the development of new and exotic materials that have inherently smaller particle sizes.

Fiddling with the magnetic materials affects their ability to record, however, so tape manufacturers constantly have to juggle a variety of factors both to effect the improvements they are looking for and to maintain some semblance of compatibility between their new product and the machines that are available to use them. Their success has varied in this regard over the years.

The spur for all this activity has

been the humble cassette. When this handy format was introduced twenty years ago, its main purpose was for portable note-taking; Philips had no expectation that it would ever become a true high-fidelity medium. But its advantages were so manifest that both tape and recorder manufacturers began a process, still going on, to squeeze out of the cassette a level of performance comparable to that of open-reel tape.

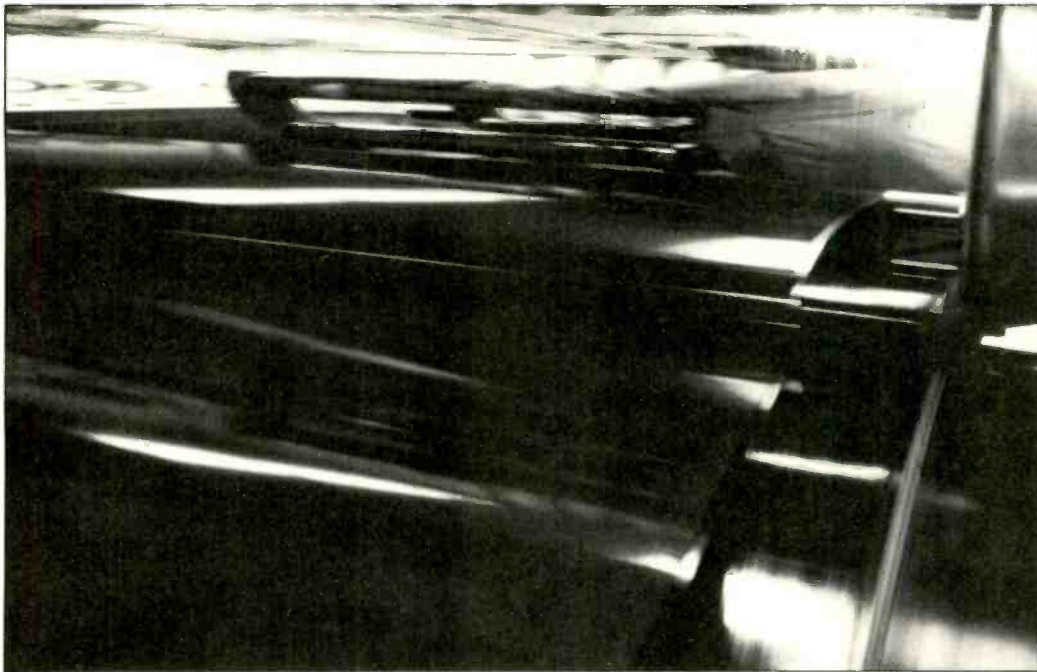
This was particularly difficult at first because the cassette machines of the day were designed to get the best from repackaged open-reel tape. Open-reel tape had reached a reasonable level of quality, but in the new format, with its extremely slow tape speed (1 $\frac{7}{8}$ inches per second) and very narrow recording track, all sorts of flaws began to show up. Dropouts that would be insignificant in a half-track, 7 $\frac{1}{2}$ -ips recording became yawning audio chasms, particle density was such that true high-frequency response was almost nonexistent, and noise approached that of the pre-a.c.-bias years. All of this was anticipated, of course, but the flaw didn't matter very much as long as the Carry-Corder was the only place the cassette was to be used.

The initial improvements in ferric oxide tapes did indeed make things better, but at a considerable sacrifice of compatibility. Every time the engineers came up with something new, it had a different

hysteresis curve from its predecessors, so it could only actually produce its benefits if the cassette deck itself was readjusted—a situation that still goes on with ferric tapes. Early on, however, DuPont came up with a whole new magnetic medium—chromium dioxide—and since the company kept a tight control on both the manufacture and licensing of the material, all chrome tapes were supposed to be compatible with all others, and all machines with provision for chrome tape could use any chrome tape. Of course, that meant that a whole new generation of decks had to be produced that could indeed use chrome.

The tape industry was not universally happy with chrome. This was partly on technical grounds, as early chrome did have some spectral problems (long since overcome), but mostly other tape companies were not wild about paying royalties to DuPont. Their response was to come up with a series of formulations that would work with the chrome positions on cassette decks—about the only standardized thing on them—without actually being chrome. These have come to be known as "chrome-equivalent" or "high-bias" tapes, and they require a slightly different equalization as well as higher bias than the standard ferric tapes.

Chrome and chrome-equivalent tapes represented a real advance,



A key to tape quality is the coating material and the way it is bonded to the backing. Here a sheet of tape leaves the coating machine to be wound into large rolls.

but there was still some way to go before cassettes caught up with open-reel. The impetus for further improvement was definitely there, however, as open-reel had virtually vanished from home audio, and the cassette deck became the best-selling audio component. Another whole new bit of chemical technology came along as a result: pure metal tape. This technically was a breakthrough, but it placed some new demands on cassette decks, just as chrome had originally done. But when chrome first came out, there were relatively few cassette decks in the hands of consumers, and virtually all that were sold henceforth could accommodate chrome. When metal arrived, however, there were millions of cassette decks in use by people who seemed reluctant to junk them for a slight technical advantage. Because of this, and because it was more expensive than other formulations, metal was less than a roaring success.

Nevertheless, all these developments and the use of various Dolby and dbx noise-reduction systems have brought cassette recording to a level of technical excellence that would amaze anyone whose only contact had been with the original system. And the improvements still go on, although they are mainly tiny advances on what has been done in the past few years.

Ferric tapes still form the basis of the tape industry, both in the "nor-

mal" form (whatever that means) and in the chrome-equivalent form. In both cases the major tape manufacturers are gradually reducing particle size and improving binders, particularly in the anticipation that people will wish to dub ever-better signals (digital, for example) for use in their cars or their Walkmans. Sometimes these new tapes carry new model designations; more often they are just quiet developments of familiar products. Chrome itself is still around, pushed hard by BASF and by PD Magnetics (the "P" is for Philips and "D" is for DuPont, so this is hardly surprising). And Japan's TDK has taken an approach that is reminiscent of the development of chrome equivalents: they have produced a metal cassette, TDK-HX, designed to work in the chrome position on decks that are not built to use true metal tapes.

But even the method of translating audio signals to magnetic impulses has changed in the past few years, and this has placed demands of its own on tape. Digital recording has in one stroke done away with speed irregularities, modulation distortion, and hiss for all practical purposes, and it has stretched dynamic range by 20 or 30 dB in the process. But a digital signal requires several times the recording bandwidth of a standard audio signal, so digital recording takes some fairly fancy technical footwork and tape with a lot of storage capacity. To

date, video tape equipment used with digital audio adaptors has been the only consumer recording medium that offers enough bandwidth for digital signals, but that may change shortly.

In Japan, a group of manufacturers are working toward a standard for a digital audio cassette as small and convenient as an analog cassette. One proposal is for a miniaturized version of a helical-scan video recorder. This would mean a relatively complex mechanism, but the cassette could be smaller than a standard audio cassette. The alternative is a fixed-head system in which the digital signal would be divided into a number of separate tracks (twenty-two in one proposed system) recorded side by side. In this case, the recorder would use a multitrack head, but the mechanism would be simpler. Both of these systems require a high-information-capacity tape. So far, there is one tape, a metal-evaporated tape, with recording density that is high enough, but it is available from only a very few sources and is very expensive.

Nevertheless, the audio industry sees a need for a digital audio cassette, particularly as the Compact Disc makes its way in the market, so the technical problems will inevitably be overcome. The digital cassette we shall have, probably within a year.

(Continued on page 108)

The Mystique Of

ESOTERIC PHONO CARTRIDGES

*Precious substances and exotic designs add to
the mystique of audio for the connoisseur*
by Daniel Sweeney

ONE was a watchmaker. Another made Samurai swords for a while and then sold cars. Still another carved tobacco pipes for a living. A fourth is a professional gambler. And one—rather prosaically—has been an electronics engineer all his life. Today they all make very rare and very expensive phono cartridges which they sell to initiates, that small elite of audio enthusiasts who feel neither outrage nor remorse when parting with the \$500 or more that it takes to acquire the products of these masters.

These men—and one woman—are the captains of a little-known industry, almost legendary figures in the small, closed world of esoteric audio. A few of the esoteric cartridges, such as the Grado Signatures and Stax electrets, are made by fairly well-known manufacturers, but most of the brands—Win, Koetsu, Miyabi, Kiseki, Promethian, Goldbug—are not recognized by ordinary audio consumers.

The products of these small enterprises are as mysterious and eccentric as their creators. The majority of the esoteric phono cartridges are Japanese in origin, and, in many cases, their manufacture seems almost an extension of some of the

spiritually imbued traditional crafts of Japan, particularly the art of carving the miniature statues known as netsukes. Like the netsukes, the rarest of these handmade cartridges are frequently fashioned from precious substances, including diamonds and sapphires, ivory and onyx, rosewood and Mediterranean brier, and fine silver wire drawn to the gauge of a sable hair.

Their workmanship is astounding. How can human fingers work to tolerances of angstroms? Inner forces—*chih*—must be involved. Mere technology could never produce such sonic and aesthetic marvels. Their very names inspire awe and wonderment—the Talisman, the Alchemist, the Grail, the Onyx, and, disarmingly, Mr. Brier and the Purple Heart. Surely phonograph records played with such wondrous instruments will speak to us in different voices. Musical truths, spiritual truths will lilt from the grooves, and the money spent, lunches forgone, and cans recycled to pay for such beauties will become as nothing in the bright dawn of musical revelation they afford us.

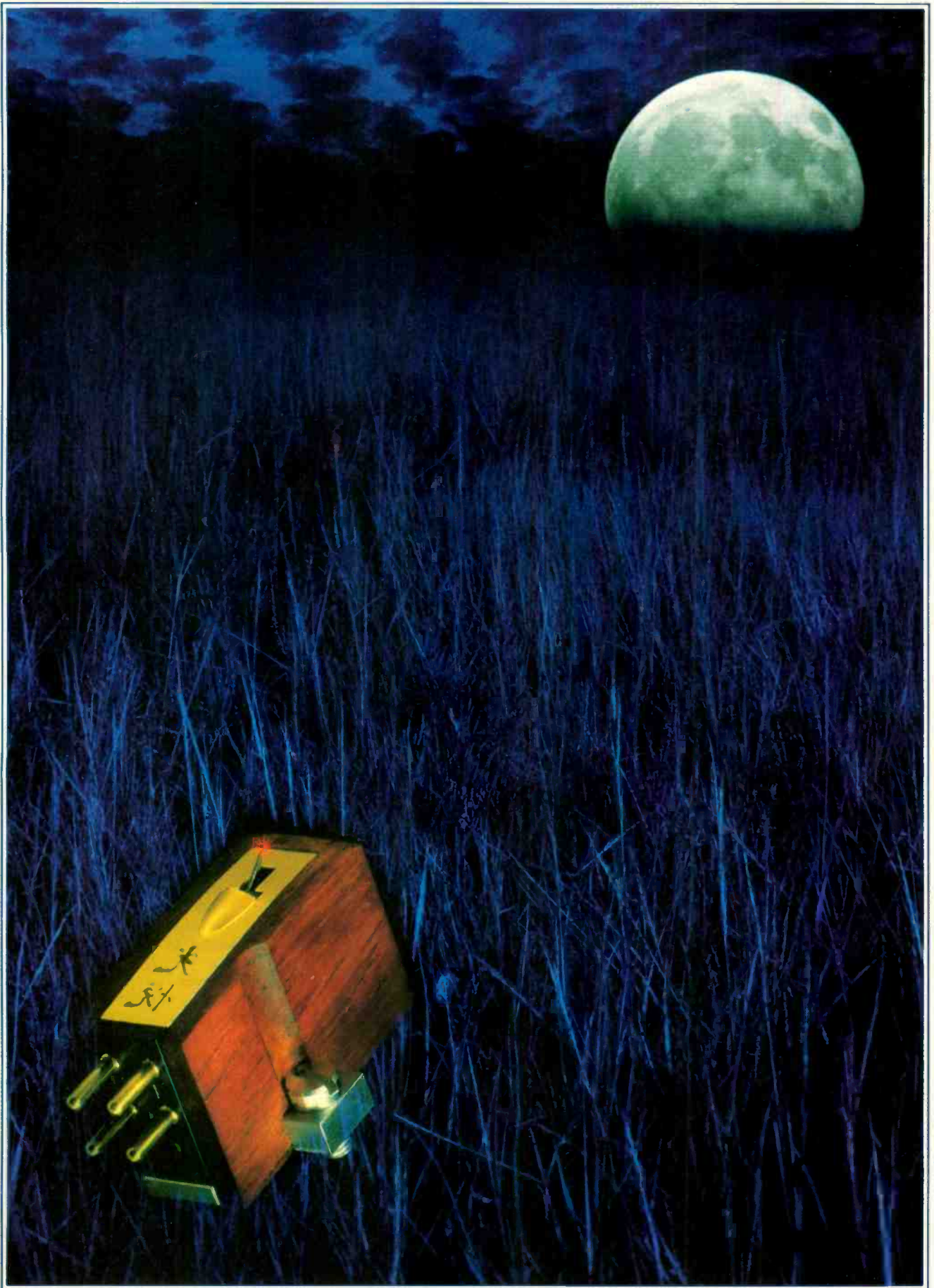
The mystique surrounding the cartridges is not easy to penetrate, but once you begin to view them in marketing terms, the mists of legend

start to dissipate. In most cases the mystique is part of the packaging of the product, something deliberately cultivated by the distributors. The cartridges are made and continue to be made only because a market has been created for them. That market did not exist a decade ago, and unlike the cartridges themselves, the market is largely American.

The market for esoteric cartridges is coextensive with the larger market for esoteric audio equipment in general. Both are much misunderstood. The common meaning of the word “esoteric” is *hidden or secret*, and in marketing parlance the word refers to an exclusive submarket that is for connoisseurs and is not well known to the purchasers of mass market goods. In audio, the word “esoteric” denotes a whole alternative industry made up of small companies dedicated to producing components of uncompromising quality and performance with few concessions to style or convenience. Performance is usually defined in terms of subjective listening impressions, not objective instrument tests.

Esoteric components differ from

The Koetsu Onyx-Diamond phono cartridge at right is hand-crafted by Yoshiaki Sugano.



"high-end" goods in that the latter may simply be the premium-priced products of mass-market manufacturers. They may in fact cost more than comparable esoteric products, but they're generally aimed at a different type of customer. The distinctions, of course, are not hard and fast, and some companies, such as Nakamichi, seem to fit somewhere in between.

Esoterica dates back to the early Seventies, and in a sense marks a return to the early entrepreneurial, elitist phase of the American hi-fi industry in the face of the growing Japanese supremacy in the mass market. At first the esoteric branch of the industry focused on amplifiers and speakers, basically because they were relatively easy to design and assemble. Very few esoteric designers attempted to make cartridges. Manufacturing cartridges requires extremely skilled labor, and the design principles for phono cartridges are not in general circulation within the esoteric community. Making phono cartridges remains something of a black art.

In the formative period of hi-fi esoterica most audiophiles involved in it simply used premium cartridges made by the big established manufacturers, such as Shure, Stanton, EMT, and Sonus. In other words, the cartridges in use in the esoteric audio systems of the time were high-end rather than esoteric themselves.

The closest things to real esoteric cartridges in the early Seventies were the Decca Mark Series, which employed an innovative English design with magnets placed near the cantilever tip rather than near the pivot point; the Weathers Pickup, a complex electrostatic transducer with a dedicated preamp and an FM carrier for the music signal; and the Euphonics Miniconic, a Puerto Rican-made semiconductor strain-gauge cartridge similar to the Win cartridge described later in this article. All three were cult items with reputations for finickiness and matching problems. Interestingly,

none of them used the moving-coil principle predominant in esoterics of the present day. Among these protoesoterics only the Decca is still made, and it is now available in two models, the Super Gold at \$450 and the Decca Van den Hul at \$850. Both use essentially the same canti-

lever design as the classic Deccas of the Sixties and early Seventies.

approached by a number of Japanese audio companies who wanted the rights to use one of his designs. These same companies had already been rebuffed by the bigger American concerns, and they went to Grado as a last resort. The design they wished to use was the stereo-

phonic moving-coil pickup, patented in the Fifties and briefly used by Grado in a line of consumer cartridges. "I didn't think it was a very good design," said Grado, "and I was willing to license them to produce it. I haven't used it since myself."

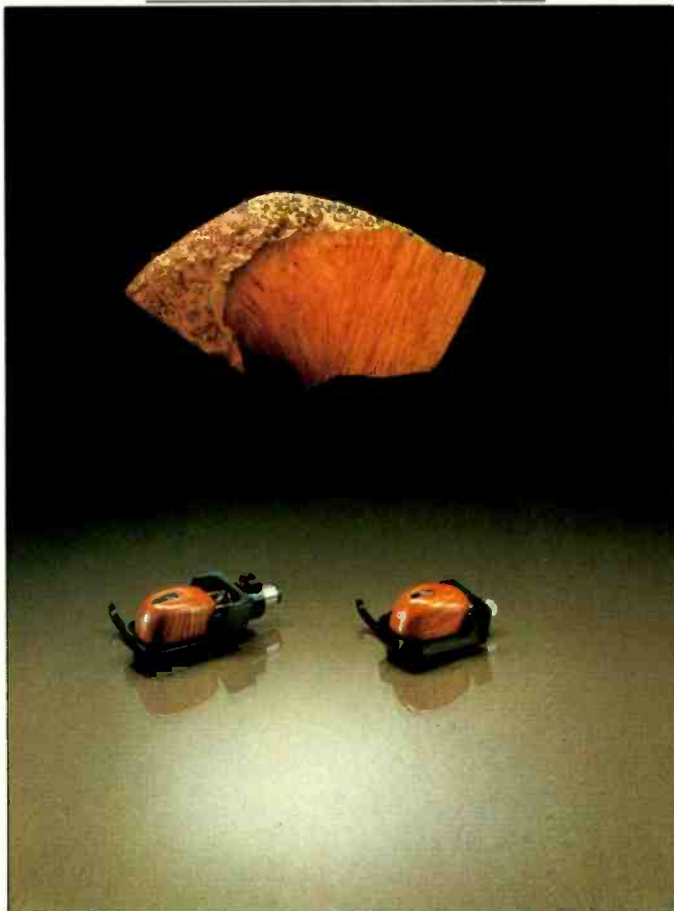
Grado's licensing agreements broke the cartridge field wide open. Japanese audio firms great and small rushed to develop moving-coil designs, and several brands, such as Fidelity Research and Supex, quickly found favor with esoteric equipment buyers.

