

Stereo Review

JANUARY 1987 ● \$2.25

**LISTENING TESTS:
DO ALL AMPLIFIERS
SOUND THE SAME?**

JAPAN AUDIO FAIR

**CHOOSING A
TURNTABLE**

**LAB TESTS:
LINN TURNTABLE
NEC CD PLAYER**

**DBX SPEAKERS
...AND MORE**

THE BANGLES



2598*****5-DIGIT 40222
30492 BCH 3104D09E 741J JAN90
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JISVILLE KY 40222
01*JM



Not Evolutionary,

Pioneer's Revolutionary C-90/M-90 Elite High-Fidelity Components.

Audiophiles, take note: The preamp and amplifier you've been waiting for are finally here.

Introducing the Pioneer Elite Hi-Fi C-90 Preamp and M-90 Power Amplifier. Together, they combine the finest in both audio and video to retrieve every detail and nuance found in your cherished records, tapes, compact discs, LaserVision™ discs and other software. Imagine a soundstage spread throughout your entire listening room! Stunning, transparent, three-dimensional music, the likes of which you've never heard, apart from a live performance.

We paid fantastic attention to detail to gain this level of musical truth. One example: the C-90 volume control is a motorized, high precision rotary potentiometer. This permitted us to create the world's first high-end preamp with a no-compromise hand-held "SR"™ remote-control unit.

The C-90 features three separate power transformers—two to power left and right audio channels for vanishingly low crosstalk, and a third transformer to drive the preamp's unique video capabilities, relays, display and microprocessor. All switching functions are accomplished by electronic relays. Thus the signal paths are as short as possible, improving signal-to-noise ratio and channel separation. Anti-vibration measures taken to further the C-90's sonic excellence include a solid aluminum volume control knob, polycarbonate chassis feet, and rubber-cradled PC boards. Soft copper-plated screws insure a snug fit of chassis, transformers, transistors, and help to dampen vibration.

The C-90 Preamp readies you for the video revolution, with six video inputs, a built-in video enhancer, and two-buss switching (separate "Record" and "View" selectors). The C-90's unique system remote-control unit features volume adjustment, input source selection, and control of audio and video input devices such as Pioneer's "SR" compatible VCRs, CDs, LaserVision players and cassette decks.

The M-90 is a superb high-power stereo amplifier, utilizing dual-mono construction. It is conservatively rated at 200 W/CH into 8 ohms¹ and delivers 800 W/CH of dynamic power at 2 ohms.² The wide dynamic range of digital sources can now be reproduced effortlessly, with any loudspeakers. The M-90's high current capacity of 47 amps can handle the challenge of the most complex speaker loads. To further enhance S/N ratio and channel separation, relay-operated electronic switches and a long shaft volume control keep the length of signal paths down to a minimum. Why include a high quality volume control on a power amp? Simple. To pursue the straight-wire-with-gain philosophy when using a CD player connected directly. Pure sound, redefined.

The exquisite finish of the M-90 and C-90 reflects their quality. Elegant rosewood side panels and front panels with a deep hand-brushed lacquer finish emphasize the care of craftsmanship we've lavished on these two components. The Pioneer C-90 Preamp and M-90 Power Amp. Evolutionary? Hardly. Revolutionary? Most definitely.

For your nearest Pioneer Elite Hi-Fi dealer, phone 1-800-421-1404.

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Revolutionary.



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Stereo Review

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The Linn Axis turntable shown on this month's cover is the subject of a test report on page 35.

BEYOND CONVENTIONAL AUDIO



THE ONKYO INTEGRA DX-320 WITH OPTO-COUPLING THE SOUND IS NO ILLUSION

The Integra DX-320 Compact Disc player is the first of ONKYO's new generation of CD players to incorporate our unique Opto-Coupling digital signal processing system. Conventional CD players transmit digital data internally via printed circuit board wiring, which interacts with analog audio signals to produce Digital Signal Interference (DSI), resulting in an audible "harshness" in the music.

Specially designed high speed Opto-Coupling modules in the DX-320 transfer the digital audio and other data signals to the analog output stage via fiber optics, preventing DSI. The result is noise-free, life-like reproduction with none of the harsh sound characteristics often attributed to other CD players. This remarkable new technology can only be found in the ONKYO DX-320.

Double oversampling and digital filtering greatly improve phase and harmonic accuracy. A fully programmable wireless remote control includes memory selection, phrase capability, and indexing for maximum convenience.

Our unique transport design incorporates ONKYO's exclusive Poly-Sorb, a rubber-like compound that improves isolation by absorbing extraneous vibrations, eliminating skipping and mistracking.

The Integra DX-320 Compact Disc player fulfills the promise of digital audio, with sound quality that's as close to the original as anything you've ever heard. Audition the DX-320 at your authorized ONKYO dealer today.

Artistry In Sound
ONKYO

200 Williams Drive, Ramsey, N.J. 07446

by Christie Barter and
William Burton

DAT AT CES

A fully operational DAT (digital audio tape) deck from Onkyo is set for display at the January Consumer Electronics Show in Las Vegas, but there is no word on when the machine will be sold to dealers. The player, said to be simpler than the fully featured deck Onkyo showed at the 1986 Japan Audio Fair, cannot be manufactured in quantity because of a shortage of custom-made integrated circuits, according to Onkyo. Other manufacturers are poised to sell DAT decks but have refrained under pressure from manufacturers who say they are worried that DAT will hurt CD.



CRYSTAL WINNERS

Reba McEntire was doubly honored at the 1986 Country Music Association Awards Show. She received the top award as Entertainer of the Year and, for the third straight year, was named Female Vocalist of the Year. George Strait took the Male Vocalist of the Year award for the second time while the Judds were given Crystal Bullets (the CMA trophy given to all winners) as Vocal Group of the Year. . . . The American rock group Toto is the latest recipient of the Crystal Globe award given by CBS Records International for sales of over five million of their records and tapes outside the U.S. Toto is the twentieth CBS act to receive this award.

CD AWARENESS INCREASES

Eighty percent of households with stereo systems know about compact discs, according to a recent market study commissioned by *Newsweek*. The study reported that ownership of compact disc players rose from 1.8 percent in 1985 to 6.4 percent this year, which is an increase of over 350 percent. Ownership is predicted to double in 1987. Factors most important to purchasers are sound quality and durability.

FREE CD's

CBS Records has launched a promotional campaign offering buyers one free CBS compact disc for every five they buy. The promotion covers all CBS-distributed recordings on CD (with the exception of Chrysalis Records titles) and runs through January 31, 1987. . . . If you buy any Sony CD player before January 31, you get two free CD's. You may choose from twenty discs by such artists as Genesis and Dire Straits.

NEW TO HALL OF FAME

Scheduled for official induction into the Rock and Roll Hall of Fame at ceremonies in New York on January 21 are the Coasters, Eddie Cochran, Bo Diddley, Aretha Franklin, Marvin Gaye, Roy Orbison, Carl Perkins, Smokey Robinson, Joe Turner, Muddy Waters, and Jackie Wilson. Cleveland was picked as the site of the hall only last year after an intense lobbying campaign conducted by the city's residents and its civic leaders.

SURROUND SOUND ON THE AIR

Amazing Stories was the first network series to go on the air with a soundtrack mixed in Dolby Surround. The episode, titled "Go to the Head of the Class," was scheduled for November 21. Viewers with Dolby Surround decoders were able to hear the show, with its "creepy, eerie background effects," in full four-track stereo. Dolby Labs is working with other TV production companies in addition to Amblin for more network broadcasts in Dolby Surround.

TECH NOTES

Alpine has announced it will ship a DAT player for the car, but not until next September. Alpine's current three-part car CD player (Model 5900) will be replaced by a one-piece in-dash unit. . . . Denon is planning high-end car stereo components designed for easy installation. The new DCA-3500 power amplifier delivers 40 watts into four channels along with 80 watts for a subwoofer, all for under \$500. . . . Blaupunkt's new top-of-the-line Berlin car stereo will have ARI traffic information, two tuner sections for diversity

reception, and a data bus for adding components such as a navigation system. . . . Pure-silver, 99.9 percent oxygen-free interconnects and speaker cable made by Siltech of Holland are being imported by Assemblage. A one-meter pair of medium-grade interconnects will be priced at \$250, speaker cables at \$285 per meter. . . . Akai America is ceasing operations, and as of this month sales, marketing, and distribution of Akai audio and video products in the U.S. will be handled by Mitsubishi. Reasons for the change are said to be the increased value of the yen and Akai's limited share of the American audio/video market. . . . Chrysler has joined the ranks of American car manufacturers offering factory-installed high-fidelity sound systems. Chrysler/Infinity systems will be available starting this month in selected Chrysler models.

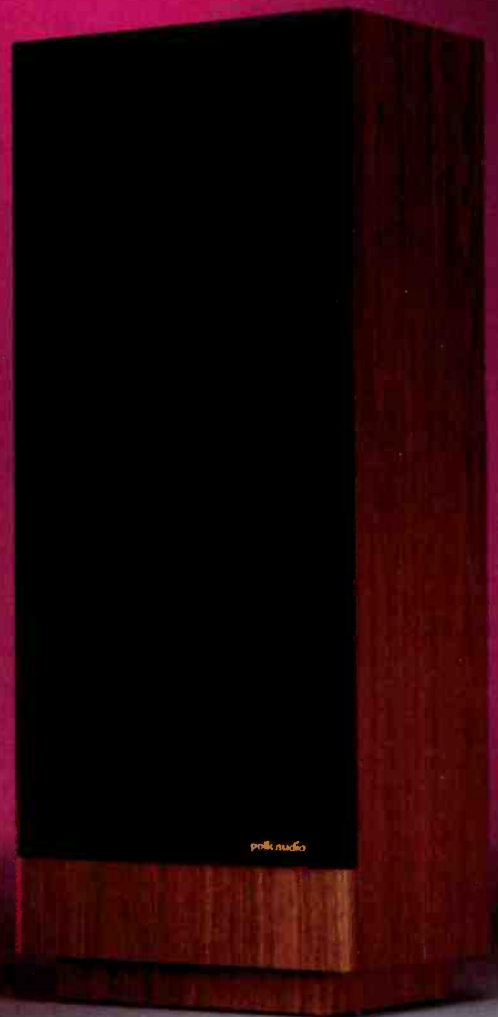
TAPE AS SPONSOR

Remember when oil companies sponsored so much good stuff that PBS was jokingly called the Petroleum Broadcasting Service? Well, tape is getting into the act. For example, in November Maxell sponsored American Music Week, a nation-wide celebration that included more than 850 events.

It has been announced that 3M will become a global sponsor of the 1988 Olympic Games—winter games in Calgary, Canada, and summer games in Seoul, South Korea. Included in the sponsorship are such things as 3M's thermal insulation for officials and athletes as well as Scotch and 3M-brand audio and video tape.



Matthew Polk's Magnificent Sounding New SDA 2A



SDA 2A
\$499.00 ea

Digital Disc Ready

Matthew Polk stands proudly alongside the latest version of his Audio Video Grand Prix Award Winning SDA 2A

The Magnificent Sound of Matthew Polk's Extraordinary New SDA 2A Puts the Competition to Shame!

*"It has the ability to make your
previous favorite speaker sound almost second rate"*

Stereo Review Magazine

Matthew Polk's magnificent sounding new 3rd generation SDA 2A incorporates many new advances pioneered in his top-of-the-line Signature Edition SRSS. It achieves stunningly life-like musical reproduction which would be remarkable at any price but is simply extraordinary at \$499. each. Stereo Review said, "listen at your own risk." Once you hear them you'll never be satisfied with anything else!

Polk's Revolutionary True Stereo SDA Breakthrough

The magnificent sounding new SDA 2A incorporates Polk's revolutionary True Stereo SDA technology. This patented, critically acclaimed, Audio Video Grand Prix Award winning breakthrough is the most important fundamental advance in loudspeaker technology since stereo itself. In fact, the design principles embodied in the SDAs make them the world's first and only True Stereo speakers.

Why do Polk SDAs always sound better than conventional speakers? When conventional loudspeakers are used to reproduce stereo both speakers are heard by both ears causing a form of acoustic distortion called interaural crosstalk which cuts down stereo separation, obscures detail and interferes with the proper reproduction and perception of imaging, and spaciousness. Polk SDAs are designed to eliminate interaural crosstalk so that each speaker is only heard by the one correct ear (i.e. left channel/left ear, right channel/right ear), like headphones. The result is dramatically improved stereo separation, detail and three-dimensional imaging. In order to accomplish this each SDA incorporates a separate set of drivers which radiates a special dimensional (difference) signal which cancels the undesirable interaural crosstalk coming from the wrong speaker to the wrong ear. High Fidelity called the results "Mind Boggling".

The Most Extraordinary Value in High End Audio Today

The new SDA 2As, like all the current SDAs, incorporate the latest 3rd generation SDA technology developed for Matthew Polk's Signature Edition SRS and SRS-2 including **1:** full complement sub-bass drive for deeper, fuller, tighter and more dynamic bass response; **2:** phase coherent time-compensated driver alignment for better focus, lower-coloration smoother, clearer, more coherent midrange and improved front-to-back depth and; **3:** bandwidth-optimized dimensional signal for smoother high-end and even better soundstage and image. The new SDA 2A is the finest sounding and most technologically advanced speaker ever produced at its extraordinarily modest price. It sounds dramatically better than speakers from other manufacturers that cost 4 times as much and more and is, at \$499 ea., truly the speaker of your dreams at a price you can afford.

"Breathtaking...a new world of hi fi listening."

Stereo Buyers Guide

The spectacular sonic benefits of SDA technology are dramatic and easily heard by virtually anyone. Reviewers, critical listeners and novices alike are overwhelmed by the magnitude of the sonic improvement achieved by Polk's SDA technology. Stereo Review said, "These speakers *always* sounded different from conventional speakers — and, in our view, better — as a result of their SDA design."

All Polk's SDAs, including the new 2As produce a huge lifelike three dimensional sonic image which will amaze you. You will hear for the first time instruments, ambience and subtle musical nuances which are present on your recordings but masked by the interaural crosstalk distortion produced by conventional speakers. Stereo Review said, "Spectacular...literally a new dimension in the sound...the result is

always better than would be achieved by conventional speakers". High Fidelity said, "Mind Boggling...Astounding...Flabbergasting...we have yet to hear any stereo program that doesn't benefit". With SDAs every instrument, vocalist

"Mindboggling, Astounding, Flabbergasting"

High Fidelity Magazine

and sound becomes distinct, tangible and alive; allowing you to experience the spine tingling excitement, majesty and pleasure of live music in your own home.

Other Superb Sounding Polks From \$85. to \$1395. each

No matter what your budget is there is a superb sounding Polk speaker perfect for you. Polk's incredible sounding/affordably priced Monitor Series loudspeakers utilize the same basic components as the SDAs and begin as low as \$85. each. The breathtaking sonic benefits of Matthew Polk's revolutionary True Stereo SDA technology are available in 5 SDA models priced from \$395. to \$1395 ea.

"You owe it to yourself to audition them"

High Fidelity

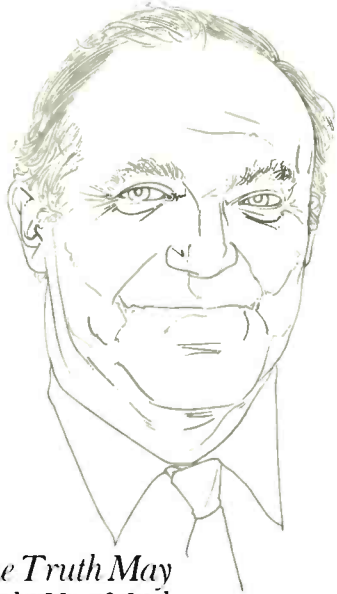
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CIRCLE NO. 37 ON READER SERVICE CARD

by William Livingstone



*The Truth May
Make You Mad*

MIDWAY along the pathway of our life, most men find themselves in a dark forest of unrealized ambitions, disillusionment, and depression. As youth slips away, one asks one's self, "Is that all there is?" This is not male menopause, but rather the dreaded Middle-Life Crisis.

My MLC came right on schedule at age forty-two or forty-three, and I was lucky to find a warm, humanistic psychiatrist to help me through it. During my talks with him I discovered some pleasantly interesting things about myself as well as some that were hard to accept. But feeling better meant facing reality and coming to grips with the truth. Know the truth, and it will make you free.

Well, sometimes. But there is an Arab proverb that says: The truth angers those whom it does not convince. Nothing in my experience has validated the accuracy of that old saying so clearly as some of our listening tests of audio equipment.

In August 1983 we published the results of double-blind listening tests designed to show whether there were perceptible sonic differences between heavy audiophile speaker cable and other kinds of wiring. The tests, conducted by Dr. Laurence Greenhill, revealed no au-

dible differences between the Monster Cable used in the test and ordinary 16-gauge lamp cord.

Some readers congratulated us enthusiastically on our consumer advocacy, and others could not have cared less, but a vocal minority were unconvinced. The test results made them angry far out of proportion to the circumstances. Boy, were they mad at us! Emotional diatribes were published, and manufacturers were urged to punish STEREO REVIEW by withholding advertising.

A similar, but somewhat less vehement, reaction followed the publication in January 1986 of results of double-blind listening tests set up to investigate differences in the sound quality of various compact disc players. Conducted by David L. Clark of DLC Design, the tests were described in an article by Ian G. Masters. They showed that experienced listeners could not even hear the difference between an inexpensive Emerson player and a high-end unit from Meridian.

You can easily understand why manufacturers and retailers might have been displeased by those results. But some journalistic rocks have been thrown and some boos and hisses have been directed at us by people whose vested interests are not so obvious. Dr. Greenhill, who is a psychiatrist as well as an audiophile, has intriguing ideas about why they react so emotionally.

I will not attempt to make the angry ones face the truth about themselves and their personal identification with audio, but I do want to know the truth about electronic equipment and human perception of sound. With that in mind I have commissioned double-blind tests of amplifiers to see what audible sonic differences there are between them. Once again David Clark has conducted the tests and Ian Masters reports on them in an article that begins on page 78.

Read it at your peril. If it leaves you unconvinced, it may make you angry. On the other hand, it may help you understand why you like certain kinds of equipment. If the truth makes you act like Rumpelstiltskin or the Terrible Tempered Mr. Bang, however, watch out. We're thinking of re-examining the audibility of distortion. □

Stereo Review

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WEST VIRGINIA Charleston: Hi-Fi Clinic • Morgantown: Video Den
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LETTERS

Bark and Bite

At the risk of inviting tooth marks from the formidable William Livingstone, I must disagree with one of the points in his November editorial ("Biting Back"): that short timings on compact discs are acceptable. I consider thirty-five minutes of material on an LP deplorable enough; in a medium that holds more and costs twice as much, it's really intolerable. No doubt licensing agreements, etc. enter the equation, but I have a strong suspicion that greed is at least as great a factor as "artistic grounds."

I trust that, as the current crunch in CD availability eases, the marketplace will have something to say about short timings. In the meantime, the amount of material on any given disc has already become one of the factors to be considered in making a purchase, along with artists and interpretations: it's hard, for instance, to justify buying *Turandot* on three CD's when there's a good version out there on two. I have bought two CD sets of Wagner's *Ring* in the last year, neither of them Euro-disc's—which, incredibly, was issued on nineteen CD's compared with London's fifteen.

Certainly there are cases where there's no logical extra work to fill the space available, and performances that are entities in themselves shouldn't be required to have padding. But to issue a lonely *Trout* Quintet, at slightly more than thirty-four minutes, is as great a crime on LP as it is on CD. Rather than make excuses for the record companies (and complain about readers who want value for money), why not use your influence to press for more reasonable programs on all formats?

S. B. MILLER
Oak Park, IL

I hope Mr. Livingstone has not lost sight of the fact that STEREO REVIEW readers are not all so wealthy that we can be frivolous about what we buy. A record of rock songs should be longer than thirty minutes. We aren't asking that "the nickel be squeezed until the buffalo grunts." We are only interested in getting a fair deal.

PHIL MADSEN
San Jose, CA

If readers object to video reviews in STEREO REVIEW, it is because such equipment reports are at the expense of needed audio reviews. How long has it been since a phono cartridge under \$100 or a receiver under \$300 received a test report? Some people interested in hi-fi are on a budget.

If readers object to CD's not having the full amount of program material, it is because CD's don't suffer from the

audio limitations that plague the inner grooves of LP's. Since Mr. Livingstone has no objection to the public's paying digital prices for analog material, there is no reason the empty space on new CD's cannot be filled from the vast supply of analog recorded material.

And if Mr. Livingstone is irritated by the remarks of certain readers, he should be made aware that his biased hard-sell campaign for compact discs is truly offensive—not because of the subject but because of the condescending tone he has adopted toward his readers. The readers of STEREO REVIEW are not idiots!

D. O. FIELD
San Leandro, CA

Some readers might not wax overly enthusiastic about being likened to the dog in the "man bites dog" analogy at the beginning of November's "Speaking My Piece." The parallel Mr. Livingstone draws suggests a lack of respect for the reader as an equal.

Among other things, Mr. Livingstone complains about those who protest video coverage in STEREO REVIEW. My sympathy on that score is with the protesters. Video equipment is nowhere near being a visual counterpart to audio equipment, and it draws upon a different set of values.

HARRISON PIERCE REED III
Chester Springs, PA

I am in complete agreement with William Livingstone's November column. I feel that high-quality audio and video enhance each other and that STEREO REVIEW would be remiss in not offering this medium to its readers, especially with technological advances that have been made in audio/video integration in the last several years.

On the subject of compact discs, I too get tired of the complaints I read issue after issue. I think the first thing readers should remember is that STEREO REVIEW really has nothing to do with the sound quality of "analog" CD's or with the amount of music the CD contains. Those complaints might better be taken up with the record companies.

SAM LOVE
Glen Burnie, MD

I was struck by the comment in the November editorial that STEREO REVIEW prints "a cross section of letters that express readers' complaints and displeasure." The term "cross section" implies that the published letters reflect some sort of an average of opinions of the readers who take the time to write. I am curious: just how does an editor determine a cross section of comments? I cannot imagine that you obtain the services of a qualified statistician for this. So how do you do it?

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CIRCLE NO. 50 ON READER SERVICE CARD

If you receive five hundred letters each complaining about a different thing, how do you choose which to publish? You obviously do not print everything. Therefore, some complaints never get aired. Is that a cross section? If you print one letter about an interesting problem, can we assume that this is the best example of a flood of letters on a subject? No, it might represent just a

single opinion of an astute reader selected because of its entertainment value or literary wit.

Your editorial selection process works very well for me, at least, because I read every "Letters" column. But I don't think you are justified in calling it a "cross section."

WILLIAM G. NABOR
Mission Viejo, CA



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CIRCLE NO. 36 ON READER SERVICE CARD

We do it by the seat of our editorial pants, choosing what we think will be of interest to many readers. We try to see that any error pointed out to us is corrected in the "Letters" column. We like to give readers who disagree with our writers a chance to have their views aired, and we select a representative letter that states the opposing case succinctly. Every month we try to put together a varied, informative column that will be fun to read. For example, we enjoyed the canoe stereo flap, but we didn't let it go on for long. A short, witty letter always stands the best chance of being published.

Amplifier Sound

I read Peter W. Mitchell's "How to Buy an Amplifier" in November with much interest because I recently purchased a new power amplifier. Again I must fuel the fire of controversy on whether amplifiers sound mostly the same.

Several months ago I bought a new pair of speakers, and I decided to upgrade from my 60-watt integrated amplifier to separate components. I took my speakers to a couple of audio stores and auditioned six different amplifiers. Each amplifier gave me a different sound. One amp sounded thin and bright, another mushy and slow, one very sweet and silky, and another extremely dynamic with a lot of punch.

Was it the power amplifiers or the way they interacted with my speakers? I don't know. Some of the amplifiers had high current, their power ratings ranged from 100 to 250 watts per channel, and their prices were from \$450 up to \$1,500. But the point is, they all sounded different with my speakers. I have to conclude that different amplifiers do not sound the same with the same pair of speakers.

STAN DAVIS
Buena Park, CA

See page 78 for a report on a series of scientifically controlled amplifier listening tests.

Remote Control

William Burton's "Unified Remote Control" in November was very interesting. These entertainment systems should be a boon to all the armchair quarterback/conductors. However, I view the introduction of the unified remote control with the same disgust as the introduction of the automatic transmission. I myself drive a four-on-the-floor, and I'll never be so lazy that I can't ask my wife to turn off the radio and put in a cassette!

ROB ROSENBERGER
Silverdale, WA

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346205. Belinda Carlisle—Belinda. Includes *Mad About You*, many more. (I.R.S.)
286914. Fleetwood Mac—*Rumours*, #1 Hit Album. Includes *Don't Stop, You Make Loving Fun*, more. (Warner Bros.)

348706. Wynton Marsalis—J Moods. *Much Later*, *Melodique*, more. (Digital—Columbia)
347245. Spyro Gyra—*Breakout*. *Freefall*, etc. (MCA)
346270. Wham! *Music From The Edge Of Heaven*. *Im Your Man*, more. (Columbia)
345777. Peter Gabriel—*So*. Includes *Sledgehammer*, *In Your Eyes*, more! (Geffen)
344812. Billy Ocean—*Love Zone*, #1 album & hits. Includes *Love Zone*, more. (Jive/Arista)
347054. David Lee Roth—*Eat 'Em And Smile*. (Warner Bros.)

334391. Whitney Houston—Whitney Houston. *Greatest Love Of All*, etc. (Arista)
347492. Glenn Miller Orchestra—*In The Digital Mood*. New! Includes Miller—Big Band hits: *In The Mood*, *Tuxedo Junction*, more. (Digital—GRP)
333286. Phil Collins—No Jacket Required. *Album of the Year!* (Atlantic)
339200. Stevie Wonder—*In Square Circle*. #1 album. (Tamla)
343319. Janet Jackson—*Control*, #1 album. *What Have You Done For Me Lately*, more! (A&M)

318089. Michael Jackson—Thriller. *Billy Jean*, etc. (Epic)
320499. The Police—*Synchronicity*. Winner of 3 Grammy Awards! (A&M)
314443. Neil Diamond's 12 Greatest Hits, Vol. 2. *You Don't Bring Me Flowers* (with Barbra Streisand), etc. (Columbia)
219477. Simon & Garfunkel's Greatest Hits. *El Condor Pasa*, etc. (Columbia)
308049. Creedence Clearwater Revival featuring John Fogerty/Chronicle. *Greatest Hits*. (Fantasy)
343582. Van Halen—*5150*. (Warner Bros.)

339226. Gershwin: *Rhapsody In Blue*; *Second Rhapsody*, etc. —M. Tilson Thomas, Los Angeles Phil. (Digital—CBS Masterworks)
336222. Dire Straits—*Brothers In Arms*. A #1 album! *Money For Nothing*, others. (Warner Bros.)
345553. Branford Marsalis—*Romance for Saxophone*. Top 10! *English Chamber Orchestra* (Digital—CBS Masterworks)
343947. Tony Bennett—*The Art Of Excellence*. Includes *Everybody Has the Blues* (duet with Ray Charles), more. (Digital—Columbia)

343327. Wynton Marsalis—*Jolivet/Tomasi: Trumpet Concertos*. Philharmonia Orchestra. (Digital—CBS Masterworks)
336396-396390. Billy Joel's Greatest Hits, Volumes 1 & 2. (Counts as 2—Columbia)
337519. Heart. Top 10 Album. *What About Love*; *Never*, etc. (Capitol)
345827. Bob James and David Sanborn—*Double Vision*. Joined by Al Jarreau, others. Includes *Since I Fell For You*. (Warner Bros.)
341305. Robert Palmer—*Riptide*. *Addicted to Love*, more. (Island)

288670. Barry Manilow—*Greatest Hits. It's a Miracle*; *Mandy*, etc. (Arista)
343095. Philip Glass—*Songs From Liquid Days*. Lyrics by Paul Simon; David Byrne, etc. Featuring Linda Ronstadt. (CBS)
321380. Barbra Streisand's Greatest Hits, Vol. II. Includes *The Way We Were*, more! (Columbia)
323261. Lionel Richie—*Can't Slow Down*. *All Night Long*, etc. (Motown)
340323. Sade—*Promise*. #1 *Smash*. (Portrait)
326629. Bruce Springsteen—*Born In The U.S.A.* (Columbia)
342097. Barbra Streisand—*The Broadway Album*. *Somewhere*; *Something's Coming*, more. (Columbia)



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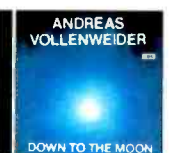
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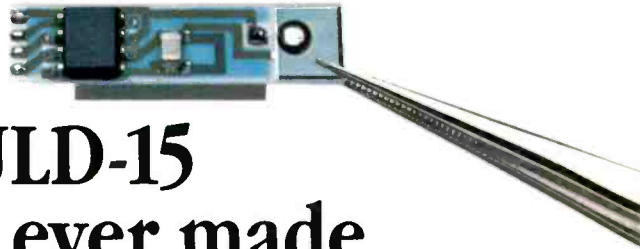
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NEW PRODUCTS

ADS

Part of ADS's Atelier series, the CD4 compact disc player has many of the features of the more expensive Atelier CD3, including special error-correction algorithms and dual high-speed, 16-bit digital-to-analog converters with double oversampling. The brick-wall digital filter and multiple-pole lowpass filter are said to make the CD4 sound "smooth and musical." Other features include a three-beam fast-focus laser, multiple power supplies, and a high-speed unitary clock. Digital outputs for future compact disc, video, and other applications and a hand-held remote control are provided. Price: \$900. ADS, Dept. SR, One Progress Way, Wilmington, MA 01887.