The new Japanese moving coils sold well in Japan itself and quickly earned the endorsement of audiophiles there. Among those impressed were Yosiaki Sugano and Nabori Tominari, whose subsequent careers did much to determine the basic form the esoteric cartridge market would take, essentially dividing it into two streams.

Sugano, maker of the highly esteemed Koetsu cartridge, was our sword-maker turned car sales-

man. For many audiophiles his life is the subject of much speculation and rumor which fills their idle hours between listening sessions. According to his current distributor, Madrigal Imports, Sugano abandoned swordsmithing in 1945, when the feudal tradition of his nation effectively ended, and pursued a career in sales for most of his life. Sugano is widely believed to have worked at one time as an engineer at Supex, but his distributor denies this, citing a letter on the subject from Sugano himself.

Sugano kept his fingers nimble by painting pictures and cultivated an interest in music and musical reproduction. In the early Seventies he began to make cartridges experi-



The body of the Goldbug Mr. Brier is carved out of solid brier root by Yoshiko Sugano.

lever design as the classic Deccas of the Sixties and early Seventies.

Joe Grado, an opera singer turned watchmaker turned cartridge builder, can be said to have inaugurated the present age of esoteric cartridges when he introduced the Signature I in 1976 and sold it for the then incredible sum of \$275. The Signature was not immediately followed by similarly priced competitors, partly because the esoteric firms lacked expertise in cartridge design, but also because major manufacturers controlled active patents, which effectively closed the cartridge field to newcomers.

In 1977, the patent limitations were significantly relaxed, thanks to Joe Grado. In that year Grado was

mentally, fabricating his own cartridge bodies and winding his own coils, but otherwise using stock parts obtainable from Namiki, the major Japanese manufacturer of cartridge components and the prime assembler of many branded cartridges, esoteric and otherwise.

Sugano's first efforts were distributed among his friends. He did not begin making cartridges commercially until the late Seventies. In 1978, Koetsu cartridges began to be irregularly distributed in the United States, where they quickly earned a cult reputation among audiophiles while at the same time provoking many complaints for the gray-market merchandising that characterized their American debut.

The name "Koetsu," which means "light and pleasure" expresses the aura many esoteric cartridge makers attempt to create. It was the name of a master swordmaker of feudal Japan, purportedly the direct ancestor of Sugano's father-in-law, who taught him to forge blades. Incidentally, Sugano was of the opinion that "light and pleasure" should be evident at every stage of the cartridge's life, and he decided that the initial random distribution pattern for North America was conducive to neither. Since 1980, Sugano has authorized but one distributor.

Koetsus are made in several grades, ranging from the budget Black at \$660 to the Onyx-Diamond at \$2,500. All Koetsus are handmade either by Sugano himself or by members of his family, and they are designed and constructed strictly by ear. Accordingly, individual cartridges do not have identical measurements. Eric Block, the current importer, claims to spend fully two hours auditioning each Onyx Diamond before releasing it.

The Koetsu is best regarded as a musical instrument, and as an expression of one man's taste and sensibility. In an age when most audio products are pre-eminently engineering exercises, the Koetsu car-

tridge must be counted a considerable anomaly.

But it is not alone. In the wake of the Koetsu, a multitude of Japan's living treasures have set up one-man cartridge factories. Among these super exotic cartridges they've produced are the Miyabi Ivory,



The Decca Van den Hul uses magnets near the stylus rather than near the cantilever pivot.

which has a body made of ivory, the Argent Diamond-Sapphire, which is topped with a solid sapphire plate and retails for \$1,200, the Audio Note Van den Hul, which sells at \$1,250, and the Kiseki Lapis Lazuli at \$3,500!

Perhaps the most interesting of these artistic cartridges is the Goldbug Brier, or "Mr. Brier" as it's sometimes called. As the name suggests, the thing is carved out of a brier root just like a smoking pipe. The carver, Ms. Yoshiko Sugano (no relation to Yosiaki), is principally employed in producing custom-made tobacco pipes. She was hired by Goldbug Labs in Tokyo when they decided that brier root had the ideal physical properties for

a cartridge body. Could be. It is said that Stradivari mixed beetle carapaces into his violin varnishes. At any rate Mr. Brier is a thing of beauty and a genuine collector's item. You can buy him for \$990.

Such are the art cartridges, the spawn of Sugano, and the first branch of the esoteric market. The second branch is associated with our other moving-coil advocate, Dynavector's Nabori Tominari, who entered esoterica from another direction and gave his branch a form quite different from the Koetsu legacy. Tominari was a professor of mechanical engineering at a Tokyo technical institute. He shared Sugano's interest in music, but he approached cartridge design as a technical project and not from a crafts perspective.

Tominari preferred moving coils on subjective grounds, but he was dissatisfied with the designs extant in the middle Seventies. He reasoned that mechanical resonances in the cantilever assembly were the chief obstacles to accurate reproduction. He advocated an extremely short, stiff cantilever which would resist flexing and would not propagate traveling waves through its own length. To achieve the desired rigidity in his first cartridge he made the cantilever an amazing 2.5 mm

long, a figure that was later reduced to 1.3 mm in the current top-of-the-line Nova. An added benefit of the short, stiff cantilever was an extremely high cartridge resonance exceeding 50 kHz, which obviated the need for cartridge damping and sharply reduced intermodulation distortion in the audible range, a perennial problem with moving-coil designs.

The first Dynavector, the Diamond, appeared in 1978. Far and away the most expensive cartridge then in existence, it sold for \$1,000. At least part of the reason for the high price was the fact that the cantilever was made of a solid diamond. Tominari had found that only a diamond could withstand the

enormous stresses generated by a short cantilever.

In spite of its cost, the Diamond was a major hit in a market where sales are generally measured in the dozens. Some five hundred were sold in the U.S. It came at a time when cartridge design appeared to be stagnant, and it posited novel solutions to some of the same prob-

How can human fingers work to tolerances of angstroms? Inner forces must be involved. Mere technology could never produce such marvels.

lems addressed by the Deccas a generation earlier. But much of its fascination for audiophiles lay in the materials it was made of rather than in its engineering. It seemed to represent perfectly the outrageous lengths to which the esoteric audiophile would go to realize an incremental gain in performance. The Diamond was extravagantly idealistic, and with it Tominari established an alternative to the Koetsu, stressing technical innovation and mathematical models rather than traditional craftsmanship and an aura of the mystical.

But the Dynavectors and other high-tech cartridges that followed were not without their own mystique, and it went beyond the cost of construction. That mystique was more a kind of cloud of unknowing that lay in the gap between theory and measurement.

Tominari was a theoretical designer, and the engineering principles embodied in the Diamond are not in dispute. But the actual behavior of the cartridge, according to some of its critics, did not completely match the theoretical models.

Joe Grado is one such critic. "Moving coils suffer from severe torsional resonances in the cantilever even when a gemstone is chosen for the cantilever material." Joe Abrams of Sumiko voices similar reservations. "There is remarkable concurrence among subjective reviewers on the Dynavectors. They sound wonderfully detailed and analytical, but they're bass-shy and ultimately unrealistic and fatiguing. That's because of uncontrolled resonances in the cantilever."

In fact there is no concurrence. Dynavectors have received rave reviews from some subjective critics, while finding less favor with others.

Who's right?

Most of the claims made for and against the Dynavectors' accuracy are based on theoretical explanations unsupported by measurements. The same can be said regarding much of the innovative technology found in other esoteric cartridges stressing novel design principles. The deficiency of data arises from a much larger deficiency—the lack of a body of generally accepted standard measurements explaining all parameters of cartridge performance. This condition has led to a welter of conflicting claims and has contributed in great part to the mystique of the esoterics.

In the high-tech school of esoterica, aside from Tominari, A. J. Van den Hul has probably made the biggest stir among the theoretically inclined designers. In 1980, Van den Hul, a Dutch academic physicist with an amateur interest in audio, introduced what he called a cutter analog stylus shape—a very sharp-edged, sharp-pointed stylus that closely approximated the shape of a cutting stylus and was said to be able to trace groove modulations more accurately than any of the related hyperellipticals.

Like the Dynavector cantilever, the Van den Hul stylus had warm advocates and implacable foes. Critics claimed that the Van den Hul was nearly impossible to align and that if it was even slightly misaligned it would recut phonograph records. The Van den Hul stylus remains controversial, but in its wake a number of radical line-contact forms have followed, including Shure's Micro Ridge and the Ogura nude vital. Van den Hul markets his own cartridge, the Van den Hul I complete with head amp at \$1,295. In addition, he sells styli to numerous other firms, including Decca, Goldring, Adcom, and Sumiko.

Most esoterics that stress design innovation tend to emphasize one aspect of cartridge construction—the cantilever, the cartridge body, the generator, or the stylus. Tominari, as we have seen, focused on the cantilever while Van den Hul worked on styli. Other theoretically oriented designers, including John Iverson, Sao Win, and Naotake Hayashi of Stax Koygo, have concentrated on a principle of operation, extolling a type of cartridge known as an amplitude sensor.

Most cartridges on the market, including moving coils, are magnetic in principle. They're actually tiny generators, and their electrical out-

puts are proportional to the square of the velocity of the moving mechanical element. For this reason they're called velocity sensors.

The amplitude sensors, which include the common ceramic cartridge as well as the rarer electrostatic, electret, and semiconductor strain-gauge types, are quite different in principle. Their output is a linear function of the distance the cantilever is deflected from center. The cantilever literally measures the record groove. Most of the frequencies in a modern phonograph record are cut at a constant amplitude, and an amplitude-sensor cartridge can play such records to the RIAA playback standard with about half the equalization of a velocity sensor. Phase shift is inherently low in such cartridges, and magnetic distortions are entirely absent. All such cartridges produce extremely high outputs, and little preamplification is required. They seem to have a lot of advantages.

Electrostatics, typified by the old Weathers pickup and the Stax CP-X, are no longer manufactured and therefore require no discussion. The electret, chiefly represented by the \$780 Stax CP-Y, resembles an electret microphone in principle. The cantilever varies the capacitance between two charged plates so as to regulate a signal voltage from an outboard power supply. The strain-gauge utilizes a pair of semiconductor elements, one per channel, which vary in their resistance according to the degree to which they're flexed. The variable resistance modulates the flow of direct current from a power supply.

Strain-gauge cartridges have been used in playback systems designed by John Iverson and Sao Win. The

Finally they went to Grado. "I didn't think it [moving coil] was a very good design," he says, "and I was willing to license them to produce it."

Iverson system, called the EK-1, which includes a dedicated preamp, is marketed by Robertson Audio for \$2,000. According to Iverson, the preamp contains electronic circuitry that compensates for all of the mechanical response aberrations of the cartridge and insures near perfect linearity and freedom from distortion. The Win cartridge is now
(Continued on page 116)

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GUITAR CLASSICS

An informal survey of new recordings reveals a healthy crop of



by William Livingstone

THERE are many reasons for the great popularity of the guitar. Portability is an obvious one, and although it is very difficult to master the classical guitar, anyone can quickly learn the simple chords needed to accompany a few songs.

Rock musicians have been blatant in their use of the electric guitar as a male sex symbol. The acoustic guitar, however, has generally been viewed as a feminine symbol, and as such it has appealed greatly to artists. The Impressionists and their associates frequently painted guitars and guitarists, and the Cubists, most notably Pablo Picasso, Georges Braque, and Juan Gris,

seemed to be obsessed with the instrument. They analyzed and rearranged its shape in an endless series of still-life compositions.

Other art works reflect its emotional range. Italian Renaissance paintings show singing angels accompanying themselves on guitars, and in Mexican folk art mermaids are depicted bare breasted, strumming seductively on guitars.

For many people the guitar has been a bridge to the enjoyment of classical music. Perhaps that is because it is less forbidding than a string quartet or symphony orchestra, perhaps because its characteristic sound has an unusual ability to evoke emotional response.

As a concert instrument the guitar reached its peak of popularity in Europe in the early decades of the nineteenth century, the period of "guitaromania." The piano then drove it from the concert stage until the twentieth century, when Andrés Segovia brought to other countries the results of a guitar renaissance that had taken place in Spain. Segovia and such younger colleagues as Julian Bream, John Williams, and Christopher Parkening have inspired so many outstanding new virtuosos that we seem to be on the verge of another guitaromania.

Today's classical guitarists, like Olympic athletes, are setting new standards of dexterity and stamina

and have produced an impressive number of new recordings over the past two or three years. I have just made an informal survey of these recordings and can recommend many of them.

Angel Records, which launched Parkening in the Sixties, has also been the home label for Angel Romero, a guitarist with an artistic temperament quite different from Parkening's rather patrician restraint. Romero's new release, "Leyenda" (S-37350), is a greatest-hits compilation from four earlier discs. It includes showpieces by such composers as Sor, Tárrega, and Rodrigo that demonstrate Romero's typical emphasis on intensity, drama, and brilliance.

The youngest son of a famous Spanish guitarist, Romero has made a digital recording of his father's work, "Music of Celedonio Romero" (Angel DS-37311). Idiomatically written for the guitar—not surprisingly—it is colorful, atmospheric music of no great substance, but it has a pleasant improvisatory quality, and it is lovingly performed.

Angel has introduced the guitarist Alfonso Moreno in several works by Joaquín Rodrigo. Moreno's performance of the *Concierto de Aranjuez* with Enrique Bátiz conducting (DS-37876) was rated among the best recordings of this piece by Richard Freed in his "Basic Repertoire" column in July.

I agree with Freed's assessment (August) of new recordings of the concerto by Williams on CBS Masterworks and Bream on RCA. It is the third time around Aranjuez for both artists, and their new performances are available on LP, cassette, and Compact Disc. Williams's version is somewhat more classic, Bream's more romantic, and you can't go wrong with either.

In addition to recording Williams and the young Canadian guitarist Liona Boyd, CBS Masterworks has also released a few albums by Alexandre Lagoya. The 1983 album "Sarabande" (CBS IM 37787) contains Lagoya's transcriptions of works by Handel, Beethoven, and Louis Couperin, as well as some display pieces from the era of guitaromania by Matteo Carcassi and Fernando Sor.

To me his performance proves the liner notes' claim that Lagoya is "one of the great living masters of the guitar." His dazzling technique serves an artistic intelligence so

communicative and so musical that he could sustain interest with nothing more than a kazoo or some tissue paper and a comb. The great nineteenth-century virtuosos of the guitar probably played this way, with lots of flair and personality.

Sixteen compositions by one of

John Williams, Julian Bream, and others have inspired so many new virtuosos that we seem to be on the verge of another guitaromania.

those virtuosos, Francisco Tárrega (1852-1909), are played with charm and authority by Narciso Yepes on his ten-string guitar in "Recuerdos de la Alhambra" (Deutsche Grammophon 410 655-1), a digital recording. The tremolo that is a characteristic of the title tune and other pieces on the album must have been a specialty of Tárrega's. Hearing his tremolo etudes played by one of my teachers years ago convinced me that I should give up the guitar.

A fascinating aural glimpse into the guitaromania of the Romantic era is provided by a Philips album (410 396-1) of sonatas by Ferdinando Carulli and Anton Diabelli played by guitarist Pepe Romero with Wilhelm Hellweg at the fortepiano. The combination of plucked strings on a period guitar and the hammered strings of the fortepiano produces a beguiling sound that I had never heard before. The sonatas are long on charm and sweetness, and the result is a delightfully pretty record.

Pepe Romero, the older brother of Angel Romero, is one of the most gifted interpreters currently before the public. Among his recent Philips recordings are an album of solo works by Rodrigo (9500 915), a Spanish recital including Tárrega's *Recuerdos de la Alhambra* (6514 381), and an album of Bach (6514 183). The last two are digital recordings, and all are recommended.

To Romero came the honor of performing the world première of a new Rodrigo guitar concerto. In a grand gesture reminiscent of Mozart's patrons, the Haffner family, Mr. and Mrs. William McKay, of Fort Worth, Texas, commissioned Rodrigo to write this *Concierto para una fiesta* for the society debut of their two daughters, Alden and Lau-

ri. Romero played the première with local musicians in Fort Worth last year, and he has recorded it with Neville Marriner and the Academy of St. Martin-in-the-Fields (Philips 411 133-1).

Mindful of the happy occasion for which the concerto was ordered, Rodrigo produced music with a generally optimistic tone and a couple of flashy cadenzas to give Romero a chance to show off. Not likely to replace Rodrigo's more melodic *Concierto de Aranjuez* or *Fantasia para un gentilhombre*, the new concerto is a pleasant work with strong rhythmic drive and lots of local color. The flip side is the easy-listening *Concierto de Málaga* by the soloist's father Celedonio Romero.

It is usual in writing about the guitar to mention that it was played by Weber, Rossini, Schubert, and Berlioz. No one can say why, if they loved it so much, these composers did not add much to guitar literature. Since they didn't, guitarists are still transcribing music written for other instruments.

The most daring feat of transcription I know of is by the young Japanese guitarist Kazuhito Yamashita, who has had the audacity to arrange Mussorgsky's *Pictures at an Exhibition* for the guitar and record it for RCA (ARCI-4203). This is a piece that strains the resources of a grand piano!

Today's classical guitarists are setting new standards of dexterity and stamina and have produced an impressive number of new recordings.

I admire Yamashita's courage in tackling the transcription and the verve with which he plays it. He has been very clever in adapting this music to the instrument, and it works better than I thought possible, but even before he gets to the Great Gate of Kiev, you think his guitar will fly to pieces. Still, he is a fearless player, and I'd like to hear him in more conventional music.

It must take courage of a different sort for a young guitarist to step forth on the world's stages and invite comparison with the masters by playing the conventional repertoire with which his or her elders made their reputations. Göran
(Continued on page 110)



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by Christie Barter
and Steve Simels

WITH performances of *La Bohème* beginning at the Public Theater in New York at the end of October, Linda Ronstadt enters a new phase in her career. She will sing the role of Mimi in an English-language version of the Puccini opera produced by the New York Shakespeare Festival.

At press time the rest of the *Bohème* cast was not set, but it had been reported earlier that Vanessa Williams, who recently abdicated as Miss America, was auditioning for the role of Musetta. For reasons not revealed, she did not get the part.