Circle 120 on reader service card



Akai

The Akai GX-8 cassette deck has three glass-and-crystal ferrite heads, with coils wound from linear-crystal-

ogen-free copper (LC-OFC), and three motors—one for the direct-drive capstan, one for the hub drives, and one for the cam system. A record-cancel feature interrupts a recording in progress and

rewinds the tape to the end of the previous selection. Other features include eighteen-element peak-level meters and Dolby B, Dolby C, and dbx noise reduction. For playback, the GX-8 automatically sets the correct equalization and recording bias, and the display shows the tape type as well as the noise-reduction system in use.

The low end of the frequency response is given as 20 Hz \pm 3 dB for all types of tape. The high end varies according to the tape formulation: 19,000 Hz for ferric tape, 20,000 Hz for chrome or high-bias, and 21,000 Hz for metal, all \pm 3 dB. Wow-and-flutter is rated at 0.025 percent wrms, dynamic range (with dbx) as 115 dB. Price: \$570. Akai, Dept. SR, 800 W. Artesia Blvd., Box 6010, Compton, CA 90224-6010.

Circle 121 on reader service card

Denon

The remote control supplied with Denon's DRA-75VR AM/FM receiver also operates important functions on several Denon CD players (DCD-1500, -1300, -1100, and -700) and one cassette deck (DR-M30HX). The receiver is rated for 65 watts per channel rms into 8 ohms with no more than 0.3 percent total harmonic distortion. An equalizer or another signal processor can be connected to the rear-panel external-processor loop without using either of the two tape-monitor circuits. Stereo FM simulcasts can be directly recorded onto a VCR, and audio from any input can be combined with pictures from another video input. The DRA-75VR has a variable loudness control. The tuner



features sixteen AM and FM presets, step and scan manual tuning, and auto-scan of all receivable channels. Price: \$500.

Denon, Dept. SR, 27 Law Dr., Fairfield, NJ 07006.

Circle 122 on reader service card

NEW PRODUCTS



Thiel

The Thiel CS3.5 Coherent Source loudspeaker has a rated frequency response of 23 to 20,000 Hz \pm 2 dB and can handle up to 250 watts per channel. The drivers in the floor-standing system include a 10-inch woofer, a 4-inch midrange with a 1½-inch voice coil, and a 1-inch dome tweeter, all with cast-magnesium housings. The flat low-bass response is the product of an active bass equalizer. Phase response is specified as \pm 10 degrees of minimum, time response as \pm 50 microseconds. Stereo imaging is said to be improved by a precisely curved baffle that limits diffraction effects. Components include polypropylene crossover capacitors and 1¼-inch-thick cabinet material. The cabinets are finished with teak veneer; walnut, oak, rosewood, and black finishes are available on special order. Price: \$2,450 per pair in teak. Thiel, Dept. SR, 1042 Nandino Blvd., Lexington, KY 40511.

Circle 123 on reader service card

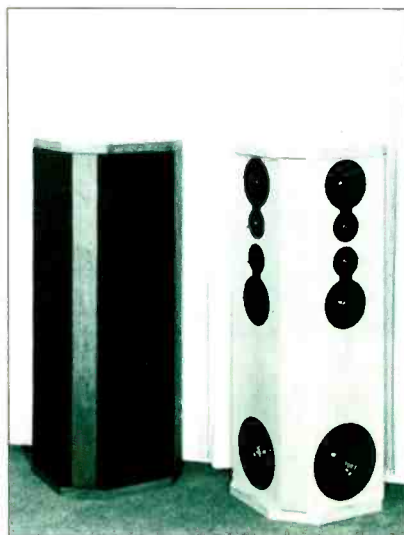
CWD

Custom Woodwork & Design has added speaker stands to its Woodmore line of home-entertainment furniture. The stands are available in three heights: 9 inches (shown) for large floor-standing systems, 15 inches for medium-size floor-standing or bookshelf systems, and a 30-inch pedestal type for mini systems. All stands have hardwood side and center panels and veneered particle-board tops and bottoms. Available finishes are natural oak, dark oak, natural American walnut, black oak, and high-gloss black. All the stands come with adjustable, spiked feet in a choice of two sizes. Speaker cables can be concealed with CWD's stick-on wire ties. Prices per pair: 9 inch, \$100; 15



inch, \$110; 30 inch, \$120. CWD Inc., Dept. SR, 7447 S. Sayre Ave., Bedford Park, IL 60638.

Circle 124 on reader service card



Allison

Designed to handle from 30 to 400 watts per channel, the Model 10 loudspeaker system from Allison has an

unconventional, nearly triangular cabinet. The two 10-inch push-pull woofers, four 3½-inch convex-diaphragm midrange drivers, and four 1-inch convex-diaphragm tweeters are symmetrically positioned on the two outward faces. The center of the midrange and tweeter array is 36 inches above the floor, limiting floor and ceiling reflections. An infrared remote control adjusts the relative output of the two driver panels for optimal stereo imaging and spatial character.

The high-density particle-board cabinet of the Model 10 has wood veneer on the out-facing panels and behind the removable grilles. The drivers are protected by screen guards. The cabinet measures 21 inches wide, 48 inches high, and 12 inches deep, and each speaker weighs 100 pounds. Low-frequency resonance is rated at 36 Hz. Response is down 3 dB at 28.5 Hz. Nominal impedance is 6 ohms. Price: \$4,500 per pair. Allison Acoustics, Dept. SR, 7 Tech Circle, Natick, MA 01760.

Circle 125 on reader service card

Revox



The Piccolo-Bass mini-subwoofer system from Revox includes a subwoofer, which is just 14¾ inches wide, 15¾ inches high, and 14¾ inches deep, and two 5½ x 8¾ x 5¾-inch satellites. The subwoofer radiates frequencies from 48 to 120 Hz \pm 3 dB with only 0.3 percent total harmonic distortion. Middle and high frequencies, 80 to 22,000 Hz \pm 3 dB, are handled by the subwoofer's companion minispeakers, each of which has a 4¾-inch midrange and a ¾-inch dome tweeter. Design features include low-resonance cabinets, sand-

wich-type tweeter diaphragms, and die-cast woofer chassis for optimum performance even at high amplitudes.

The three-piece system is rated to handle up to 50 watts per channel. Suggested power for the subwoofer is 20 to 70 watts. Nominal impedance is 4 ohms. Finish is matte white or black. Price: \$448; subwoofer and satellites also available separately for \$250 and \$99 each, respectively. Revox, Dept. SR, 1425 Elm Hill Pike, Nashville, TN 37210.

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CIRCLE NO. 68 ON READER SERVICE CARD

by Ian G. Masters



CD Rumble

Q Why do some CD's, even ones labeled "digital recording," seem to produce rumble?

MICHAEL SHEEHY
New Canaan, CT

A They don't produce rumble, but they're pretty adept at reproducing it. Many recordings, particularly classical ones, are made in less-than-ideal locations, at least as far as extraneous noise is concerned, and this can affect the final product whether it's digital or analog.

It is common for classical music to be recorded in real concert halls because of their acoustics, but these are very rarely isolated from outside sounds in the way a recording studio is. Obvious intrusions, like jets flying over or police sirens, can be prevented either by rerecording the interrupted passages and editing out the noise or by choosing another location.

Low-frequency sounds—the "rumble" you are hearing—are more difficult to eliminate. Most are caused by traffic near the recording site or by mechanical noise (such as air conditioning) within it. The reason these sounds sometimes crop up on recordings is that the engineer often can't hear them; monitor speakers, particularly those used "on location," rarely produce bass as good as that of a first-class home system.

There's nothing new about any of this. Subwoofer owners have been dis-

covering such sounds on analog recordings for years. But with the coming of theoretically "perfect" digital discs, perhaps we're less inclined to be forgiving of audible flaws.

Warp Signals

Q When taping from records, I sometimes notice the recorder's meters indicating a signal where I can't hear much, or anything at all, especially in the lead-in grooves before the music starts. What causes this effect?

SHAVASH SAFVATI
Los Angeles, CA

A A phono cartridge is basically an indiscriminating device: if anything moves the stylus, it will produce an electrical output. For the most part, what moves the stylus is an intentional audio signal embodied in a record's groove, but there are a number of unwanted forces that can affect the pickup as well.

In your case, the cartridge is responding to very-low-frequency signals caused by minor warps in the record (they're usually worse at the edge). You can't hear them because human ears are not sensitive that far down the spectrum (a once-around warp produces a signal of about half a hertz), but your equipment still responds as if they were audible signals. To check this out, play a record that does this, remove the grille cloth from one of your speakers, and look at the woofer—you will be able to see, but not hear, a slow in-and-out motion corresponding to the warp.

Such signals can use up a great deal of your amplifier's reserve of power, because a warp-induced stylus movement can be huge compared to the excursions caused by musical information. The power demands will be correspondingly large, so to prevent damage to your equipment you should eliminate these phantoms. Fortunately, most amplifier manufacturers provide a "subsonic" or "infrasonic" filter for just this purpose. It's a good idea to use it.

Switching Order

Q Is there any particular order in which audio components should be turned on and off?

ANTHONY J. GALBATO
King of Prussia, PA

A Generally, the power amplifier should be the last component to be turned on and the first to be turned off. Otherwise, any loud "pops" or "thumps" caused by switching components on or off earlier in the chain might be amplified to damaging levels. (If the power amplifier itself makes a pop, there's not much you can do about it.)

In reality, such considerations matter less than they once did because many of us turn our systems on and off all at once with a single switch. The majority of today's power amplifiers provide for a slight delay between the time you flip the switch and the time it begins amplifying, so that any thumps are not fed to the speakers. Turning the system off is less hazardous; by the time any pops occur, the power amp is already off.

Bi-Amplification

Q I have heard a number of references to "bi-amplification." Could I use it to increase power without upgrading to a bigger amplifier?

PETER D. CLARK
New Orleans, LA

A I'm afraid not. Bi-amplification means using separate amplifiers to drive the woofers and tweeters in a speaker system ("tri-amplification" is used for three-way systems). Proponents of the technique believe that it reduces intermodulation distortion and damping problems, among other things, but it has nothing to do with raising the power of your present amplifier. If anything, you would need *more* power.

In a conventional system, the power amplifier deals equally with all parts of the audio spectrum and feeds full-range signals to the speakers, where built-in crossover networks split them up, directing the appropriate parts to the individual drivers. Speaker designers go to great lengths to optimize the system by matching crossover and drivers within very narrow tolerances; much of the "fine tuning" of a speaker takes place in the crossover design. With a bi-amped system, the audio signal is split by an electronic crossover *before* amplification, and the separated signals are fed directly from the amplifier outputs to the individual drivers. There is no crossover network in the speaker itself.

To convert an existing speaker to a bi-amplified one, you would not only need to buy an electronic crossover and a second amplifier, but you would probably have to tear your speakers apart to disable the built-in crossovers and wire the amps directly to the drivers. And because things like crossover frequencies, filter characteristics, and relative levels are of critical importance in determining a speaker's "sound," chances are that you will end up with worse performance than you started with.

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

Dynamically Different.

THE CARVER M-500t MAGNETIC FIELD POWER AMPLIFIER LEADS AN INDUSTRY TREND TOWARDS MORE USEFUL DYNAMIC POWER FOR MUSIC... AND YET STAYS WELL AHEAD OF ITS INSPIRED IMITATORS.

With its astonishingly high voltage/high output current and exclusive operation features, the M-500t sets standards yet unequaled in the audio community. A conservative FTC sine wave output of 251 watts per channel belies its incredible ability to satisfy peak musical transients demanding far more power. In fact, the M-500t provides more power, more current and more voltage than any comparably priced amplifier ever offered.

POWER EXPRESSED BY THE DEMANDS OF MUSIC. The Carver M-500t responds to musical transients with 600 to 1000 watts of dynamic power, depending on speaker impedance. The gulf between FTC and dynamic power ratings reflects Bob Carver's insistence that amplifier design should fit the problem at hand: The need to reproduce music with instantaneous, stunning impact.

The individual leading edge attack of each musical note lasts less than 1/1000 of a second, yet forms the keen edge of musical reality which must be present if true high fidelity is to be realized. It is especially necessary with the increased dynamic capabilities of Compact Discs and video Hi-Fi. In ordinary amplifier designs, the vast amounts of power required is provided by bulky, expensive power supplies and huge output transformers.

THE MAGNETIC FIELD AMPLIFIER SOLUTION. Rather than increase cost, size and heat output with massive storage circuits, Magnetic

Field Amplification delivers instantaneous high peak and long-term power from a six-pound, four-ounce Magnetic Field Coil. Shown below are the 40-pound toroid coils from a pair of \$7000 esoteric power amplifiers. In front of them is the M-500t's Magnetic Field Coil capable of delivering TWICE the output current (± 100 amperes at 10% regulation!) for exceptionally precise control of voice coil motion.



Thus Carver's remarkable, patented design not only lets you enjoy the stunning sonic benefits of simultaneous high current and voltage in a compact, cool-running component, but enables you to afford audiophile-level power as well.

POWER WITH FINESSE. While the M-500t isn't the only amplifier with aggressive output capabilities, it is one of the few that tempers brute power with sophisticated protection circuits beneficial to both the amplifier and your loudspeaker system. These include DC offset, short circuit and power interrupt systems, as well as two special computer-controlled speaker monitor circuits which protect against excessive high frequency tweeter input and overall voice coil thermal overload.

Output is continuously monitored through dual lighted infinite-resolution VU-ballistic meters

which can react to musical transients as brief as 1 millisecond.

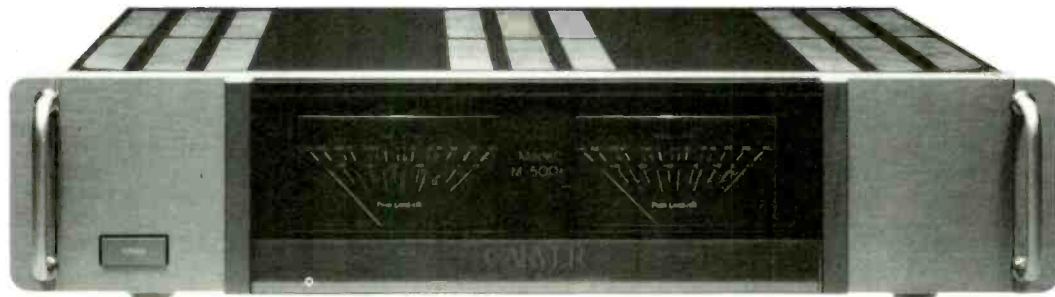
In addition, the M-500t's lack of external fan noise is complimented by internal circuitry with the best signal-to-noise ratio of any production amplifier. Better than 120dB. And, unlike any other amplifier in its price or power ranges, the M-500t is capable of handling problematic speaker loads as low as 1 ohm. It may also be used in a bridged mode as a 700 watt RMS per channel mono amplifier without any switching or modification.

MUSIC IS THE FINAL PROOF. Specifications aside, final judgment of any amplifier must be based on musicality.

Bob Carver has carefully designed the M-500t with a completely neutral signal path that is utterly transparent in sonic character, resulting in a total lack of listener fatigue caused by subtle colorations exhibited by many other amplifiers, regardless of their power rating. A veil will be lifted between you and your musical source as the most detailed nuances are revealed and delivered with proper impact.

We invite you to audition the M-500t at your nearest Carver dealer soon. Against any and all competition. We believe that you will be pleasantly surprised at just how affordable this much power, musicality and accuracy can be.

SPECIFICATIONS: POWER, 251 watts/channel into 8 ohms 20Hz to 20kHz, both channels driven with no more than 0.15% THD. Instantaneous Peak power, 1000 watts into 2 ohms, 950 watts into 4 ohms, 600 watts into 8 ohms. Long Term Sustained RMS power, 500 into 2 ohms, 450 into 4 ohms, 300 into 8 ohms, 1000 watts bridged mono into 4 ohms, 900 watts bridged mono into 8 ohms. Bridged Mono RMS Continuous Power, 700 watts continuous into 8 ohms. Noise, -120dB IHF A-Weighted. Weight, 25 lbs.



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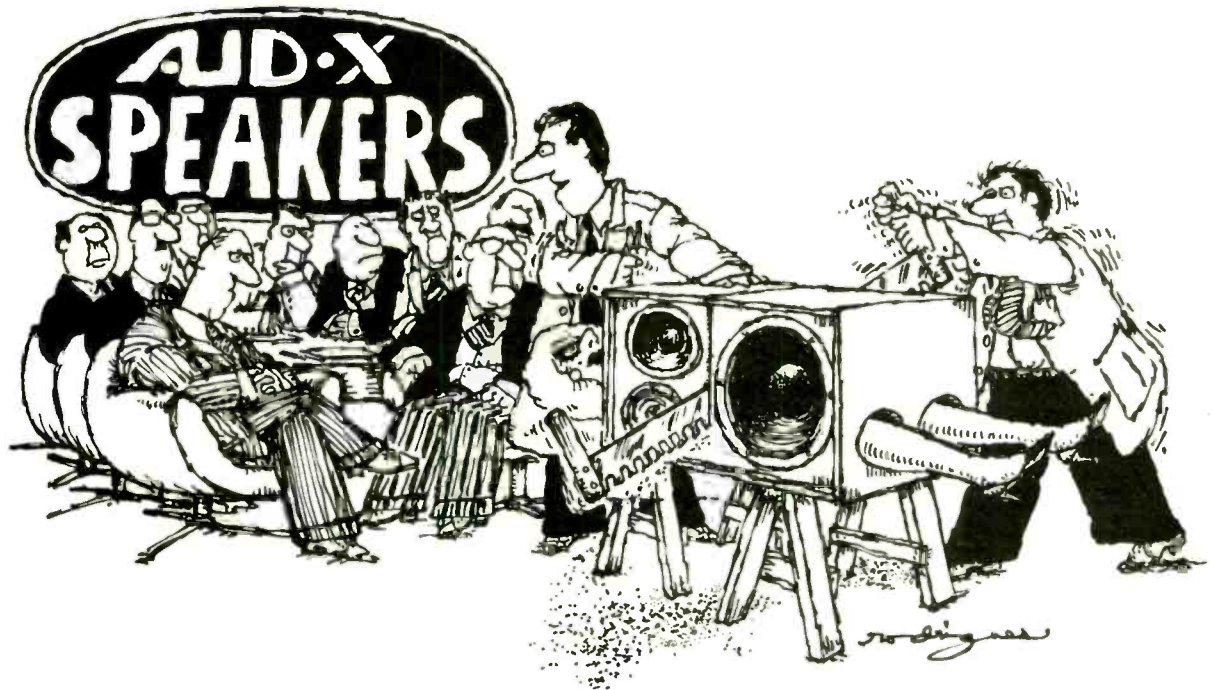
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Now an annual event! Soon to be a time-honored tradition (if not a major motion picture)! The Rodrigues Cartoon Caption Contest! Your chance to win fame and valuable prizes! Match wits with the other readers!

What are the guys demonstrating to the members of the Aud-x board of directors? And who are these fellows in the white coats anyway? Are they from the Research and Development Division, the advertising agency, or a local circus or magic show? You decide. Endlessly inventive cartoonist Charles Rodrigues has devised the situation. STEREO REVIEW wants to know who can supply the funniest caption.

The winner will receive the original signed drawing shown here, a cash prize of \$100, and the glory of seeing his or her name published in this magazine along with the winning caption when the results of the contest are announced.

Anyone may enter, and there is no limit to the number of times you may enter, but each caption submitted must be on a separate sheet of paper that also contains the clearly legible name and address of the person who enters it. Entries with more than one caption per page will be disqualified. All entries must be received by STEREO REVIEW no later than March 1, 1987.

The panel of judges will include members of the editorial staff of STEREO REVIEW and Rodrigues himself as well as Thomas Briggie and Michael Binyon, who were the winners of the first two contests. Entries will be judged on the basis of originality, appropriateness, and humor. The decision of the judges will be final.

The winning caption (and a selection of near misses) will be published in the June 1987 issue. Prepare yourself now for the fact that you will probably like one or more of the runners up better than the

caption to which the judges award the prize. Why should our competition be any different from, say, the Miss America Contest?

The usual restrictions and disclaimers are printed below. Send entries to:

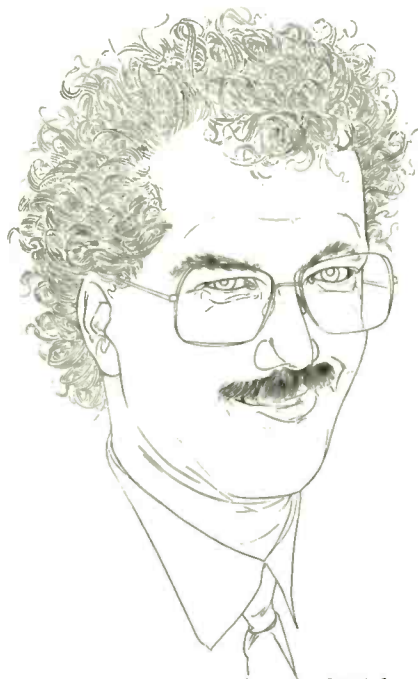
Rodrigues Cartoon
STEREO REVIEW
1515 Broadway
New York, NY 10036

No purchase is necessary. Anyone may enter except the staff of Stereo Review and its parent company (CBS Magazines) and their immediate families. All entries become the property of Stereo Review and none will be returned. If you wish to be notified of the results of the contest by mail, send a stamped self-addressed envelope to the above address.

In the unlikely event of duplicate entries, the one first received will be considered the winning entry. The names of the winner and perhaps a dozen runners-up will be published in Stereo Review and may appear in promotional literature for the magazine. Submitting an entry will be deemed consent for such use.

Stereo Review will arrange the delivery of the prize; any tax on it will be the responsibility of the winner. The judges have every intention of reaching a decision in time for the publication of the results in the June 1987 issue, but Stereo Review reserves the right to delay the announcement until July if the response is as overwhelming as last year.

by William Wolfe



The Union of Audio and Video

VIDEO is many things to many people. An audiophile I know says that video bores him and that there are just not enough interesting programs to justify his purchasing a hi-fi videocassette recorder or videodisc player—let alone a TV set capable of receiving stereo broadcasts. Another friend, who also has a great-sounding hi-fi system, recently ran down to his local electronics shop and bought a LaserVision videodisc player and a video receiver/monitor capable of displaying the fine picture produced by LV. He said he'd seen a videodisc of Ingmar Bergman's *The Magic Flute* that had a CD-quality digital soundtrack, and now the new equipment is wired into his hi-fi system.

There are many stands to take in between, of course, but in all matters of home entertainment I tend to take my cue from the availability of programming. I now own a CD player, but I rushed out to buy one only when I saw the number of discs I was interested in climb above thirty. Likewise, there are hundreds of videotapes recorded with hi-fi sound and about one hundred LV

discs encoded with digital audio. Other, nondigital LV discs number over 1,600, and nearly all have stereo audio characteristics that rival those of top-quality tape cassettes.

It is exciting to think of what you can do with a home entertainment system that unites both audio and video capabilities. I enjoy listening to my hi-fi system as much as I ever did, but I have found that a visual component often adds a great deal to the overall impact. That is certainly the case with action movies and musicals. And while most rock videos have reached consistency only in their silliness, and the TV networks still offer only rare gems of stereo programming, there are plenty of well-recorded concerts, ballets, operas, and movies to sink your teeth into. Something for everyone, you might say.

All told, there are simply too many programs in a wide range of entertainment categories to ignore, but you do need the video equipment to play them. In this space you will find the guidance to help you shop for that equipment, to make better use of it, and to maintain it.

For me, the apex of current audio/video excellence is the combination compact disc/LV player. The CD/LV machines play both compact discs and digital-audio laser videodiscs with a frequency response of 5 to 20,000 Hz ± 0.5 , -1 dB, audio signal-to-noise ratio of 98 dB, 0.005 percent total harmonic distortion, and a horizontal resolution (a measure of picture detail) of 370 to 400 lines—an excellent figure. They are available both from Pioneer, which was the first to come out with a CD/LV player, and from companies known primarily as audio manufacturers: Luxman, NAD, Sansui, and Teac. Pioneer's second-generation CLD-909 (\$900) is a full 2 inches slimmer and almost 10 pounds lighter than first-generation models.

The sound quality of videodiscs without digital soundtracks isn't too shabby, either: 50 to 15,000 Hz frequency response, 75 dB signal-to-noise ratio, and 0.08 percent total harmonic distortion.

The LV picture must be seen to be believed. It is appreciably more detailed than broadcast television. For comparison, the LV format rates

from 330 to 400 lines of horizontal resolution, broadcast and cable TV peak at about 330 lines, SuperBeta VCR's measure up at 300 lines, and VHS, Beta, and 8mm VCR's range from 230 to 250 lines. By the way, don't let anyone tell you that the new HQ (high-quality) circuitry in VHS VCR's increases detail—it doesn't, but it does subtly sharpen the edges of images.

To understand the concept of horizontal resolution, imagine your TV screen covered with hundreds of evenly spaced vertical lines. If you're using a video source (such as an LV player) and a video monitor with 400 lines of horizontal resolution, you will be able to see 400 distinct vertical lines. But you'll see only 300 of them with a video system rated at 300 lines, and so on. More lines means more observable detail in the picture.

If you like the thought of LV discs with digital audio but already own a compact disc player, Yamaha offers the LV-X1 digital (\$850). The first LV-only player equipped to handle digital soundtracks, the LV-X1 Digital is rated for 3 to 20,000 Hz frequency response (50 to 15,000 Hz for analog discs), 97 dB audio signal-to-noise ratio (70 dB analog), 0.001 percent total harmonic distortion, and 400 lines of horizontal resolution. Prepare to be wowed.

Remember, however, that CD/LV and LV-only players are just that—players that do not record. If you don't care to record TV programs, LV is a much better "movie player" than a VCR. If you already own a VCR, use it for "time shifting" (unattended recording of programs for later viewing) and consider LV the ultimate upgrade.

Hi-fi VCR's—which play back videotapes of movies, music programs, and more with high-quality stereo sound—have nothing to be ashamed of. Their audio capabilities are surpassed only by compact discs and digitally encoded LV discs. There are many more videotapes than videodiscs to choose from at most stores. Until recently, the problem was that you had to connect the VCR to a stereo system really to take advantage of hi-fi video. That is not always convenient. You may not want to sacrifice an input on your receiver or preampli-

fier, for example, or your hi-fi system may be across the room or in another room altogether. Relying on the average TV's built-in amplifier and speaker (or speakers) just doesn't cut it.

The Sony SL-HFT7 SuperBeta Theater VCR (\$699) solved this problem by incorporating a 20-watt-per-channel stereo amplifier along with Beta Hi-Fi, an MTS (multi-channel television sound) decoder for stereo TV, and simulated-surround circuitry. Most VCR shoppers and owners side with the dominant VHS format, however, and may not have cheered Sony's innovation. They should have.

In a predictable move known as "keeping up with the Sonys," Akai became the first to offer a stereo amplifier built into a VHS Hi-Fi VCR. Though the VS-565U "Instant A/V" VCR (\$880) does not have simulated surround, its 10-watt amp will prove serviceable

with a pair of efficient loudspeakers. Audio-oriented features include an MTS decoder, volume control from the remote, and FM simulcast. All that's left is to connect a pair of speakers.

Don't connect just any speakers, though. All speakers use magnetic drivers to make sound, and magnetic fields are a natural byproduct. Left to themselves, the fields interfere with and distort the video signal you see as a picture on TV. To solve this problem, a new category of audio/video component was born: the shielded loudspeaker. Shielded speakers typically incorporate some type of lining material to prevent magnetic fields from escaping the speaker enclosure.

A more advanced, more expensive method is to cancel rather than block the offending fields by employing additional magnets whose polarities are opposite to those of the magnets used with the speaker's

drivers. Models such as B&W's VM-1 (\$398 per pair), Infinity's VRS-3 (\$299), and Polk's VS-19 (\$300) are all medium-size shielded speakers that will sound fine with the power provided by the Akai or Sony VCR's or with a spare amplifier or receiver.

Juggle the components mentioned above and you have, to borrow Akai's phrase, an Instant A/V system. The programs are there, ready and willing. And there's more. Upgrade possibilities include a surround-sound processor and an additional set (or sets) of speakers, a 3-pound camcorder (video camera and recorder in one) for home moviemaking, and special-effects generators for creative video editing. Perhaps the union of audio and video isn't the pure experience you're accustomed to, but it offers some very interesting possibilities. Home entertainment may never be the same. Stay tuned. □

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EPI LSR-42

by Julian Hirsch and Christopher Greenleaf

The amplifiers of the EPI LSR-42 cassette receiver are rated to deliver 12 watts per channel into 4-ohm loads from 50 to 20,000 Hz with less than 0.8 percent distortion. It also has line-level outputs for driving external power amplifiers. The digital-synthesis AM/FM tuner has six station presets for each band, with automatic scanning in addition to manual step tuning. Small buttons below the cassette opening switch the frequency bands, select LO(cal) or DX(distance) tuner sensitivity, and activate the automatic stereo/mono switching circuits of the FM tuner. A red light glows when a stereo FM transmission is received, and lights in the illuminated digital frequency display show that the band is in use.

An SRO button activates EPI's Stereo Reception Optimizer circuit, which automatically reduces the FM tuner's high-frequency response and channel separation on weaker signals. Other buttons control the tape-playing functions, activate the Dolby B or Dolby C noise-reduction circuits, and change the normal 120-microsecond equalization to 70 microseconds for chrome or metal tapes. Lights in the fast-forward and reverse buttons indicate the direction of tape travel for the autoreverse transport.

The tape player has an automatic music search feature that scans the tape at high speed in either direction until it encounters a silent interval between recorded sections, at which it stops and plays the next selection. Tapes can be changed by pressing the soft-touch eject button, and ejection is automatic when the radio

or the car ignition key is turned off.

The remaining controls of the LSR-42 are two concentric knob pairs. On the left is a combined volume control and power switch. Pushing it in switches the display between radio frequency and time or, while playing a tape, reverses the direction of play. The outer concentric knob operates the front/rear fader and, when pressed in, the left/right balance control. At the right of the panel, the smaller inner knob tunes the radio up or down when it

To our surprise and pleasure, the automatic music search was more finely tuned than most others we have used.

is moved clockwise or counterclockwise. This knob is pushed in to set the clock time. The outer concentric ring adjusts the bass and, when pushed in, the treble tone control. All of the knob controls have center detents. Price: \$430. Epicure Products, Inc., Dept. SR, 25 Hale St., Newburyport, MA 01950.

Lab Tests

Like many auto radios, the EPI LSR-42 carries some optimistic, even unrealistic, specifications. For example, although its amplifiers are capable of delivering their rated 12 watts per channel into 4-ohm loads, they are also rated for a maximum output of 25 watts per channel at 1,000 Hz. Such an output is quite impossible except by over-driving the amplifiers to produce a square-

wave output, and it might also be destructive to the radio. We measured a clipping-level output of about 14 watts into 4 ohms and 8.6 watts into 8 ohms, both consistent with the radio's use of bridged amplifiers in each channel (neither side of the speaker output can be grounded).

Since the amplifiers were driven from the output of the tuner section, we could not measure their distortion. All our tuner and tape-deck measurements were made at the receiver's line outputs. Here, too, we found a specification anomaly. The preamplifier's maximum output is rated at 1 volt, which it achieved in our tests, but the power amplifiers were driven into clipping when the line output exceeded 0.24 volt. Fearing their destruction, we limited our maximum line output to the lower value. Even at moderate power outputs, both sides of the radio's housing became uncomfortably hot to the touch after a short period of operation.

Our measurements of the radio's frequency response with its tone controls centered showed a pronounced rolloff below 100 Hz. This appeared to be a property of the tuner section, since the tape playback response was flatter in that frequency range. The FM tuner's performance was generally satisfactory, although we noted a curious discrepancy in the sensitivity figures listed in the instruction booklet. They were given in both microvolts and dBf but calculated as though the radio had the 300-ohm input of a home receiver (car radios use a 75-ohm antenna input, which halves the microvolt figure corresponding to a given dBf rating). The tuner proved, however, to be much more sensitive than rated, as well as quite good in most other performance areas.

The FM distortion, never low, increased considerably at high signal levels. It was slightly lessened by switching to LO sensitivity, but it was still higher than is typical of car radios (their FM distortion is usually much higher than that of a home tuner or receiver). Interestingly, this effect was worse in mono than in stereo. The stereo channel separation was a constant 30 dB across most of the audio frequency range,



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David Lee Roth: Eat 'Em And Smile • Goin' Crazy, Yankee Rose, etc. Warner Bros. 153814

Robert Palmer: Riptide • Addicted To Love, Discipline Of Love, Hyperactive, title song, more. Island DIGITAL 133507

Canadian Brass: High, Bright, Light & Clear • Masterpiece Theatre theme, Air On A G String, more. RCA DIGITAL 144529

Prince And The Revolution: Parade • Kiss, Mountains, Girls & Boys, others. Warner/Paisley Park 140234

Mozart, Piano Concertos Nos. 12 & 20 Rudolf Serkin; London Symphony Orchestra/Abbado. DG DIGITAL 115062

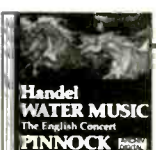
Daryl Hall: Three Hearts In The Happy Ending Machine • Dreamtime, Foolish Pride, Someone Like You, For You, etc. RCA 123691



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154570

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

Tchaikovsky, Symphony No. 6 (Pathétique) Levine/Chicago Symphony Orchestra. RCA DIGITAL 153939

Peter Gabriel: So • Sledgehammer, In Your Eyes, Red Rain, etc. Geffen 147064

Vivaldi, The Four Seasons • Pinnock/English Concert. Archiv DIGITAL 115356

Linda Ronstadt: For Sentimental Reasons, My Funny Valentine, etc. Asylum 154382

Bach, Organ Works • Daniel Chorzempa plays Toccata & Fugue in D Minor, more. Philips DIGITAL 115193

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

Rimsky-Korsakov, Scheherazade • Vienna Phil./Previn. Philips DIGITAL 115415

ZZ Top: Afterburner • Stages, Sleeping Bag, Velcro Fly, more. Warner Bros. 154042

Bob James & David Sanborn: Double Vision. Warner Bros. 123682

Alabama: Greatest Hits • She And I, Why Lady Why, Feels So Right, etc. RCA 120247



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151758

The Judds: Rockin' With The Rhythm Have Mercy, Grandpa (Tell Me 'Bout The Good Old Days), others. RCA 154265

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

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

Pavarotti: Mamma • Title song, Vieni sul mar, more. Arranged & conducted by Henry Mancini. London DIGITAL 115310

Wagner, Orchestral Highlights From The Ring • Vienna Philharmonic Orchestra/Solti. London DIGITAL 115426

Kenny Rogers: They Don't Make Them Like They Used To • Title song, Hold On To Love, After All This Time. RCA 151174

Elvis Presley: Return Of The Rocker • King Of The Whole World, Return To Sender, Stuck On You, etc. RCA 164071

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

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- Soft-touch transport-control buttons
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- Ignition-key-off tape eject
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- Switchable tape equalization
- Fader and balance controls
- 12-watt-per-channel power amplifiers drive either one or two speakers each (into 4 ohms)
- Line-level audio outputs for external amplifier

LABORATORY MEASUREMENTS

FM measurements in DX (distant) mode unless specified LO (local)

FM mono usable sensitivity (75-ohm input): DX, 6.8 dBf (0.6 μ V); LO, 30 dBf (8.7 μ V)

Mono 50-dB quieting sensitivity (75-ohm input): 11 dBf (1 μ V)

Tuner signal-to-noise ratio at 65 dBf: 68 dB

Tuner distortion at 65 dBf: DX, 4.5%; LO, 0.53%

FM frequency response (-3-dB limits): 60 to 20,000 Hz

Stereo separation (at 65 dBf) at 100, 1,000, and 10,000 Hz: 29, 30, and 29.5 dB

Capture ratio at 65 dBf: 2.6 dB

AM rejection at 65 dBf: 25 dB

Selectivity: alternate-channel, 74 dB; adjacent-channel, 4 dB

Image rejection: 75 dB

AM frequency response: 35 to 2,250 Hz \pm 1, -6 dB

Tape playback frequency response (standard IEC test tapes): 120- μ s EQ, 31.5 to 18,000 Hz \pm 0,

-11.5 dB forward and \pm 0, -5.5 dB in reverse; 70- μ s EQ, 31.5 to 18,000 Hz \pm 0, -8 dB forward and \pm 0, -7.5 dB in reverse

Tape signal-to-noise ratio

(A-weighting, referred to 250 nWb/m at 315 Hz): 120- μ s EQ, no noise reduction, 56 dB; Dolby B, 64 dB; Dolby C, 68.5 dB. 70- μ s EQ, no noise reduction, 59 dB; Dolby B, 65.5 dB; Dolby C, 70 dB

Flutter: 0.1% JIS-weighted rms; \pm 0.15% CCIR-weighted peak

Tape speed accuracy: \pm 1% at start of tape, \pm 0.8% at end

Fast rewind time (C-60): 98 seconds

Tone-control range: \pm 11 dB at 100 Hz; \pm 11.5 dB at 10,000 Hz

Line output at clipping (into EIA load): 1 volt

Power-amplifier output at clipping (1,000 Hz): 8-ohm loads, 8.6 watts; 4-ohm loads, 14.1 watts

and except for the bass rolloff, the FM frequency response was flat within about \pm 1.5 dB from 90 to 15,000 Hz (it was down 6 to 8 dB at 30 Hz). Although the FM tuner's image rejection, selectivity, and capture ratio were reasonably good, its AM rejection was a poor 25 dB at 65 dBf and a mediocre 47 dB at 45 dBf. The AM tuner's frequency response was \pm 1, -6 dB from 35 to 2,250 Hz.

Like most autoreverse tape decks, the EPI LSR-42's high-frequency response was different in the two directions of tape travel. With 120-microsecond equalization, the highs rolled off above 10,000 Hz in the forward direction but were exceptionally flat during reverse play. With 70-microsecond equalization, the pattern was reversed (the for-

ward response was flatter than the reverse response), although neither was as good as the better of the two 120-microsecond response curves. The other tape-deck performance characteristics were essentially as specified.

Except for the few measurements that fell well short of its ratings, the EPI LSR-42 did a creditable job as a tuner and a cassette deck. Our chief reservation about it concerns the obviously limited signal range that its FM tuner can handle without considerable distortion (more than 4 percent at some levels). In most practical situations it will have to be operated in the DX mode, but within a few miles of a transmitter the distortion may become audible. Should that happen, the LO/DX button may provide the cure, but such

actions should not be required of the user. The tape deck's performance was not unlike that of many other autoreverse decks we have tested; you usually pay a price in high-frequency response for this convenience.

The detents on the control knobs were sometimes difficult to feel, especially when the knob had to be pushed in while it was being adjusted (this, too, is a common problem with many car receivers). Similarly, the small and closely spaced buttons require a careful touch to achieve the desired result. These criticisms aside, we found the LSR-42 smooth and easy to use. *J.H.*

Road Tests

For the most part, the pleasures of a fine fall day and a responsive car were enhanced by the EPI LSR-42. An FM dial packed with listenable stereo broadcasts and the speed with which the controls felt right to my probing fingers were the highlights of that drive, but to the list of good impressions I must also add one or two quibbles.

I made a cassette dub from a master tape and fed it into the LSR-42. The first piece was a Baroque organ chorale in which the bright, tingling sound of the instrument's revolving *Zimbelstern*, a wind-driven wheel laden with tiny bells, overlaid the music of the pipes. The Dolby B circuit of the LSR-42's tape player mistracked, producing not only a slight pumping of the high-frequencies but also an unusual set of non-musical harmonics below the various bell pitches. To a much lesser extent, variations on this same Dolby B nonlinearity happened when I played other tapes with a lot of high-frequency material at moderately high levels.

The FM sound was smooth and full except for a slight rubberiness in the middle-bass, which the bass tone control could not satisfactorily alter. The treble performance on FM was good most of the time, even excellent when presented with a clean signal from an uncompressed broadcast. The SRO circuitry was useful, effective, and unobtrusive enough not to detract from the listening experience. Between the SRO and mono buttons, I felt that I had plenty of control over the vagaries

CAR AUDIO TODAY

BULLETIN NO. 3 1986

HOW ALPINE RE-ENGINEERED THE CD PLAYER AND TUNER SECTION TO SHARE THE SAME IN-DASH CHASSIS.

It began with the goal of a car audio system able to do justice to the most artfully recorded music. It led to the development of a Compact Disc player smaller and more advanced than any before. And an FM-AM tuner of astounding capability. It resulted in Alpine's new Model 7902. The first true single-chassis all-in-one design available in a standard DIN-size unit.

Throughout the 7902, Alpine has blended the digital engineering of CD with state-of-the-art analog circuitry to precisely control the musical signal at all stages of its journey. A double-oversampling linear-phase digital filter eliminates the distortion you hear when digital signals are converted into analog form. The filter suppresses ultra-high frequency signals before their conversion to analog, while the double over-sampling process improves the upper-band frequency response. The result? Dramatically reduced harmonic distortion in your music.

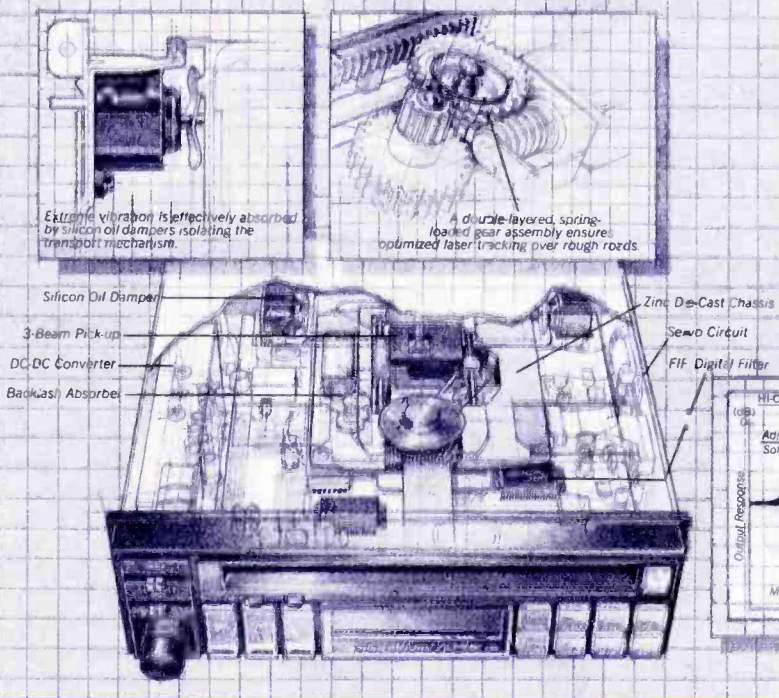
Once the music is converted to analog form, the signal continues to pass through a Butterworth analog filter. This rejects the ultrasonic noise that is characteristic of CDs.

ABSORBING THE SHOCKS OF THE ROAD WITHOUT LEAVING THE TRACK.

The mechanics of the 7902's CD section are no less innovative than its electronics. Alpine has combined its

own 3-beam laser pick-up with a series of other advances. Together they deliver exceptional sonic accuracy, while compensating on the road for the bumps and jars that can

Silicon oil dampers also protect the CD mechanism from vibrations and outside shocks. And the entire CD assembly is mounted on a rugged zinc die-cast



A CLOSER LOOK AT THE ALPINE 7902 CD PLAYER/FM-AM TUNER.

cause a lesser CD player to mistrack.

A specially designed gear system for the laser drive prevents backlash—the looseness that degrades tracking accuracy. The 7902 uses unusual two-layered gears, with a spring placed between them to maintain tension. So the drive operates with absolute precision.

chassis that's able to absorb shock and vibration better than a common pressed steel or aluminum die-cast chassis.

Alpine's 3-beam laser pick-up uses a diffraction grating to split the laser light into a main beam and two "sub-beams." Constant comparison of the two sub-beams instantly corrects the main beam's alignment, keeping it right on track. Remarkably, Alpine engineering

has packaged all these advances into the first CD pick-up small enough to share an in-dash DIN-sized head unit with an equally advanced FM-AM tuner.

GIVING THE MOST DISTANT STATIONS A POWERFUL RECEPTION.

The Model 7902 incorporates a tuner section that's already legendary for its performance: Alpine's remarkable T-10II Tuner."

Its circuitry was created using STAR (Signal Transit for Accu-

truly linear musical output.

Three other Alpine innovations contribute to the T-10II Tuner's ability to make the most of your favorite radio stations. A double balanced mixer removes signal saturation from strong FM broadcasts before it reaches the tuning stage, so headroom is increased. Selected dual-gate MOSFETS reduce the noise level in the receiver. And a double automatic gain control circuit reduces the intermodulation distortion that can degrade your musical reception.

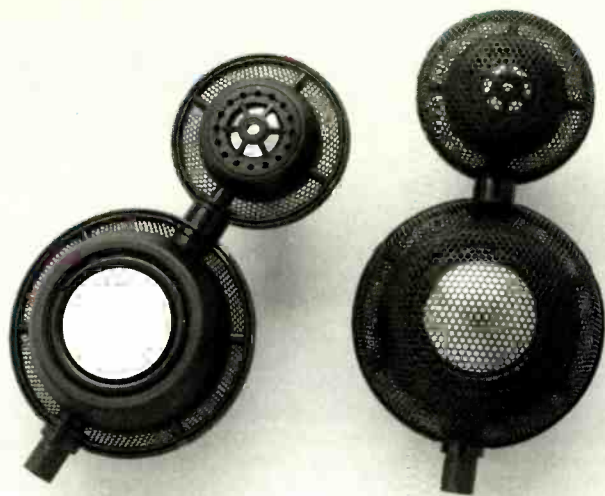
Making the 7902 all the more unique is a shielded, pulse-width-modulated power supply designed with dual circuitry—two discrete power blocks that eliminate high-frequency signal interference. This rethinking and redesign of every aspect of circuitry results in improved clarity and definition, and contributes to the exceptional musicality of the 7902.

rate Response) topology. This technique keeps critical circuits separated to avoid interference, while using computer-aided design to engineer the shortest routes for signals to travel. By streamlining the tuner's electronic pathways STAR achieves exceptionally clear reproduction with greater dynamic range and a

It all adds up to a tuner with superb clarity and definition. In an incredibly small package that, combined with Alpine's equally compact new CD section, makes the model 7902 a first for Alpine. And a first for the mobile audio industry.

To see and hear Alpine's new 7902 CD Player/FM-AM Tuner, visit your local Alpine autosound specialist.





The Shape Of Things To Come.

For years physicists have agreed that the ideal loudspeaker would imitate an "acoustically pulsating sphere"—a ball that radiates music omnidirectionally. And for years companies have been trying to design speakers based on this model. Many of their efforts have been interesting, but most have fallen short of the mark. So far short that many people have given up on the idea of a *true* omnidirectional speaker as being "a thing of the future."

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of New York's radio waves. The tuner's resistance to impulse-noise interference was moderately good for FM but decidedly mediocre throughout the AM band. In any case, AM was rarely listenable except for very powerful nearby stations.

To my surprise and pleasure, the automatic music search was more finely tuned than most others I've used. It readily found tracks on tapes with substantial quiet sections, making only a *few* mistakes, as any such silent-interval sensor will do when confronted with extended low-level audio signals of the kind common in classical or acoustic popular music. Illogically, you have to depress the PLAY button to disengage the search feature.

Although there are more than enough truly useful controls for most listeners, I missed one option I've come to cherish. When you

EPI's Stereo Reception Optimizer circuit automatically reduces the tuner's high-frequency response and channel separation on weaker signals.

eject a cassette, it is very irritating to be lashed by a sudden burst of radio racket, especially after quiet listening. A tuner/tape selector would not only alleviate this problem but also let you check the radio's status during the time-consuming fast-wind process (2½ minutes for a C-90).

My fingers, eyes, and ears liked this unit more than my quibbles may suggest. It is complete yet simple. The audio quality of tape play in both directions was consistently excellent except for the Dolby mis-tracking with strong treble material like bells and synthesizers. It was also especially pleasant to encounter a well-written owner's manual. I wish the bass control were centered a bit lower—say, around 60 Hz—where it could affect real bass frequencies. It would then be more useful to owners with well-placed and equalized loudspeakers. Otherwise, this is a good car receiver, and its resistance to mechanical shocks and to the worst FM woes is definitely a plus. C.G.

by Julian Hirsch



Moving-Magnet vs. Moving-Coil Cartridges

THE two common forms of magnetic phono cartridges are usually referred to as *moving-magnet* (MM) and *moving-coil* (MC) cartridges. Although they operate on identical principles, the two differ substantially in their internal construction and in some of their electrical and physical characteristics.

The output voltage of any magnetic cartridge is generated by either the motion of a coil of wire in a magnetic field or the motion of a magnetic field relative to a fixed coil. This is something of an oversimplification, since no physical movement of either the coil or the magnet is needed; a change in the number of magnetic flux lines (the strength of the magnetic field) linking the coil turns is what actually generates a voltage in the coil. In almost all cases, however, either the coil or the magnet moves according to the motion of the stylus as it traces the groove modulation of the record. The chief exception is the *variable-reluctance* cartridge, in which the magnet and coils are fixed and the strength of the magnetic

field is varied by the motion of a small piece of magnetic material suspended in the field.

The output voltage of any magnetic cartridge is proportional to the rate of variation of the magnetic field surrounding the coil and the number of turns of wire in the coil(s). This voltage should be high enough to mask system noise (hiss and hum) but less than the overload input of the preamplifier. In a moving-magnet cartridge, it is possible to wind the stationary coils with thousands of turns of very fine wire and to construct a relatively efficient magnetic circuit. The magnet, however, which is usually mounted on the cantilever of the stylus system, must be small and light in order to minimize the effective moving mass.

In recent years, very powerful and very light magnetic materials have become available, and their widespread use has enabled most MM cartridges to generate several millivolts at normal recorded levels. This output level is compatible with the operating requirements of almost all preamplifiers, and there is no reason to generate a higher output (which might drive some preamplifiers into distortion).

In a moving-coil cartridge, the stylus cantilever moves a pair of tiny coils, which are suspended in a powerful fixed magnetic field. The delicate coils and wire leads coming from them usually make it impractical for the user to replace a damaged or worn stylus. The number of turns in each coil may be only a few, or as many as several hundred, but in every case it is much less than the number in the coils of a moving-magnet cartridge. In fact, it is so

much less that an excessively powerful magnetic field would be required to generate a voltage comparable to that of most MM cartridges. The magnetic system of a typical MC cartridge is comparable in size and weight to the coil structures of an MM cartridge. Most MC cartridges have an output of a fraction of a millivolt, with a few in the low microvolt range. Obviously, these cannot be used successfully with ordinary phono preamplifiers designed for input levels ten to a hundred times greater.

The low output voltage of a typical MC cartridge must be "stepped up," or amplified, before being fed to a standard preamplifier. The step-up process is not, however, amplification in the usual sense since it is done with a transformer that does not increase the power in the signal—just its voltage level. A moving-coil cartridge is actually a much more efficient generator of audio power than a moving-magnet cartridge, and the step-up is basically an impedance-matching process.

A transformer that matches the low impedance of a moving coil (anywhere from 3 to 200 ohms or so) to the 47,000-ohm input of a conventional preamplifier will increase the voltage level some twenty or thirty times. These transformers have a wide frequency range (often well beyond the limits of the audible band) and must be shielded thoroughly against inductive hum from power lines or line-operated equipment. The better ones tend to be rather expensive as well as surprisingly bulky and heavy.

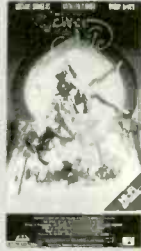






The other option is a so-called "head amplifier," or "pre-preamplifier." This is a true voltage amplifier, much like the input stage of a conventional phono preamplifier, but without equalization. Its input termination is often about 100 ohms (suitable for most MC cartridges), and a voltage gain of twenty times is typical. Many head amplifiers are sold as external accessories to record-playing systems, but a growing number of preamplifiers, integrated amplifiers, and even receivers have this extra amplification built into their phono sections. Very low noise is important in a head amplifier. Although the noise usually cannot be kept as low as that of a

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transformer (which generates virtually no wideband noise of its own), it can still be inaudible, and the active amplifier has the advantage of being relatively immune to magnetic hum pickup.

Apart from the details of their physical construction and their output voltages, what other differences are there between MM and MC cartridges? First, it should be appreciated that the playing quality of any cartridge is determined almost entirely by the accuracy with which its stylus traces the groove modulation and couples its motion to the generating element, whether it's a magnet or a coil. The nonlinearities, and resulting distortions, caused by the magnetic system of a cartridge are minute compared with the tracing distortions that take place at the critical groove/stylus interface. The shape and dimensional tolerances of the diamond stylus are far more important than the generating system employed in the cartridge. But that does not mean the magnetic systems are perfect! A magnetic circuit that includes ferric materials is inherently subject to nonlinearities of various kinds—consider the shockingly high distortions present in magnetic recording systems and media. The important thing to remember, however, is that these magnetic distortions are minuscule compared with the tracing distortions in phono reproduction.

There are some important differences between MM and MC designs that can affect their suitability for your particular application. Some of these differences are inherent in the cartridges' design, while others are not. For example, in past years almost all MC cartridges had very little damping of their stylus resonances. The result was a high-frequency peak, usually somewhat above 20,000 Hz but with a substantial effect on the frequency response in the 10,000- to 20,000-Hz octave. The audible result was a crisp, bright sound that was often interpreted as improved definition.

When compared with a good MM cartridge, with a well-damped stylus resonance and a flat response, such an MC cartridge can sound more "alive," or the MM cartridge may be felt to be "dead" or "lifeless." A similar effect occurs when compar-

ing loudspeakers with flat and peaked responses. Much of the difference could have been eliminated (or the sound characters of the two cartridges interchanged) by frequency equalization, although few ordinary tone controls can modify the response at 20,000 Hz by 10 dB or more without having an excessive effect on frequencies a couple of octaves lower.

Many of the better MC cartridges now have good stylus damping and a flat response, quite comparable to that of a good MM cartridge. There are also some MC cartridges whose output levels are sufficient to drive a standard MM phono input without amplification or stepping-up. Although they usually have less output than a typical MM cartridge (1 or 2 millivolts instead of 3 to 6 millivolts), the difference is not significant in most cases. Even if you have to listen with the amplifier's gain set near its maximum, the low impedance of the MC cartridge acts as a short circuit on the phono input, so both hum and noise may be less than they would be with an MM cartridge having a higher output.

Another way in which MC cartridges differ from MM cartridges is in their tracking ability. This is a measure of the maximum recorded velocity (at a specific number of frequencies) that the pickup can track with acceptable distortion at a given vertical stylus force. For years MC cartridges, even the most highly regarded and expensive models, had notoriously poor tracking ability in spite of their relatively high tracking forces (usually 2 to 3 grams). Such a cartridge, playing a heavily modulated record, could produce harsh, shattering distortion on program peaks, even though it probably tracked at twice the force needed by a much less expensive moving-magnet cartridge with superior tracking ability. I have noted a general improvement in this respect, and some current MC cartridges can track high levels as well as the best MM cartridges.

Although I have been talking about problems with MC cartridges, the MM cartridge is not perfect either. Insofar as the stylus system and the moving magnet itself are concerned, the same problems exist in these as in MC cartridges. The sty-

lus resonance and its damping are equally important considerations in both types of cartridges, but here the MM cartridge has a strong advantage—which can also be interpreted as a fault! Whereas any damping of the resonance of an MC cartridge must be done mechanically, within the cartridge, and its frequency response is unaffected by external loading parameters, the high-frequency peak resulting from the stylus resonance of an MM cartridge is modified by the external loading resistance and capacitance. In fact, the response of such a cartridge is specified at a particular value of load capacitance and resistance (the latter is universally standardized at 47,000 ohms). An appreciable change in either value will usually have a measurable—and often audible—effect on the frequency response and sound of the cartridge.

A high-quality MM cartridge can have a response flat within less than 1 dB from 20 to 20,000 Hz when correctly terminated. In spite of that, its mechanical response (as set by the stylus resonance) may have a large peak at 25,000 to 35,000 Hz. It has been claimed by some that such a peak degrades the performance of the cartridge despite its external equalization to a flat characteristic. Considering the absence of program material at those frequencies (to say nothing of their inaudibility), this claim seems questionable.

The "bottom line" on the MM vs. MC issue is something like this:

Noise depends on local conditions and amplifier performance; neither type is necessarily lower.

Frequency response is usually flatter with MM, but there are numerous exceptions.

Tracking ability is usually better for MM, but there are some exceptions here as well.

Output voltage is usually very low for MC, but some "high-output" models are compatible with MM phono preamplifiers.

Stylus replacement. Almost all MM cartridges allow user replacement, but almost all MC cartridges require replacement by factory or service agency—if at all.

Price. MC cartridges used to be very expensive, but many are now available at moderate prices.

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LINN AXIS TURNTABLE

Julian Hirsch, Hirsch-Houck Laboratories

THE Linn name is familiar to virtually all audiophiles largely because of the LP12 Sondek turntable, although the product line of the Glasgow-based company also includes amplifiers, speakers, tonearms, and phono cartridges. While the qualities of the LP12 are still the subject of some discussion in high-end audio circles, there are two indisputable facts about it: it is a very good turntable, and it is also a very expensive one.