Coming off her summer tour and before going into rehearsal for *Bohème*, Ronstadt worked with conductor-arranger Nelson Riddle on her second album of standards for Asylum. □

CHUCK BARRIS, eat your heart out. Do you recognize the two gentlemen crooning to each other over the fake flowers? No, they aren't Bachelor Number One and Bachelor Number Two



Costello, Hall: dream dates

on some revamped version of *The Dating Game*. Actually, they're Elvis Costello and Daryl Hall. And what brought this Odd Couple together was a video, of course. More specifically it was a video for Costello's latest single, *The Only Flame in Town* (directed by Alan Arkush, known for *Rock and Roll High School* and Bette Midler's *Beast of Burden*). In case you haven't seen it, Elvis and Daryl play "dream dates" for contest winners at a posh night club while Elvis's trusty



Ronstadt: breaking new ground as Puccini's Mimi

back-up band, the Attractions, cavort as the in-house entertainment. □

THE popular male vocal sextet from London who call themselves the King's Singers have spent a lot of time in the recording studio since they formed as a group sixteen years ago. They have at least ten titles on the MMG (Moss Music Group) label and have just added a new one, "Madrigal History Tour," a two-record set that engagingly surveys the output of the madrigal-writing masters of yore.

The King's Singers have recorded collections of Victoriana as well as music they specially commissioned from such contemporaries as Krzysztof Penderecki and Richard Rodney Bennett, and they have recorded routines by Flanders and Swann and songs by Lennon and McCartney as well as the obligatory Christmas album. But sales figures indicate that their most successful album is "By Request," a pop-oriented grab bag ranging from the tra-

The King's Singers



ditional *Hush Little Baby* to Hoagy Carmichael's *Georgia on My Mind*. Its success is probably the result of the group's appearance (and on-the-air promotion of the album) on the *Tonight Show* back in April. They appear on the show again this month (November 8), so if the "Madrigal History Tour" gets the same treatment, they'll perhaps find themselves spinning off a Hot-100 single by Claude Monteverdi or Bill Byrd. □

ON Friday evening, October 26, the PBS network is carrying a two-hour gala called "Lincoln Center Special: A Twenty-Fifth Anniversary Fan Fare." The program is made up of segments from past Live from Lincoln Center telecasts. . . . A new fall release from RCA is an eight-record set honoring another anniversary: "A Hundred Artists at the Met—A Centennial Celebration." □

THE George Peabody Medal for Outstanding Contributions to Music in

America went this year to composer Elliott Carter; baritone Todd Duncan, the first to play Porgy in Gershwin's *Porgy and Bess* (and featured still in an MCA highlights album); and William Schwann, founder and publisher of the indispensable *Long Playing Record Catalog*, now published, in radically revised form, by ABC Schwann Publications and known simply as *The New Schwann*. □

CAN the Cars' Ric Ocasek really walk on water? Could be, at least on the basis of this scene from the group's recent *Magic* promotional short. In the meantime, Warner Home Video will be attempting something



Ocasek: miracles

even more miraculous—the release of a fifty-five-minute long-form video package, starring Ric and his colleagues, that they hope will duplicate the success of "Making Michael Jackson's Thriller." Included in the Cars tape are six songs from the band's current LP, clips from the older *Shake It Up*, and *Panorama*, a documentary look at the making of *Hello Again*, directed by Andy Warhol. The suggested price for what is scheduled to be Warner's first VHS Hi-Fi product is a supernaturally low \$29.98. □



IN July, RCA's Earl Thomas Conley became the first recording artist ever to see four singles from one album go to the top on *Billboard's* Hot Country Singles chart. The four number-one singles from the LP "Don't Make It Easy for Me" were the title tune itself, *Your Love's on the Line*, *Angel in Disguise*, and *Holding Her and Loving You*. All but the last were written by Conley as well. □

THE Philharmonia Virtuosi of New York, a chamber orchestra conducted by Richard Kapp, has attracted thousands of new listeners to Baroque music with its recent CBS Masterworks recordings. Its "Greatest Hits of 1720" and similar collections focusing on the years 1721 and 1790 have been best sellers, as has the album "Handel's Top Tunes."

With Handel thus covered for his tricentennial in 1985, it seemed only right that the group make a record of works by J. S. Bach, whose three hundredth birthday will also be celebrated next year. The contents range from dances drawn from the keyboard suites to choruses excerpted from the cantatas, all in instrumental arrangements by Kapp. The album title: "Bach's Tops."

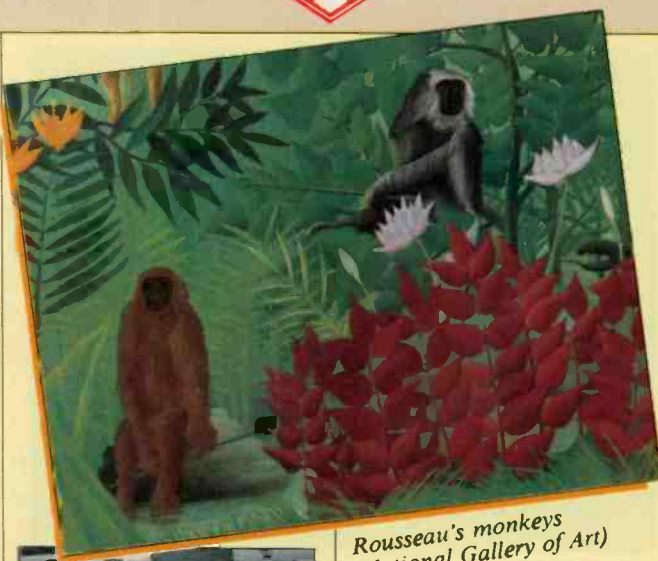
Kapp and the Philharmonia Virtuosi play it the way Bach wrote it, though, in their



Kapp: top tunes

upcoming, year-end release of Bach's six Brandenburg Concertos, also on CBS. □

WHAT? Another remake of *Beauty and the Beast*? No, just the unflappable Ray Parker, Jr. and an unidentified friend at a recent *Ghostbusters* look-alike con-



Rousseau's monkeys (National Gallery of Art)



Parker: record-making ghostbuster and friend

test at a Manhattan record store. Parker, who judged the affair, is, of course, currently enjoying much chart success with the film's theme song, but who's the Godzilla clone at the right supposed to look like, Bill Murray or Sigourney Weaver? □

THE picture at the top of the page is not another entry in a *Ghostbusters* look-alike contest, but a detail from the painting *Tropical Forest with Monkeys* by the French artist Henri Rousseau. It is an important holding of the National Gallery of Art in Washington, D.C., and it is shown on a new video disc devoted to that museum.

Produced by Videodisc Publishing in New York and released by Pioneer Artists, the disc documents the National Gallery's collection with 1,645 still frames of its paintings and sculptures. Each frame is accompanied by a second frame designating the name of the artist, the title, and the dimensions of

each work as well as the medium in which it was created. This catalog may be the first video art book, and at a suggested price of \$95, it sells for much less than what a book of comparable scope would cost.

The disc can be played like any other LaserDisc on home video-disc players manufactured by Pioneer and Magnavox. Each work of art is numbered in an accompanying booklet and can be called up by punching the appropriate number into the machine's remote-control unit.

Also contained in this video book is a tour of the National Gallery conducted by its director, J. Carter Brown, and a capsule history of the gallery with footage of early contributors, such as J. P. Morgan and Andrew Mellon. Next on Videodisc Publishing's schedule is a similar disc devoted to the private collections of the Guggenheims. □

IT's been fifteen years since the great Hungarian pianist Georges Cziffra has *Cziffra: living legend*



been to the States or played here, and his records (he's made more than fifty over the years) have all but vanished from the domestic catalog. That's how you get to be called "legendary," which he is—here. But Cziffra remains very much alive and well in France, where he now lives (hence the name change, from György to Georges), and he is generously represented in French record bins.

As if to prove to us that the legend lives, Cziffra came to America this fall to play three dates, in San Francisco, Los Angeles, and Toronto, and he will return next season for an extended tour to inaugurate the Liszt Centennial in 1986. He's also been back to the recording studio to make a brand new digital collection of Brahms's Hungarian Dances for EMI (see review on page 99). □

Springsteen: back home



LOCAL BOY MAKES GOOD: The fella with the exposed armpits is none other than The Boss (a.k.a. Bruce Springsteen), seen here exulting during his recent ten-concert stand back in the old neighborhood deep in the heart of Jersey.

Speaking of Jersey, Springsteen fans take note: *Cover Me*, the second single culled from the "Born in the USA" album, comes with a nifty little bonus—a live B-side version of Tom Waits's *Jersey Girl*, recorded during an earlier Jersey performance back in 1981. □



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BEST OF THE MONTH

Stereo Review's critics choose the outstanding current releases

THERE are now nearly two dozen available recordings of the Mahler First Symphony, and doubtless there is among them a reading for every taste. Most of them are marked by good to superb sonics, and an ample share of them can be described as truly distinguished performances. You can put the new Angel record-

ing by the Philadelphia Orchestra under Riccardo Muti right up there in the top brackets on both counts.

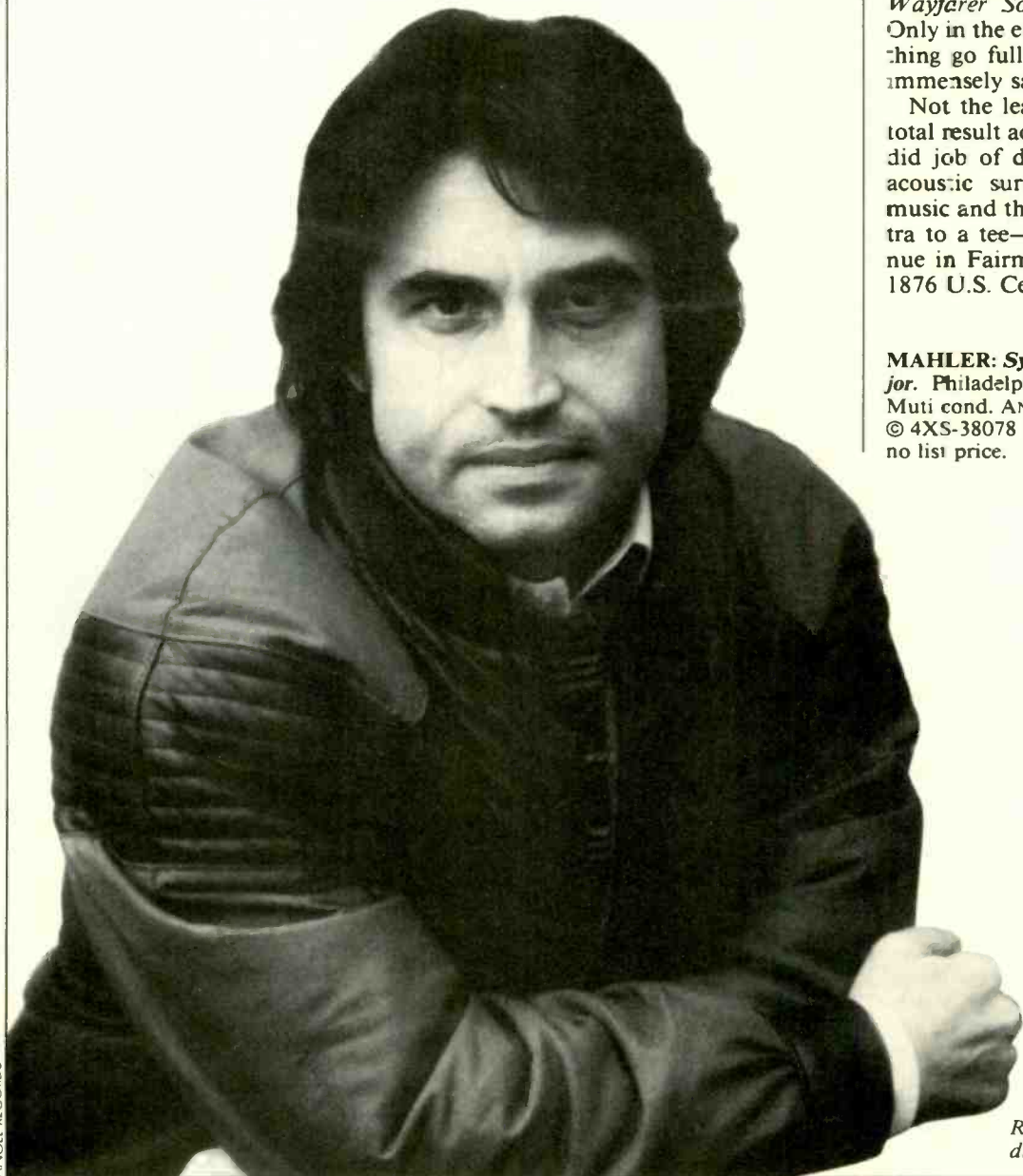
Given Muti's tendency in the past to deliver occasionally over-emphatic interpretations, I was half-expecting a blockbuster Mahler First, but then as the music got well along, I recalled that the most sheerly musical recording of Tchaikovsky's *1812* is Muti's with the Philadelphia. So it is here with the Mahler First: Muti passes up many of the more obvious places for "scoring points" in favor of preserving flow and lyric impulse. This is par-

ticularly true throughout the whole of the opening movement, and the exposition repeat is observed to good effect. The Ländler movement gets urgent yet flowing treatment with ample repeats and delicious cantabile in the trio. The crudely satirical in the mock-funeral march is softened here in favor of an idyllic, dreamlike conception. There could be a shade more tension in the stormy sections of the finale, but again the singing approach carries the day. Indeed, throughout his traversal of the score, Muti makes us more than usually aware of the relationship of this symphony to the *Wayfarer Songs* that preceded it. Only in the end does Muti let everything go full tilt, leading up to an immensely satisfying conclusion.

Not the least contribution to the total result achieved here is a splendid job of digital mastering in an acoustic surround that suits this music and the Philadelphia Orchestra to a tee—its new recording venue in Fairmount Park, site of the 1876 U.S. Centennial Exhibition.

David Hall

MAHLER: *Symphony No. 1, in D Major*. Philadelphia Orchestra, Riccardo Muti cond. ANGEL ● DS-38078 \$11.98, © 4XS-38078 \$11.98; © CDC 47032-2, no list price.



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BEST OF THE MONTH



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Charles: blues, ballads, boogie

ANYBODY who wants to know just what Ray Charles is doing making a country-music album would do well to remember that, back in the early Sixties, Charles cut a country album that startled the pants off his r-&b and pop audience and inspired any number of generations of country fans and soon-to-be country converts. While that album was probably a momentary, if heartfelt, diversion, Charles has been concentrating on country music almost exclusively for the past couple of years: "Friendship," his newest offering, is his third country album for Columbia Records.

The two previous Columbia albums were anything but gigantic sellers, and "Friendship," an LP of duets Charles sings with ten of the biggest names in country music, was probably designed to sell. But it is also one of those rare commercial records that passes just about every artistic test too. For the most part, Charles and his guests are musically and stylistically well suited to each other, and the material is consistently topnotch and well balanced with ballads, blues, honky-tonk, and boogie. With the exception of the Janie Fricke and Oak Ridge Boys tracks (and other duets for which the vocal tracks were obviously recorded separately and put together later), the chemistry between Charles and his guests makes the performances nearly crackle with electricity.

In the lead single, *We Didn't See a Thing*, a charming piece of honky-tonk put-on, Charles and George Jones show themselves to be the vocal masters they are, reveling in every nuance and shading and trying to sing rings around each other. On *Friendship*, the old Cole Porter standard, where Charles is joined by Ricky Skaggs, the magic lies more in the innovative and delightful bluegrass-flavored instrumental arrangement, and in the odd juxtaposition of the singers' disparate vocal textures.

Some of the pairings work better than others, obviously, and I would like to have heard Charles—who does not have a keyboard credit here—work out on the piano a little bit. But this is an inordinately high-quality collection, and it will undoubtedly become a collector's item in the future. All in all, an irresistible record. *Alanna Nash*

RAY CHARLES: *Friendship*. Ray Charles, Hank Williams, Jr., the Oak Ridge Boys, George Jones, Janie Fricke, B.J. Thomas, Ricky Skaggs, Mickey Gilley, Merle Haggard, Johnny Cash, Willie Nelson (vocals); Chet Atkins (guitar); vocal and instrumental accompaniment. *Two Old Cats Like Us; This Old Heart (Is Gonna Rise Again); We Didn't See a Thing; Who Cares; Rock and Roll Shoes; Friendship; It Ain't Gonna Worry My Mind; Little Hotel Room; Crazy Old Soldier; Seven Spanish Angels.* COLUMBIA FC 39415, © FCT 39415, no list price.

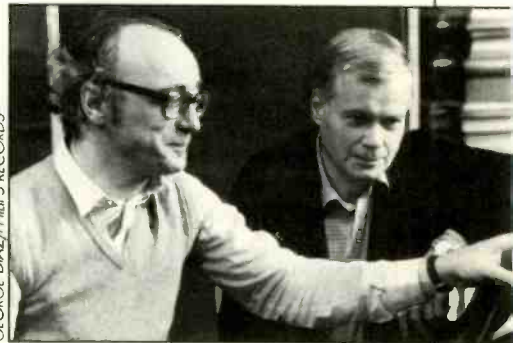
LISTENING to the latest of his records of Schubert songs makes it hard to believe that Dietrich Fischer-Dieskau has been singing for the better part of four decades and will be sixty next year. On the second of his Schubert releases from Philips, with Alfred Brendel as his piano associate, Fischer-Dieskau's voice is as beautiful as it was thirty years ago, with a remarkably youthful lightness and flexibility, and yet so much richer in the subtle ways only the experience of a lifetime can bring. The partnership is evidently a stimulating one both for him and for Brendel.

While Gerald Moore, in Fischer-Dieskau's earlier recordings of Schubert songs, brought an understanding of the music that is in a sense beyond that of any pianist

who has not made such material his lifelong preoccupation, Brendel displays an obvious sympathy with the songs and with Fischer-Dieskau's style. He also imparts to the accompaniments the formidable expressive power of a musician who has lived long and productively with Schubert's great solo works for the piano. In only one instance among the fourteen songs in this collection—*Der Einsame*—might he be said to come near overpowering the sung text; in some of the other songs the accompaniment reaches the dramatic level of Schubert's *Impromptu* without in any way distorting the singer-accompanist balance.

The realization of *Der Wanderer* by both artists is so outstanding an example of deepfelt and superbly balanced music, poetry, and emotion that it alone would more than justify investment in this package. But this might be said of the three *Harfner* songs as well, and in fact of just about everything in this beautifully recorded package. The order in which the songs appear is an eminently sensible one, and full texts and translations are included.

Richard Freed



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Brendel, Fischer-Dieskau: poetry

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BEST OF THE MONTH

LINDSEY BUCKINGHAM'S latest solo album, "Go Insane," is even more over-the-top than his wonderful "Law and Order" of 1982. The new one is a spectacular, eccentric tribute both to the potential of the modern recording studio and to Beach Boy Brian Wilson's brilliantly innovative Sixties production style. Working again as a one-man band, Buckingham has tinkered up a set of alternately funny and scary little numbers that mostly derive from rock of the most basic sort but (as in his *I Want You*, a *Sweet Jane* rip-off that still sounds like nothing ever heard by the ears of Western Man) are all just askew enough to be profoundly and aesthetically disorienting. There's nary an opportunity missed here to confound the listener. For the price of admission you get insanely inappropriate instrumental segues, preposterous symphonic percussion, tacky Baroque-sounding keyboards (*Bang the*

Drum, my personal favorite), bizarre vocal effects (the chorus of drunken Chipmunks on *Go Insane*), even stinging neopsychedelic sitar-like lines (*Play in the Rain*) that could have been lifted from something by the 13th Floor Elevators. And that's just for openers.

Buckingham isn't fooling around, really; there's a genuinely visionary quality to all this, and you get a real sense of a creator trying to cut through the miasma of complacency, boredom, and copy-catism that suffuses most contemporary pop. This is an element of Buckingham's musical personality that surfaces in his work with Fleetwood Mac only fitfully, and it's a delight to see him give it free rein again. *Steve Simels*

LINDSEY BUCKINGHAM: *Go Insane*. Lindsey Buckingham (vocals and instrumentals). *I Want You; Go Insane; I Must Go; Play in the Rain; Loving Cup; Bang the Drum; D.W. Suite*. ELEKTRA 60363-1 \$8.98, © 60363-4 \$8.98.



Buckingham:
askew

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- CHICK COREA/GARY BURTON:** *In Concert, Zürich, October 28, 1979*. ECM 1182-2. "Boppish, bouncy, beautiful" (April 1981).
- HERBIE HANCOCK:** *Feets Don't Fail Me Now*. COLUMBIA CK 35764. "Destination disco" (July 1979).
- HARRY JAMES:** *The King James Version*. SHEFFIELD LAB CD-3. 1976 recordings by James and His Big Band, "superbly performed" (March 1977).
- KEITH JARRETT:** *The Köln Concert*. ECM 1064-2. "A great set" (March 1976).
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- WEATHER REPORT:** *Mysterious Traveler*. COLUMBIA CK 32494. "Their best to date" (November 1974).

CLASSICAL

- BACH:** *Violin Concertos*. Kuijken. PRO ARTE CDD 124. "Wonderful—strongly recommended" (July 1983).
- BEETHOVEN:** *Symphonies Nos. 1-8*. Walter. CBS SONY 35 DC-76/DC-80. *Symphony No. 9*. CBS SONY 35 DC-116. Classics all.
- BRAHMS:** *Alto Rhapsody, etc.* Hodgson, Haitink. ORFEO C 025821. "Performed with surpassing warmth and tender care" (April 1983).
- HANDEL:** *Water Music*. Harnoncourt. TELDEC 8.42368. "Hair-raising" (March 1979).
- MONTEVERDI:** *Selva morale e spirituale*. Partott. ANGEL 7 470162. "Fresh and vital" (October 1984).
- REICH:** *Music for Eighteen Musicians*. ECM 1129-2. "Charming" (April 1979).
- SCHUMANN:** *Songs*. Margaret Price. ORFEO C 031821. "Exquisitely sung" (December 1983).
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GARY U.S. BONDS: *Standing in the Line of Fire*. Gary U.S. Bonds (vocals); the American Men (vocal and instrumental accompaniment). *Standing in the Line of Fire*; *Sneaking Away*; *Fred Astaire*; and seven others. PHOENIX PRT-0072 \$8.98, © PRT-0072-C \$8.98.

Performance: Spirited
Recording: Very good

This is Gary U.S. Bonds's first self-produced album, and its success suggests that either he always had it in him to take creative control or that he learned an awful lot doing his earlier albums under the aegis of Bruce Springsteen and Miami Steve Van Zandt. "Standing in the Line of Fire" is, in fact, a nifty little record, a satisfying mixture of up-to-date AOR panache, old-fashioned soul-music heart, and the kind of Jersey Shore frat-party rock that Springsteen and friends have lately repopularized. Picks to click: *Fred Astaire*, which mates a flat-out rock instrumental background to a tribute to everybody's favorite hooper without sounding even slightly incongruous, and *Come On Let's Go*, the wonderful old Ritchie Valens rouser given an E-Street Bandish treatment. No masterpiece, but a very pleasant surprise. S.S.

LINDSEY BUCKINGHAM: *Go Insane* (see Best of the Month, page 84)

RAY CHARLES: *Friendship* (see Best of the Month, page 82)

THE DB'S: *Like This*. The dB's (vocals and instrumentals). *Love Is for Lovers*; *She Got Soul*; *Spitting in the Wind*; *Lonely Is as Lonely Does*; *Not Cool*; *Amplifier*; and five others. BEARSVILLE 25146-1 \$8.98, © 25146-4 \$8.98.

Performance: Superior pop
Recording: Very good

The dB's, who once (apparently to their lasting regret) characterized what they

Explanation of symbols:

- Ⓛ = Digital-master analog LP
- Ⓢ = Stereo cassette
- Ⓣ = Digital Compact Disc
- Ⓜ = Monophonic recording

HERE COMES PETER WOLF

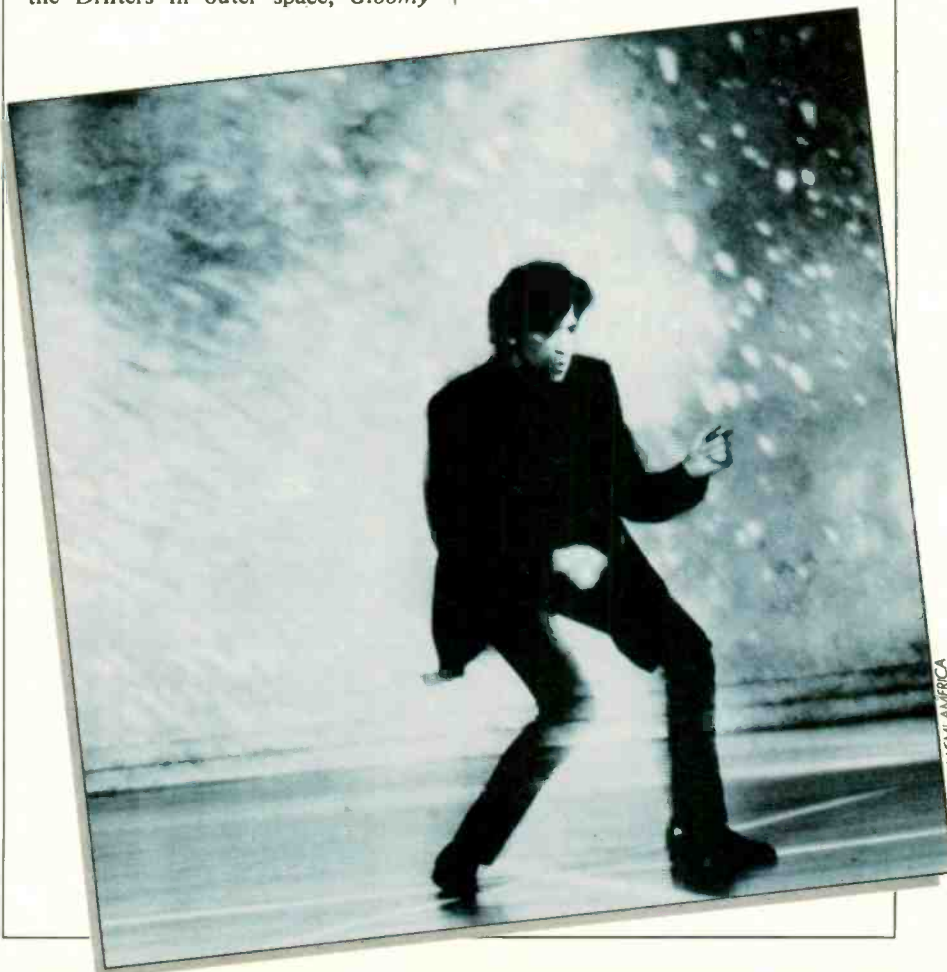
IN "Lights Out," everybody's favorite Jewish blues singer, Peter Wolf, has come up with a most impressive artistic declaration of independence from his old pals in the J. Geils Band—and one of the best albums of the year so far. A sprawling, funny slice of slick Eighties dance music unmistakably rooted in doo-wop, old New York City r-&-b, and vintage Motown, it nearly explodes with vitality and sass in a reassuringly color-blind way. Despite the all-star cast—appearances by Mick Jagger, Cars guitarist Elliot Easton, avant-garde axe hero Adrian Belew, the P-Funk Horns—it never sounds like a superstar's studio indulgence. In fact, "Lights Out" has an almost palpable cohesiveness, a quality for which the producers, Wolf and his partner-in-funk Michael Jonzun, clearly deserve the credit.

The high points on the album are *Here Comes That Hurt*, a brilliant soul ballad produced so as to bring to mind the Drifters in outer space; *Gloomy*

Sunday, a hilarious version of the old Hungarian tune (a hit for Paul White-man, way back when) that is rumored to have caused the Budapest suicide rate to rise every time it was played; and *Mars Needs Women*, a sublime novelty number in the grand tradition of the old Buchanan and Goodman Flying Saucer records. But everything else is absolutely first-rate. Wolf sings with more soul and passion than he has demonstrated in years and, in general, offers as intelligent a combination of urban street-smarts and AOR savvy as has crossed my desk in ages. In fact, this has got to be my 1984 candidate for the Record I'd Most Like to Hear Somebody Playing on a Real GhettoBlaster. Go get it!

Steve Simels

PETER WOLF: *Lights Out*. Peter Wolf (vocals); Elliot Easton (guitar); Michael Jonzun (bass); G. E. Smith (guitar); other musicians. *Lights Out*; *I Need You Tonight*; *Oo-ee-diddley-bop!*; *Gloomy Sunday*; *Baby Please Don't Let Me Go*; *Crazy*; *Poor Girl's Heart*; *Pretty Lady*; *Here Comes That Hurt*; *Mars Needs Women*; *Billy Bigtime*. EMI AMERICA SJ-17121 \$8.98, © 4XJ-17121 \$8.98.



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do as making "smart music for stupid people," are a pop band in the tradition of Alex Chilton's *Big Star*—which is to say that if they're not exactly a cult group they're at least commercially underappreciated. This new album may change all that.

"Like This" is probably the most likable entry in the Revisionist Pop-Rock sweepstakes since the first Marshall Crenshaw LP. It reminds me of lots of Sixties stuff, though I'd be hard pressed to pin down specific reference points, and despite the wonderful ringing guitars, bracing harmonies, and obviously felt lyrics, there's no avoiding the band's modernist sensibility. The future of rock-and-roll? Hardly, and probably not intended to be. Personal, quirky, undeniably excellent stuff? You bet, and worth checking out. **S.S.**

A FLOCK OF SEAGULLS: *The Story of a Young Heart*. Mike Score (vocals, guitar, keyboards); Frank Maudsley, Paul Reynolds (guitar); Ali Score (drums). *The Story of a Young Heart; Never Again (The Dancer); The More You Live, The More You Love; European (I Wish I Was)*; and five others. JIVE/ARISTA JL8-8250 \$8.98, © JC8-8250 \$8.98.

Performance: Unflappable
Recording: Good

After three albums, I still don't understand how a band can succeed with a name as dumb as A Flock of Seagulls. Not only that, they have to overcome disposable lyrics, a drab lead vocalist, and the worst hair in New Music today. Yet "The Story of a Young Heart" is as danceable and listenable an album as you'll hear in any club right now.

Most of the credit here must go to Paul Reynolds. The Seagulls' lead guitarist bangs, slashes, and squeals along, with a sorcerer's command of special effects and an irresistible sense of timing. Reynolds's staccato rhythms, coupled with Mike Score's spacey synthesizer flourishes, drive this bright, racing "Young Heart" at a breakneck pace. Even a song called *Suicide Day* hurtles along.

If anything finally does the Seagulls in, it won't be the name or the hair or the woeful lyrics. It will be monotony. Every song sounds just alike. In fact, there only seem to be two real songs here, each one played four slightly different ways, with different words. Still, they're a couple of great songs. **M.P.**

LUCIANO PAVAROTTI: *Mamma*. Luciano Pavarotti (tenor); orchestra, Henry Mancini cond. *Vivere; Musica proibita; Lolita; Vieni sul mar; Firenze sogna*; and eleven others. LONDON Ⓞ 411 959-1 \$9.98, © 411 959-4 \$9.98; © 411 959-2 no list price.

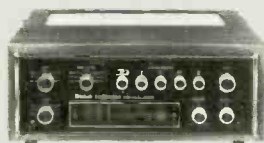
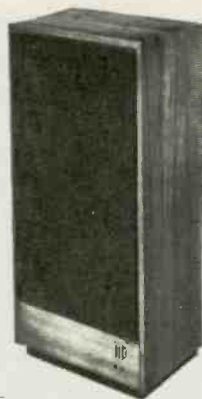
Performance: Robusto
Recording: Glitz à la marinara

They've probably broken out the chianti already over at London in anticipation of the sales figures on this one.

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Henry Mancini's arrangements are passionately glitzy, and he produces the kind of sweeping orchestral sound that first surfaced in the early days of "breathtaking Cinemascope and stereophonic sound." Mancini also keeps the pace unusually brisk, with no lingering allowed. Probably only an artist of Pavarotti's gifts and stature could bring off a recital of material this lightweight. But he can, and superbly does. P.R.

CHARLEY PRIDE: *Power of Love*. Charley Pride (vocals); vocal and instrumental accompaniment. *The Power of Love; Missin' Mississippi; Ellie; Stagger Lee*; and six others. RCA AHL1-5031 \$8.98, © AHK1-5031 \$8.98.

Performance: New and improved
Recording: Okay

Charley Pride, one of the last bastions of traditional country music, has finally thrown in the towel and gone for the kinds of records that will "keep him contemporary on the charts," as his agent puts it. That means that at least half a dozen of the songs here, including the winning title ballad, already a big hit, are as pop-sounding as they come. There's only one country song here, the affecting *Missin' Mississippi*.

Ironically, Pride sounds a lot more convincing on this kind of pop material than he ever did with pure country, and his bored delivery of old has given way to genuine new emotion and verve. To me, at least, "Power of Love" is Charley Pride's most enjoyable album, a metamorphosis of one of country music's most durable artists. A.N.

PATRICE RUSHEN: *Now*. Patrice Rushen (vocals, keyboards); vocal and instrumental accompaniment. *Gone with the Night; To Each His Own; Heartache Heartbreak; Perfect Love; Superstar*; and five others. ELEKTRA 60360-1 \$8.98, © 60360-4 \$8.98.

Performance: Attractive
Recording: Very good

Since 1973, when, at the age of nineteen, she signed with Prestige, Patrice Rushen has performed as a singer and keyboard artist with some of the best and some of the worst pop acts around. She has had several hits of her own since moving to Elektra in 1978, and there are a few likely candidates on "Now," her fifth release for the label. These are not spectacular vocal exhibitions, but Rushen has an inviting voice that fits the material she writes. She also plays keyboards here—again, not spectacularly, but well. In sum, a mellow pop album that's hard to hate. C.A.

SPANDAU BALLET: *Parade*. Tony Hadley (vocals); Gary Kemp (guitars, vocals); Martin Kemp (bass); Steve Norman (sax, percussion); John Keeble (drums); instrumental accompaniment. *Only When You Leave; Highly Strung; I'll Fly for You; Nature of the Beast*; and four others. CHRYSALIS FV 41473, © FVT 41473, no list price.

Performance: Dramatic
Recording: Flawless

The other day I overheard a Muzak arrangement of Boy George's *Do You Really Want to Hurt Me?* that I took as evidence that the New Romantic movement is brain dead. I hadn't bargained on Spandau Ballet's "Parade," an album that convinces me New Romance is very much alive. Like Boy George, Spandau Ballet's Gary Kemp has discovered that he can make American soul and r-&-b sound like something entirely new by singing them with a cabaret-like sense of tragedy suggesting the Empire in its last throes.

On "Parade," as on Spandau Ballet's U.S. breakthrough, "True," Kemp explores romantic themes and variations—longing, uncertainty, surrender, revenge, despair, resignation—through sophisticated though somewhat theatrical lyrics and guitar-saxophone-piano arrangements that swing from quasi-jazz to suave, brilliantine soul. Add the passionate vocals of Tony Hadley, who all but defines the New Romantic sound, and you get a sort of modern-day dance-club Noël Coward with a beat. A bit overwrought, but isn't that what romance is all about? M.P.

DON WILLIAMS: *Cafe Carolina*. Don Williams (vocals); vocal and instrumental accompaniment. *The Only Game in Town; Walkin' a Broken Heart; Maggie's Dream; Beautiful Woman*; and six others. MCA MCA-5493 \$7.98, © MCAC-5493 \$7.98.

Performance: Dignified
Recording: Very good

My frequent gripe about Don Williams is that too many of his songs sound alike, particularly in the pacing. On "Cafe Carolina," Williams offers his dependable stock of solid—if not always memorable—country/folk love songs, but he also rounds out the album with a few bittersweet surprises. If *Beautiful Woman* and *That's the Thing About Love* seem a little more pop-oriented than the things Williams has done in the past, he balances the MOR direction with a stirring little minor-key folk song, *Leavin'*, that he wrote fifteen years ago. Still, the real gem on the album is a story song called *Maggie's Dream*, the uneventful saga of a lonely truck-stop waitress that hits the head and heart at about the same time. As with any Don Williams album, the vocals are clean and soulful, the production delightfully unassuming, and the backing appropriately low-key, with just enough saxophone to keep things lively. A lovely little record. A.N.



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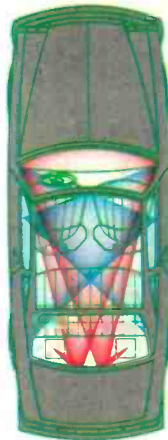
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SUPERCHARGED SINATRA

As pop, mass-culture events go, Frank Sinatra's "L.A. Is My Lady" is humongous. From Beverly Hills to Bayside, from Newport to Newark, the album has already bewitched, besotted, and bemused Sinatra's long-standing army of fans. Critically it has received an almost unanimous ovation from reviewers of every stripe and persuasion. Is it really that good? In a word, yes. And then some.