Linn has introduced a new turntable, the Axis, that is priced much more affordably and still offers outstanding performance. Like the LP12, the Axis is belt-driven, but it features a rather unusual and sophisticated electronic drive system. Its twenty-four-pole synchronous motor is operated from an internal oscillator and two low-distortion

Class A amplifiers (one for each of the motor phases). According to Linn, the careful adjustment of the phase and amplitude of the two driving signals removes much of the usual motor noise and vibration. A control circuit monitors the motor's speed, applying full power during start-up to get the platter up to speed. When the correct speed (either 33 $\frac{1}{3}$ or 45 rpm) is reached, the motor's drive voltage is automatically reduced to maintain that speed, which also further reduces motor noise.

The die-cast aluminum platter is formed of two pieces. The inner drive platter, which is driven by the belt from a pulley on the motor shaft, is about 6 $\frac{1}{2}$ inches in diameter. The outer platter, 11 $\frac{3}{4}$ inches in diameter, rests on the drive platter and is covered by a thin felt mat. The total rotating weight (both plat-

ters plus the mat) is about 3 $\frac{3}{4}$ pounds. The drive platter is supported on a single-point thrust bearing in a permanently lubricated sleeve.

The turntable's only operating control is a single button at the left front of the wooden base. A momentary touch on the button lights a red LED and causes the platter to turn at 33 $\frac{1}{3}$ rpm. If the button is held down for about 2 seconds, a green LED lights and the platter accelerates to 45 rpm. The speed change is made electronically by changing the frequency of the oscillator that drives the motor. At either speed, a single touch on the button stops the turntable.

The Linn Axis is normally supplied with a Linn LVX tonearm, although it is also available without an arm. The arm and platter are mounted rigidly on a metal plate. The Axis is supported on three tubular silicone-rubber feet under the wooden base, which ensure a level playing surface (when the supporting surface is level). Three other rubber supports, coaxial with the

base-mounting feet, isolate the metal platter/arm board from the base. The Linn LVX is a moderately priced, high-quality tonearm with an integral arm lift, antiskating compensator, and threaded counterweight whose force scale is calibrated from 0 to 3 grams in 0.1-gram increments. The low-mass headshell is removable for ease of cartridge mounting.

The black-finished wooden base of the Linn Axis measures 17½ inches wide, 13⅝ inches deep, and 5⅝ inches high, including the hinged, clear-plastic dust cover. The heat-sink fins for the driving amplifiers extend about ¾ inch behind the base, and the removable molded-rubber power connector extends about 2 inches (2 inches is also the rear clearance needed when opening the cover). The complete Axis record player weighs about 16½ pounds. Price: Linn Axis with LVX arm, \$575; without tonearm, \$425. Audiophile Systems, Dept. SR, 8709 Castle Park Dr., Indianapolis, IN 46256.

Lab Tests

Our test sample of the Linn Axis came with a Linn K9 cartridge installed in its tonearm. The K9 (which sells for \$175) is a moving-magnet cartridge that is generally similar to the lower-priced Linn Basik but with a "Vital" stylus (a form of line-contact stylus). The cartridge appears to be an ideal companion to the Axis and the LVX arm. We measured the effective mass of the cartridge and arm as 24 grams. Subtracting the rated weight of the cartridge indicates an arm mass of 16 to 17 grams, which places it in the medium-mass category, compatible with most cartridges rated to track at forces of 1.5 to 2 grams. The K9 is rated to track at 1.7 grams, which is the force we used during our tests of the system. The low-frequency resonance of the arm/cartridge combination was about 8 to 9 Hz, close to the ideal frequency of 10 Hz.

The cartridge output was 3.5 millivolts at a standard recorded velocity of 3.54 cm/s, and the two channels had identical outputs. The overall frequency-response variation was about ±1 dB from 40 to 20,000 Hz, with the responses for both channels within 0.5 dB of each

other. The channel separation was about 20 dB up to 10,000 Hz, decreasing to 13 to 15 dB in the 15,000- to 20,000-Hz range. The reproduction of a 1,000-Hz square wave showed only a single small overshoot and no sustained ringing. The vertical tracking angle of the stylus was 20 degrees.

Our high-velocity tracking tests indicated that the tracking ability of the Linn K9 was very good: it delivered an excellent sine wave from the 30-cm/s 1,000-Hz tones on the Fairchild 101 test record, tracked the high-level 32-Hz tones of the Cook 60 record, and tracked the 80-micrometer level of the 315-Hz tones on the DIN 45-549 test record. This is the sort of tracking performance that we expect to get from a good hi-fi phono cartridge but often do not.

The Linn LVX tonearm was equally outstanding. The calibration of its tracking-force scale was accurate within 0.1 gram, and its tracking error was less than 0.5 degree per inch for radii between 2.5 and 6 inches. The antiskating calibration—unlike that of almost every other arm we have tested—was correct. When the antiskating was set to match the vertical tracking force, it resulted in equal distortion (and tracking ability) from both channels at high recorded velocities. Another rare quality of this arm was its no-drift cueing lift. The friction between the rubber covering on the lift bar and the bottom of the arm tube prevented the arm from shifting during its descent. The arm unfailingly returned to the same point on a record from which it was raised. This may not sound like a major achievement, but among the tonearms we have tested over the past thirty years or so, those matching it can easily be counted on the fingers of one hand!

The turntable itself performed to the same high standards as the arm and cartridge. Its speeds were exact, and the flutter was only ±0.1 percent DIN-weighted peak, or 0.07 percent JIS-weighted rms. The unweighted rumble was -42 dB, and with DIN-B weighting it improved to -69 dB. The effectiveness of the two-stage isolation system was demonstrated in our measurements of base-transmitted vibration. The

overall isolation effectiveness was well above average, with the major transmission at about 25 Hz and a smaller response at 10 Hz. There were no significant responses above 30 Hz.

Comments

Testing (and using) the Linn Axis was a pleasurable experience. Admittedly, not having to install or set up the cartridge or make critical adjustments contributed to our enjoyment of the system's qualities. But what we appreciated most of all was the combination of sophistication and simplicity in its design, the virtually ideal performance of each of its components and of the entire system, and the near-absence of aggravating "bugs."

I say "near-absence" because even this superb record player was not quite perfect. On several occasions, switching on the amplifier from whose convenience outlet the turntable was powered also started up the turntable. Apparently a transient impulse sometimes triggered its control circuits when line voltage was first applied to the turntable. Possibly this would not have happened if the player were always connected to a powered outlet. Another aspect of its performance, which would not be likely to bother most people, was the slow start-up (about 12 seconds) at 45 rpm. At the lower speed, 3.2 seconds elapsed between pressing the start button and the achievement of rated speed.

But this is truly nit-picking. The Linn Axis is certainly one of the best record players we have seen in recent years. And, while it is not exactly inexpensive (though it is less than half the cost of a Linn LP12), it is an excellent value. The LVX arm is probably one of the least expensive high-quality tonearms available, and we have not yet used another one at *any* price that was as comfortable to handle. The K9 cartridge (not a part of the Axis, but certainly an ideal adjunct to it) sounded as good as any we have used, although there are a number of excellent cartridges selling in the same general price range. The synergism that produces such a fine overall product from these components is surely no accident.

Circle 140 on reader service card

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CIRCLE NO. 44 ON READER SERVICE CARD



NEC CD-500E CD PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

THE NEC CD-500E compact disc player has an unusually simple control panel. The operation of this front-loading machine is controlled by a clearly marked group of four soft-touch push-buttons. The large, square PLAY/PAUSE control performs its functions on alternate touches. To its right is the rectangular STOP/CLEAR control, which stops playback on the first touch and clears the programmed memories on the second. Two slightly smaller buttons with double-arrow markings step the laser forward or backward by one recorded track with each touch; holding a button in steps the laser repeatedly.

Smaller buttons open and close the disc drawer, activate the repeat function, and enter selected tracks into the unit's memory. The CD-

500E can be programmed to play up to fifteen tracks in any desired order by successively locating each desired track using one of the skip buttons and then pressing the MEMORY button. Once the machine is programmed, the skip and REPEAT buttons access only the selected tracks. The player can also be operated from a timer, since it goes into play mode automatically when power is applied if a disc has been loaded.

The CD-500E's display is also considerably simpler than most. For a few seconds after a disc is loaded, a numerical readout shows its total number of tracks (up to ninety-nine) and then reverts to the number ONE. When PLAY is pressed, the tracks are played in sequence starting with the first. In programmed operation, the display shows only the numbers of the pro-

grammed tracks. A four-section OPERATION MODE display indicates the presence of a disc in the machine, the status of the repeat mode, whether a programmed sequence has been stored, and when the disc is actually being played (the symbol in the last section blinks when the player is in pause mode). There is also a front-panel stereo headphone jack and a small output-level control. The rear apron of the player contains two pairs of jacks, one for fixed and one for variable line output; the variable level is controlled by the same front-panel knob that adjusts headphone volume.

The NEC CD-500E is furnished with a wireless remote-control unit that duplicates all of its front-panel functions except the power switch—even the disc drawer and the program level adjustment can be operated remotely! The black-finished player measures 16 $\frac{7}{8}$ inches wide, 10 $\frac{3}{8}$ inches deep, and 3 inches high. It weighs 9 $\frac{3}{4}$ pounds. Price: \$329. NEC, Dept. SR, 1401 Estes Ave., Elk Grove Village, IL 60007.



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CIRCLE NO. 74 ON READER SERVICE CARD

FEATURES

- Three-beam laser pickup
- Front-loading motorized drawer
- Fast track skip/search
- Programmable playback of up to fifteen tracks
- Repeat function for entire disc or programmed sequence
- Headphone jack with level control
- Fixed- and variable-level line outputs
- Display of total tracks, current track number, operating status
- Wireless infrared remote control for all functions except power switching
- Unattended playback with external timer switch

LABORATORY MEASUREMENTS

Maximum output level: 1.6 volts
Total harmonic distortion at 1,000 Hz: 0.0047% referred to 0 dB; 0.0063% referred to -10 dB; 0.0053% referred to -20 dB
Signal-to-noise ratio (A-weighted): 94.2 dB

Channel separation: 87 dB at 1,000 Hz; 75 dB at 10,000 Hz
Frequency response: +0.3, -0.6 dB from 20 to 20,000 Hz
Cueing time: 4.5 seconds
Cueing accuracy: A
Impact resistance: top, C; sides, A
Defect tracking: tracked all defects on Philips TS5A test disc

Lab Tests

The level from the fixed outputs of the NEC CD-500E was relatively low, measuring 1.6 volts; the CD standard is 2 volts from a maximum-level (0-dB) recorded test signal. The channel levels, however, were matched within 0.05 dB. The maximum level from the variable outputs was identical to the fixed output level. The frequency response was flat within +0.3, -0.6 dB from 20 to 20,000 Hz. The signal-to-noise ratio (A-weighted) was 94.2 dB, and the total harmonic distortion (THD), excluding noise, was between 0.0047 and 0.0063 percent for levels between 0 and -20 dB. Our THD + N measurements (in-

cluding noise) were slightly higher, 0.007 percent at 0 dB and 0.031 percent at -20 dB, because of the contribution of noise.

The stereo channel separation measured 87 dB at 1,000 Hz and fell to 70.5 dB at 20,000 Hz. The crosstalk at 1,000 Hz was quite asymmetrical, measuring -94 dB from left to right and -80 dB from right to left, but this effect diminished greatly at the higher frequencies. The square-wave response of the CD-500E indicated its use of analog lowpass filters. Also, the interchannel phase shift rose from about 5 degrees at lower frequencies to 81 degrees at 20,000 Hz, which is characteristic of a single digital-to-analog (D/A) converter being multi-

plexed (switched) between the left and right channels.

The CD-500E tracked all of the calibrated defects on the Philips TS5A test disc without difficulty. Its cueing between the unseparated Tracks 17 and 18 of the TS4 disc was perfect, and it slewed from Track 1 to Track 15 of that disc in 4.5 seconds. Its resistance to physical shock in the form of tapping with the fingers was very good on the sides of the cabinet but poor on the top. Even a light drumming anywhere on the top plate would cause loss of tracking when a disc was playing. The headphone volume was excellent with medium-impedance phones, and their load did not noticeably reduce the level at the rear output jacks.

Comments

Although the NEC CD-500E has most of the normal operating and control flexibility of a typical CD player, as well as full remote-control capability (rare in the lower price ranges), it lacks one of the most basic features we have come to expect from CD players—a fully informative status display. In particular, we were surprised and disappointed by the lack of any time information either for the current track or the entire disc, which is provided by virtually every other CD player we have seen. Although the CD-500E's simplified display tells the user which track is being played, we would expect more.

Another common feature omitted from the CD-500E is a fast-scan mode. The laser can skip from track to track but not within a track. The instruction manual refers to a fast-scan capability, but it was not present in our test unit.

Although the CD-500E fell slightly short of other CD players in some of its measured characteristics (notably high-frequency channel separation), it actually met its specifications quite nicely. In fact, the performance of any CD player is so far beyond real-world requirements that in most respects it could be degraded by a factor of several hundred without any audible effect. In actual use, the NEC CD-500E sounded as good as any other CD player we have tested.

Circle 141 on reader service card



A NEW PERSPECTIVE

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Traditional driver materials and designs proved inadequate for the accurate rendering of a soundstage. So we developed new materials—like polypropylene compounds and poly-

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YAMAHA AVC-50 INTEGRATED AUDIO/VIDEO AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

THE Yamaha AVC-50 combines a highly flexible audio/video control center with a "universal" remote control that also works with other Yamaha components. It is comparable in size and shape to a typical medium-power integrated audio amplifier, but it provides switching and signal-processing functions for several video sources in addition to the usual audio inputs. Its power section is rated to deliver 45 watts per channel continuous output into 8-ohm loads (50 watts into 6 ohms) from 20 to 20,000 Hz with no more than 0.05 percent total harmonic distortion. The capabilities of the AVC-50, however, extend well beyond mere amplification and program selection.

The AVC-50 can be used several ways in an audio/video entertainment system. The recommended mode is as a preamplifier for the entire system, with its internal pow-

er amplifiers driving a pair of rear speakers and with a separate stereo power amplifier driving the front speakers. Alternatively, the AVC-50 could drive the front speakers and use an external amplifier for the rear pair. Another operating mode might be as a conventional integrated amplifier for a stereo sound system, including switching control of several video sources, but its unique sound-processing modes are not usable in such a configuration. Finally, the AVC-50 can be used solely as a preamplifier for a four-speaker system, with external power amplifiers for both the front and rear channels. This arrangement might be necessary if speakers having unusually low sensitivity are used in a large room, which would require more amplifier power than the AVC-50 can provide.

A row of eleven small pushbuttons select the program source supplied to the tape-recorder outputs.

The outputs are separate for audio and video sources, permitting a video program to be recorded or dubbed with a different audio track from its original one. The audio-recording options include phono, CD, tuner, auxiliary, two audio tape decks, and the sound portions of programs from a TV set, a video-disc player (VDP), and two VCR's. A separate group of video-recording buttons selects the output from a TV, a VDP, or one VCR. The audio amplifier inputs include all of these sources, which are selected by pressing one end or the other of a rocker switch. Small lights on the front panel indicate the selected source. A similar control selects the picture source for viewing on a monitor.

The Yamaha AVC-50 does not have audio tone controls; the only concessions to frequency-response adjustment are buttons to select the BASS EXTENSION or HIGH FILTER features. The large volume knob is the only regular operating control. The AVC-50 does, however, provide audio processing facilities not ordinarily found in integrated amplifiers. A small PROCESSING MODE switch on the front panel has three positions for enhancing stereo

FEATURES

- Pushbutton input switching for phono, tuner, CD, auxiliary, two audio tape decks, two VCR's, TV set, and videodisc player
- Separate switching for audio and video programs
- Separate selection of audio and video signals for tape recording
- Defeatable audio processing with comb filters and time delay for two types of stereo surround sound and two types of simulated-stereo surround sound for mono programs
- Dolby Surround decoding
- Electrically separate preamplifier and power-amplifier sections joined by jumper links
- Video enhancement controls for detail, sharpness, and level
- Front-panel inputs for one VCR, duplicated on rear
- Wireless remote control that can be used with other Yamaha components

LABORATORY MEASUREMENTS

- 1,000-Hz output power at clipping:** 60.5 watts into 8 ohms, 68 watts into 4 ohms, 60.5 watts into 2 ohms
- Clipping headroom** (relative to rated output): 1.29 dB (8 ohms)
- Dynamic power output:** 95 watts into 8 ohms, 128 watts into 4 ohms, 105 watts into 2 ohms
- Dynamic headroom:** 3.25 dB (8 ohms)
- Harmonic distortion (THD + noise)** at 1,000 Hz into 8 ohms: 1 watt, 0.0148%; 10 watts, 0.0058%; 45 watts, 0.0045%
- Maximum distortion** (from 20 to 20,000 Hz into 8 ohms): 0.057% at 4.5 watts (20,000 Hz)
- Slew factor:** 8
- Sensitivity** (1-watt output into 8 ohms): phono, 0.4 mV; CD/tuner/aux, 24.5 mV
- Phono-input overload:** 140 to 175 mV
- A-weighted noise** (referred to a 1-watt output): phono, -75 dB; CD/tuner/aux, -77 dB
- Phono-input impedance:** 46,000 ohms in parallel with 200 pF
- RIAA phono-equalization error:** +0.1, -1 dB from 20 to 20,000 Hz
- High filter** (-3-dB response frequency): 8,500 Hz

sources in a four-speaker system: NATURAL SURROUND, HALL SURROUND, and DOLBY SURROUND. The last is the well-known matrix-decoding system (with time delay) used for reproducing the soundtracks of movies and video recordings made with the Dolby Surround process.

Yamaha's own NATURAL SURROUND system, based on comb filters, can be used to add a sense of space (particularly depth) to most stereo programs. The HALL SURROUND effect is similar, but the addition of an adjustable analog time-delay circuit before the comb filters makes the sound more suggestive of a large music hall. A knob next to the PROCESSOR switch continuously varies the delay from 10 to 30 milliseconds. It is detented at the 20-millisecond setting, which is suggested for general use.

The stereo surround modes do not function with mono programs, so Yamaha has provided two simulation modes for mono programs,

also selectable with the PROCESSING switch. The SIMULATED STEREO circuit performs the comb-filtering operation on the mono signal, sending one "channel" to the front and rear speakers on the left side and the other channel to the right side. The SIMULATED SURROUND circuit is similar, but it adds the adjustable time delay to the mono signal before it is filtered and divided.

The PROCESSING MODE switch has a defeat setting that passes the unaltered input signal(s) to the front and rear speakers. An INPUT BALANCE knob on the front panel is used principally to balance the channel levels before they are processed by any of the surround modes, and conventional left-right signal balancing is done with a small screwdriver adjustment on the rear apron of the amplifier.

The remaining front-panel controls are for the video-enhancement functions of the AVC-50. An on/off button activates these circuits, and another button selects either the in-

coming (playback) or the outgoing (recording) signal for enhancement. A small DETAIL knob compensates for the loss of detail when recording a video program. It can be used to exaggerate the detail of a signal before it is recorded and again, if desired, to enhance the detail of the playback program. A SHARPNESS control applies a similar correction to the edge outlines in the picture, while the VIDEO LEVEL control merely adjusts the overall video signal level for suitable brightness. In all cases, it is suggested that the on/off button be used to compare the appearance of the original program with that of the enhanced program during the adjustment process.

In addition to controlling the AVC-50's key front-panel features (volume, video and audio input selection, front and rear levels, audio muting, and power switching), the remote control performs comparable functions for other Yamaha components (identified by an RS logo) that can be connected to the amplifier, including tape decks, CD players, and record players. The rear apron of the AVC-50 is much like that of other integrated amplifiers, with input and output jacks for video and audio sources, insulated clips for connections to front and rear speakers, and five AC outlets, three of them switched. The VCR 2 inputs are duplicated on the front panel, a convenience for temporary use of a VCR that is not part of the regular system. The Yamaha AVC-50, finished in black, measures 17 $\frac{1}{8}$ inches wide, 12 inches deep, and 4 $\frac{3}{8}$ inches high, and it weighs 14 pounds. Price: \$449. Yamaha, Dept. SR, 6600 Orangethorpe Ave., Buena Park, CA 90620.

Lab Tests

During the 1-hour preconditioning period at one-third rated power, the top of the AVC-50 became quite hot directly over the internal heat sinks, but over most of its surface the temperature was moderate. Its outputs clipped at 60.5 watts per channel when driving 8-ohm loads at 1,000 Hz. Into 4 ohms, the amplifier clipped at 68 watts, and into 2 ohms at 60.5 watts.

The dynamic power output with the standard 20-millisecond burst was 95 watts into 8 ohms, 128 watts



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av. per cigarette, FTC Report Feb '85

into 4 ohms, and 105 watts into 2 ohms. We also extended the pulse times to determine the amplifier's "power envelope." Although the available power dropped steeply between 20 and 50 milliseconds, it effectively leveled off from 75 to 300 milliseconds, remaining at 65 to 70 watts with bursts in that range. The slew factor was 8 (the output waveform at rated power became triangular at about 200,000 Hz).

The amplifier's stability when driving a complex reactive simulated speaker load was somewhat marginal, with extended ringing at 50,000 Hz on a square-wave signal, but the amplifier did not oscillate under any conditions we could apply. The reactive load factor was 0.96 dB at 63 Hz. Its 1,000-Hz harmonic distortion was about 0.005 percent over much of the power range up to the 8-ohm clipping point. The distortion was only slightly higher, about 0.007 percent, into 4 ohms, and into 2 ohms it averaged less than 0.05 percent. It reached its maximum of 0.03 to 0.05 percent at 20 Hz and above 10,000 Hz with the rated 45 watts into 8 ohms and at half-power, but it was under 0.01 percent over most of the amplifier's usable power range. At one-tenth rated power the distortion measurements had slightly higher minimum readings.

The amplifier's frequency response was flat within about ± 0.2 dB from 30 to 20,000 Hz and was down 1.5 dB at 20 Hz. The HIGH FILTER began to roll off the response above 5,000 Hz, with its -3 -dB point at 8,500 Hz. The BASS EXTENSION terminology seemed to be something of a misnomer, since this circuit rolled off the response at about 16 dB per octave below 50 Hz! There was, however, a gentle rise in output below 200 Hz, to a peak of about 2.5 dB at 70 Hz, which may be what Yamaha considers to be a bass extension. The RIAA phono equalization was impressively accurate, varying ± 0.1 dB from 25 to 12,000 Hz, and down only 0.3 dB at 20,000 Hz.

We also measured the responses of the comb filters used for the audio enhancement processing and the characteristics of the time-delay circuit. In the SIMULATED STEREO mode (for mono signals), the right-

channel response was broadly maximized in the 100- to 300-Hz range and around 5,000 Hz, with nulls at 20, 1,000, and 17,000 Hz. The left-channel signal was at its maximum at 20 to 30 Hz, 1,000 Hz, and 20,000 Hz, roughly complementing the other channel, and it had deep nulls at 150 and 4,500 Hz. The time-delay circuit provided only a single delay, adjustable from 8 to 30 milliseconds, with its detented center setting providing a delay of 19 milliseconds.

Comments

There is a growing number of audio/video integrated amplifiers, receivers, and signal processors on the market. Most of the amplifiers and receivers are conventional audio products combined with a video switching capability. Yamaha has taken an additional step with the AVC-50. While it is still basically an audio amplifier—and a good one, as our tests show—the usual tone controls have been replaced by circuits especially designed to improve the sound of video-related programs.

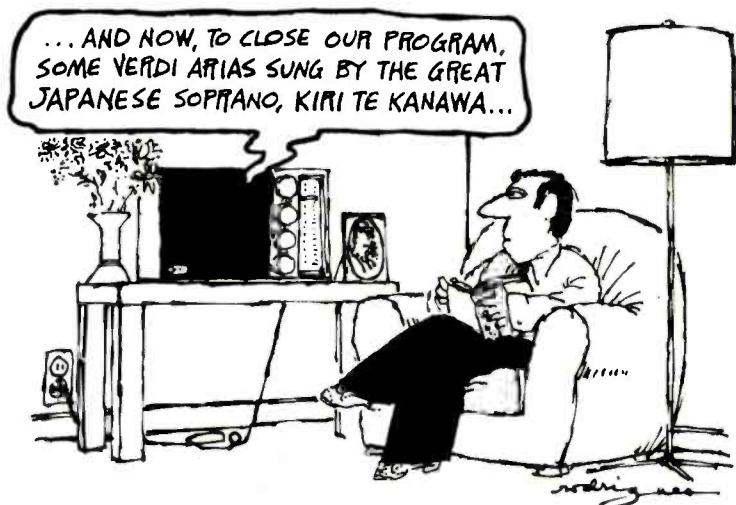
There is nothing intrinsically novel or unusual about using comb filters or time delays to enhance the ambience of reproduced sound. Some of these circuits have been much more sophisticated than those in the AVC-50, using more elaborate comb filters or multiple time delays to impart a more "natural" quality to the sound. None of these

systems will work miracles, however, and people who have used them, even after an initial positive reaction to the processed sound, have often eventually become disillusioned.

Listening to the Yamaha AVC-50, we found its special effects always pleasing, definitely enhancing the listening experience. It is our impression that Yamaha intended the AVC-50 to produce just that effect, with no pretensions of taking you from your listening room into a concert hall. Even this kind of enhancement probably will not appeal to purists or most "high-end" audiophiles, but the AVC-50 is not aimed at them.

We found the AVC-50's processing features at least as beneficial for mono programs as for stereo. We used it to drive the rear speakers in a four-speaker installation, and we liked what we heard. The remote control of volume and program switching was very convenient, and Yamaha's use of a motor-driven potentiometer instead of electronic control circuits continues to impress us as the best way to handle that task. Overall, the Yamaha AVC-50 is a versatile, effective audio/video control amplifier that is well worth considering if you have a multitude of program sources in your entertainment system or if you are thinking of adding surround-sound capability.

Circle 142 on reader service card



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Receivers are not equipped with the heavy-duty, high current, high voltage power supplies available in the best separate power amplifiers. First of all, there just isn't enough space. More importantly, there are technical limitations. In a receiver, such supplies would generate unacceptable levels of heat and hum. And the high signal levels found in the power output stages create a source of noise, crosstalk and preamplifier instability.

Obviously, heat and noise-generating elements shouldn't be operating in close proximity to tuner and preamplifier circuits. However, this is exactly where such elements—scaled down, to be sure—are found in receivers.

That's why the over-all performance of receivers (and integrated amplifiers, for that matter) is seriously compromised for the seeming advantage of all-in-one convenience.

Our new tuner/preamplifier totally eliminates all such compromises, and avoids any degradation in tuner and preamplifier performance typically introduced by the presence of incompatible power-amplifier components.

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60 to 600 watts per channel!

At the same time, we've achieved something else that you can appreciate even without a technical background.

You can now have all the low-distortion power you are ever likely to need or want—from a conservative 60 watts per channel to an awesome 600 watts per channel, continuous, at any time you need it, not just for milliseconds! All with a matching high-performance tuner/preamplifier to control and apply the power.



THE ADCOM TUNER/PREAMPLIFIER AND 60 WATTS PER CHANNEL.

There's a lot more to the GTP-500 tuner/preamplifier than meets the eye.

The tuner section is quartz-referenced and digitally synthesized, with a tuning accuracy of 0.000025 percent. Since tuner accuracy translates into lower distortion, our superb rating is audibly significant.

If you're in an urban area troubled by excessively strong stereo-FM signals and multipath distortion—or in a rural area where distance is a problem—you'll appreciate how well this tuner brings alive the musical aspects of the received signal.

The specially-designed IF stage offers distortion-free listening from high-quality broadcasts. And sensitivity and selectivity are optimized for a balance of performance characteristics that can be appreciated every time you listen to a radio signal.

When especially difficult reception conditions cause excessive noise, a switchable high-blend circuit can be used.

Sixteen stations—eight each, FM and AM—can be programmed for instant retrieval at the touch of a button. Once a station is tuned in, it's locked in. No drift. No error. And a touch of another button scans up or down from any point.

We've added even more remote-control convenience and flexibility than you've been enjoying with your VCRs and TV sets.

An integral part of this new system component is a full-function wireless remote control that lets you command the GTP-500.

Every bit of this high level of performance is yours to control from the comfort of your favorite chair, and—with optional extension remote sensor—from other rooms in your home, as well as patio and pool.

Remote control from any chair, any room.

Most useful functions of the GTP-500 can be operated by remote control:

- Power on/off
- Selection of pre-programmed FM and AM stations
- FM scan
- Volume level
- Source selection

Remote sensors, wired to the system, can be installed in other rooms, and activated in the same manner. Thus, the superb performance of your Adcom system can be enjoyed whenever and wherever you like at minimal additional cost.



RC-500



THE ADCOM TUNER/PREAMPLIFIER AND 100 WATTS PER CHANNEL.

The preamplifier section.

The preamplifier section provides optimum signal-to-noise ratios at both the phono and high-level inputs. That's very important for playing compact discs and the new wide-range HiFi video systems, as well as your treasured LPs.

The phono and high-level amplifiers (which are at the heart of the preamplifier) use custom-designed linear gain stages that provide low distortion, low noise and high speed.