A generous part of the credit must go to Quincy Jones, a man who seems content to perform a non-Jackson miracle every other year or so. (Two years ago it was the re-introduction to Eighties audiences of the legendary talents of Lena Horne in the album "The Lady and Her Music.") His production here for Sinatra is Ziegfeldian in its glorification of a great American singing idol, and his conducting is superbly unobtrusive, following Sinatra as unerringly and effortlessly as a magnet. Then there are the featured instrumentalists—George Benson, Lionel Hampton, Bob James, Ray Brown, Steve Gadd, Joe Newman, Urbie Green—all big names in jazz.

But the real star attraction, as it has been for the forty-four years he's been performing and recording, is "Frankie Boy," "Ol' Blue Eyes," "Chairman of the Board," a.k.a. Frank Sinatra. He's in supercharged voice, better than he's been on recordings for years, and in a kind of vigorous, joyful, artistic com-



mand that signals he could mow you down with a performance of *Happy Birthday* if he chose to. Two of the new songs, *L.A. Is My Lady* and *How Do*

You Keep the Music Playing?, both with lyrics by Alan and Marilyn Bergman, are performed way beyond their intrinsic worth. Sinatra lavishes on them such care and respect, with his own special kind of sensitivity, that they sound like instant classics. As he sings them, they probably are. Sung by anyone else, they'd only be passable.

On the other hand, new charts of old songs seem to bring out Sinatra's playfulness with lyrics, the kind of playfulness that probably only he can get away with. I seriously doubt that I'd sit still for any other singer performing today who would change the original Cole Porter line, "They're not her lips/But they're such tempting lips," from *It's All Right with Me*, to "They're not her chops/But they're such tempting chops. . . ." That one made me squirm a little, even from Sinatra. But, as always with Sinatra, if you want the steak you have to take the bone.

All can be quite easily forgiven, though, when Sinatra swings lithely and gracefully through such things as *If I Should Lose You, Until the Real Thing Comes Along*, and *Teach Me Tonight*, creating the kind of immutable magic that only a very great singing actor can.

Peter Reilly

FRANK SINATRA: *L.A. Is My Lady*. Frank Sinatra (vocals); orchestra, Quincy Jones cond. *L.A. Is My Lady; The Best of Everything; How Do You Keep the Music Playing?; Teach Me Tonight; It's All Right with Me; Mack the Knife; Until the Real Thing Comes Along; Stormy Weather; If I Should Lose You; A Hundred Years from Today; After You've Gone.* QWEST 25145-1 \$8.98, © 25145-4 \$8.98.

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JAZZ



CHICO FREEMAN: *Tangents*. Chico Freeman (woodwinds, percussion); Bobby McFerrin (vocals); Steve Coleman (saxophones); Mark Thompson (piano); Cecil McBee (bass); Billy Hart (drums); others. *Ballad for Hakima; Computerized Indifference*; and six others. ELEKTRA/MUSICIAN 60361-1 \$8.98, © 60361-4 \$8.98.

Performance: Imaginative
Recording: Excellent

I have always admired the music of Chico Freeman, and there are times when I am quite pleased by the performances of vocalist Bobby McFerrin. On Freeman's new album, "*Tangents*," they appear together on a few selections with excellent results. McFerrin should be heard in small dosages, as he is here, but I have yet to hear an overdose of Freeman, who is still one of the most interesting players around. In a time

when far too many releases are 90 percent filler, Freeman and co-producer John Koenig continue to make outstanding albums that sustain the quality established on the first track. *C.A.*

STAN GETZ AND ALBERT DAILEY: *Poetry*. Stan Getz (tenor saxophone); Albert Dailey (piano). *A Night in Tunisia; Confirmation; Lover Man*; and four others. ELEKTRA/MUSICIAN 60370-1 \$8.98, © 60370-4 \$8.98.

Performance: One-on-one
Recording: Quite good

Until they hear "*Poetry*" many people will be unaware of how great a loss music suffered earlier this year when pianist Albert Dailey died of AIDS. Sure, Dailey, who had just turned forty-six, made other recordings, but—withstanding his lengthy stints with Sonny Rollins, Dexter Gordon, the Thad Jones-Mel Lewis band, and Stan Getz—he never received the public recognition granted so many of his less talented colleagues.

Getz wrote some very peculiar things in his notes to this album, but there's nothing strange about his playing here. It's too bad that this duo won't be able to collaborate again, but even worse that we shall never hear Dailey's further explorations of *Lover Man* and *'Round Midnight*, both exquisite solos. *C.A.*

GIANTS OF JAZZ. Dizzy Gillespie (trumpet); Kai Winding (trombone); Sonny Stitt (tenor and alto saxophones); Thelonious Monk (piano); Al McKibbon (bass); Art Blakey (drums). *Straight, No Chaser; Epistrophy; Sweet and Lovely*; and three others. CONCORD JAZZ GW-3004 \$8.98, © GWC-3004 \$8.98.

Performance: Excellent
Recording: Fine

Considering the high rank of the players, it is a wonder that the *Giants of Jazz* ever found time to get together as a unit, and still more remarkable that they more or less stayed together for a year. Though "*Giants of Jazz*" is a new album release, it was recorded in Switzerland in 1972 and contains the last recordings of Thelonious Monk, who died ten years later.

All-star groups often impress more with their roster of names than with their music, but that is not the case here. No one acts the prima donna. There is no grandstanding—just good, solid jazz expertly played. Each musician gets a chance to step up front. Sonny Stitt is featured on *Don't Blame Me*, Kai Winding renders *Sweet and Lovely*, and *I'll Wait for You* is Dizzy Gillespie's. Monk gets the lion's share of the limelight; he composed the remaining three tunes and is heard prom-

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inently on them. His work with Art Blakey on *Thelonious* is particularly outstanding. C.A.

ETTA JONES: *Love Me with All Your Heart*. Etta Jones (vocals); Joe Newman (trumpet); Houston Person (tenor saxophone); Cedar Walton (piano); George Duvivier (bass); Jimmy Cobb (drums). *Blues in the Night; I Wish I Knew; I Should Care; Darling Je Vous Aime Beaucoup*; and four others. MUSE MR 5262 \$9.98.

Performance: Fine
Recording: Quite good

She wobbles a bit too much on the slower numbers—especially on *My Romance*—but Etta Jones is otherwise in fine fettle on her new Muse album, recorded a year ago. It's been forty years since Jones won the famous Apollo Theatre Wednesday night amateur contest, and twenty-five years since *Don't Go to Strangers* launched her on a comeback trail. Now fifty-six, the lady still delivers smooth performances that deserve the fine backing she receives here from a formidable sextet. C.A.

BUCKY AND JOHN PIZZARELLI: *Swinging Sevens*. Bucky and John Pizzarelli (guitars). *In a Mellow Tone; Soon; Four Brothers; Blame It on My Youth; Lush Life; Why Did I Choose*

You?; Sleeping Bee; In a Mist; and three others. STASH ST 239 \$8.98.

Performance: Silken
Recording: Very good

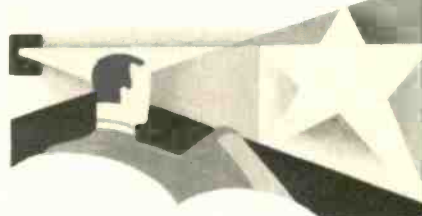
"Swinging Sevens," a new album by Bucky Pizzarelli and his son John, is so named because it features two seven-string guitars. Rarely does a record of such consistent high quality come along. The program consists entirely of vintage material that has stood the test of time, and the smooth execution by these skillful musicians makes it one of the gentlest-sounding jazz albums you are ever likely to hear. C.A.

SADAO WATANABE: *Rendezvous*. Sadao Watanabe (alto saxophone); Roberta Flack (vocals); others. *Fire Fly; If I'm Still Around Tomorrow; I'm Yours; Cool Breeze*; and four others. ELEKTRA 60371-1 \$8.98, © 60371-4 \$8.98.

Performance: Pale
Recording: Fairly good

Saxophonist Sadao Watanabe has made some interesting albums, but "Rendezvous," his latest, offers anemic music that flows in one ear and out the other leaving not a trace behind. The band of studio musicians is lethargic, and Roberta Flack sounds as if she were whispering to herself in the corner. C.A.

FILM & THEATER



GHOSTBUSTERS (Elmer Bernstein). Original-soundtrack recording. Ray Parker, Jr., Laura Branigan, Air Supply, others (vocals and instrumentals); orchestra. ARISTA AL8-8246 \$8.98, © AC8-8246 \$8.98.

Performance: Parker on the loose
Recording: Good

How hot is *Ghostbusters* at the box office? So hot that sometime in the Nineties you can probably expect the umpteenth sequel, something like *Rocky XIII Meets Ghostbusters*. The album taken from *Ghostbusters*, on the other hand, is strictly a one-shot deal. The one-shot actually narrows down to one track, and that is Ray Parker, Jr.'s performance of the title song. It's a lot of inane, rambunctious fun, and if you haven't heard it on the radio yet I'm sure you've heard kids on buses yowling it or seen breakdancers contorting to it.

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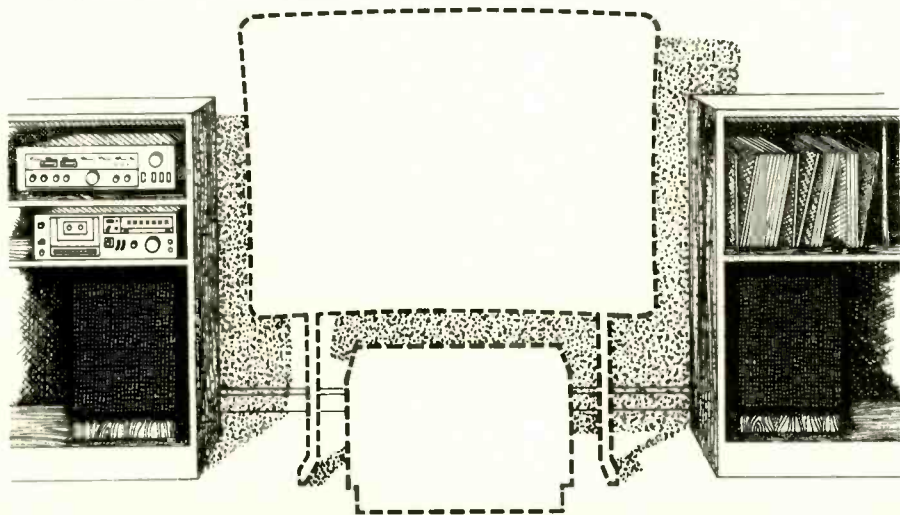
The rest of the album is strictly standard commercial zilch. P.R.

THE NATURAL (Randy Newman). Original-soundtrack recording. WARNER BROS. 25116-1 \$8.98, © 25116-4 \$8.98.

Performance: Haunting
Recording: Excellent

As a take on Bernard Malamud's justly celebrated novel, the film version of *The Natural* comes off as more than a tad simplistic—sure, the book is a parable, but it is not, as director Barry

Levinson seems to think, a mélange of the World Series, *Rocky*, and *Return of the Jedi*. About Randy Newman's score for this flawed entertainment, however, I have no complaints. A haunting, melodic throwback to the Coplandesque, Marlboro Country school of film composition that flourished in the Fifties and early Sixties, it is elegiacally beautiful in an authentically American way. It is also, for my money, not only the smartest orchestral score for a big-budget feature in nearly a decade but Newman's best music since he became a reluctant pop star. Don't miss it. S.S.



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STARLIGHT EXPRESS (Andrew Lloyd Webber). Original London-cast recording. Stephanie Lawrence, P. P. Arnold, Ray Shell, Jeff Shankley, Lon Satton, others (vocals); orchestra, David Caddick cond. POLYDOR LNER 1 two discs \$25.96, © LNERC 1 two cassettes \$25.96 (from International Book and Record Distributors, 40-11 24th St., Long Island City, N.Y. 11101).

Performance: High-speed
Recording: Super

Andrew Lloyd Webber has done it again. He's come up with a show he conceived in some idle, inspired moment (on a train, reportedly), cranked out a score to lyrics by Richard Stilgoe, called in the topflight director-designer team of Trevor Nunn and John Napier—all of whom he's worked with before (on *Cats*)—and hired out the Apollo Victoria in London for an opening last March and a run that (like *Cats*) is probably "forever."

Starlight Express, you see, is about trains. All of its characters are rolling stock—engines (male), coaches of various descriptions (female), and a caboose, all thirty-three of them on roller skates throughout. That doesn't have much bearing on the cast recording, but it explains to some extent the headlong, high-speed nature of the score Lloyd Webber has written. It's strictly Life in the Rail Yard, much as *Cats* was Life in the City Dump. It doesn't have the diversity that his music for *Cats* has, but it *does*, on record at least, have an almost oratorio-like, incantatory directness of style that, curiously, even makes it a pretty decent dance record.

Lloyd Webber has been lucky and gotten (or perhaps insisted upon) two-record sets of most of his shows, and this one, like the rest, has been slickly produced. The double-sleeve jacket gives no indication of who sings what, but their performances have the heft and energy of a diesel. The recording was made in the theater during the course of three live performances last spring and is technically first-rate, but it's strange they wouldn't have recorded this very high-tech show digitally. A CD version is clearly on the way.

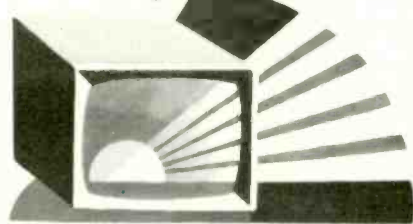
Christie Barter

STAR TREK III—THE SEARCH FOR SPOCK (James Horner). Original-soundtrack recording. CAPITOL SKBK-12360 two discs \$10.98, © 4XKK-12360 one cassette \$10.98.

Performance: Authoritative
Recording: Effective

James Horner, who is rapidly turning into the poor man's John Williams, has concocted a suitably sweeping, romantic score for the latest ride aboard the Starship Enterprise, and while there's nothing here you haven't heard before—"Spock" more or less recycles Horner's previous Trek music—it makes for pleasant, undemanding listening at home. Personally, though, I'd wait for the video disc. S.S.

VIDEO



DARYL HALL/JOHN OATES: *Rock 'n Soul Live*. Daryl Hall (vocals, guitar); John Oates (vocals, guitar); vocal and instrumental accompaniment. PIONEER ARTISTS LaserDisc PA-84-077 \$24.95.

Performance: Solid
Recording: Over-reverberant

This is an expanded version of a concert special originally aired on HBO, and though the sound, despite a mix job by the usually reliable Bob Clearmountain, is a little cavernous, it's nonetheless one of the better examples of its genre. Hall and Oates remain one of the few consistent, hit-making acts in contemporary pop that, for whatever reasons, refuse to play down to their audience. As documented here, they come off as splendid musicians, charismatic performers, and genuinely likable guys who just happen to be stars. I'm not a major fan of arena-rock shows (this one was taped at the Montreal Forum), but "Rock 'n Soul Live" made me wish I'd been there. *L.M.*

CHRISTINE McVIE. Christine McVie (vocals, keyboards); Billy Burnette (vocals, guitar); other musicians. PIONEER ARTISTS LaserDisc PA-84-084 \$24.95.

Performance: Understated
Recording: Good

Christine McVie has always struck me as the one member of Fleetwood Mac I'd like to have a beer with, and this particular video, or at least half of it, catches her at her most appealing. Forget side one, which is a dull documentary on the making of her solo album. It's a vanity production that seems designed mostly for members of her backup band and their immediate families. Side two, however, finds McVie in concert, and as usual her vaguely bluesy, confessional romanticism, as expressed in creamy pop numbers like *The Challenge* and *Keeping Secrets*, is nearly irresistible. *L.M.*

THE OTHER SIDE OF NASHVILLE. Performances and interviews with Willie Nelson, Johnny Cash, Kris Kristofferson, Emmylou Harris, and others. MGM/UA Beta Hi-Fi MB600351 \$59.95, VHS MV600351 \$59.95, CED MD100351 \$19.95.

Performance: Worthy
Recording: Okay

For what was originally shot as a documentary for French public television, producer/director Etienne Mirlesse went to Nashville to chronicle the evo-

lution of country music as an art form and to examine the sharp-toothed machinery that has made it one of the most commercial U.S. products imaginable.

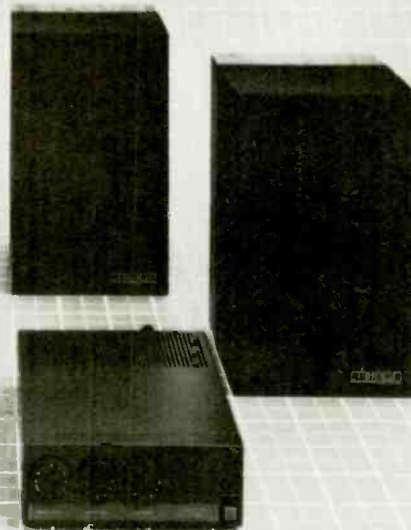
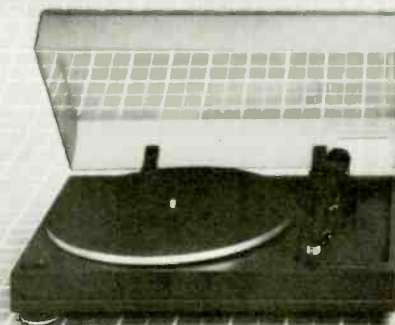
Narrated by former CBS Records producer Bob Johnston, the film does a good job of detailing how the music has lost its identity as the voice of the poor, Southern working class—mostly at the hands of businessmen in three-piece suits—and how the country-music industry is rapidly becoming a self-devouring monster. If the film is rambling, repetitive, and occasionally strained in its few dramatized segments,

the rare footage of the Bob Dylan-Johnny Cash "Nashville Skyline" sessions alone makes it worth its price. And the interviews and performance segments, with such artists as Kris Kristofferson, Emmylou Harris, Hank Williams, Jr., Chet Atkins, Willie Nelson, Bobby Bare, and Gail Davies, are far more real and informative than most of the entertainment profiles on *20/20*.

The definitive Nashville story has yet to be told, especially on film. But for any serious student of country music, "The Other Side of Nashville" definitely merits checking out. *A.N.*

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BACH: Six Sonatas for Flute and Keyboard. Eugenia Zukerman (flute); Anthony Newman (harpsichord, organ). VOX CUM LAUDE VCL 9070 \$7.98, © D-VCS 9070 \$7.98.