High accuracy in the RIAA phono equalization circuit assures superb performance from any high-output moving-coil or moving-magnet cartridge.

The separate recording selector allows listening to one source while recording from another.

Tone controls and contouring circuits can be switched in when needed, and are more useful and musically accurate than any you're likely to have encountered.

As for convenience...

Those lights you see on various buttons and controls all have a useful function. They indicate the program source you've selected—phono, tape, CD, tuner, etc.—either manually or with the wireless remote control. The motorized level control also has an LED that rotates with it and can be observed from across the room. Note: Unlike electronic remote control circuits, this one is infinitely adjustable and distortion-free.

As for power...

You've already noted the most obvious advantage of having the tuner and amplifier on one chassis and power amplifier on another: the virtually unlimited choice of output power.

If at this time, 60 watts per channel meets your needs, that's what you can have with the matching GFA-535 power stage. If you need more power—because of your new CD library, or less efficient



GTP-500 and GFA-545

THE ADCOM TUNER/PREAMPLIFIER AND 200 WATTS PER CHANNEL.

speakers in a larger room—you might want our 100-watt/channel GFA-545 or our 200-watt/channel GFA-555.

And if you should ever need extraordinarily high power, that's also available, even at a later date. Just add a second GFA-555, with each amplifier bridged to its mono mode. You'll then have 600 watts per channel.

The quality of power.

Here is where we've made our strongest impact on music lovers who demand the best sonic performance regardless of price.

All our power amplifiers are based on the same sophisticated circuitry as our flagship GFA-555, which received a rare tribute from *Stereophile* magazine (Volume 8, no. 4). A pertinent quote:

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

It's now decision-making time.

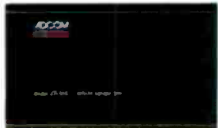
If you've been thinking about just another receiver, or something really extravagant, you now have a significantly new and different choice. For the first time, you can have a superb level of sound quality together with convenience and flexibility. And all at a remarkably affordable price.

Anything less will be another compromise.

*A reprint of the complete report is yours for the asking. It also includes the approximate retail prices—up to \$6,000!—of all the amplifiers mentioned in the report.



Remote control of your GTP-500 throughout your home!



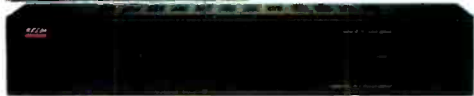
XR-500

With one or more XR-500 remote sensors (optional) connected to the GTP-500 Tuner/Preamplifier, you can use the RC-500 wireless remote control to operate your Adcom system from as many rooms as you like.

Speaker selectors.



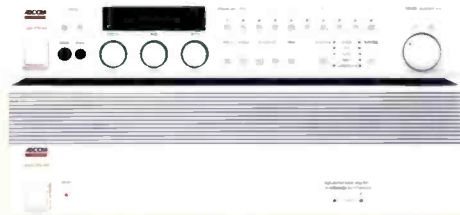
GFS-3



GFS-6

These heavy-duty speaker selectors can be used with amplifiers rated up to 200 watts/channel. The GFS-3 switches up to three speaker pairs; the GFS-6, up to six pairs. Each speaker selector contains special-circuitry to protect your amplifier from reduced impedance when multiple speakers are operating at the same time.

Components also available with white or silver front panels.



All components shown in this brochure (except the GFS-3) are available on special order with white or silver front panels. The GTP-500 Tuner/Preamplifier and GFA-545 Power Amplifier are shown here with white front panels.

Rack Mount Adaptors.

Optional adaptors for 19" rack mount are available for all models except GFS-3.

SPECIFICATIONS GTP-500

FM TUNER SECTION

IHF sensitivity, mono: 9.5 dBf
 Signal strength for 50dB quieting, mono/stereo: 12.5/36.5 dBf
 Capture ratio: 1.5 dB
 AM suppression: 65 dB
 Alternate channel selectivity: 80 dB
 Separation at 1kHz: 52 dB
 THD/stereo: at 1kHz, 0.09%
 Maximum signal-to-noise ratio, mono/stereo: 85/75 dB
 Frequency response: 30Hz-15kHz
 Antenna impedance: 75 or 300 ohms

PREAMPLIFIER SECTION

Total harmonic distortion: 0.01%
 IM distortion: 0.005%
 Frequency response: 20 Hz — 20 kHz ± 0.1 dB
 Maximum output level: 8 volts
 Input sensitivity for .5V output: Phono: 4mV High level: 40 mV
 Signal-to-noise ratio: For .5V output: Phono: 82 dB For 2V output: High level: >100 dB
 Tone controls: Bass (40 Hz) ± 9.0 dB Treble (15 kHz) ± 9.0 dB
 Output impedance: 470 ohms
 High filter: -2 dB at 20 kHz
 Low filter: -5.0 dB at 20 Hz
 Voltage: 117V/60 Hz (Available in 220V/50Hz on special order)
 Dimensions: 17 x 3 1/4 x 12 3/4"
 Weight: 15 lbs.
 Optional accessory for GTP-500: RM-3 rack mount adaptor

AMPLIFIERS

Power output, watts/channel, continuous, both channels, 20 Hz-20 kHz, <0.09% THD:

8 ohms

GFA-555 GFA-545 GFA-535

200 100 60

4 ohms

325 150 100

Bridged, mono, 8 ohms, 20 Hz-20kHz, <0.25% THD:

600 n/a n/a

Bridged, mono, 4 ohms, 20 Hz-20kHz, <0.25% THD:

850 n/a n/a

Signal-to-noise ratio A-weighted, full output:

>106 dB

Input impedance:

22 kOhms

Input sensitivity: for rated output: for 1 watt:

1.0 volt 1.3 volts 1.85 volts
 130 mV

Damping factor (20 Hz-20 kHz):

f30

Dynamic headroom (at 4 ohms):

2.3 dB 2.6 dB 3 dB

Voltage:

117V/60 Hz

(Available in 220V/50Hz on special order)

Dimensions:

17x7 3/8 17x5 1/2 17x3 1/4
 x11 1/2" x12 1/2" x12 1/2"

Shipping weight:

35 lbs. 27 lbs. 22 lbs.

Optional rack mount adaptors:

Black:
 White:
 Silver:

RM-7 RM-5 *RM-3
 RM-7W RM-5W *RM-3W
 RM-7S RM-5S *RM-3S

*Also for GTP-500



11 Elkins Road, East Brunswick, NJ 08816 USA • Telephone: 201-390-1130
 Distributed in Canada by: PRO ACOUSTICS INC. Pointe Claire, Quebec H9R4X5



PERREAUX TU-3 FM TUNER

Julian Hirsch, Hirsch-Houck Laboratories

PERREAUX, a New Zealand manufacturer of audio components, is best known in this country for its rugged, high-quality power amplifiers and preamplifiers. The company also manufactures an FM stereo tuner, the TU-3, built to the same exacting standards as its other products. The Perreaux TU-3 was designed to provide high-quality reception with a minimum of gadgetry and features that do not contribute to its listening performance.

The tuner's silver-colored panel contains a single tuning knob, a few buttons, and a display window. The frequency of the digital-synthesis TU-3 is controlled by a phase-locked-loop (PLL) circuit. The tuning knob, which has a large number of detented positions, shifts the frequency in 100-kHz increments. The

frequency display uses large, blue fluorescent numerals and also shows an ST indication when a stereo transmission is received.

The TU-3 can store the frequencies of six preset stations. A row of red LED's indicates relative signal strength. The only other front-panel controls are buttons for switching power and stereo/mono mode. In the stereo mode, stereo/mono switching is automatic. Selecting mono reception disables both the stereo multiplex decoder and the interstation-noise muting. The multiplex decoder, like the tuner's frequency-selection system, uses a PLL circuit.

A three-position toggle switch in the rear of the TU-3 selects the FM de-emphasis time constant: 50 microseconds, or μ s in Europe, Australia, and New Zealand, and 75 μ s in

the United States and Canada. The third setting, 25 μ s, is used when listening to a station employing Dolby B encoding (this also requires an external Dolby decoder). In addition to the de-emphasis switch, the rear of the tuner has an F connector for a 75-ohm FM antenna and a socket for the detachable power cord. A 300- to 75-ohm matching

The tuning knob of the TU-3 provides the accuracy and precision of digital synthesis yet retains most of the basic "feel" of analog tuning. Combined with the six presets, this is, in many respects, the ideal system.

transformer is supplied for use with 300-ohm FM antennas.

The low-profile Perreaux TU-3 measures 19 inches wide (including the rack-mounting extensions), 13½

FEATURES

- Digital-synthesis FM tuner
- PLL synthesizer circuit
- Knob tuning in 0.1-MHz steps
- PLL stereo multiplex decoder
- Six station presets
- Stereo/mono switch, interstation-noise muting in stereo mode
- 75-ohm antenna jack, adaptor for 300-ohm antenna
- Switchable de-emphasis (25, 50, or 75 μ s)

LABORATORY MEASUREMENTS

Mono usable sensitivity (75-ohm input): 16.8 dBf (1.9 μ V)
50-dB quieting sensitivity (75-ohm input): mono, 15.6 dBf (1.65 μ V); stereo, 38 dBf (21.8 μ V)
Signal-to-noise ratio at 65 dBf: mono, 77 dB; stereo, 72.5 dB
Distortion at 65 dBf: mono, 0.185%; stereo, 0.17%
Frequency response: 30 to 15,000 Hz +1.1, -0 dB

Stereo separation (at 65 dBf) at 100, 1,000, and 10,000 Hz: 37, 47, and 36 dB
Capture ratio at 65 dBf: 1.75 dB
AM rejection at 65 dBf: 50 dB
Selectivity: alternate-channel, 2.5 dB
Image rejection: 84 dB
19-kHz pilot-carrier leakage: -66 dB
Hum: -76 dB

inches deep, and 1 $\frac{3}{4}$ inches high. It weighs about 13 pounds. Price: \$795. Perreux International, Dept. SR, 4701 Hudson Dr., Stow, OH 44224.

Lab Tests

The frequency response of the Perreux TU-3 was flat over most of the audio range, rising gently above a few kilohertz to +1.1 dB at 15,000 Hz. Its channel separation was 47 dB at 1,000 Hz, decreasing smoothly to 27 dB at 30 Hz and 33 dB at 15,000 Hz. The tuner's usable sensitivity (in mono) was 16.8 dBf (1.9 microvolts, or μ V, at its 75-ohm antenna input). The muting and stereo switching thresholds were identical at 18 dBf (2.2 μ V).

The measured distortion levels in mono and stereo were close to the tuner's rating and consisted entirely of second and third harmonics. We found, however, that the output waveform was clipped (on its positive peak) when we modulated the test signal 100 percent at frequencies below 1,000 Hz. For some of our measurements, we were forced to use 90 percent modulation instead of the usual 100 percent. The tuner's noise levels were appreciably lower than rated in both mono and stereo. Its fixed output voltage measured 640 millivolts, which was considerably higher than the rated 330 millivolts. The signal-strength indicator came on at levels ranging

from 10 dBf (0.85 μ V) to 60 dBf (275 μ V).

Comments

The Perreux TU-3 is a pleasingly simple, attractive tuner that exemplifies the "minimalist" design philosophy. Its only external features that are not related to its principal function are the six preset station selectors and the signal-strength indicators, both of which are very worthwhile conveniences for any tuner to have.

Those people who prefer to turn knobs instead of pressing buttons when operating their hi-fi equipment will find the tuning knob of the TU-3 eminently satisfactory. It provides the accuracy and precision of digital-synthesis tuning yet retains most of the basic "feel" of analog tuning. When combined with the convenience of preset station memories, this is, in many respects, the ideal tuning system.

The TU-3 operated flawlessly and sounded every bit as good as any FM tuner we have used at our location. The distortion we observed at 100 percent modulation during bench tests was never audible, nor is it ever likely to be. Most FM stations take care to limit their peak modulation level to slightly under 100 percent, and the effect we observed (which may have been peculiar to our test sample) never occurred below 90 to 95 percent modulation,

and even then only at frequencies below 400 Hz.

The key performance specifications of the tuner were somewhat unusual, however. Its image-rejection specification of 80 dB is a good one, yet the tuner surpassed it comfortably. The capture-ratio and AM-rejection ratings, neither of which was especially noteworthy, were met satisfactorily. Probably the least impressive specification for this tuner is its selectivity, rated at 45 dB for alternate-channel spacing. Doubtless this is more than sufficient for many countries (including New Zealand), that do not have the population density and spectrum crowding typical of the United States. (New Zealand, we're told, has all of two FM stations.)

In our tests, the tuner came quite close to meeting its selectivity specification, but even so its suitability for use in this country may depend on specific location. In a crowded metropolitan area, or if your favorite station is located only one or two channels away from a stronger station, it would not be the tuner of choice. In fairness to the TU-3, however, we never experienced problems with such interference in the metropolitan New York area, since the few good-music stations here are well removed (in frequency) from possible sources of interference.

We noted with some amusement that Perreux, which stresses the listening qualities as well as the specifications of its amplifiers in its catalogs and brochures, says of the TU-3: "We have not commented on tuner specifications, since they have much to do with reception and little to do with sound quality . . ." Given the nature of the programming and audio quality of most FM broadcasting in this country (and, by inference, in New Zealand as well), this statement applies to just about any tuner one might name.

In any case, we found the Perreux TU-3 to be an unusual, handsome, well-built product that is likely to extract all the quality available from any FM broadcast. It is expensive, to be sure, but, as with Perreux amplifiers, its construction quality is commensurate with its price.

Circle 143 on reader service card

JBL PRO SOUND COMES HOME.

Now JBL brings advanced state-of-the-studio and state-of-the-stage speaker technology all the way home.

JBL is the speaker of choice in renowned concert halls and nearly seventy percent of recording studios worldwide. JBL puts on a powerful live performance on tour with superstar rock artists, under the most demanding, sustained volume conditions.

Using technology developed to satisfy these professional applications, JBL lets the home audience experience pro performance, too. The new JBL home loudspeaker systems deliver smooth, flat, accurate response with maximum power handling capability. Time domain and titanium technologies throughout ensure full dynamic range and precise stereo imaging for exciting, true-to-live sound.

JBL. The loudspeakers professionals feel most at home with.

For more information and your nearest dealer call toll free 1-800-633-2252 Ext. 150 or write JBL, 240 Crossways Park West, Woodbury, New York 11797.



A Harman International Company



A Denon amp vs. its only competition.



**Denon PMA-900V
Integrated Amplifier**



DRA-95VR: Remote Control; Video Capability; 85 W/ch., both ch. driven, 8 Ohms, 20 Hz-20 kHz, 0.03% THD.



DRA-75VR: Remote Control; Video Capability; 65 W/ch., both ch. driven, 8 Ohms, 20 Hz-20 kHz, 0.03% THD.



DRA-55V: Non-Switching Class A Circuitry; Video Capability; 55 W/ch., both ch. driven, 8 Ohms, 20 Hz-20 kHz, 0.015% THD.



DRA-35V: Non-Switching Class A Circuitry; Video Capability; 40 W/ch., both ch. driven, 8 Ohms, 20 Hz-20 kHz, 0.05% THD.



Admittedly, it's tough to compete with Denon's integrated amplifiers. In Japan, they've been praised for "a wide balance and richness in sound" and called "nothing short of phenomenal." But now Denon amps are getting a run for their money... from the new Denon receivers.

Combining a separates-quality amplifier and tuner on the same chassis is not a new idea. But who else actually does it? Look inside the new DRA-95VR Receiver and you'll find precisely the same circuits that make Denon amps so highly acclaimed.

You'll discover the same Pure Current Power Supply for an amazing 60 dB reduction in dynamic IM distortion. You'll see the same discrete output transistors (not cheap IC "power packs") for superior sonic resolution. The same video inputs and outputs. And the same MC cartridge head amp.

Beyond even this, Denon's top two Receivers are supplied with an integrated remote control that also operates a Denon Cassette Deck and any of three Denon CD Players.

So before you make your next high fidelity purchase, get yourself to a Denon dealer. He'll show you the only receivers with the guts to stand up to the world's finest integrated amps



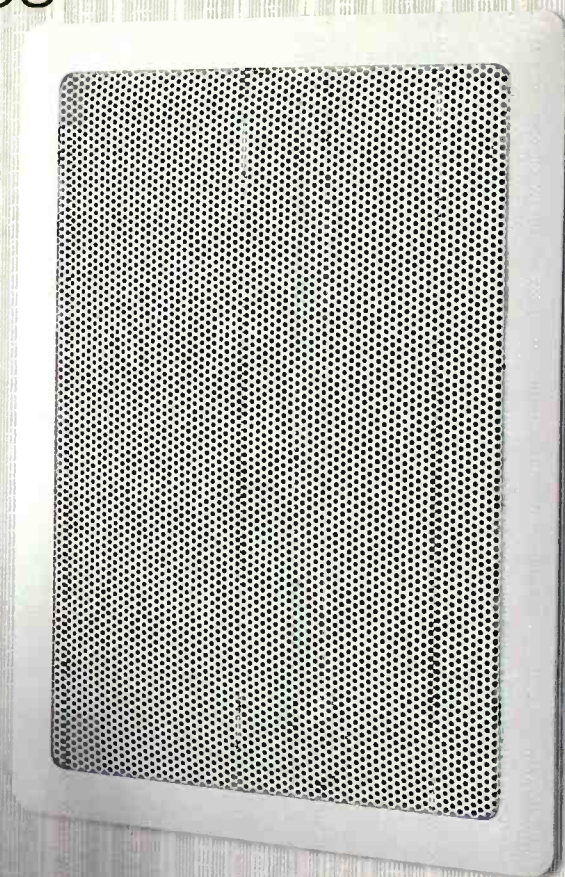
Denon DRA-95VR
AM/FM Receiver

DENON
DESIGN INTEGRITY

CIRCLE NO. 27 ON READER SERVICE CARD

BostonAcoustics

*Let the walls
surround you
with music.*



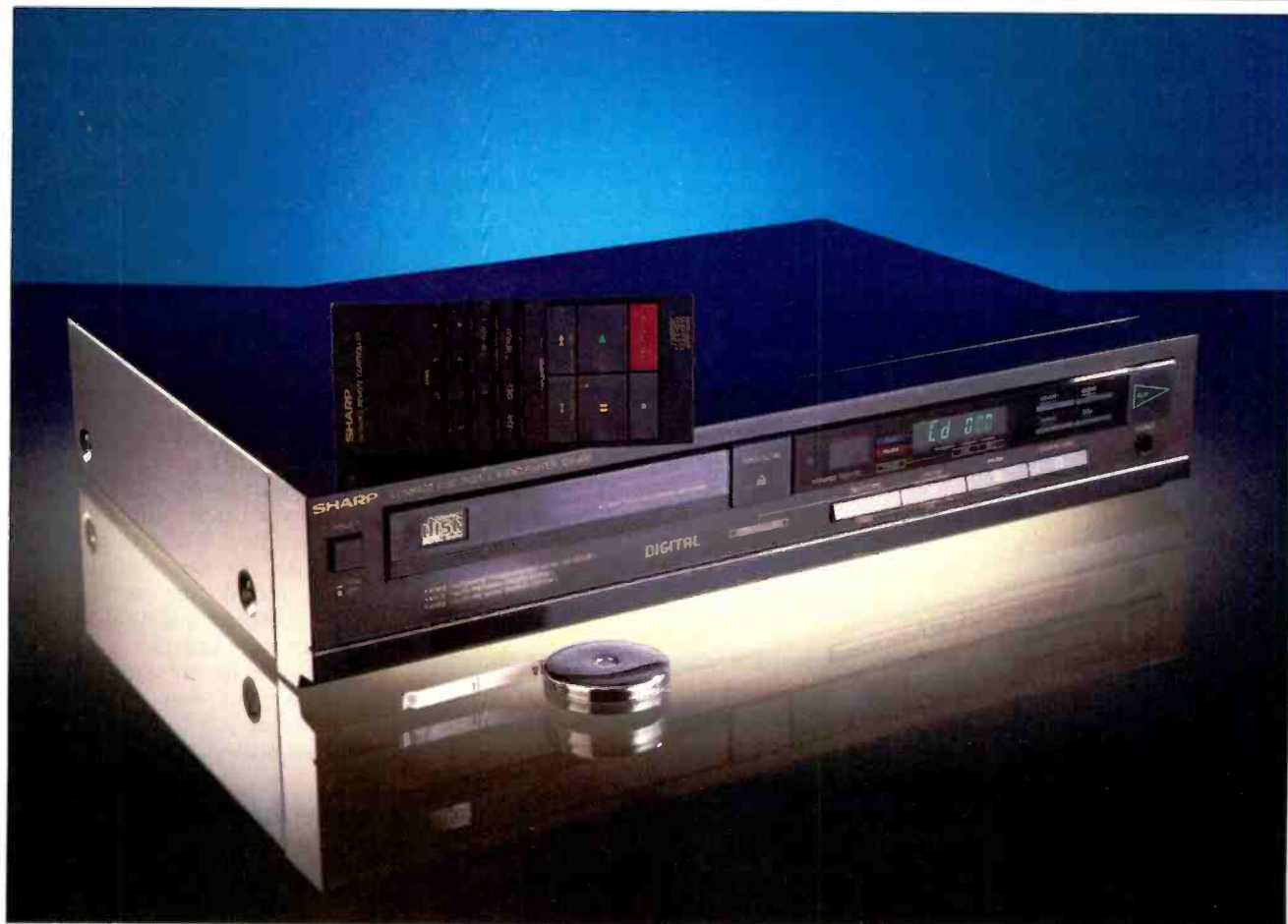
With the new Boston 360 Designer Series speaker system, you can enjoy high fidelity music everywhere in your home. It mounts flush in walls or ceilings, to blend unobtrusively into any room setting. And unlike a conventional speaker, it takes up absolutely no shelf or floor space.

As a main, surround or extension speaker system the 360 gives you the accurate, uncompromised sonic performance you've come to expect from Boston Acoustics. Its 6 1/2-inch woofer is specially engineered to provide full bass performance without need for a special enclosure. Its CFT4 tweeter, of a quality not

normally found in built-in speakers, is a new version of the one-inch dome used in our finest home systems.

The clean, contoured grille and trim are finished in matte white. If desired, the 360 can be painted any color - to match or complement its surroundings. Since the woofer and tweeter diaphragms are waterproof, you can confidently install the 360 in kitchens and bathrooms - even boats.

For a 360 Designer Series brochure, just send us your name and address. Boston Acoustics, Inc., Department 536, 247 Lynnfield Street, Peabody, MA 01960. (617) 532-2111.



HALLEY GANG/ES

SHARP DX-620 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

THE Sharp DX-620 is a front-loading CD player whose operating features include programmed playback of up to nine selections in any desired order, quick access to any track on a disc, and scanning in either direction at low or high speed with audible sound. The DX-620 comes with a wireless remote control that duplicates all of its front-panel operating controls. There is a headphone jack on the front panel but no means of adjusting the headphone volume.

The DX-620 is unusual among home CD players in using a liquid-crystal display (LCD) with internal lighting. The numerals and other indications are large and clearly vis-

ible. After a disc is loaded and the drawer is closed, the display initially shows the total number of tracks on the disc. In a couple of seconds it changes to "01," and the machine is ready to play the first track on the disc. During play, the number of the current track and its elapsed time are shown in minutes and seconds (total time on the disc is not displayed).

Unlike most CD players, which have one pair of buttons for stepping through a disc one track at a time and another pair for the fast-search modes, the DX-620 uses a single pair of buttons for both functions. With the front-panel controls, the only way to select a specific

track, or to program several in random order, is by successive operations of the track-search buttons. Accessing high-numbered tracks can be a slow process, since it is necessary to pause almost a full second between successive operations of the buttons. The remote control offers a more convenient method of selecting tracks, since it has a nu-

The Sharp DX-620 is unusual among home CD players in using a liquid-crystal display with internal lighting. The numerals and other indications are large and clearly visible.

meric keypad that allows any number (up to 99) to be entered in a single operation.

When a programmed sequence of tracks has been entered into the

FEATURES

- Digital and analog filters
- Programmed playback of up to nine selections in any order
- Fast search in either direction at two speeds with music audible
- Skip to beginning of each track in either direction
- Repeat play of entire disc or programmed segment
- CALL button displays program sequence
- LCD display shows track number, elapsed time of current track, and status of operating functions
- Front-panel headphone jack (fixed level)
- Full-function wireless remote control
- Playback controllable by external timer

LABORATORY MEASUREMENTS

Maximum output level: 1.87 volts
Total harmonic distortion at
 1,000 Hz: 0.0038% referred to 0 dB; 0.0032% referred to -10 dB
Signal-to-noise ratio (A weighted):
 91.8 dB referred to 1.97 volts (0-dB level)
Channel separation: 83 dB at 1,000 Hz; 61 dB at 20,000 Hz

Frequency response: +0.1, -0.6 dB from 20 to 20,000 Hz
Cueing time: 5.3 seconds
Cueing accuracy: A
Impact resistance: sides, A; top, A
Defect tracking: tracked all maximum defects on Philips TS5A test disc

player's memory, the CALL button can be used to display the programmed track numbers in their correct sequence. If CALL is used during playback, it causes the number of the next track to be displayed for two seconds. The Sharp DX-620, which is finished in black, measures 17 inches wide, 11¾ inches deep, and 3½ inches high. It weighs about 9 pounds. Price: \$299. Sharp Electronics Corp., Dept. SR, Sharp Plaza, Mahwah, NJ 07430.

Lab Tests

With an EIA standard load of 10,000 ohms in parallel with 1,000 picofarads (pF), the DX-620 produced identical outputs of 1.87

The Sharp DX-620's resistance to external shock was outstanding—rather hard slaps on its top or sides had no audible effect on the playback of compact discs.

volts in both channels from the 0-dB (maximum-level) bands of our test discs. Into a high-impedance load (Sharp recommends a load impedance of at least 10,000 ohms) the output was 2.2 volts. The head-

phone volume with medium-impedance phones was good.

The frequency response, though not quite as "ruler-flat" as some we have seen, was a very respectable +0.1, -0.6 dB from 20 to 20,000 Hz for both channels. Although the specifications for the DX-620 state that it uses a combination of digital and analog lowpass filtering in its outputs, its square-wave response was typical of analog filters, lacking the symmetry associated with digital filters. The interchannel phase shift increased from 2 to 4 degrees at low frequencies to 44.5 degrees at 20,000 Hz, indicating the probable use of a single multiplexed filter for both channels in combination with double oversampling.

The total harmonic distortion (excluding noise) was 0.0032 to 0.0038 percent for recorded levels of 0 to -10 dB at 1,000 Hz. The A-weighted noise level was -91.8 dB referred to a 0-dB signal level. Channel separation (which was not specified by the manufacturer) was somewhat less than we have measured from most CD players, though still far in excess of any practical needs. From about 83 dB at low and middle frequencies, it decreased to 66 dB at 10,000 Hz and 61 dB at 20,000 Hz.

The DX-620 played all of the cal-

ibrated errors on the Philips TS5A test disc without difficulty. It also made the transition from Track 17 to Track 18 of the TS4 test disc (which have no silent interval between them) without clipping any of the opening syllable of Track 18. The player's slew time from Track 1 to Track 15 of that disc was a relatively slow 5.3 seconds. The DX-620's resistance to shock was outstanding—rather hard slaps on its top or sides had no audible effect on the playback.

Comments

The Sharp DX-620 proved to be an excellent CD player, demonstrating once again the genuine improvements in each new "generation" of these machines. While some people might wish for some of the extra features found on some other players, most users should find this one completely satisfactory.

To us, the special appeal of the DX-620 lies in how effectively it does its basic job of playing CD's, instead of providing a multitude of

The special appeal of the DX-620 lies in how effectively it does its basic job of playing CD's instead of providing a multitude of special features that will rarely, if ever, be used.

special features that will rarely, if ever, be used but usually make a machine more difficult to operate as well as more expensive. Rather than being concerned about minute (and usually insignificant) sonic differences, we appreciate a player that will not be overwhelmed by the playback errors in some CD's (some of the CD's broadcast on FM stations demonstrate this problem vividly with their chattering and "hang-ups"). It is also good to have a player that does not have to be handled with kid gloves to avoid loss of tracking. The Sharp DX-620 is about as good a CD player as any we have seen in that respect, and it's a lot less expensive than most. It is a nice job all around.

Circle 144 on reader service card



The first VCR that makes a bad tape good.

In this imperfect world, some videocassette recordings look worse than others. That's why NEC invented the new DX-2000U. It's the world's first VCR with Digital Noise Reduction — a computerized system that actually improves the picture.

On the left is a dramatization of a noisy videocassette. (Noise can arise from repeated playing, off-air recording,

copying, etc.) You can see snow, grain, and glitches. On the right is the effect of the same tape, as it would be played on NEC's DX-2000U. The snow has melted. The fuzz has fled. And the glitches are gone. Digital Noise Reduction not only improves the picture on bad tapes, it helps even well-recorded tapes look their best.

So if you want to see the cleanest

picture from any VHS cassette, see your NEC dealer. He's got good news for bad tapes: the DX-2000U with Digital Noise Reduction.

NEC®

We bring high technology home.

FOR MORE INFORMATION CALL: (312) 860-9500.
NEC Home Electronics (U.S.A.), Inc., 1255 Michael Drive, Wood Dale, IL 60191
CIRCLE NO. 19 ON READER SERVICE CARD



DBX SOUNDFIELD 100 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

THE dbx Soundfield speakers are designed to create a stable sound field in the listening room, so that the stereo imaging and sonic "stage" remain fixed in space over a wide range of listening positions without requiring critical speaker placement in the room. Most conventional speakers produce their best stereo image along a line equidistant from the speakers (down the center of the listening area). Moving any considerable distance to one side of this line usually shifts the apparent location of a sound source. In extreme cases, sitting or standing close to one of the speakers causes its sound to dominate, or masks that of the other speaker, wiping out the stereo image.

The dbx technique is to create a shaped horizontal dispersion pattern from each speaker favoring an inward-angled axis. The speaker's frequency response and directional properties are also controlled throughout the full 360-degree space

surrounding it. Empirical studies showed that such a pattern could create a stereo stage and apparent sound-source location that remain virtually unchanged over a wide range of listening locations. Achieving this result in the first Soundfield speaker, the SF-1, required fourteen drivers and a complex crossover network to supply the necessary phase and amplitude control for each of those drivers. Understandably, it was—and is, in its current version, the SF-1A—a rather expensive speaker.

Improvements and simplifications have been incorporated in subsequent Soundfield systems with no loss of imaging effectiveness. The new dbx Soundfield 100 uses only five drivers, is smaller than the Soundfield 1A, does not require an active equalizer, and costs about one-third as much, yet it has the same essential sound qualities as the larger Soundfield models.

The Soundfield 100 is a floor-standing speaker whose asymmetri-

cal cabinet, crossover, and driver configuration were all computer designed. It is supplied in mirror-image pairs, and except for the top and bottom, the cabinets have no parallel surfaces. The cabinet's rear panel is conventionally positioned parallel to a wall, which should be about a foot or so behind it. The main speaker panel, which is angled inward about 60 degrees, has a 10-inch woofer at the bottom and a 4½-inch midrange cone driver and a ½-inch dome tweeter close together near the top. Another ½-inch tweeter is on the narrow front panel, which is angled slightly outward, and the outer panel, which is angled slightly forward, contains a third ½-inch tweeter and the woofer port. The three identical tweeters, which use plastic diffusers to improve their dispersion, are all at the same height from the floor.

The rated frequency response of the dbx Soundfield 100 is 40 to 20,000 Hz \pm 3 dB, and the nominal system impedance is 4 ohms (with a 2.5-ohm minimum). The system's rated sensitivity is a high 91 dB sound-pressure level (SPL) at 1 meter with an input signal of 2.83 volts. It is recommended for use with amplifiers capable of delivering from 20 to 250 watts per channel into 4-ohm loads.

The walnut-veneered cabinet stands 31½ inches high, 17 inches wide and 13 inches deep, and each speaker weighs about 40 pounds. Insulated binding-post terminals

The dbx Soundfield 100 is smaller than the Soundfield 1A and costs about a third as much, yet it has the same essential sound qualities as the larger Soundfield models.

are recessed into the rear, and there are no user-adjustable controls. The removable dark-brown grilles covering the drivers on the three panels are retained by plastic snaps. Price: \$899 per pair. dbx, Dept. SR, 71 Chapel St., Newton, MA 02195.

Lab Tests

Although we would expect a speaker with several drivers facing

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in different directions to have good dispersion, we were unprepared for the excellent room-response curves of the two dbx Soundfield 100's. When we measured the response on the forward axis of the left speaker and about 30 degrees off the same axis of the right speaker, the two curves were unusually flat and virtually identical from 500 to 20,000 Hz, differing by no more than 2.5 dB (and usually less than 1 dB) over that full range. This sort of measurement result, in a normal listening room, is unique in our experience. Although room boundaries have an unavoidable effect on the response at lower frequencies, the Soundfield 100's response curves were far more uniform with frequency, and varied less between the two speakers, than we can recall seeing from any other system we have tested.

The close-miked woofer response, including the output from its port, varied only ± 4 dB from 20 to 500 Hz. Splicing the woofer-response curve to the averaged room-response curve produced a composite overall frequency-response curve that was flat within ± 2.5 dB from 400 to 20,000 Hz and varied only ± 3.5 dB from 20 to 400 Hz.

The system's impedance was about 2.4 ohms from 100 to 400 Hz and from 15,000 to 20,000 Hz. The maximum values were 6 ohms at 50 Hz and 11 ohms at 1,350 Hz. The

measured sensitivity depended somewhat on the measurement axis: when we drove the speaker with 2.83 volts of pink noise, the SPL at 1 meter was 91 dB from the main panel, 90 dB from the front panel, and 88 dB from the outside panel. We chose 90 dB as the average sensitivity. With the same drive

The room response of the dbx Soundfield 100's was unique in our experience: the on-axis and off-axis curves were unusually flat and virtually identical from 500 to 20,000 Hz and far more uniform at low frequencies than any other system we have tested.

voltage, the woofer distortion was under 0.5 percent from 100 Hz down to 55 Hz, increasing slightly at lower frequencies. We also measured the distortion at the port and used those readings below 45 Hz, where the port output was dominant. The distortion reached 7.7 percent at 30 Hz, dropped to 3.5 percent at 25 Hz, and rose to 12.3 percent at 20 Hz.

In our peak-power-handling tests, the woofer cone "bottomed," with

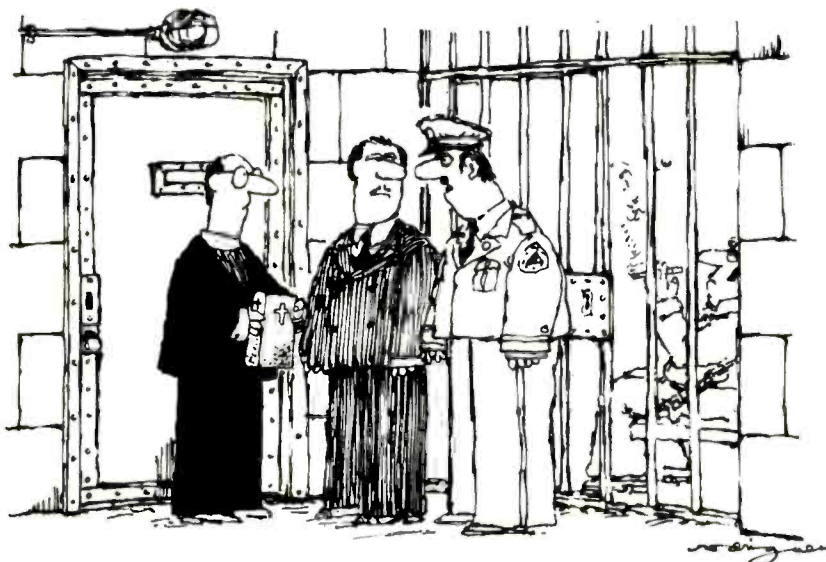
audible rasping, at 100 Hz with an input of 2,000 watts into its 2.5-ohm impedance. At higher frequencies, our amplifier clipped before the speaker's output showed significant distortion (at 1,000 Hz this occurred at 862 watts into 8 ohms, and at 10,000 Hz with 2,060 watts into 2.8 ohms).

Quasi-anechoic FFT response measurements could not be made on the entire speaker system because of its complex directionality. The main panel, however, which plays a major part in establishing its audible frequency balance, had an axial response that was flat within ± 3 dB from 230 to 20,000 Hz. Our close-miked individual measurements of the three tweeters showed that the output of the main tweeter was flat within ± 1 dB from 2,500 to 12,000 Hz, falling at 12 dB per octave at higher frequencies. The outside tweeter's response was fairly flat from 3,000 to 12,000 Hz but rose sharply to a peak of +7 dB at about 16,000 Hz before dropping off rapidly. The front tweeter had a rising response over most of its range, but its output level was about 10 dB below that of the main tweeter. Apparently it was the combination of the three tweeters, radiating in different directions, that produced the extremely uniform room response we measured.

The dbx Soundfield 100 had excellent phase linearity. On the forward axis of the speaker (with major room reflections removed by our FFT analyzer), the group delay was constant within about 0.1 millisecond from 3,000 to 23,000 Hz. Even the relatively irregular phase response of the complete signal (including numerous reflections) was better than we have measured from many conventional forward-facing speakers, with a 0.7-millisecond variation from 3,000 to 22,000 Hz.

Comments

Our first impression on hearing the dbx Soundfield 100 was of its bright sound, especially compared with other, more conventional, speakers to which we had been listening. We soon realized that this apparent brightness was not due to a peak or other emphasis in the treble range. In fact, as our measurements soon proved, this speaker has



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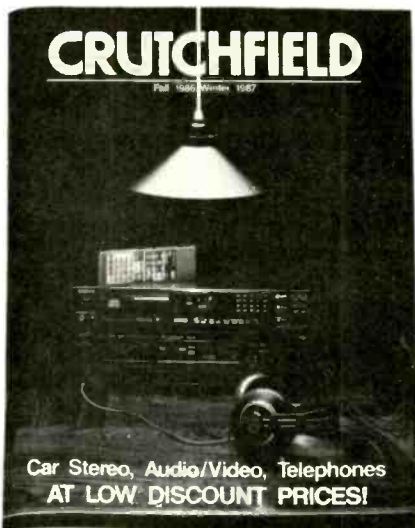
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one of the flattest middle- and high-frequency response curves we have ever measured.

It seems likely that the brightness we heard was the result of the system's highly uniform total power response. In contrast, most speakers may have a flat response on their forward axis, but have reduced high-frequency levels in other directions because of driver directivity. Normally we hear the total output of a speaker after reflection (and absorption) of its higher frequencies by the room boundaries and its contents. With the Soundfield 100's, there is more total high-frequency output to be reflected.

Although we could only guess at its cause, the noticeable brightness of the Soundfield 100's was quite real. As often happens, a short period of listening to these speakers made their sound quality seem perfectly natural, and switching back to conventional speakers always produced a sense of loss—they sounded so muffled in comparison.

At the other end of the audio spectrum, the bass seemed somewhat thin at first, but that was certainly a by-product of the subjectively bright sound. Actually, the Soundfield 100 is as outstanding in the bass as in the treble. It is one of those rare speakers that does not deliver any bass unless those frequencies are present in the program. Performance like this can be deceptive, especially when it is compared with that of other speakers, most of which add an unnatural emphasis to frequencies in the upper bass. When real bass is present in the music, the dbx Soundfield 100 brings it forth unmistakably.

But the spatial qualities of this speaker are, after all, its major reason for existence. Compared with any of the conventional forward-radiating speakers we had on hand, its sound was distinctly *different*. At a moderate distance (12 feet or so), the speakers are not heard as distinct sources; rather, the sound is spread across the wall behind them. Closer to the speakers, the spatial distribution of the sound does not change significantly, but the tonal balance varies slightly (you hear more of the direct sound from their main panels). Under any reasonable listening conditions, you are never

aware that the sound is emerging from the speaker cabinets; it always seems to come from the wall behind them (or even from behind that wall).

An interesting experiment is to walk close to the speakers while they are playing and stand directly against one of them. It completely disappears (acoustically), and the entire sound appears to come from the other speaker. Except for this one special case, the subjective loudness and apparent source posi-

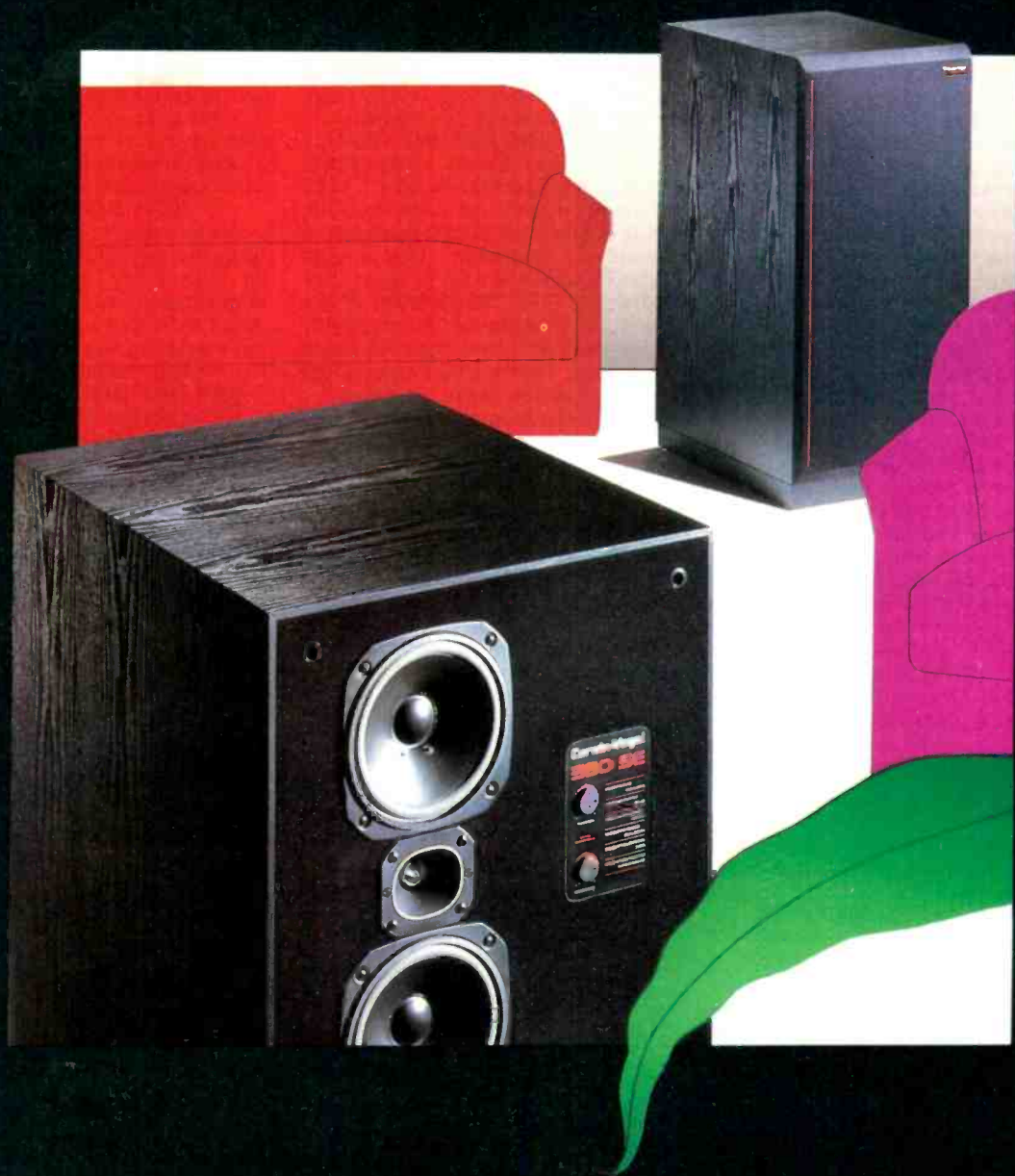
The Soundfield 100's sound distinctly "different" from conventional speakers. You are never aware that the sound is emerging from the speaker cabinets; it always seems to come from the wall behind them (or even from behind that wall).

tion remain quite constant no matter where you move relative to the speakers. Having tested two previous Soundfield speakers, with very similar reactions to their sound, we would guess that the Model 100 is very similar to them in all important respects, though without an A/B comparison it is not possible to be more specific on that point.

Although it is difficult to describe the sound of any speaker to someone who has not heard it, our "bottom line" judgment is that the dbx Soundfield 100 is superbly balanced and free from most of the usual speaker colorations. A few minutes of listening to these speakers can make most other speakers seem rather lifeless. And in addition to making the sound largely independent of the listening position, these speakers, according to dbx, are relatively unaffected by their placement in the room. You don't have to place them—and yourself—at particular locations, with an accuracy of inches or less, to enjoy their full performance. They are a genuine pleasure to listen to. Do so if you possibly can.

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Escort Refuses!

Dear Customer,

From: Drew Kaplan

Escort turned down our \$10,000 head to head challenge described below. Escort says that Maxon's Radar Detector is "primitive", "bottom-end" and "an off-shore produced electronics 'gadget' ". I don't know about you, but to me these words conjure up visions of a cheap toy being produced off in the middle of a rice paddy somewhere in the middle of nowhere.

Escort, on the other hand, which is made in the U.S., exudes a high cost, quality image. Don't you just bet that it costs a fortune to build Escort and Passport (the smaller version)?

Well, we are going to challenge Escort **AGAIN** to a head to head 'duel to the death' on Maxon's electronic merits alone. And, we plan to win. But first there are a few things you should know.

Cincinnati Microwave, the company that makes Escort & Passport, is a public company. And being public, they have to file financial information with the SEC.

The public information they have published appears to show that in the year that ended Dec. 1985, Cincinnati Microwave with "substantially all of its revenues and profits derived from the sale of radar warning receivers" made an operating profit of about \$45,810,000 on sales of about \$112,605,000. Wow!

The \$45 million profit is after all engineering, selling and General & Administrative expenses, but before taxes.

Their cost of sales (goods) was only about \$40,027,000. So, if you divide \$40,027,000 by \$112,605,000 it doesn't take a genius to figure out that cost of goods represents an average of only about 35.5% of selling price. Wow!

I only bring up their profit to illustrate that a high retail price doesn't always

mean a high manufacturing cost.

There's no question in my mind that Maxon can manufacture cheaper in an off-shore 'rice paddy', but if you pay \$245 for Escort or \$295 for Passport, it should be based on a head to head test with Maxon, not on perceived retail price points.

FORGET PRICE COMPLETELY

So, forget that Escort costs \$245, Passport \$295, and Maxon \$99⁹⁰. Let's judge them on their own merits. And, let's look at just what Escort itself has to say about our challenge. (Please read DAK's and Escort's letters to the right.)

Escort says that, "Regardless of the results, such an event lends credibility to the challenger." Well, they are absolutely correct. That's why I put up the \$10,000 in the first place. Fair is fair.

Plus, there are several radar detectors that claim to have won this or that ranking in "Independent Magazine Reviews." So, I'm ignoring any reviews and asking for a one on one, head to head test.

But look at what Escort says in their letter: "Range is the easiest detector quality to measure, but by no means the only important quality." Wow, I thought range was really important?? Escort refers to "goodness" being determined by things not so easily measured.

Well frankly, I don't know how to measure "goodness". Escort, in my opinion,

is a top notch company. They make a superb product I'd be proud to sell. And, they have great customer service.

DAK has great toll free technical and regular customer service. But, I'd be the first to admit that with over \$45 million in profits, Escort can probably run circles around us in advertising, and maybe even in service. But, I don't think they can beat Maxon's Radar Detector.

HOW GOOD IS GOOD?

When Escort was introduced, it was revolutionary. But, you can only go so far. And in my opinion (someone else might object), radar detecting has gone about as far as it can go. So, while Escort has made improvements, it's Maxon who has moved mountains to catch up.

DAK UPS THE ANTE TO \$20,000

Now I realize that next to \$45 million dollars, \$20,000 isn't much, but it's a lot to DAK. And, I'll even go one step farther. I'll print the exact results of the test, win, lose, draw, or no-show in the first catalog I publish after January 1, 1987.

Escort, the ball is now in your court. Below is the "NEW" version of my challenge with the time and amount changed.

I don't know what else DAK or Maxon can do to prove that the RD-1 Superheterodyne Detector should be judged on its head to head performance against Escort, not on its selling price!

WAS \$10,000

A \$20,000 Challenge To Escort

Let's cut through the Radar Detector Glut. We challenge Escort to a one on one Distance and Falsing 'duel to the death' on the highway of their choice. If they win, the \$20,000 (was \$10,000) check pictured below is theirs.

By Drew Kaplan

We've put up our \$20,000 (was 10). We challenge Escort to take on Maxon's new Dual Superheterodyne RD-1 \$99⁹⁰ radar detector on the road of their choice in a one on one conflict.

Even Escort says that everyone compares themselves to Escort, and they're right. They were the first in 1978 to use superheterodyne circuits and they've got a virtual stranglehold on the magazine test reports.

But, the real question today is: 1) How many feet of sensing difference, if any, is there between this top of the line Maxon Detector and Escort's? And 2) Which unit is more accurate at interpreting real radar versus false signals?

So Escort, you pick the road (continental U.S. please). You pick the equipment to create the false signals. And finally, you pick the radar gun.

Maxon and DAK will come to your highway with engineers and equipment to verify the results. And oh yes, we'll have the \$20,000 check (pictured) to hand over if you beat us by more than 10 feet in either X or K band detection.

BOB SAYS MAXON IS BETTER

Here's how it started. Maxon is a mammoth electronics prime manufacturer. They actually make all types of sophisticated electronic products for some of the biggest U.S. Electronics Companies. (No, they don't make Escort's).



Bob Thetford, the president of Maxon Systems Inc., and a friend of mine, was explaining their new RD-1 anti-falsing Dual Superheterodyne Radar detector to me. I said "You know Bob, I think Escort really has the market locked up." He said, "Our new design can beat theirs".

So, since I've never been one to be in second place, I said, "Would you bet

\$20,000 (10) that you can beat Escort?" And, as they say, the rest is history.

By the way, Bob is about 6'9" tall, so if we can't beat Escort, we can sure scare the you know what out of them. But, Bob and his engineers are deadly serious about this 'duel'. And you can bet that our \$20,000 (was \$10,000) is serious.

...Next Page Please

... Challenge Continued
We ask only the following. 1) The public be invited to watch. 2) Maxon's Engineers as well as Escort's check the radar gun and monitor the test and the results. 3) The same car be used in both tests. 4) We'd like an answer from Escort no later than December 31, 1986 and 60 days notice of the time and place of the conflict. And, 5) We'd like them to come with a \$20,000 (was \$10,000) check made out to DAK if we win.

into action in just 1/4 of one second.
 Just imagine the sophistication of a device that can test a signal 4 times in less than 1/4 of one second. Maxon's technology is mind boggling. **But, using it isn't.** This long range detector has all the bells and whistles. It has separate audible sounds for X and K radar signals because you've only got about 1/3 the time to react with K band. There's a 10 step LED Bar Graph Meter to accurately show the radar signal's

And you'll have a very high level of protection. Maxon's Dual Conversion Scanning Superheterodyne circuitry combined with its ridge guide wideband horn internal antenna, really ferrets out radar signals.



By the way Escort, we'll be happy to have our test around a bend in the road or over a hill. Maxon's detector really picks up 'ambush type' radar signals.

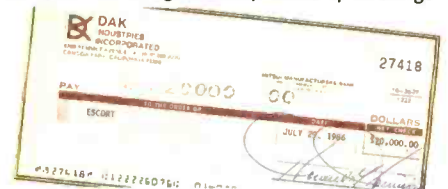
And the key word is 'radar', not trash signals. The 4 test check system that operates in 1/4 second gives you extremely high protection from signals from other detectors, intrusion systems and garage door openers.

So, when the lights and X or K band sounds explode into action, take care, there's very likely police radar nearby. You'll have full volume control, and a City/Highway button reduces the less important X band reception in the city.

Maxon's long range detector comes complete with a visor clip, hook and loop dash board mounting, and the power cord cigarette adaptor.

It's much smaller than Escort at just 3 1/2" wide, 4 3/4" deep and 1 1/2" high. It's backed by Maxon's standard limited warranty. Note from Drew: 1) Use of radar detectors is illegal in some states.

2) Speeding is dangerous. Use this detector to help keep you safe when you forget, not to get away with speeding.



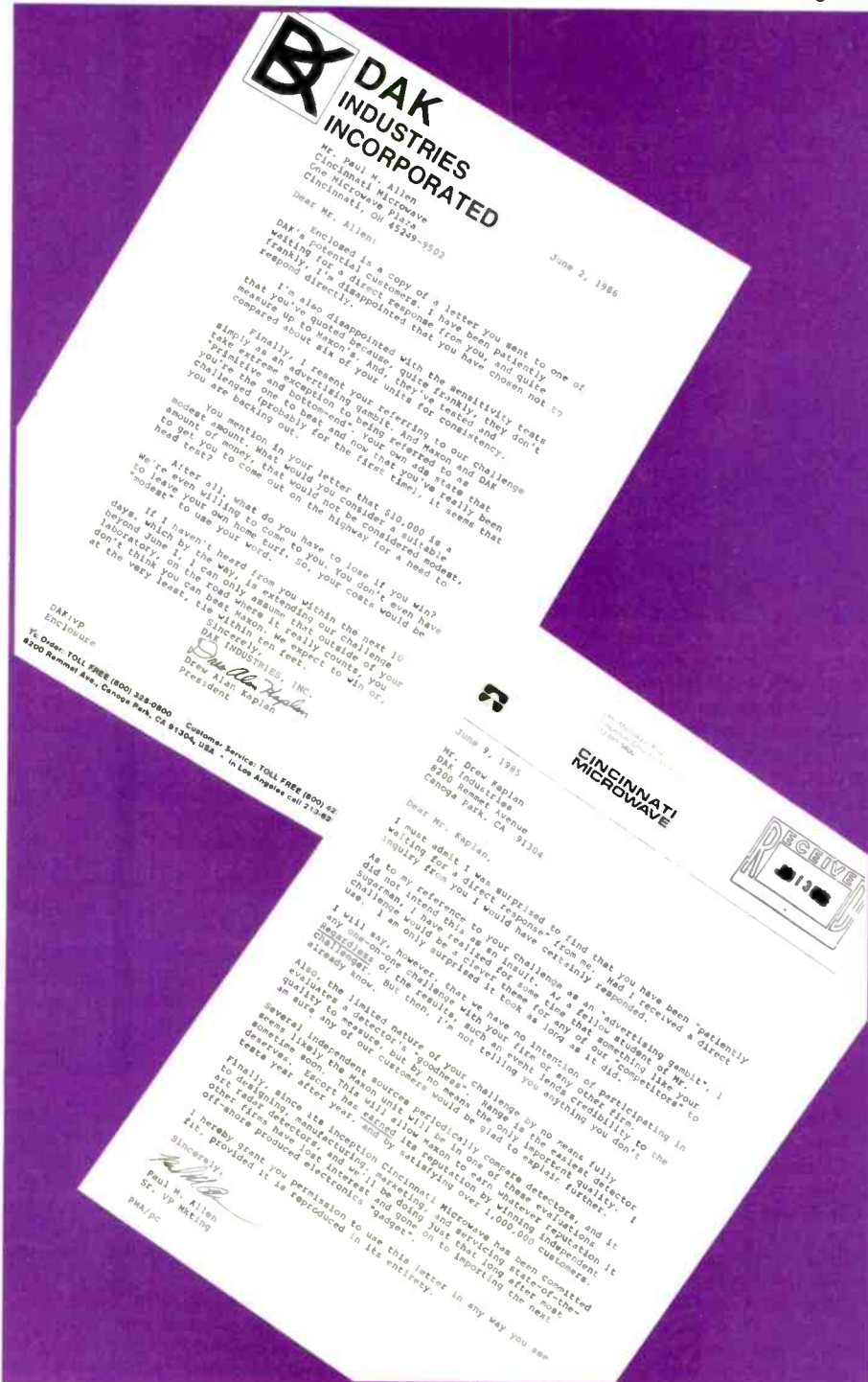
CHECK OUT RADAR YOURSELF RISK FREE

Put this detector on your visor. When it sounds, look around for the police. There's a good chance you'll be saving money in fines and higher insurance rates. And, if you slow down, you may even save lives.

If you aren't 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To get your Maxon, Dual Superheterodyne, Anti-Falsing Radar Detector risk free with your credit card, call toll free or send your check for just \$99⁹⁰ (\$4 P&H). Order No. 4407. CA res add tax.

CK Escort, it's up to you. We've got \$20,000 (10) that says you can't beat Maxon on the road. Your answer, please? Escort and Passport are registered trademarks of Cincinnati Microwave.



SO, WHAT'S DUAL SUPERHETERODYNE?

Ok, so far we've set up the conflict. Now let me tell you about the new dual superheterodyne technology that lets Maxon leap ahead of the pack.

It's a technology that tests each suspected radar signal 4 separate times before it notifies you, and yet it explodes

strength. And, you won't have to look at a needle in a meter. You can see the Bar Graph Meter with your peripheral vision and keep your eyes on the road and put your foot on the brake.

So, just turn on the Power/Volume knob, clip it to your visor or put it on your dash. Then plug in its cigarette lighter cord and you're protected.

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By Drew Kaplan

No, I don't want you to listen to the 60 cycle hum of your AC power. No, I don't want you to listen to a 120 volt blast.

But, if you're like me you're going to find that this 'Weird Music' is really going to end musical frustration. And frankly, I've been frustrated.

As you might expect from reading my catalogs, I have 4 complete music systems in my home, and a very large collection of records, cassettes, open reel tapes and CDs.

One reason I'm frustrated is because I can't listen to my open reel tapes unless I'm at one of my two main systems.

And, if I'm on the patio, in the kitchen, or in the garage, I'm relegated to AM, FM or cassettes on a pocket stereo or portable.