Performance: Brittle
Recording: Fine

Although originally written for organ, these sonatas make excellent flute pieces. The three in which Anthony Newman plays the harpsichord are effective, but those in which he plays the organ are even better because of the more equally balanced treble lines. Eugenia Zukerman's playing is highly articulated and favors an almost constant Baroque-style staccato, while Newman plays with brilliance and accuracy in a rather mechanical fashion. The result is somewhat cold and brittle, but, as ever, Bach's genius shines forth. S.L.

BEETHOVEN: Piano Concerto No. 2, in B-Flat Major, Op. 19. HAYDN: *Piano Concerto in D Major.* Martha Argerich (piano); London Sinfonietta, Martha Argerich cond. DISCHI RICORDI/PSI RCL 27059 \$10.98.

Performance: Excellent
Recording: Fine

Martha Argerich is a lady who really knows what she is doing, both as a piano soloist and as a conductor. The Haydn concerto is particularly difficult to bring off because most pianists try to make too much of its technically unassuming piano part. Argerich plays it for what it is, for its naiveté and charm. The Beethoven Second is a much more complex work but still takes some doing to make it more than a copy of a Mozart concerto. Again, Argerich notches herself and the London Sinfonietta up to the demands of the music and turns in a wonderful performance. Excellent sound throughout. S.L.

BRAHMS: Hungarian Dances. Georges Cziffra (piano). ANGEL/PATHÉ MARCONI © 1731311 \$12.98, © 1731314 \$12.98 (from International Book and

Explanation of symbols:

- Ⓛ = Digital-master analog LP
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- Ⓜ = Monophonic recording

KARAJAN'S ROSENKAVALIER

THE new Deutsche Grammophon recording of Strauss's *Der Rosenkavalier*, made in Vienna in 1982 under the direction of Herbert von Karajan, boasts the same cast and conductor as last summer's Salzburg Festival production. I attended a performance there—one that the maestro announced was the hundredth performance of the opera at Salzburg. Karajan of course conceived, staged, and conducted many of those performances. So it was particularly interesting to compare what I saw and heard at the Grosses Festspielhaus with what comes across in the recording.

Agnes Baltsa's Octavian is beautifully sung and so inflected that the listener has a clear impression of the young aristocrat's character; not since Frances Bible's interpretation has the part been this convincingly projected. As the Marschallin, Anna Tomowa-Sintow matches her Octavian musically, singing with sensitivity, delicate phrasing, and no apparent effort, if not with the dramatic incisiveness of Elisabeth Schwarzkopf, with whom Karajan previously recorded the opera.

Janet Perry's Sophie is vocally accurate and floating, which, sadly, is about all you can ask that a Sophie be unless the interpreter of the role is a very accomplished singing actress. Sophie's character is uninteresting, and Perry is able to do little to change that impression. The very difficult music assigned to Baron Ochs is negotiated with ease by Kurt Moll, who has a fine voice for the part, and the supporting cast is an admirable one.

But the true star here is Karajan, who, despite illness and physical impairment, conducts the Vienna Philharmonic with the sure hand of a master thoroughly at home with the score. Throughout Act I the huge orchestra is so well controlled that you hear every word of conversation between the Marschallin, Octavian, and Ochs; at the same time, you hear details of orchestration that you have never heard before, creating the impression that you must be hearing the work for the first time. Except for the "big moments" of Acts II and III, Act I is, for me, the most musically rewarding, but in this recording the high level of musical performance is sustained throughout.

It must be said that Karajan's *Rosenkavalier* bears his signature in the same way that Furtwängler's *Tristan* bore his or Toscanini's recorded operas his. Few conductors would dare approach this

score with the leisurely tempos Karajan adopts, but by so doing he shows us how richly detailed this music is.

While I was somewhat disappointed by the Salzburg staging, in that it lacked overall dramatic excitement and impulse, this recording is something else again. Presiding over it is a conductor who knows the Strauss score as well as if not better than any other living exponent of it, and the roles are sung by an eminently capable cast. Small wonder, then, that the music shimmers, soars, and sings as we have rarely heard it do before. Robert Ackart

STRAUSS: Der Rosenkavalier. Anna Tomowa-Sintow (soprano), Marschallin; Agnes Baltsa (mezzo-soprano), Octavian; Janet Perry (soprano), Sophie; Kurt Moll (bass), Ochs; others. Vienna Philharmonic, Herbert von Karajan cond. DEUTSCHE GRAMMOPHON © 413 162-1 four discs \$47.92, © 413 163-4 three cassettes \$47.92; © 413 163-2 four Compact Discs, no list price.



Anna Tomowa-Sintow as the Marschallin

S. LAUTERWASSER/DEUTSCHE GRAMMOPHON

Record Distributors, 40-11 24th St., Long Island City, N.Y. 11101).

Performance: Razzle-dazzle
Recording: Midrange a bit hard

Georges Cziffra's dazzling keyboard technique, first heard over here in 1959 on an Angel Franz Liszt collection (when he was better known as Gyorgy Cziffra), has remained undimmed. Whether you go along with what he has done here musically with fifteen of the twenty-one Hungarian Dances is something else again: the LP's subtitle is "Transcriptions and Paraphrases."

Brahms described his Hungarian Dances for piano four-hands as "genuine gypsy children, which I did not beget but merely brought up with bread and milk." As in the *Liebeslieder* Waltzes for vocal quartet and piano duet, he undoubtedly had in mind *Hausmusik* for the performance and enjoyment of amateurs at home in a day when radio, TV, and phonograph did not exist. Michel Béroff and Jean-Philippe Collard have recorded a version of the complete original for Pathé Marconi to perfection.

In his program notes Cziffra states the

case for a virtuoso treatment, and then gives us his versions in what I would guess is the way he imagines the dances might be played on the violin—which is to say he plays fast and loose, adding all sorts of virtuoso ornamentation and frills in the passagework. *D.H.*

ENESCO: Suites for Orchestra. Monte-Carlo Philharmonic Orchestra, Lawrence Foster cond. ERATO/RCA ◉ NUM 75118 \$10.98, © MCE 75118 \$10.98.

Performance: Splendid
Recording: Very good

Georges Enesco stands as Romania's counterpart of Hungary's Bartók, Spain's Falla, and Britain's Vaughan Williams. In common with all three, he had a profound knowledge of the craft of musical composition and of the literature of music. He was a violinist and teacher of the first rank, a conductor of formidable gifts. And he was a prolific composer. Yet he is known internationally chiefly by the two famous Romanian Rhapsodies.

The first of the two orchestral suites dates from 1903, the second from 1915. But the two opening movements of the First Suite, titled *Prélude à l'unisson* and *Menuet lent*, are alone worth the price of the recording. The *Prélude*, a singular tour de force, consists of a seamless melodic flow played by the strings, continuing in unison and without a break for almost nine minutes.

The rest of the First Suite and the Second do not display this kind of originality or power; the music occasionally suggests Reger or d'Indy in some of its polyphonic intricacies and elsewhere the influence of Fauré. For his part, Lawrence Foster turns in a first-rate conducting job. *D.H.*

FOSS: Psalms (see STRAVINSKY)

HAYDN: Piano Concerto in D Major (see BEETHOVEN)

IVES: Psalm 67 (see STRAVINSKY)

MAHLER: Symphony No. 1, in D Major (see Best of the Month, page 81)

MAHLER: Symphony No. 9, in D Major. Berlin Philharmonic Orchestra, Herbert von Karajan cond. DEUTSCHE GRAMMOPHON © 410 726-2 two Compact Discs, no list price.

Performance: Intense
Recording: Superb

The first Compact Disc-only release of a major work by a major orchestra and conductor is itself a major event—here made all the more so by a galvanizing performance.

Herbert von Karajan has recorded Mahler's Ninth Symphony once before, three or four years ago, and to the best of my knowledge it was the first time he had ever conducted the work. But that studio-made recording, released by Deutsche Grammophon at the time on

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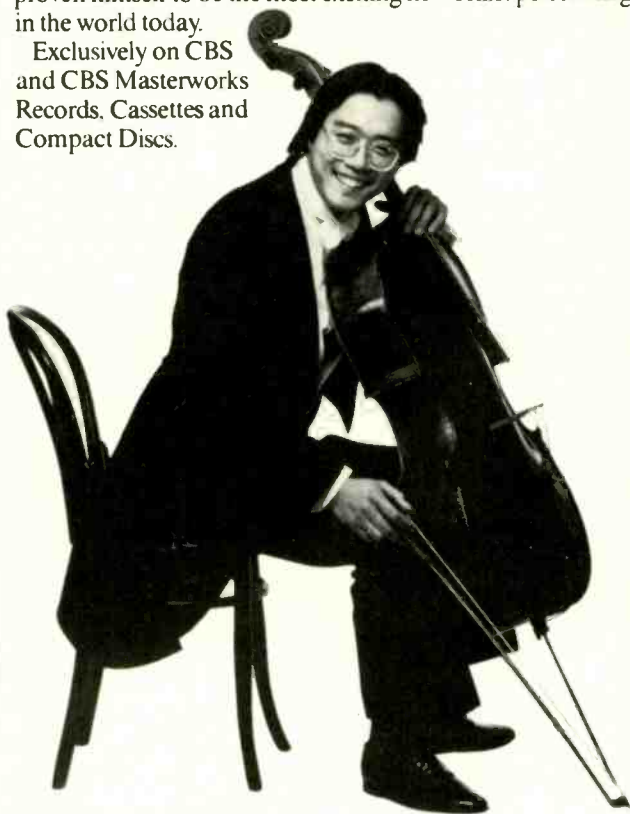
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LP and tape, went on to win all kinds of prizes and critical acclaim. David Hall, writing in the October 1981 issue of this magazine, called it "one of the greatest of the [Berlin Philharmonic's] many great discs," citing Karajan's "conductorial prowess and insight" in getting at the heart of this most challenging work.

Apparently feeling that he had still more to say, and being the perfectionist he is, Karajan steered a second, live recording through DG's A&R division in 1982, and this double-CD package is the spectacular result. It is also the second Mahler Ninth in the CD catalog, the other being by Sir Georg Solti and the Chicago Symphony on London. Recorded the same year (1982) in Chicago's Orchestra Hall, though under studio conditions, the Solti may have a very slight edge technically; London's engineers did a splendid job. But Karajan's interpretation is in a class by itself. His readings of the first two movements are altogether tighter and have more thrust; the *Rondo burleske* is more assertive and more cutting; and the sublime agonizing of the finale becomes a compellingly truthful personal statement—uniquely Karajan's.

DG's banding on these two CD's is more generous and handier to anyone studying the score (or looking for demonstration passages). The Solti performance is simply divided by movement, while the DG/Karajan layout makes the seven or eight subsections of each of the four movements immediately accessible. This may not be reason enough to invest in a CD player if you don't already own one, but the performance here surely is.

Christie Barter

MOZART: Piano Concerto No. 26, in D Major (K. 537, "Coronation"); Rondo in D Major (K. 382); Rondo in A Major (K. 386). Murray Perahia (piano); English Chamber Orchestra, Murray Perahia cond. CBS ◊ IM 39224, © IMT 39224, © MK 39224, no list price.

Performance: Outstanding

Recording: Rich and realistic

As he comes nearer to completing his Mozart concerto cycle, Murray Perahia is not only consistently satisfying but ever more deeply inside the music and more assured in his refreshing exploration of its wonders. The assurance now extends to his conducting, which in the last few installments has become a pleasure in its own right, making for exceptional integration of the two performing elements. The orchestra has a bit more to say in the K. 382 Rondo than in K. 386, and Perahia sees to it that it is said with a wit, color, and overall polish on the same level as his playing of the solo part.

The *Coronation* Concerto may be the weakest of Mozart's mature concertos, but Perahia reminds us that to be least in such a group is hardly an embarrassment. He realizes to the full the work's considerable substance and individual character in a superbly balanced per-

formance, at once more intimately scaled than most and more truly enlivening, which simply has no peer in today's catalog. Perahia plays his own tasteful cadenzas in all three works, and CBS has come through with rich, warm, altogether lifelike sonics. *R.F.*

MOZART: *Sinfonia Concertante for Violin and Viola in E-flat Major (K. 364); Concertone for Two Violins in C Major (K. 190).* Norbert Brainin (violin); Peter Schidlöf (violin and viola); English Chamber Orchestra, Sir Alexander Gibson cond. CHANDOS ◉ ABRD

1096 \$13.98, © ABTD 1096 \$13.98; © CD 8315 \$20.

Performance: Heart-felt
Recording: Okay

This pairing of these fine concertos is particularly interesting because it offers the opportunity of measuring Mozart's phenomenal development during the few years between his first double concerto and his final essay in that genre. It also affords us a chance to hear three fine musicians of a generation back—Norbert Brainin, Peter Schidlöf, and Sir Alexander Gibson—playing in a style

where warmth and feeling bring a sense of humanity to music. *S.L.*

PERGOLESI: *The Music Master.* Judith Blegen (soprano), Laurotta; David Britton (tenor), the Music Master; John Ostendorf (baritone), Colagianni; Gerard Schwarz (voice), Butler; Los Angeles Chamber Orchestra, Gerard Schwarz cond. ANGEL ◉ DS-37344 \$11.98, © 4XS-37344 \$11.98.

Performance: Charming
Recording: Excellent

Although we will never know exactly which, or even how many, composers had a hand in this comic intermezzo attributed to Pergolesi, it is a thoroughly delightful affair concerning a student who, despite her amorous teacher's protestations, believes she is ready for the operatic stage.

The performance is sung with great charm, and the Italian comic spirit shines forth winningly. The dialogue, however, is spoken with such precision and so deliberately paced that it contradicts the camp of the music. Better left out or set to recitative. *S.L.*

SCHUBERT: *Lieder* (see Best of the Month, page 82)

STRAVINSKY: *Symphony of Psalms.* **FOSS:** *Psalms.* **IVES:** *Psalm 67.* Wisconsin Conservatory Symphony Chorus; Milwaukee Symphony Orchestra, Lukas Foss cond. PRO ARTE ◉ PAD-169 \$10.98, © PCD-169 \$10.98.

Performance: Good
Recording: Chorus in background

Lukas Foss composed his *Psalms* in 1956, drawing in part from material from his musical setting of *The Skin of Our Teeth*. Dimitri Mitropoulos and the New York Philharmonic gave the première, and the Roger Wagner Chorus has recorded Foss's two-piano reduction, but this is the first recording of the original orchestral version. Foss frames a setting of verses from Psalm 98 ("Make a joyful noise unto the Lord") with a prefatory section using verses from Psalms 121 and 95 and a brief epilogue using the familiar Psalm 23. These are effective treatments of the texts, and the performance must be regarded as definitive, but the recording balance, with the chorus rather in the background, seems to keep the work from making its strongest effect.

The same sort of balance works against the effectiveness of the Stravinsky performance. Though *Symphony of Psalms* is a work Foss understands and communicates well, the recording does not suggest the electricity that comes from Bernstein's. Foss's tempos are closer to Stravinsky's own, but Bernstein shows a greater sense of momentum, as well as intensity, in his more deliberate pacing.

The *a cappella* setting of Psalm 67 comes off best here, its specifically Ivesian flavor admirably caught and handsomely projected. *R.F.*

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VERDI: Operatic Arias. *Luisa Miller: Sacra la scelta... Ah! fu giusto. Ernani: Oh de' verdi anni miei. I due Foscari: O vecchio cor. Il Trovatore: Il balen. Macbeth: Pietà, rispetto, amore. Rigoletto: Pari siamo; Cortigiani, vil razza dannata. La Traviata: Di Provenza il mar, il suol. Un ballo in maschera: Eri tu. La forza del destino: Urna fatale... È salvo.* Leo Nucci (baritone); National Philharmonic Orchestra, Richard Armstrong cond. LONDON ◊ 410 159-1 \$10.98, ◊ 410 159-4 \$10.98.

Performance: Okay
Recording: Good

Now, at forty-two and in the prime of his career, Leo Nucci is a well-schooled and authoritative singer. His baritone is neither powerful nor particularly distinctive, but it has impact and is used with intelligence and considerable dynamic variety. His tone is well centered and cleanly produced, not too strong in the lower range, but open and ringing at the top. He is more impressive in lyric utterances such as the rarely heard "O vecchio cor," where the *bel canto* flourishes are smoothly executed, and the unusually elegant "Di Provenza." Passionate and explosive declamations, on the other hand, cause Nucci to depart from pitch. Texts are supplied with unusually good, though uncredited, translations. G.J.

Collection

GHENA DIMITROVA: Arias. *Aida: Ritorna vincitor! I Lombardi: Salve Maria. Attila: Oh! nel fuggente nuvolo. Macbeth: Vieni! t'affretta! La Gioconda: Suicidio! Adriana Lecouvreur: Io son l'umile ancella; Poveri fiori. Andrea Chénier: La mamma morta. La Wally: Ebben? Ne andrò lontano. Turandot: In questa reggia.* Ghena Dimitrova (soprano); Munich Radio Orchestra, Lamberto Gardelli cond. ANGEL ◊ DS-38074 \$11.98, ◊ 4DS-38074 \$11.98.

Performance: High-powered
Recording: Serviceable

Today, when lyric sopranos tackle spinto roles and spintos aspire to the dramatic ones, there is an understandable thirst for really big voices in the Milanov mold. Several have chanced by—Gulin, Marton, Evstatieva—but none has caught the groundlings' fancy so resoundingly as Ghena Dimitrova, the Bulgarian blockbuster soprano.

In the wake of Deutsche Grammophon's complete *Nabucco* under Giuseppe Sinopoli, in which she sings with great finesse as well as power, Dimitrova's first aria recital proves a slight disappointment. Working here with a less finicky maestro, Lamberto Gardelli, she sometimes lapses into the generalized rhythm and attack so characteris-

tic of Balkan singers, resulting in a certain heaviness. She seems not to understand Verdi's slurred staccato notes—a very specific effect—and while her range of dynamics is complete, she does not always follow *piano*, *forte*, *crescendo*, and *decrescendo* markings in the score, preferring to choose what sounds best for her.

On the other hand, there is no gain-saying that she is mistress of the magisterial, sweeping phrase. One expects exalted lift in the "Numi, pietà" conclusion of *Aida's* first aria, and Dimitrova delivers. Though not possessed of a velvety, sensuous beauty, her voice is strong and sure, handsome in timbre, reliable in intonation, and equally, expressively attractive at loud and soft, high and low extremes.

If the Verdi selections occasionally show a slightly gluey legato, the verismo arias are noteworthy for fervor and frank emotion. Not the least of Dimitrova's gifts is her saving the high voltage for all-out moments ("Suicidio!" is a prime example), contrasting these with asides of disarming gentleness and intimacy. Where recitative merges into cantilena, however, as in "La mamma morta," she could profitably distinguish more clearly between the textures of the two, thereby enhancing the sweep of the big phrases when they start to unfold.