And frankly, I've never taken the time to transfer all my albums, open reel tapes and CDs to cassettes. So, I haven't been able to listen to what I want where I want.

WELL, NO MORE

It may seem weird to plug a speaker into an AC outlet, but a new technological breakthrough has allowed me to listen to any music I choose from my best stereo, anywhere in my home.

The music (or speaking) is transmitted through the AC wiring in my home.

So, instead of running speaker wires all over my house, I just plug in a speaker wherever I want rich, room filling sound.

I really like it. I had always wanted to have wireless speakers in my living room because my wife hates having me run wires everywhere.

In the dining room, we can have uninterrupted music from one of my auto-reverse cassette decks 'piped in' while we entertain guests.

In the bedroom, now I can listen to my old open reel tapes. And in the garage, I can use the continuous programmable playback from my CDs. Of course, my system can transmit AM or FM too.

NOT STEREO AND PROBLEMS

It's not a perfect system. But, you'll be shocked by the magnificent rich sound.

And, installation consists of simply plugging its cable into the left and right tape jacks of your receiver and plugging in the AC power transmitter.

It will have no effect whatsoever on your stereo system.

NOTE: Don't worry about your tape jacks. Extra jacks are provided so you won't lose the use of your tape jacks.



and transmits a combined signal throughout your home's electrical system. So, you'll enjoy full rich music anywhere.

You can plug in as many 2-way speaker systems as you wish. And, you can plug them in anywhere in your home, or office, that you'd like vibrant, room filling music.



The 9½" X 4¾" X 6" speakers will knock your socks off with their rich full sound. A 4½" woofer combined with an acoustically designed cabinet really belts out the bass, while a 2½" tweeter easily matches the high frequency response of most traditional speaker systems.

A word about noise. You can virtually forget it. This system is virtually noiseless. It operates on VLF (Very Low Frequency) FM that is virtually unaffected by noisy motors and fluorescent lights.

It will, however, react to wireless intercoms and the BSR's X10 remote control system that we sell. But, the reaction is momentary and not too bothersome.

So, in short, although it's not stereo (you can put two speakers in a room), it's a fabulous sounding way to listen to your favorite music wherever you are.

IT'S PORTABLE

Installation of the speakers consists of simply plugging them in. Then you can adjust their On/Off volume controls.

Each even has a handle on the back so you can take them out to the garage, the patio or even to unattached barns.

As long as you're on the same side of the AC transformer (most houses are), virtually any plug in your home should be a source of your favorite vibrant music.

It's made by Universal Security and backed by their limited warranty.

**NON-WEIRD MUSIC EVERYWHERE
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Wait till you hear the quality and depth of the sound. Wait till you listen to your favorite music in the bathroom, guest room, laundry or bedroom.

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To order your Wireless Music System complete with Transmitter, Cables and a 2-Way Speaker System risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just \$69⁹⁹ (\$6 P&H). Order No. 4631.

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But, it's not stereo. It combines the signals from the left and right channels



Computer PT Boat

It's a swift, incisive, 5 pound powerhouse armed with MicroPro's powerful Wordstar Word Processing and Calc Spreadsheet Programs. This 64K briefcase portable is ready to sink battleship sized desk PCs. Add 2 modems, more software and a superb near letter quality printer, and it's a \$1,968 retail value. Price blasted to just \$699.

By Drew Kaplan

Attack wasted time. Work where and when you want. Connected to, or competing with a desk top PC, Epson's portable computer is a perfect main computer or companion to one you have.

And competing with a desk top computer for most applications, is no idle joke. Wait till you read about the power and versatility of this computing system.

At only 5 pounds, including its built-in ni-cad batteries, it fits easily in your briefcase, without filling it up.

So, you can have full word processing, spreadsheet analyses/projections, telecommunications and computing power wherever you are, without having to look for a desk or even an AC plug.

Its full size keyboard is 98.6% the size of a standard typewriter, so your hands won't be cramped after hours of typing.

Its non-glare infinitely adjustable, high resolution, full 80 column, 8 line LCD display with full 25 line access, won't give you eye fatigue.



It has battery backed memory in the form of an instant access RAM disk, which you'll use much like a hard disk.

And, it has infinite capability to store files through its unique on-board micro-

cassette drive which functions more like a floppy disk drive than a cassette drive.

Imagine a microcassette drive with a file directory and high speed access to the beginning of the specific file you want. It knows exactly where each file is.

Now, you'll NEVER waste time when you are stuck waiting, traveling on a train, a plane or sitting in a hotel room.

And, most important. By using normally dead time that gets wasted every day, you'll find you have more free time to spend with your family and friends and to pursue your hobbies. Wow!

So, whether you're a writer and/or a company president as I am, or a student as I once was, this computer will let you be incredibly more productive.

If you're an accountant, which I'm not, you can run spreadsheets and models with the 16,384 cell Calc program.

However, you'll be amazed at how easy it is to use this spreadsheet program and all the things it can do for you. It comes with a great tutorial which will have you projecting your own sales, profit, and more in just about an hour.

Just imagine how effectively you can get your ideas across to clients when you can change variable models of their potential costs or profits right in front of their eyes in their own offices or even at a restaurant while you wait for lunch.

Plus there's a scheduler program for setting up appointments with day by day calendar screens that you can print out.

You can even look at a bar chart that shows how you've planned every 1/2

hour for the next 24 days. It's great for plotting in new appointments.

Of course there's a vast reservoir of programs you can buy or even download for free from electronic bulletin boards by using the included modems.



IT GOES WHERE YOU GO

During the day, you can use it at your desk, in the warehouse or in the field for work. It's simply great for writing, inventory taking or sales forecasting.

At night, take it home to finish a project. Then, you can study your stock portfolio or log onto databases to make airline reservations, check the latest price of gold or the specific history of one of your stocks. You can even get the current S&P Green Sheet Reports.

And, look at this. You can actually
Next Page Please. . .

...Epson Continued
 look up on-line information about public companies' 10K reports, such as earnings, officers' salaries and trends. Wow, what a great way to keep track of your competition, suppliers and customers!

If you're a student, you'll find a wealth of research information available through your modem on thousands of diverse subjects. There are lots of group forums on-line to help you with educational research. Plus, when you're through studying, you can even log onto a computer dating board and choose your ideal mate.

And look at this bonus. If you're at all shy about using modems, we've included a \$39 value (we sold it for \$24) CompuServe Membership Package, complete with a full manual and \$25 worth of free on-line time.

While many bulletin boards are free, you'll find that learning your way around CompuServe with \$25 worth of free time, will give you a good solid knowledge of how to get the information you want from bulletin boards across the country.



HOT LINK

You can directly connect this Epson computer to any IBM PC or Clone or virtually any other computer with a serial interface and any standard communication program, simply by using its cable.

You can download (receive) a file from your desk PC to the Epson to take with you, or upload (send) a file from the Epson to your desk PC for your secretary.

In fact, this system is an incredible replacement for a secretary's typewriter. Portable WordStar will let you edit, correct and even move paragraphs or sentences at will. A letter won't have to be re-typed and reproofed if a change is made.

```

not editing
  C C O P E F I G M E N U >>>
  O Open a document file  O COPY a file  T TRANSMIT a file
  N Open a non-document file  O COPY a file  C RECEIVE file
  L Change logged drive  Y DELETE a file  X EXIT to system
  
```

```

C C C  M A I N  M E N U >>>
--Cursor Movement--  -Delete-  -Miscellaneous-  -Other Menu-
C char left  D char right  C char  - F10 -  S Return  S Block
A word left  F word right  DEL char LP  Y INSERT OW/OP  O Onscreen
S line up  X line down  T word rt  L Find/Replace again  P Print
--Scrolling--  T line  RETURN lock paragraph  Q Quit
V up line  Z down line  I Insert a RETURN  HELP display/
P up screen  C down screen  U Stop a command  resource menu
  
```

If you already use WordStar, you know why it's the most popular word processing program in the U.S. If you use another program, don't despair. You can still send the file. You'll just have to use it under the commands of your program.

ALL THE THINGS YOU'LL GET

Epson's 64K Geneva Computer has a suggested retail of \$995. It is just 1.87" high, 11.58" wide and 8.42" deep. It has 3 CPUs. It has 72 keys. Plus 'Number Lock', lets you have a standard 10 key pad for fast entry of numerical data.

No matter where you use Epson's computer, you'll have up to 10-20 uninterrupted hours of computing from its internal ni-cad batteries. Then it will automatically shut down. Even after battery-low shutdown, your memory will be protected by the internal backup battery.

Of course, the AC adaptor/charger is included. So, you can operate from AC or DC to suit your needs.



Geneva's microcassette drive gives you a choice of storing your files on the RAM disk or on microcassettes. The on-board microcassette drive uses standard 30 or 60 minute microcassettes.

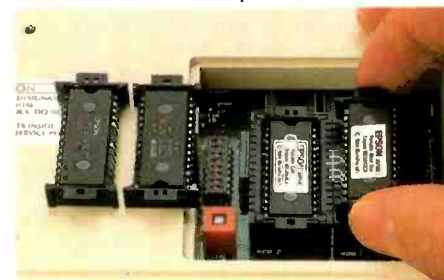
Just one 30 minute tape will store up to 50,000 bytes of information (about 25 pages of text).

And, don't forget, this intelligent machine actually stores a directory at the front of each cassette and in RAM. You can directly access any whole file without having to search a whole cassette.

This computer will power off after 10 minutes if you don't enter data to save its batteries. (Shut off time is adjustable.) Just flip a switch and you'll be exactly where you were when it powered down.

It can use its on-board clock to turn itself on. And, if you type in a password, your information will be secret.

This \$995 Computer comes complete with 4 powerful software programs plus a group of Utility Programs. The programs are stored on ROM Chips that simply slip into either of 2 sockets on the back of the computer.



Again, like a hard disk, these ROM chips are fast and load automatically. You get Portable WordStar, Portable Calc and Portable Scheduler. Plus you get a powerful form of Basic. This system can run virtually any CP/M programs.

You can write very sophisticated programs in Basic. This advanced Basic is so powerful that it even supports such obscure extensions as Inkey\$. And, it supports sound, so you can even finish Schubert's 'Unfinished Symphony'.

```

*** MAIN MENU ***
1=auto power off
2=CP/M function key
3=cursor & function key display
4=date & time
5=disk drive
6=printer
CONFIG V3 0
1=RAM disk
2=PC-232C
3=screen mode
4=serial
5=power BIOS
6=country
  
```

Here's just one menu from the Utility Programs Rom.

There are two ports on the back of the Geneva. One is a serial port for the optional disk drive(s). The other is a fully programmable RS232 serial port for the superb printer we have included. Or, you

can use it to communicate with other computers and external modems.

Of the total 64K in this computer, you can actually store files in a 24K RAM disk. The balance of RAM is used for running your programs. But, don't fret, there is lots more RAM and power to come.

THE FLYING WEDGE

A 24K RAM disk may sound like a lot of writing to some. But if you write as much as I do, you're sure to want more:

Another reason for more RAM is that WordStar creates back-up files which occupy memory space.

Back-up files are really great, because if you are editing a file you've written and you really mess it up, you can go back and get your untouched back-up file and start over. So read on for more memory.

Epson makes a \$360 accessory (included) called a Multi-Unit which gives you a 64K RAM disk and leaves all the RAM within the computer free for processing.

It's a small wedge that attaches to the bottom of the computer and doesn't increase its footprint on your desk at all.

And there's more. The 1st modem I described earlier is included inside the Multi-Unit Wedge. It's a 300 baud auto-answer, auto-dial, Tone & Pulse Modem.

It's a terrific modem that comes with a modular phone cable that you plug into any standard phone jack and away you go.

Well you won't go far, since Epson doesn't include a modem program. The modem program is a \$79 value. We've included one that lets you dial in Tone or Pulse, and send or receive files. It's very sophisticated but it's very easy to use.

And oh yes, the Multi-Unit has one more feature. It has a 3rd ROM slot for the Utility ROM. So, you can keep 2 programs loaded in the computer. You can swap ROMs in less than 10 seconds, so it's no big deal, but an extra slot is nice. Once attached, the Multi-Unit actually becomes part of the computer.

GENEVA USER'S GROUP

There is a terrific guy who knows just about everything about the Geneva, including where to find all types of software for more diverse applications.

It's a free bulletin board. If you have a modem now, you can log on by dialing 1-313-538-6968. The SysOp, as system operators are called, can answer questions and even supply you with public domain software.

He's been an incredible help to me and he's got everything from a spelling dictionary to an outline formatter to games. He can even produce ROMs for you or direct you to various bulletin boards you'll find of interest.

Since he doesn't work for DAK, I can't guarantee he'll always be there, but he has been for me, and at least you'll get a running start on doing a whole lot more than you, or frankly Epson, probably ever imagined with this computer.



Here's the 2nd included Modem. It's an external Acoustic Modem. One last word about modems. If you're Next Page Please. . .

...Epson Continued on the road, you may need Epson's \$129 acoustic coupler modem. It fits on pay phone and hotel room handsets (the rounded traditional kind only).

It's a 300 baud modem that you can use with any computer. It has its own internal ni-cad batteries and its own charger. Wow, this is some system.

PRINTER HEAVEN

We've acquired a superb \$299 List Price NLQ (Near Letter Quality) printer from Seikosha, Epson's sister company. It can take single sheet plain paper or letterhead or fan fold computer paper.

And its printing is so good that I think Near Letter Quality doesn't do it justice.

It's fast, quiet and easy to use. It's AC powered. It has a Self Test Mode, Bold, Underline, Condensed and Expanded Type capabilities. It's a superb value at \$299, but to be honest, I've seen it selling for as little as \$199.

This printer is the best NLQ printer I've used. I'm proud to have my important business letters produced on this printer mailed from my office.

I can't overemphasize what a powerful word processing system this is. You can even do text screen dumps (print out exactly what you see on the screen).

AND YOU THOUGHT THAT WAS ALL

Epson didn't include free cables to connect any of these devices, but we have. You'll get a \$29 cable to connect the Geneva to the printer or to your desk top computer.

But, does your computer have male or female Serial plugs? Well I don't know, so we've included a \$19 Gender Bender so you can connect to male or female.

For external modem use, you'll need what's called a Flip (included). It's a \$19 value and it makes Epson's cable suitable for a modem. So, wherever you take your Geneva, you can plug in.



THE BEST FREE PART OF ALL

We've written an easy to understand, step by step instruction book that basically instructs you how to take the computer out of the box and how to plug it in.

Then in step by step detail, you'll get into each facet of its basic capabilities.

Of course, you'll get a massive set of individual instruction and reference manuals from Epson and MicroPro too.

By the way, if you suffer from fear of spreadsheets and modeling, in an hour you'll be a confirmed user. MicroPro's Calc tutorial is fabulous.

WHY SO CHEAP?

It's a terrific \$1,968 system. And, that's just the problem. Epson designed and built very sophisticated equipment. But they relied on salespeople to explain what was needed to consumers.

Many salespeople don't understand why you need each component and what it does. So, only the very sophisticated

consumers who figured it out themselves were able to put together a really productive system.

Enter DAK. Epson was stuck with 6714 computers. We made them a ridiculously low offer (we frankly didn't think they'd accept) for everything. Well, 6714 computers isn't very much to a company the size of Epson, so they accepted.

Then, we sifted through all the components and chose just the most useful, added the printer, the cables and the programs required and slashed the \$1,968 retail price down to just \$699.

Every Epson Component is backed by Epson's standard one year limited warranty. And, the printer is backed by an almost unbelievable 2 year limited warranty from Seikosha.

THE COMPLETE COMPUTER SYSTEM RISK FREE

Wait till you experience the power and your own increase in productivity, as I have. I'm amazed at the amount of work I can get finished in half hour segments if I'm stuck at a restaurant or during unexpected breaks between meetings.

What's even more exciting, is that instead of transferring the work to my PC when I get home, I like the keyboard on the Geneva so well that I'm finishing what I start, right on the Geneva.

Just imagine working at your desk, on the patio or in a hotel room. I actually wrote an ad on a flight from Atlanta to Boston. I'm 100% sold on this computer.

If you're not 100% satisfied with its typing or computing or communications capabilities, simply return it in its original boxes within 30 days to DAK for a refund.

To order your Epson Geneva 64K portable computer complete with Portable WordStar, Calc, Scheduler, Basic and CP/M Utilities, On-Board Direct Access Microcassette Deck, Built-In Ni-Cad Batteries, AC/Charger Adaptor, Extra 64K RAM Disk Wedge with 300 Baud Modem, External 300 Baud Acoustic Modem, Communication Software, NLQ Sheet and Fanfold Printer, plus Cable and Connectors, forget the suggested retail price of \$1,968. Call toll free or send your check for just \$699 plus \$18 for P&H. Order Number 4610. CA res add tax.

OPTIONS

Once you attach the Multi-Unit Wedge or options below, the computer initializes itself to the installed component. So, the following 2 options are instead of, not in addition to, the Multi-Unit.

If you don't need the extra 64K RAM disk memory, you can have the complete system with a Wedge that contains only the Modem for just \$629 (\$18 P&H) Order No. 4611.

If you don't need a modem and you're into writing long novels, we have the complete system less the modem and CompuServe package but with a Wedge that gives you a 120K RAM disk (Wow!) for just \$799 (\$18 P&H) Ord. No. 4612. Note: You can still use an external modem.

For the many people who already own basic Genevas, you can purchase the \$460 retail, 120K RAM disk for just \$200 (\$5 P&H) Order No. 4613.

OPTIONS FOR EVERYONE

For massive storage we have Epson's state of the art 3½" floppy disk drive. It's rated at 320K. It has internal Ni-Cad Batteries and an AC Adaptor/Charger. Ep-

son's retail is \$599, plus \$19 for the Cable and \$17 for the Utility Disk for the drive. It plugs directly into the Geneva's serial port and boots automatically. This \$635 value is yours for just \$189 (\$5 P&H) Order No. 4614. Note: You may connect up to two disk drives.



A box of 10 Double Sided Double Density 320K Floppy Disks is just \$34 (\$1 P&H) Order No. 4615. Note: 3½" disks are the standard format for many of the newest computers.

High Grade Microcassettes for the cassette drive are available in 30 and 60 minute lengths. They come in hard plastic boxes. 30 minute microcassettes are just \$2⁹⁰. (\$0.50 P&H). Ord. No. 4616. 60 minute microcassettes are just \$3⁹⁰. (\$0.50 P&H). Ord. No. 4617.

The Seikosha printer comes with a unique long life ribbon (up to 2½ million characters). Extra ribbons are just \$7 (\$1 P&H) Order No. 4618.

You'll buy or download software as you broaden your computing needs. Epson had some great programs in stock.

You can have Travelers Pack: Time, Appointment, & Expense manager which is fabulous for a lot of reasons. But, if you bill your time, it lets you feed in projects and multiple billing amounts for each client. Each program is on its own ROM and it's a \$139 retail value. It's yours for just \$29 (\$2 P&H) Order No. 4619.

Epson even had a small supply of Ashton-Tate's dBase II on ROMs for the Geneva. It's a sophisticated relational database management program. It's file compatible with desktop dBase II versions. It's a \$469 retail value that's yours for just \$199 (\$3 P&H) Order No. 4620.

Epson also has Ashton-Tate's dBTraveler on ROMs which is a less expensive version of dBase II with most dBase II functions. It's also file compatible with desktop versions of dBase II. It's a \$329 value that's yours for just \$129 (\$3 P&H) Order No. 4621.

As you can see from the above software, the Geneva can run even the most complex, sophisticated programs. It makes duck soup out of most of the standard \$20 to \$99 programs you'll find.

For your desk, your home or for the great outdoors, you'll be able to write, forecast, and compute with mammoth power and in real style. Like a PT Boat, this computer moves in fast and does the job while it lets you escape the chains of traditional deskbound PCs.



DAK INDUSTRIES INC.

Call Toll Free For Credit Card Orders Only
24 Hours A Day 7 Days A Week

1-800-325-0800

For Toll Free Information, Call 6AM-5PM Monday-Friday PST
Technical Information. . . . 1-800-272-3200
Any Other Inquiries. . . . 1-800-423-2866
8200 Remmet Ave., Canoga Park, CA 91304

1200 Baud Smart Duck

If it walks like a duck, sounds like a duck, and looks like a duck, it darn well better act like a duck. And ADC's new Hayes Compatible 1200 baud auto-answer/auto-dial modem is one heck of a duck. And, it's a market buster at just \$169.

By Drew Kaplan

Hats off to Hayes. They've just about written the book on specs and protocol for the 1200 baud modem market.

Every professional modem bills itself as 'Hayes Compatible'. But the big question is, how much does it really cost to make a top-of-the-line 1200 baud modem? Or, who's getting rich?

ADC's modem is made in the same factory, by the same people, as one of Hayes's biggest competitors. And, ADC is a division of BSR, the enormous half-billion dollar electronics giant.

So for \$169, you'll not only be getting a duck that quacks properly to Hayes modems, but sings like a nightingale to your pocketbook. It can save you a fortune in time with its extra features.

Don't forget. Now you'll get the \$39 value (DAK sold it for \$24) complete CompuServe Subscription Kit, including \$25 worth (Yes, that's twenty five dollars. Wow!) of on-line time, added by DAK, when you buy ADC's Modem.

DUCK SOUP

Any computer with an RS232 standard serial port, will work flawlessly with this modem. And, virtually any modem or terminal software that's compatible with Hayes, will be compatible with ADC.

We've even got intelligent programs, cables, and interfaces (if you need them) to activate your IBM PC or Clone, and your Apple IIE or IIC. Of course, you can supply your own cables and modem programs for these computers or for any other computer you may own.

I've owned a Hayes 1200 baud modem for about 2 years. I just unplugged it and plugged in ADC's to operate my Hewlett-Packard dumb terminal which I use at home to monitor DAK's computer.

The only differences I noted were improved monitor sound, more screen displays and a help menu. And oh yes, one last extra. I use a few local data bases whose phone lines are always busy.

Well, ADC's intelligent modem recognizes a busy signal, hangs up and keeps retrying the number every 30 seconds.

There are less important (to me) extras like day, date and time, an extra phone jack and auto tone/pulse switching. So, you'll love it for discount services.

DO YOU NEED TO KNOW?

Just think, you can transform your PC into a terminal that can interact with main-frames. You can download information from your main office computer and run Lotus, Wordstar, or you name it. It's all possible with your PC and modem.

You can exchange information with other computers. Say you're a writer, you can send a chapter from your home or office in Los Angeles to New York, have it edited and sent back to you.

You can even send it directly to typesetters and have a book or a newsletter prepared from your transmitted file.

It's really great when drafts of contracts are flying back and forth. Why retype everything over and over again?

Electronic mail lets you type in your message and you won't have to worry

NOW WITH \$25 COMPUSERVE ON-LINE BONUS

It's An Added \$39 Value That DAK Sold For \$24

Plus, you'll Get CompuServe's Complete Subscription Kit

NOW PRICE SLASHED TOO--NOW JUST \$149⁹⁰

Use Order No. 4334 Plus (\$6 P&H)



about playing telephone tag any longer.

You can get the weather in Baltimore, the latest quote on your company's stock, or even reserve a seat on the next flight to Las Vegas. You can upload public domain software (there's an enormous amount of free software) or sample the newest programs before you buy.

There are pay data bases like CompuServe and The Source that have information about anything, and thousands of free bulletin boards about everything from Ham Radio to Parapsychology.

There's even a book that lists and describes such diverse data bases as one with 6500 references about coffee, to one with 2,000,000 on agriculture.

Of course, economics, medicine, law and computers are all well represented.

THE TECHNICAL SIDE OR, WHY 1200 BAUD?

The ADC Modem will communicate at 1200 baud (about 120 characters per second) or 300 baud (about 30 characters per second) automatically, depending on the link at the other end.

So, it's clearly a decision of money and time. 1200 baud is roughly 400% faster than 300 baud, so if you transfer data across the country, you save 400% on your phone bill. And think of the time \$169 can save you!

If you download material from pay data bases, even though some charge more for 1200 baud, you still come out way ahead because of the amount of information you get per dollar.

It comes with a modular phone cord that you simply connect to any standard modular jack. And, it uses standard Bell 103 and 212A protocols. It operates in half or full duplex.

Its built-in microprocessors let you automatically answer in-coming (auto-answer) calls & act on all Hayes commands.

It even waits for dial tones and phone network tones during auto-dial. The modem is 9 1/2" X 5 1/2" X 2". It's backed by ADC's standard 1 year limited warranty.

HOOKING IT UP MADE EASY

All you need is a serial output, a cable and a modem program. Use your own for any computer. Or you can use ours for the computers below. All our modem programs on disk let you save, upload

and download files. Look how easy it is.

If you own an IBM PC or a Clone, usually you'll find an RS232 serial port already built-in. All you need is our cable and modem program on disk, which we've packaged together for just \$29 (\$3 P&H). But, before you order your cable, you may need a short sex education course.

Sex Education 1A. You need to determine whether your computer's RS232 connector is male or female.

If you look at the picture below, you'll note that ADC's RS232 Modem connector has holes going in. It's a female. If it had copper pins sticking out, it would be a male. Now wasn't that simple?



So, if yours is female, order our male cable and modem program Or. No. 4353. If you have male pins sticking out, order our female cable, Order No. 4354.

If you don't have an RS232 port, we have a serial interface card for your IBM or Clone, complete with cable and modem program for \$99 (\$4 P&H). Or. No. 4355.

For your Apple IIC, your serial interface is built-in. All you need is our cable and modem program on disk. They are just \$29⁹⁰ (\$3 P&H). Order No. 4356.

For your Apple IIE, you'll need a serial interface with an RS232 port, a cable and a modem program. It's all yours for just \$89 (\$4 P&H). Order No. 4357.

1200 BAUD SMART DUCK RISK FREE

For business or pleasure, you'll communicate, gather information and save time. If you aren't 100% satisfied, simply return it in its original box to DAK within 30 days for a courteous refund.

To Order Your ADC 1200 Baud Intelligent Modem, now including CompuServe's Complete Subscription Kit (nothing else to buy), with \$25 worth of on-line time, risk free with your credit card, call toll free or send your check for DAK's market busting price of just \$169 plus \$6 P&H. Order No. 4334.

The OnLine Directory of over 1,100 Data bases, complete with descriptions
...Next Page Please

Modem Continued
is just \$14⁹⁵ (\$2 P&H). Order No. 4358.

The ducks will be sure to be quacking up a storm when they see BSR's factory direct, through DAK, price on this state-of-the-art 1200 baud intelligent modem.



A LOOK AT COMPUSERVE & MORE

Get a date, check your stocks, leave E-Mail, or post messages on Electronic Bulletin Boards. Transfer files or download public domain programs. Let your computer bring you the wealth of elec-

tronic information that's on-line.

Imagine dialing a number and hooking up to a free Electronic Bulletin Board where people post messages about everything, from new jokes (I've signed onto a joke bulletin board.) to computer equipment they want to sell.

Most are free, some cost money. But until you are on-line yourself, no brief description that I can give you will even scratch the surface of what's available.

But, let's take a brief look at part of the menu (index) that you'll have at your fingertips when you log onto CompuServe. I've used CompuServe's names or descriptions. This is by no means complete. And CompuServe is just one of many data bases available to you.

No matter what your interests are, you'll spend hours on-line learning about things, making plane reservations or even playing logic games. And, on most bulletin boards, you'll find the numbers of other bulletin boards.

PARTIAL COMPUSERVE INDEX

AIRLINES, ARTS (Art & Literature), ATARISIG (Atari Forum), AVIATION (Aviation Forum), BANK (Home Banking), BANSHI (Ban-shi Game), BROKER (Brokerage), Business (Business Menu), C&S (Commodore 64 Forum), CASTLE (Castle Telengard Game), CBIG (CB Interest Group), CBMSIG (Commodore Programming Forum), Clarke school (For the Deaf), COCO (Color Computer Forum), COM-MODITIES, CP/M, CQUOTE (Current Quotes), DEMOGRAPHICS (SuperSite), DISCLOSURE (Public Company Details), EARNINGS (Earnings Projections Menu), EASY (EasyPlex), ECONOMICS, EDUCATION, EMAIL, ENCYCLOPEDIA (On-Line Grolier's Academic American Encyclopedia), ENGINEERING (Engineering Menu), ENTERTAINMENT (Entertainment Menu), ENVIRONMENT (Environmental Forum), EPIE (EPIE Forum), FINANCE, FINTELL (Personal Finance), FLIGHTS (Travel Menu), FOOD, FORUMS (Menu of Forums), GAMES (Menu of Games), GOURMET (Electronic Gourmet), HEALTHUSERS (Health Users Group), HOBBIES (Hobbies Menu), HOLLYWOOD (Hollywood Hotline), HOME (Home Menu), HOTELS (A to Z Hotels), IBMNOVICE (IBM Novice Forum), IBMSIG (IBM Users Forum), INSURANCE, INTERESTS (Other Interests), INTERFACE, INVEST-MENTS (Investments Menu), IQINTERFACE (IQ Interface Program), LAWSIG (Law Forum), LEGAL (Legal Menu), LEISURE (Leisure Travel Menu), LIBRARIES (Home Reference Menu), LOTUS (World of Lotus), LOVE (Love Messages), MAGAZINES (Electronic Publishing Menu), MAUG (Apple Users Group), MEDICAL (Medical Menu), MOVIES (Movie Reviewettes), MSOFT (Microsoft Users Group), SBP (Standard & Poors), SCI-FI (Science Fiction Forum), SCIENCE (Science Education Forum), SHOWBIZ (Showbiz quiz), STATE (Department of State), SPORTS (Sports Menu), TECHNOLOGY, TICKER (Ticker retrieval), VACATION, VIDEO, WEATHER (NOAA Weather Wire), WINEFORUM (Bacchus Wine Forum), and MUCH MORE.