John W. Freeman

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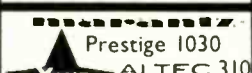
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TAPE

(Continued from page 67)

A process of upgrading has been going on with video cassettes as well, although only in the past few months. Generally speaking, owners of VCR's have been less critical of performance than audiophiles, so video cassettes (and the machines they're used in) have taken a rather minimalist approach—it's sufficiently amazing that they work at all, never mind with something approaching broadcast quality. Recently, however, the tape manufacturers have gone through a frenzy of updating their formulations in the face of greater sensitivity on the part of videophiles, an increasing number of whom are demanding the same sort of quality in video tape as in audio tape.

One of the reasons for this has been the introduction of Beta Hi-Fi and its VHS equivalent, the audio tracks of which are unforgiving of the sort of oxide flaws characteristic of older video cassettes. Significantly, many of the new tapes include the words "Hi-Fi" or "Stereo" on their packaging.

The improvements tend to echo those in audio: smaller particles, better cassette-shell construction, unusual formulations (such as JVC's titanium oxide cassette). The basic benefit of all these hi-fi video cassettes will essentially be better mechanical stability, lower audio and video noise, and fewer drop-outs—all good things even if you have no intention of taking advantage of the new systems.

Part of the impetus for the activity is a belief that there is a huge market for "video home movies," which has given rise to several variations on the VCR. One is a miniature VHS cassette that will fit conveniently in a lightweight camera. Sony has been using this approach for some time with its already compact Beta cassettes, of course, but JVC's solution was to make an adaptor that will allow the VHS-C miniature cassettes to play in conventional machines.

Some observers feel that the future, as far as the portable market is concerned, is with what is called "8mm video." The name is obviously designed to recall the photo-

graphic movie film it seeks to replace; in reality it represents a system using a video cassette similar in size to the standard audio type, but with slightly wider metal tape. The advantages in portability are obvious, but the problem of reliably and cheaply fitting adequate video information onto such a small amount of tape is far from being solved. So 8mm video is still pretty much in the future. As with digital audio, metal-evaporated tape is proposed as one solution, but whatever the engineers come up with, a workable and economic system is not too far off.

Tape manufacturers offer an object lesson in what can be done with a thoroughly imperfect system if enough effort is expended. If tape itself is an improbable technology, and cassettes fraught with technical compromises, and home video out of the question, then the fact that tape recording has arrived at such a point of technical sophistication is a tribute to the engineers' refusal to accept format limitations and to the industry's determination to offer benefit to consumers. □

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But, DAK came to the rescue. We not only bought all 3500 of the speakers, we bought the exponential horn tweeters that BSR had left out and let our customers install the correct tweeter themselves. The highs and lows this system created were nothing short of awesome.

BUT, THERE'S A PROBLEM

We thought we'd have enough speakers for the rest of the year, but we sold over 3300 in just our Spring Catalogs. So, we went back to BSR and tried to buy more of the speakers. But, they only sold us the first batch at a close-out price because they had put in the wrong tweeters and didn't know what to do with them.

BSR said that luckily they didn't make mistakes very often and the only other 'problem' they had was an inventory of 6000 too many super tweak 8" midrange drivers with an exotic polypropylene cone they used for an expensive BSR tower system.

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The bass, all the way down to 20hz is reproduced with thundering accuracy by



the pride of the BSR line, a 15" acoustic suspension bass driver. The lows seem to have life of their own.

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Its characteristics give incredible purity to the entire midrange. It's much more accurate than a paper midrange.

And, it's a perfect match for the dramatic thundering bass and startling highs these speaker systems produce. There's a presence control that lets you adjust the midrange level to suit your taste.

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The beautifully crafted wood-grain appearance cabinet is 29" tall, 18" wide and 10½" deep. It comes with a beautiful removable real cloth speaker grill.

BSR backs this system with a 2 year limited warranty, and speaking of protection, the tweeter is fuse protected. The system can handle 180 watts peak, 90 watts continuous and requires 15 watts.

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BSR says that this is it. When these 6000 speakers are gone, there'll be no more. They say they have no more mistakes and no more extra speakers.

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GUITAR

(Continued from page 75)

Söllscher from Sweden has such courage. His debut recording on the Deutsche Grammophon label is "Greensleeves" (DG 2532 054), which begins with Elizabethan lute music and ends with Segovia's transcription of Bach's Chaconne and Sor's Variations on *Marlborough s'en va-t-en guerre*. DG has since released Söllscher's album of Bach's Lute Suites (410 643-1). Though his tone hardens more than I like, he plays with secure technique, and everything he does commands respect. He plays the lute music on an eleven-string alto guitar, which gives the music a warm, manly sound.

Young Sharon Isbin's "Dances for Guitar" on Pro Arte (PAD 191) is a collection of pieces by Rodrigo, Barrios, Turina, Granados, and others. Isbin dominates the instrument as well as any of the men in her generation, and if there is anything that might be called feminine in her work, it is the way her frequent use of rubato gives her playing a coquettish quality. Some of the pieces here

are familiar from many other recordings, but Isbin makes them sound fresh because her interpretations are very much her own.

My favorite of the younger generation is Manuel Barrueco, who was born in Cuba and trained in this country. I discovered him with his third recording for Vox Turnabout, an album of sonatas by Scarlatti, Cimarosa, Paganini, and Giuliani (TV 34770). I would call his playing here quite breathtaking (the word used by Igor Kipnis in reviewing Barrueco's first Turnabout album in this magazine in 1978). His Scarlatti performances are ravishing in their delicacy and beauty, and they alone are enough to make you feel that you are in the presence of a major artist (the phrase used to describe him in the *Los Angeles Times*).

With his album of Bach Lute Suites Nos. 2 and 4 (VCL 9023), Barrueco graduated to the Vox Cum Laude series. He seems to be artistically endowed with everything required for a prestigious career.

Another gifted young artist who appears to have a bright future is Robert Secrist. His latest album

(Musical Heritage Society 4864Z) is a recital of contemporary Spanish and Latin American music. Reviewers of Secrist's concerts dwell on his subtlety, sensitivity, and poetic quality. These traits make him particularly well suited for Federico Mompou's impressionistic *Suite Compostelana*, which he brings to life with a pleasing variety of tone color. The selections by Rodrigo and Antonio Lauro permit Secrist to show a more robust side, and he plays the four Barrios pieces with special feeling and insight.

It was an unpleasant surprise to me to discover that the Compact Disc has not brought us entirely noise-free guitar recordings. In fact, in addition to the low-level "hall rumble" that sometimes shows up on digital recordings, some recent guitar CD's are plagued by microphone hiss and other kinds of noise that sound remarkably like plain old-fashioned tape hiss.

I first noticed this on the CD version of Bream's recital of Granados and Albéniz on RCA (RCD1-4378). I still recommend that disc because the performance is fabulous and the

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By Drew Kaplan

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And you can create as many different data bases as you wish, each with up to 200 files. In the example above, I've created a Telephone/Address book.

You can keep the information in your computer or print it out. The data base program can arrange it for you numerically or alphabetically. Or, use 'Greater Than' or 'Less Than' commands.

For example, if you had your stocks listed and one of the 8 fields was the value of each stock, you could simply tell the computer to list everything greater than or less than a certain dollar value.

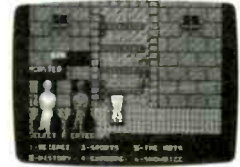
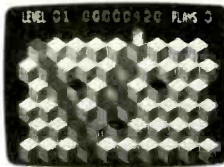
And, you can locate information from any field in 'Global Search'. In the example above, you could locate me by my phone number, my first or last name, zip code, my interests, or even my street name or number.

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who are out to get him. As you clear each level, you'll see a cartoon featurette celebrating your success.

But, beware. After the first level it gets hard because if you land on the same square twice, the square turns back to its original color. In the May '84 issue of Commodore User Magazine, they said "It's the best game we've seen so far this year!"

Forbidden Forest was chosen as one of the top 50 games of all time. You have to use three-dimensional skills to shoot arrows at everything from bloated bees and winged dragons to killer skeletons and more, as you run through an ever changing scenic arena.

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Finally, it's time to stretch your brain. If you have a nagging desire to remember things that are less than monumental, Monster Trivia is for you.

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noise is almost entirely masked by the music. But I do not recommend the CD version of Bream's new recording of the *Concierto de Aranjuez* (RCD1-4900). During the famous Adagio it has an irritating amount of noise that does not appear on the LP.

Once sensitized to rumble and hiss on these CD's, I found that by straining I could hear occasional noise on the CD of the Romero family playing Rodrigo's *Concierto Madrigal* (Philips 411 024-2) and on Pepe Romero's Spanish recital (Philips 411 033-2). My advice here is to listen to the music and don't strain to catch the noise. But the hiss cannot be ignored on the CD of Söllscher's "Greensleeves."

It was a pleasant surprise to discover the emergence of three new guitar chamber groups. All three have just made their first albums for small California labels, and all three records feature transcriptions of music by Manuel de Falla.

A suite of five ballet scenes by Falla takes up most of side one on the album by the San Francisco Guitar Quartet (Klavier KS 573).

The sound seems a bit hard and twangy at times, but that may be an attempt at flamenco authenticity. Side two contains one of the few works composed specifically for four guitars, Federico Moreno Torroba's *Estampas*, a suite of short, melodic, folk-like pieces of considerable charm. The recording costs \$8.98 per disc or \$9.98 per cassette plus \$1 for shipping from Klavier Records, 9700 Glenoaks Blvd., Sun Valley, Calif. 91352.

Falla gets more polished playing—fittingly—from the Falla Trio. Their album "Virtuoso Music for Three Guitars" (Concord Concerto CC 2007) includes a suite from *The Three-Cornered Hat*, which they suffuse with mystery and drama. The album also includes a concerto by Vivaldi and one by Bach as well as an ingenious transcription of Mozart's *Eine kleine Nachtmusik*. It's lovely. These three remarkable young artists communicate musically with the finesse and vitality of a seasoned chamber ensemble, and their debut album is wonderful. In stores it costs \$8.98 for disc or cassette, and it can be ordered by mail

for \$7.98 plus \$1.50 for shipping from Concord Records, P.O. Box 845, Concord, Calif. 94522.

No less remarkable is the Los Angeles Guitar Quartet, one of the most intriguing new chamber groups I've heard in a long time. Their debut album, the first record to be issued on the Orpharion label, contains a couple of short pieces by Falla, three each by Praetorius and Stravinsky, Debussy's *Soirée dans Grenade*, and—believe it or not—a transcription of Bach's Sixth Brandenburg Concerto! Everything here is played with spirit, style, and polish, and the record is yours for \$12 plus \$1.50 for shipping from Orpharion Recordings, P.O. Box 91209, Long Beach, Calif. 90809.

Although I knew the guitar was popular in California as elsewhere, I didn't know the state was producing guitarists not just singly but in groups of three and four. These last three debut albums have made me most curious to hear a guitar chamber group in concert. So when the Los Angeles Guitar Quartet makes its New York debut in January, I plan to be on hand. □

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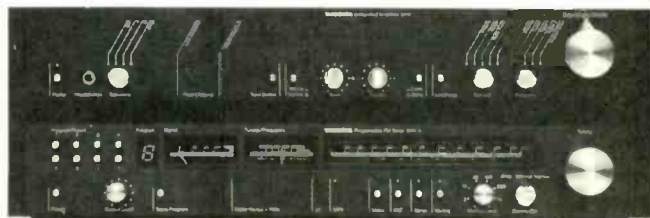
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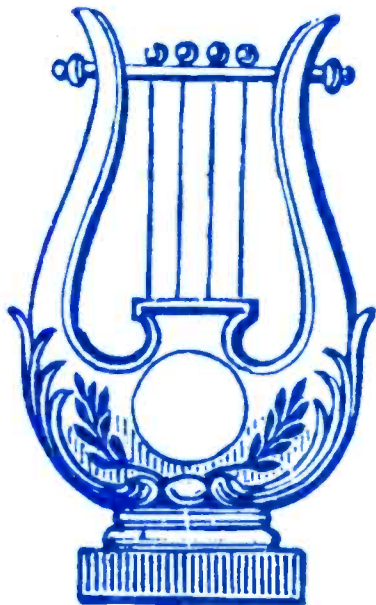
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Revised and updated!
Stereo Review's SRT14-A

STEREO TEST RECORD



THE EDITORS AND TECHNICAL STAFF OF STEREO REVIEW PRESENT THE MOST COMPREHENSIVE, ACCURATE, AND EASY-TO-USE TEST RECORD EVER DEVELOPED—REVISED AND UPDATED FROM THE ORIGINAL SRT14 VERSION.

This latest version contains everything you need to get the fullest, most realistic reproduction from your stereo equipment. You can actually perform a complete stereo system checkup by ear alone.

A test lab in a record jacket

Employing the most advanced recording, mastering, and pressing techniques, the Stereo Review SRT14-A is produced to strict laboratory standards. Engraved in its grooves are a series of precisely recorded test tones, frequency sweeps, and pink noise signals that enable you to accurately analyze and check your stereo system for:

- Frequency response.
- Stereo separation.
- Cartridge tracking ability.
- Channel balance.
- Hum and noise, including turntable rumble.
- Wow and flutter.
- Optimum speaker placement.
- Cartridge Tracking Force & Anti-skating.
- Musical Instrument Tuning Standards, and more . . . much more.

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Included with SRT14-A is a detailed instruction manual, complete with charts, tables, and diagrams. It explains the significance of each test. It tells you what to listen for. It clearly describes any aberrations in system response. And it details corrective procedures.

For professionals too

Included on the record are a series of tests that call for the use of sophisticated measuring instruments, such as oscilloscopes, chart recorders, and distortion analyzers. These tests permit the advanced audiophile and professional to make precise measurements of transient response, recorded signal velocity, anti-skating compensation, IM distortion, and a host of other performance characteristics.

SRT14-A record contents

- CARTRIDGE TRACKING, HIGH FREQUENCY
- FREQUENCY RESPONSE, 20 kHz to 25 Hz
- SEPARATION, LEFT-TO-RIGHT
- SEPARATION, RIGHT-TO-LEFT
- CARTRIDGE TRACKING, LOW FREQUENCY
- CHANNEL BALANCE
- CARTRIDGE AND SPEAKER PHASING
- LOW-FREQUENCY NOISE
- TURNTABLE FLUTTER
- FREQUENCY-RESPONSE SWEEP, 500 TO 20,000 Hz, LEFT CHANNEL
- FREQUENCY-RESPONSE SWEEP, 500 Hz TO 20,000 Hz, RIGHT CHANNEL
- TONE-BURST
- INTERMODULATION DISTORTION
- ANTI-SKATING ADJUSTMENT
- 1000-Hz REFERENCE TONES
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- STEREO SPREAD
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- CHROMATIC OCTAVE
- GUITAR TUNING TONES

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ORDER FROM: TEST RECORD, Dept. 30013, CN 1914, Morristown, NJ 07960.

Two Lines For Everyone

Now you can forget expensive, but dumb, two-line phones from the Phone Company at home or at the office. DAK has slashed the \$129 price tag on this installation-free two-line, 10 memory, Tone/Pulse decorator styled telephone down to just \$49.

You're at the office. You have just 5 minutes before your next meeting. And, you want to call home.

You dial your home number. You want to tell your wife to meet you for an early 5 o'clock dinner at a new restaurant near the office. It sounds great.

But, the line is busy. Your meeting starts. So, tonight it looks like you're going to eat dinner at home.

NOT JUST THE RICH

For those of us who already have two lines, we can send back our expensive, dumb phones. If you don't already have two lines, you might be surprised to know that having the extra line will cost you only about 30 cents a day.

And, installing this phone consists of simply plugging in a jack(s) just like on a single line phone. It's easy and it's fast.

We even have optional \$1 cords to let you plug this phone into two standard, single line jacks or one 2 line jack.

If you don't already have jacks, you can put them in yourself. Or, you can have the phone company do it for you. **SO, WHAT DOES A \$129 PHONE DO?**

For \$129 it does a lot. For DAK's \$49 close-out price, it's a smash, even if you use it as a single line phone. (Yes, you can use only one line if you wish.)

Tone/Pulse Switchable. Just switch it to fit your area. Or, dial in pulse to access your Sprint or MCI number, then switch to tone for dialing.

10 Memory Dialing. You'll have 10 16 digit memory locations including last number redial to make your dialing easy.

You can store frequently dialed numbers, or your complicated Sprint or MCI codes. I store my Telephone Credit Card.

First, I dial a long distance number. Then, the phone automatically dials my 14 digit credit card number. No more mistakes and no more hassles. Wow!

And, look at this. The memory is protected for over a year by two built-in, replaceable calculator-type batteries.

A Real Hold Button. You can put one or both lines on hold. If you answer a call in the bedroom, and you need to look up something in the kitchen, just put the call on hold. Red LEDs show which line(s) are on hold.

Any phone, of any type, in your home can take over the call with this professional hold feature. It's up to you.

Mute Switch. Using the mute switch is like electronically putting your hand over the mouthpiece for privacy.

Full Conference Capability. While you are talking on one line, you might want to add a third person from the other line to your conversation.

You can put whichever line you are using on hold, and use the other line to call out. Then just push both the line 1 and line 2 buttons, and both calls will be joined. It's easy. It's fast. And, group conversations can be really productive for work and fun with friends and family.

Two Bells, Two On/Off Controls. There are actually two separate, real mechanical bells built into this phone (one for



each line). The ring(s) will sound just like a Phone Company Phone ring.

Plus, LEDs show which phone line is ringing. There are even separate on/off switches for each bell. So, you can turn one phone on and one off. This is really neat. You can give one phone number to only your most important friends or family.



A, B, C, and D Buttons. These special buttons generate special tones for future services, such as bank transfers.

YOU'LL LOVE THE CONVENIENCE

Now you can have the luxury of two phone lines. If you have kids at home, you'll still be able to make or receive calls even when they are talking.

And, don't ever worry about getting a busy signal again when you call home. Plus, you're going to have an extremely comfortable, great sounding phone with traditional 'Phone Company' fit and feel.

WHY SO CHEAP?

Toryo is primarily an engineering company. They subscribe to the "design a better mouse trap and the world will beat a path to your door" theory.

We at DAK saw this phone selling for \$129.95 in another catalog. But unfortunately for Toryo, they didn't know how to get these phones in enough stores or catalogs to make it profitable.

So, DAK offered a ridiculous all cash price to Toryo and Toryo's factory to clear out all 37,000 of these phones.

So, you can buy this phone from another

large company (we have a copy of their summer catalog in our factory outlet store) for \$129.95, or you can buy it from us for just \$49.

This handsome addition to any room may be desk or wall mounted. And, it's backed by a DAK 1 year limited warranty.

TWO LINES FOR YOU RISK FREE

Call your friends. Feel and hear the quality of this phone for yourself.

If you're not 100% satisfied, simply return the phone to DAK within 30 days in its original box for a refund.

To order your Toryo Two-Line Phone with Tone/Pulse Dialing, 10 Number Memory, Hold, Conference and Future Banking Service Buttons, call toll free, or send your check, not for the \$129.95 price we've seen, but for just \$49 plus \$4 for postage and handling. Order No. 4129.

If you want to plug it into 2 jacks, we have a pair of modular cables for \$1 (\$0.50 P&H). Or. No. 4130. If you have a single 2 line modular jack, we have a cable for \$1 (\$0.50 P&H). Order No. 4131.

If you have two lines as I do, this phone will end fumbling with receivers forever. If you only have one line, think of the convenience and luxury this phone and a second line can add to your life.



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CRUTCHFIELD

ESOTERIC CARTRIDGES

(Continued from page 72)

available only on a custom-order basis.

All of the amplitude sensors are extremely arm-sensitive, and matching problems have limited their acceptance. The manufacturers themselves tend to treat the cartridges as specialty items. Says Mike Detmer of Stax Koygo, "We make cartridges for the sophisticated audiophile who is capable of understanding their limitations. The CP-Y is not for everyone."

The same might be said of any of the esoterics. They're not for everyone. But after that is said, one is almost compelled to ask if they represent a good value for anyone, especially in view of alternative digital playback systems now obtainable for about the same amount of money. For the price of one esoteric, you can buy two or more high-spec mass-market cartridges or at least one CD player.

The manufacturers themselves are far from uniform in their responses to these questions. Most think current CD players are flawed, and that attitude is widely shared by esoteric buyers. There's not much evidence that the esoteric cartridge makers are losing a lot of business to mass-market companies touting digital systems. But the manufacturers are scarcely united on the value of esoterics in general as compared with mass-market cartridges.

Most of the technically innovative designers, including Joe Grado, Frank Van Alstine, John Iverson, and Sao Win, have a low opinion of esoterics in general. Sao Win is particularly outspoken on the subject. "Most of the esoterics are Japanese moving coils, and the great majority are made out of stock Namiki parts. Very few differ significantly in construction from lower-priced moving coils sold by the major Japanese audio firms. Anyone who cares to disassemble esoteric cartridges can confirm this for himself. The prices commanded by the esoterics are generally not justified." Win's own Jewel moving coil sells for \$420.

Frank Van Alstine, who markets a modified Grado cartridge for \$100, is even more critical. "Most of these moving coils selling for several hundred dollars should be sold in blister packs for \$7.95," he says.

Van Alstine may be guilty of hyperbole, but the manner in which cartridge prices have risen relative to the costs of other audio compo-

(Continued on page 121)

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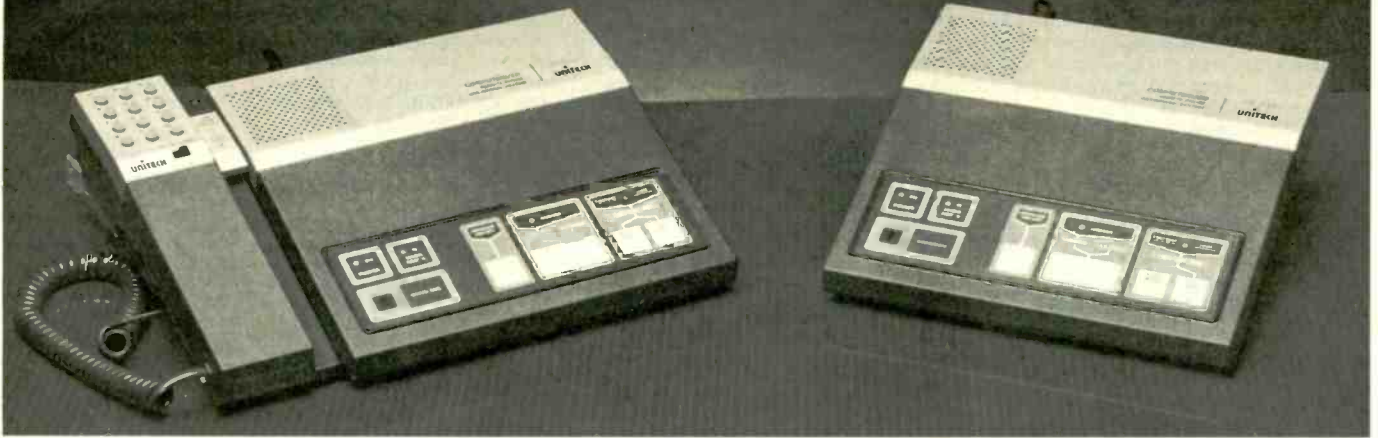
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CIRCLE NO. 71 ON READER SERVICE CARD

VoicePrint Plus Answerer



Now, just the sound of your voice is all you'll need to remotely retrieve phone messages with the all new VoicePrint Plus Answering Machine. And, at DAK's \$79 price, the answering machine market will never be the same.

Forget beepers. Your own voice is your remote beeper with this incredible new breakthrough in sophisticated telephone answering computers.

And, the VoicePrint breakthrough is just the beginning. You can forget both the regular 20 second fixed announcement and 30 second fixed incoming message recording length that's standard with most answering machines.

Plus, you can forget listening to your own announcement between your incoming messages. But, best of all you can forget forgotten beepers forever.

FIRST THE SIMPLE THINGS

The new VoicePrint's computer brain lets you record any announcement up to 40 seconds in length. So, with VoicePrint, you don't have to worry about your message being too short or too long.

comes in, you can monitor the caller's message (it's called call screening) and then decide if you wish to pick up.

This machine does everything. If you're on the phone and you want to record both sides of the conversation, just touch the 2-way record button and you'll have a permanent record of the conversation.

IT SAVES YOU MONEY

When you call in to get your messages, VoicePrint's toll saver takes over. The machine tells you by not answering on the second ring that you have no messages. So, you can hang up before the connection is made.

When you're home, you can set the machine to answer on the 2nd, 4th or 6th ring to give you plenty of time to get to the phone if you desire.

If there are messages when you call

For an extra \$20, you'll have a model with a Tone/Pulse phone that gives you the convenience of on hook dialing.

On hook dialing lets you dial a number without picking up the receiver. Through the speaker in the answering machine you'll hear whether you get a busy signal, a ring or if someone answers. Then, just pick up the phone and talk.

EASY INSTALLATION

Just plug in the modular phone jack and the included AC adaptor. Then, just record your message(s) using the built-in condenser mike. The VoicePrint Plus is made by Unitech. It's backed by their standard limited warranty.

TRY THE VOICEPRINT PLUS RISK FREE

It's new. And, it will set you free. Wait till you see how easy it is to use. And, wait till you and your callers hear just how good it sounds.

Try this heavy duty industrial quality answering computer in your own home or office. If you aren't 100% satisfied, simply return it within 30 days in its original box for courteous refund.

To order your Unitech VoicePrint Remote Control Microprocessor Controlled Answering Computer, risk free with your credit card, call toll free or send your check for DAK's market breaking price of just \$79 plus \$6 for postage and handling. Order No. 4148.

If you'd like the VoicePrint Plus with a Tone/Pulse On Hook Dialing Phone, it's just \$99 plus \$7 for postage and handling. Order No. 4149. And finally, if you don't want to talk to your machine, we have a special remote beeper that works with either machine for just \$12 (\$1 P&H) Order No. 4160. CA res add 6% tax.

At home, at the office or on the road, you'll be in full control with the latest in user-friendly telephone technology.



Taking messages is automatic too. Many cheap answering machines must record a preset 30 second incoming message. The more expensive units let callers talk as long as they want.

The VoicePrint combines the best of both. The computer will stop recording as soon as the caller stops talking.

But, calls are limited by the computer to no more than 1 minute. And, if someone hangs up without leaving a message, the machine ignores the call.

LOADED

Everything is automated. Just touch one of the full logic controlled touch pads and the computer answers with a confirming beep and jumps into action.

To play back messages at home, just touch the Message Report Button. Of course, you can elect to save them or let the machine record over them.

A message light tells you at a glance if you've received any messages while you were out. If you're home when a call

in, just give the computer your personalized VoicePrint and you'll get all your messages. Plus, we've got an optional beeper for you to use if you don't want to use the 'Voice Function'.

Here's a nice extra. If your machine has taken a lot of messages and filled up its tape, a second message that you've recorded will come on and inform callers that no more messages can be taken.

NEW ELECTRONIC TECHNOLOGY

You can forget costly endless loop cassettes and long empty spaces. This machine is so intelligent it knows exactly where each message is on the tape.

This machine is fascinating to watch in action. First, it plays your outgoing message. Then, it sounds a tone as it zips to the end of the last message it took.

It then beeps and starts taking the new message. Finally, it rewinds back to your outgoing announcement to start the cycle again. It's one smart computer.

OPTIONAL SMART TELEPHONE



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nents suggests some rather extravagant profit margins. Of course, the real issue is whether the escalating prices of the esoterics are matched by performance even marginally better than what is available in the mass market, and the lack of uniformity in testing procedures among reviewers and in specification reporting among manufacturers prevents a clear answer.

Available information suggests that esoterics as a group—and it's hard to group them—generally surpass high-spec mass-market cartridges in only one aspect of measured performance, namely rise time. The fastest low-output moving coils have rise times of under 10 microseconds, and the amplitude sensors are even faster. Fixed-coil designs (with the exception of Decca) and high-output moving coils are invariably slower, though the importance of very fast rise times is itself a matter of debate.

Certain esoterics (again moving coils and amplitude sensors) exhibit exemplary phase response, but here also the importance of the measurement is debatable.

Sao Win, perhaps the most measurement-oriented of the esoteric manufacturers, states that quite a few measurable and audible differences do exist among premium cartridges and that the lack of comprehensive standardized measurements prevents consumers from objectifying listening impressions. Dr. Win feels that all manufacturers should cite such data as induced hum level, dynamic compliance at 10 Hz, channel balance at 100 Hz, 1 kHz, and 10 kHz, channel separation at 1 and 10 kHz, lateral and vertical distortion and trackability, high-frequency square-wave response, and FIM distortion.

Perhaps the general adoption of such rigorous testing standards would justify the claims of at least some of the esoterics. Certainly such tests would help to isolate the real effects of different cantilever lengths and substances as well as different stylus shapes, cartridge bodies, and generator designs. But no "best design" is likely to emerge. Patent restrictions will dictate a multiplicity of approaches.

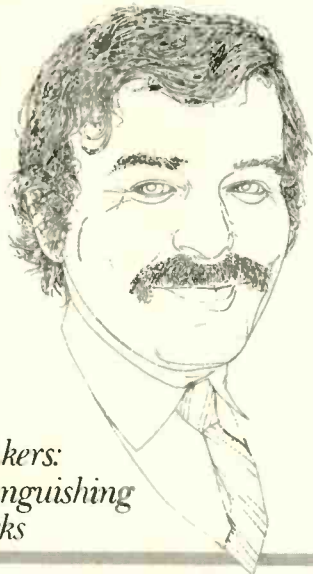
And in any case, high performance in one area is often achieved at the cost of reduced performance in another. The compromises ultimately incorporated in a finished product are always a reflection of taste, and taste is a chief ingredient of mystique. □

ADVERTISERS' INDEX

READER SERVICE NO.	ADVERTISER	PAGE NUMBER
33	Adcom/Dual	8
12	Alwa	89
	AKG	95
	Alpine Electronics of America, Inc.	98
	AMC-Renault	85
26	Audiophile Systems	20
20	Audio-Technica U.S., Inc.	92
47	B & W Loudspeakers	12
	Bose Corporation	14
	Bryce Audio	104
49	Carver Corporation	41
54	CBS Masterworks	102
	Chrysler Corporation	Cover 3
	Crutchfield Corp.	116
	DAK Industries	21, 23, 25, 27, 107, 109, 111, 115, 117
	Delco/Bose	91
28	Denon America, Inc.	88
71	Discount Music Club	116
10	Discwasher	13
	Ford Motor Co. Electrical & Electronics Div.	79
	Harman Kardon, Inc.	9
	Illinois Audio	110
	Jack Daniel's	31
39	J & R Music World	101
7	JVC	4-5
2	Klipsch & Associates	28
3	Kloss	96
30	LaBelle Camera & Stereo of Maine	103
	Magnavox Corp.	49
4	Magnepan	112
53	Marantz	46
	Maxell Corp. of America	76
32	McIntosh Laboratory, Inc.	88
	Memtek Products	86
	Merit	34-35
50	Mission Electronics	97
31	NAD USA	22
	Pioneer Electronics (USA), Inc.	80
37	Polk Audio	19
	Radio Shack	2
	RCA/Compact Disc Club	116
	R. J. Reynolds/Camel	10-11
	R. J. Reynolds/Salem	43
	R. J. Reynolds/Sterling	83
	R. J. Reynolds/Vantage	73
55	Rotel	100
44	Sansul Electronics Corp.	Cover 4
9	Sanyo	33
11	Sennheiser Electronic Corp.	17
	Shure Brothers	93
	Sony/Digital Disc Club	90
38	Stereo Corp. of America	108
46	Studer Revox	94
6	Tandberg of America	112
51, 48	TDK Electronics	39, 50
1	Technics	Cover 2
8	Ultrix	45
56	Wisconsin Discount Stereo	45
	Yamaha International Corp.	37

NOVEMBER 1984

by Ralph Hodges



Speakers: Distinguishing Marks

As a breed, high-end speaker systems have a few earmarks (excuse the expression) that set them apart from their higher-sales-volume competition and that (sometimes) significantly affect their performance. A couple of these characteristics are worth noting because they frequently run counter to what you might expect.

First, except for the manufacturers of electrostatics and other film-diaphragm designs, most high-end speaker manufacturers don't make their own drivers. This is a practice they share with the worst of the three-cones-in-a-box brown-goods purveyors, and it has occasionally given promotional aid and comfort to the more "vertically integrated" manufacturing operations, those that can all but lay claim to mining the ore that goes into their magnets. But the high end tends to see as its goal not expertise in fabricating voice coils, cone materials, and pole pieces, but the triumph of assembling the ultimate in definitive sound. To this end, there are about a dozen driver suppliers worldwide that build perfectly splendid devices—within the performance limitations every speaker-system designer must assess for himself—and all of them are for sale. There is no need for a high-end manufacturer to assume the complications of plant capitalization and labor training just to create something he appre-

ciates listening to—unless, of course, his particular holy grail involves materials and construction he can't buy off the shelf.

Second, more and more high-end speakers are not physically big (again excepting those using film-diaphragm drivers). This is a departure from earlier days, when all "hi-fi" speakers were big—or at least bigger than most nonenthusiasts were willing to accept as rational—and the more highly esteemed ones were larger still, up to the point of the 30-inch woofer made until recently by Electro-Voice and the home-crafted folded-horn enclosure that extended down into—and filled much of—the basement.

The drift away from sheer size has other justifications than the comparative ease of shipping and selling a small package. A major one is driver mass, which translates into the rapidity with which a small cone can be gotten moving versus a large one. In any multi-way speaker system, the output of a large woofer must smoothly meld with the contribution of a small tweeter or midrange, and the success of this melding is much more plausible if both cones respond with the same alacrity. In other words, the high-frequency response of the low-frequency driver(s) and the low-frequency response of the high-frequency unit(s) must be good. If they aren't, go certain high-end theories, the waveform of the reproduced signal will be measurably distorted (which is quite probably not audibly important) and the impact of transients will be diluted, just as the impact of a bag of lead shot is less stunning when it hits you piece by piece over a protracted period of time instead of all at once.

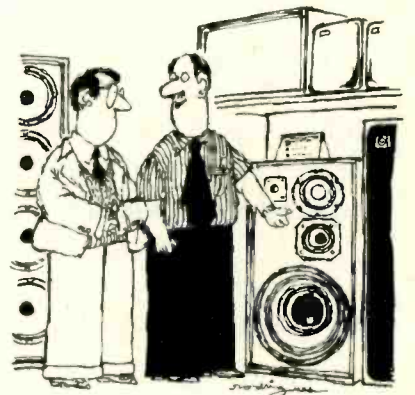
Many high-end manufacturers are convinced that this dissipation exists and *is* audible, particularly to musicians and others constantly exposed to music "in the flesh." From all this comes one high-end justification for using several small woofers instead of one large one, and to consider large woofers suspect unless they are confined to the bottom two octaves of the audio range (below 150 Hz).

Small speakers, it is said, are also less apt to get in their own way acoustically than large ones. Reflec-

tion and diffraction effects diminish with enclosure size, and the short-wavelength dispersion of smaller drivers is greater. The resulting "openness" of sound (it can also be promoted by distancing the speakers from walls and floor) can be matchlessly seductive even to hard-bitten speaker designers—until they start wondering about what to do for low-bass response.

Sometimes the answer is just to forget about it. Demo records featuring such things as unaccompanied solo voice have been popular amongst the high end of late, and there has been a general warming to the charms of unadorned, ascetic music (folk, Gregorian chant) rather than hi-fi "effects" (Tchaikovsky, the Stones). Contrast this attitude, however, with the insistence of some purists on bass extending down to the barometric, if only to capture the subtle infrasonic shudder of real-world spaces in which music is performed.

Being aware of these (debatable) design distinctions is, of course, little help to someone beset with urgent acquisitive needs, but it does bring home the point that, in the high end, *sound is all*; the physical make-up of the speaker is irrelevant except to those who wrestled with its design. It is readily possible to hear three or four speaker designs from different companies, all with the same drivers, but all presenting different versions of sonic reality. A confusing state of affairs, but it's what the quest is all about. □



"... and remember this about the Audek 4, sir. If you unwound all the wire from the voice coil of the woofer, it would stretch from Tillie's Snack Bar all the way to Jim's Texaco Station."

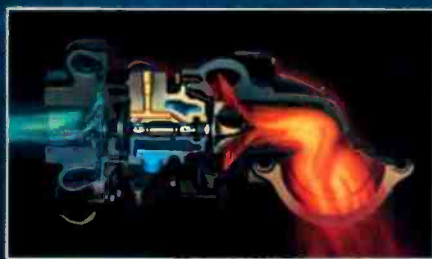


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