On one board, I found the numbers of 40 other boards. Wow, there's so much information, education and entertainment.

Hayes, Lotus, Wordstar, IBM, and Apple IIE & IIC are registered trademarks of Hayes Microcomputer Products, Lotus Development, MicroPro, International Business Machines and Apple Computer

Computer Power Controller



Protect your computer and 5 peripherals from spikes, turn everything on and off from the front & swivel your monitor.

By Drew Kaplan

It's great. Now you don't have to reach around the back of your computer to turn it on. And not only can you turn on each peripheral separately, you can turn them all on or all off with one switch.

But there's more. This all new Power Controller is much more than just a fancy 'octopus' that supplies you with 6 outlets to get rid of cumbersome tangled cords.

It aids in the prevention of damage caused by voltage surges and spikes. It then goes on to filter your AC to help protect your equipment and data from line noises caused by power disturbing air conditioners, refrigerators and the like.

And look at this. It protects your equipment from itself. There are 4 separate filtered sections. So, your computer will be protected from your printer, modem or other peripherals.



BUT IT'S CONVENIENT

There are 6 protected 3-wire outlets

on the back. 5 are switched from the front. One is unswitched but spike protected so you can leave a peripheral on.

Each of the 5 switched outlets has a non-glare status light so you know what's on. Push a button for on/off control.

You can swivel the monitor from side to side. So, if you have a separate keyboard, you can really type in comfort.

Above, you can see The Power Controller between the Visual IBM® Compatible Computer and its monitor. It is 1 3/4" high, 13 3/4" wide and 12 3/4" deep.

You can use it with virtually any computer. (It can hang off the back up to 3 1/2 inches with no problem.) It's a perfect combination of convenience and protection for your computer system. It's backed by a limited warranty.

PROTECTION & CONVENIENCE RISK FREE

I've only had my data wiped out once by a power surge. But, I had over 2 hours of irreplaceable 1st draft copy in my computer when it happened.

Now, I'm using my new Power Con-

trollers with 4 different computers. With this added protection, maybe I won't lose data again. And, I've learned to save my data much more often since my loss.

If you're not 100% satisfied, simply return it to DAK within 30 days in its original box for a courteous refund.

To order your 6 outlet Power Controller with Spike Protection, Line Filtering, Circuit Breaker and a 10' 3-wire grounded power cable risk free with your credit card, call toll free or send your check for DAK's blockbuster price of just \$79 (\$6 P&H). Order No. 4623. CA res add tax.

I like the convenience. It's something that helps me every day. But, I'm thrilled with the added protection. If it even helps once, it's worth many times the cost.



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a rose by any other name

It's the sweetest phone that this writer has ever used. From its elegant good looks to its elegant sounding speakerphone, it's a class act. And, it remembers and dials up to 200 numbers by THE NAME of the person you want to call. Plus, it's now available in ivory and 1-line models too.

By Drew Kaplan

It's not red. And it has no aroma. But it is definitely a rose amongst the thorns. Here's an all new name dialing 2-line conferencing speakerphone that will revolutionize your concept of telephones.

As president of DAK, I've tested hundreds of phones. Some are very good and you will find them in DAK's catalog. **But, I've never used a better sounding, more useful phone, at home or at the office, than the phone pictured above.** Let me tell you some of the reasons why.



NAME

FIRST, IT DIALS BY NAME

I hate having to remember phone numbers. With this phone, all I do is push the 'H' button when I want to dial Home. The 'D' button dials DAK. And, the 'I' button dials my insurance broker.

Most other dialers make you remember location numbers, such as '26' for 'Mom'. So, you're really just substituting one number for another. **Now, all I need to remember is the person's name.**

Where I have more than one name that begins with the same letter, I can scroll through the names before it dials, or enter just the first 3 letters. So, if I want to dial Howard instead of home, I push 'H', 'O', 'W'.

BRANCH

It's quick, it's easy and you'll never have to remember or look up and dial anyone's number again. Each memory location can hold up to 32 digits and you can store up to 200 different names. It has a memory capacity of 4096 digits.

You can store your Sprint and MCI codes with the person's name, in a separate location that the phone automatically accesses as it dials, or totally separately so that you can automatically access the service and then dial a number manually.

CREDIT

And speaking of manual dialing, you don't even have to push the speakerphone button to dial. When you touch the first number on the dial, the phone automatically seizes the line, turns on its speaker, and you have on-hook dialing.

So, you never have to lift the receiver or activate the speakerphone unless someone answers the line.

FORGOTTEN HANDSET

This phone has the latest K2 handset. It gives you traditional Phone Company fit and feel, yet, I find it even more comfortable to use.

But, you'll probably never use it. The speakerphone is so powerful, so clean, and so easy to use, you'll never pick up the handset unless you need privacy.

I've used good speakerphones before, but this speakerphone's sound quality rivals an in-person conversation, not a phone call. How's that for a description of a phone you can try on a 30 day risk free trial?

2-LINE MASTERPIECE

You can select Line 1 or Line 2. And, you can push 'Conference' to combine both lines for convenient business conferences or friendly group calls with friends. There are LEDs that show which line is 'In Use', 'On Hold', or 'Ringing'. And, there are different rings for each line.

Installation is a breeze. It simply plugs into one standard modular 2-line jack or two modular 1-line jacks. Nothing could be simpler. Just plug it in.

PAGES OF HELPFUL FEATURES

The list of features would have to be microfilmed to fit on this page. There's a large LCD display that shows you the name you want to call and the number.

An automatic timer tells you exactly how long you've been talking. And, a clock appears on the display whenever you hang up.

Every conceivable feature from Mute to Tone/Pulse switching, to Pause, to Flash, to battery backup (2 C batteries included), to three direct Emergency Memory Keys and more is included.

There's even Automatic Redial which will redial a busy number for you every 30 seconds.

YUPPIE POWER

I'm anything but a yuppie, even though I just turned 40, but when you look at the sleek, swept back, silver-grey HiTec appearance, and when you examine its complete computer keyboard, you'll understand why it would warm a yuppie's heart. My heart is warmed by what it does, but I must admit it is impressive.

It's made by Colonial Data, a research company partially owned by one of the largest inter-connect (big business phone systems) companies in the world.

It is 9½" wide, and it's backed by Colonial's standard limited warranty. **PUT NAME DIALING ON YOUR LINE RISK FREE**

It's the best sounding speakerphone I've ever heard. Dialing by names instead of numbers is a quantum leap in both technology and convenience.

Now, I don't have to remember people's phone numbers. I just touch a 'C' for customer and let the phone do the rest.

If you are not 100% convinced, as I am, that this is the best sounding, most convenient phone you have ever used, simply return it in its original box within 30 days for a courteous refund.

To order your Name Dialing 2-Line Speakerphone with God only knows how many features risk free with your credit card, call toll free or send your check for DAK's breakthrough price of just \$129 (\$4 P&H). Use Order No. 4335 for Silver-Grey. Or, use Order No. 4452 for Ivory.

If you'd like the 1-line model in Ivory without the 2-line features, it's just \$99⁹⁰ (\$4 P&H). Order No. 4453. CA res add tax.

In DAK's electronic world, where a new best is achieved almost every day, this phone stands out as the 'best' best I've ever had the pleasure of introducing. DAK and the 'a rose by any other name' phone are not affiliated with CXG Corporation's Rose Console.



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What's a Mamfactacdc?

Have you guessed yet? It's all the musical sources in this incredible, top of the line, complete music system, backwards. And, if you think Mamfactacdc is a mouthful, wait till you see all you get for just \$299. Wow!

By Drew Kaplan

It's party time. With a Mamfactacdc, there's something for everyone. And, wait till you hear the sound.

This top of the line complete stereo system has more musical sources than any modular system I've seen. And, the sound from each source is breathtaking.

Let's explore all that it does on a musical source by source basis.

CD = Compact Disc Player. And it's not just any player. You can program up to 20 different selections in any order you desire. Wow, 20 memories!

You'll have Next Song and Previous Song. There's even Repeat so that you can have continuous music from 1 disc.

This CD even has a motorized front loading system. Its oversized display shows track number or running time, and, of course, program selections.



But, you've really got to hear a CD for yourself. The sound quality and clarity of the music is so awesome it makes the switch from 78s to LPs a non-event.

CA = Cassette Deck Times 2. There are twin high speed dubbing cassette decks. You can duplicate tapes at high speed or normal speed.

The decks are matched for flawless copies and there's even mike mixing. You'll love this feature if you sing.

Simply put a recorded tape in deck 'A' and copy it onto deck 'B' as usual. But, while you're copying, you can add your own vocal. Just plug in your mike and sing. You can be a single, a duet, a trio, or even a chorus by repeated recording.

Of course, you can make original tapes from any of this system's musical sources.

And, look at this. There's even sequential play, so you can play a cassette in one deck and when it's finished, the other deck will automatically start. You'll have twice the amount of uninterrupted music.

With these twin decks, you'll make great recordings and enjoy great sounding music from your cassettes.

TT = Belt Drive Turntable. It's a semi-automatic turntable with a hinged dust cover. A low mass tone arm and quality cartridge protect your cherished records while providing superb reproduction.

You can listen to LPs and 45s. There's automatic arm return. And, there's a cueing control for record protection and easy track selection.

In a world gone CD crazy, if you're like me, you'll still want to listen to your record collection. And, this stable turntable should provide years of superb listening pleasure from your records.

FM/AM = FM stereo and great sounding AM are yours with the sensitive tuners in this system. A large slide rule dial makes it easy to find stations.

There's a built-in antenna or you can connect to an outside antenna. Just wait



till you hear your favorite stations locked in by these receivers.

MUCH MUCH MORE

There's a 5 band equalizer so that you can sculpture your sound just the way you want it. You can really 'detonate' the bass or high end for room filling sound.

And speaking of vibrant room filling sound, the matching 2-way speaker systems really pack a punch. Rich deep bass is produced by the woofers, and crystal clean highs by the tweeters.



Emerson had to use better than normal speakers in this system to handle the dramatic capabilities of the CD. You won't be disappointed with the full rich sound.

There's no volume knob because this system has an electronic volume bar. Just touch one end or the other.

And there's one more thing. There's a built-in clock timer. You can have this system shut itself off automatically. Or, you can have it turn itself on.

When it turns itself on, it can wake you with your favorite music, or if you've set it to record, it can record from the AM or FM radios. Wow, how neat.

It is 16 1/2" tall, 14" wide, and 13 3/4" deep. Each speaker is 14 1/4" tall, 7" wide, and 9 3/4" deep. It's backed by Emerson's standard limited warranty.

MAMFACTACDC IN YOUR HOME RISK FREE

You'll be amazed at the sound. And you'll be thrilled by your choice of musical sources. It's an incredible system.

If you're not 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order Emerson's Stereo System with 20 Program Capacity CD Player, Dual High Speed Cassette Decks, Belt Drive Turntable, AM and FM Stereo, Speakers, Equalizer and Timer System risk free with your credit card, call toll free or send your check for DAK's breakthrough price of just \$299 (\$18 P&H). Order No. 4684. CA res add tax.

A lot of sources stuck together wouldn't mean much if they weren't top quality. Just wait till you hear how your favorite music sounds through this system.

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DO ALL AMPLIFIERS SOUND THE SAME?

*David L. Clark attempts to find an answer to one of hi-fi's most hotly debated questions.
A Report by Ian G. Masters*

FEW things can set hi-fi enthusiasts to squabbling faster than a discussion of amplifier sound. Ever since the tubes-vs.-transistors controversies of the early 1960's, the nature of audible differences between power amplifiers—or even the existence of such differences at all—has been a hot topic, and one that is nowhere close to being resolved even yet.

On the surface, it seems logical that an amplifier costing ten times more than another should sound better. Not ten times better, perhaps, but there should be some improvement detectable to the ears. Otherwise, what justification could there be for very high-priced units and exotic circuit designs?

One very vocal faction holds that such logic can easily be borne out simply by listening—that important differences *do* exist and that they are readily audible. The vocabulary used by members of this group in describing the nature of the sounds they hear has a tendency to be somewhat . . . um . . . poetic, which tends to put off those who are more conversant with engineering terminology—as most of the difference-deniers are.

The skeptics believe that many reasons exist to choose one amplifier over another, but that they have nothing whatever to do with the particular sound characteristics of the amplifiers. Rather, buyers make such choices on the basis of reliability, visual appeal, brand recognition, ease of operation, and a host of other factors that have nothing whatever to do with



technical performance. In their view, any sonic differences that exist would be revealed in the normal battery of measurements performed on any piece of audio equipment: frequency response, distortion, signal-to-noise ratio, and so forth. Such tests rarely show anything but the most minute variations from one unit to another, so the skeptics hold that audible differences are extremely unlikely. Even the believers grant that differences are extremely subtle but insist that they do exist and can be heard, particularly over an extended listening period.

Over the years, there have been a number of attempts to identify the distinguishing audible characteristics of amplifiers and to explain them. In most cases, listeners have been unable to hear differences consistently enough to proceed with the second part of the project, for if the differences are not identified, they are very hard to quantify and to explain. To some, this has been the basis of the argument that amplifiers sound alike; to others it has simply pointed to the inadequacies of the testing procedures. So the debate continues.

And yet, STEREO REVIEW's editors felt that there must be some test that would answer the question one way or the other. They concluded that a carefully controlled series of listening tests using a large sample of listeners and a group of amplifiers with as many technological differences as possible should be able to elicit reliable information at least as to the kind of differences there might be. To set up such a test, the

magazine approached David Clark of DLC Designs, who in the past year has designed and conducted similar listening tests for CD players and hi-fi VCR's.

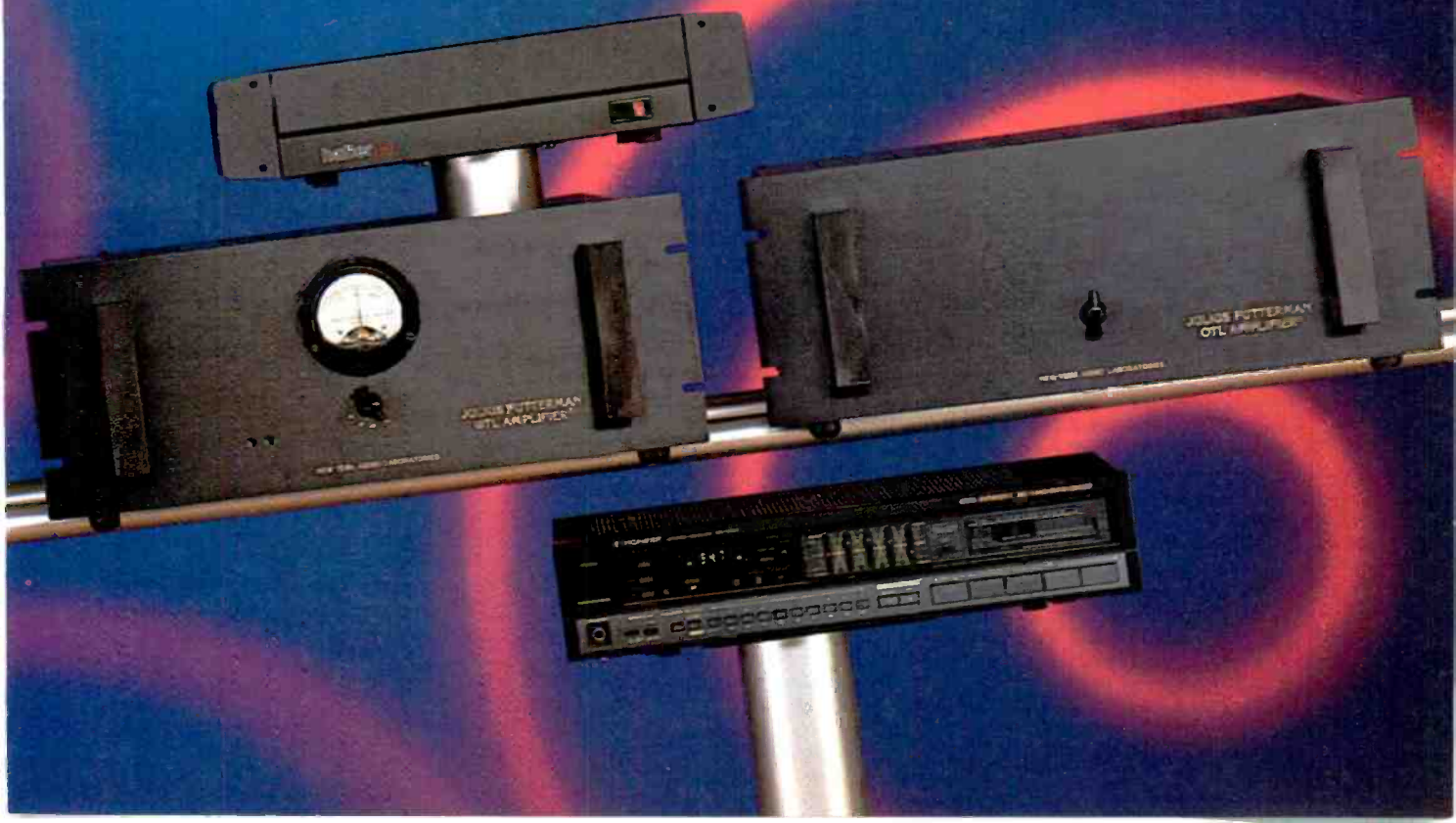
Clark's task was to set up a series of tests that would not only satisfy his own technical standards, and those of the magazine, but that would be conducted in such a way as to meet most of the potential criticisms of the believers. As far as possible, the aim was to forestall claims that the test procedures were not adequate to reveal amplifier differences.

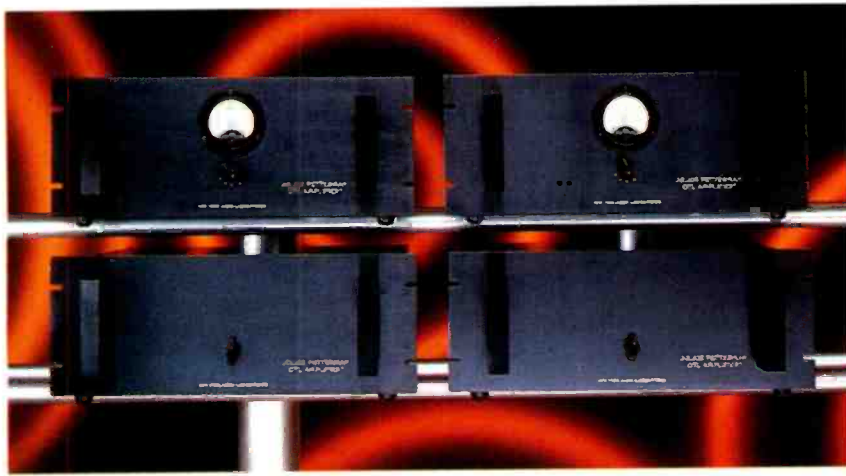
The first consideration was to set up a system in which the other components would be perceived as appropriate for the task. Every piece of equipment in such a setup would have to be beyond reproach in the eyes of the high-end audiophile community. That was clearly impossible, but a close approach was made.

For source material, it was decided to make both compact discs and analog records available. For the former, a Meridian MCD Pro player was used. For the latter, a Sota Star turntable with its vacuum hold-down system was set up, fitted with an Eminent Technology straight-line arm and a Van den Hul MC-10 moving-coil cartridge. Both sources were fed into an Audio Research SP-11 tube preamplifier using high-end interconnect cable.

The speakers used were Magnepan MG-111a's, connected to the subject amplifiers with a very heavy-duty specialty speaker cable. The tests took place in the dedicated listening room that had been used for Clark's earlier tests for the magazine.

PHOTOS BY ROBERT L. LOKENZ





From New York Audio Labs, two \$6,000 Julius Futterman OTL-1 80-watt mono amplifiers with their separate power supplies. The signal path uses vacuum tubes only.

Equally important was the choice of amplifiers to be tested. They had to run the gamut from truly exotic to mass-market cheap, with some interesting things in between. Since the number of amplifiers that could be included in the test was limited, the probability that there would be differences within the group had to be reasonably high. For this reason, the low end was represented by a modest Pioneer receiver, the Model SX-1500, priced at \$220, while the upper end of the scale was represented by New York Audio Labs'

Julius Futterman OTL-1 tube amplifier, which weighs in at a hefty \$6,000 per channel. (The pair of Futtermans, with their separate power supplies, made a stack roughly the size of a small stove and gave off about as much heat.) In between these two extremes were one audiophile favorite, the Mark Levinson ML-11 (\$2,000), and two well-respected mid-price units, the Hafler DH-1 120 (\$320) and the NAD 2200 (\$548). The Counterpoint SA-12 (\$995) represented tube-transistor hybrids, but its untimely demise

during the early listening tests prevented its full participation. The gains of all the amplifiers were equalized by attenuators in the tape-monitor loop of the Audio Research preamplifier.

A further factor was the choice of listeners. A sample had to be assembled that was large enough for statistical validity in the results, but the group had to be small enough to allow the tests to be done in a reasonably short period of time. The total number arrived at was twenty-five, with each participating in a varying number of listening sessions, and this permitted Clark to complete the tests within a week.

The kind of listeners was important as well, and so the sample was made up both of people who professed to be able to hear differences between amplifiers, the "Believers," and of those who doubted their existence, the "Skeptics." Both factions had to be represented because it was necessary to secure their approval of the testing methods; otherwise either side could cry "foul" if the results failed to match their preconceived notions.

Two options were offered for the tests themselves. The listeners could choose to have the operator manually swap cables between the two units being listened to in any

TEST DESIGN AND EQUIPMENT

My first double-blind amplifier comparison was in 1976 when I was a listener in a test run by the Southeastern Michigan Woofers and Tweeters Marching Society—SMWTMS, pronounced "Smootums." I remember the experience vividly because I was so frustrated and amazed at not being able to hear a difference between any of the amplifiers tested.

The design of the present test, one that would make it as easy as possible to hear differences between amplifiers, therefore presented some special challenges. First, I had to keep my old skepticism about the audibility of amplifier differences from influencing the test. Second, a highly pedigreed sound system, acceptable to the most critical listeners, had to be assembled. Third was the matter of finding those listeners. The SMWTMS group provides my usual pool of experienced listeners, but most had previously participated in such tests and had become as skeptical as I. In addition, I wanted to end up with more than statistics from the tests: I wanted to record the emotional experiences of the listeners as they discov-

ered how small (if not inaudible) the differences are between gain-matched amplifiers operated below clipping.

The best solution was simply to present my plan to some audiophile believers in significant sonic differences between amplifiers and ask for their assistance. After all, they should see this as an opportunity to prove the validity of their belief to the skeptics. The cooperation I received from manufacturers, a local high-end audio salon, and other audiophiles was more than I ever hoped for. Their assistance and participation as listeners in this project demonstrated that they were secure in their belief and brave enough to risk being exposed to an uncomfortable outcome.

Harry Francis of Audio Dimensions in Royal Oak, Michigan, brought out a Sota vacuum hold-down turntable and an Eminent Technology air-bearing arm with a Van den Hul MC-10 cartridge. To complete this exotic head end, he supplied an Audio Research SP-11 tube preamplifier. After pondering the system for a while, he also suggested that it be equipped with better cables. I chose the fat, directional inter-

connects from Music Interface Technology as well as the company's 3/4-inch-diameter speaker cable, called Music Hose. After optimizing all adjustments on the turntable and arm, Francis listened for a while, but he did not have the time to go through a blind test session.

Also feeding the Audio Research preamp was a Meridian MCD Pro CD player, which was mounted on a Torlyte stand whose spiked feet pierced the carpet and rested on the concrete floor. Inserted in the tape loop of the preamp was a precision attenuator that trimmed gain to match the outputs of the amplifiers in the test within ± 0.05 dB. This attenuator—as well as the ABX Comparator relay module (when used)—was connected by short lengths of the highly acclaimed Hitachi LC-OFC cable. All connections were treated with a small amount of Tweek or Cramolin contact enhancer.

Most of the equipment was placed on a sturdy shelf unit located between two Magnepan MG-IIIa speakers. These large-panel speakers radiate very little energy to the sides, so the turntable and other components were not in a

given session if they felt that would contribute to the accuracy of their responses. It was expected that some of the Believers would prefer this method, as many high-end audiophiles are leery of instantaneous A/B testing, and this proved to be the case.

The alternative was using the ABX comparator for double-blind listening. With the ABX system, two of the amplifiers under test (designated A and B) are connected to the comparator, and listeners can switch back and forth between them using a hand-held remote control. The system includes a third selection, called X, that is the same as either A or B. By switching back and forth, the listener tries to determine which amplifier X represents. For each round of sixteen trials in each test, the comparator randomly connects X to one amplifier or the other, and the listeners note on an answer sheet which one they think it is. When the test is over, the comparator can be programmed to read out the correct answers, and then each round is scored as correct or incorrect for each listener.

The system is designed to discover differences, not preferences. To the extent that any listener can reliably match X to the correct amplifiers, it can be presumed that he is



The stereo Mark Levinson ML-11, rated at 50 watts per channel, costs \$2,000. It can deliver 25 volts of peak power at currents up to 12.5 amperes.

actually hearing a difference—with gross differences, a listener should be able to make the correct identification in every round. If there are *no* differences, the number of correct responses should be about the same as could be achieved by mere chance, 50 percent—assuming there are enough choices in the sample.

In between certainty and pure guesswork, the results are subject to statistical analysis. If the number of correct choices is statistically significant, it can be concluded that a real difference was being heard; if not,

then the choices were random, at least in the particular test being studied.

The test sessions themselves involved anywhere from one to eight listeners at a time, and ABX switching and selection among the available LP's and CD's was performed by the listeners. Throughout all the tests the equipment could be seen at the front of the room, although there were no hints as to which amplifier was playing at any one time.

At the beginning of each session,

strong direct sound field. The huge Futterman OTL-1 amplifier was placed directly on the floor, as was the Torlyte CD player stand.

Critical to hearing differences in audio equipment is the choice of speakers and listening room. Besides sounding exceptionally good over a wide range of listener positions, the Magnepan speakers have fairly low efficiency and a low impedance. Both of these factors conspire to make an amplifier work very hard, possibly exposing a weakness. The load the Magnepans present is not highly reactive, but it is typical of the low-efficiency, highly damped speakers often preferred by audiophiles.

The listening room was the same 18 x 25 x 10-foot dedicated facility used in previous double-blind test for STEREO REVIEW. It is designed to have an even reverberation time, damped room modes, and controlled diffusion of reflections.

The program material was highly varied, though all the music used acoustic instruments. Both LP's and CD's were supplied, and some listeners also brought their own. At each session, the particular test recordings used were selected by the listeners. Following are some of the more popular items: Reference Recordings' "Düfos"

(LP and CD), an ethnic percussion album, and Capriccio espagnole (LP); Sheffield's "Track Record" (LP and CD), "West of Oz" by Amanda McBroom (LP), "I've Got the Music in Me" by Thelma Houston (CD), and "The King James Version" by Harry James (LP and CD); Joan Baez's "Diamonds and Rust" (Nautilus LP); Opus 3's "Test Record 1: Depth of Image" (LP and CD); Andrew Lloyd Webber's Requiem (CD); Gershwin's Rhapsody in Blue on Telarc (CD); and the Digital Music CD's by Warren Bernhardt, "Trio '83," and Jay Leonhardt, "Salamander Pie."

A major feature of these listening-test sessions was their openness. All the equipment could be seen and inspected. At listener request, all the amplifiers could be auditioned with or without the ABX system prior to the blind testing. Listeners were given as much time as they needed to get used to the audio system, to select revealing program material, and to note apparent differences between the various amplifiers. Almost all listeners (even the skeptics) thought they could hear differences at this point. They wrote down their sonic observations and selected the pair of amps that seemed to differ most to compare in the following blind test.

The listeners even decided which kind of blind testing they would use: manual swapping of the cables feeding the chosen amplifiers (in this case hidden behind a screen) or ABX switching, where the relay system would allow a more rapid changeover. Listeners new to the ABX system had already been trained in its operation at a separate setup while they waited their turn in the listening room. Most listeners opted for the convenience of the ABX relay control, feeling that the extra contacts in the system would not degrade the signal. Nine people, however, chose to augment their ABX tests with blind cable-swap tests.

After completion of the blind (cable-swap) or double-blind (ABX) testing, the listeners were given their scores and a follow-up form asking questions about their experience. Thus, the often painful experience of being certain of audible differences but being confronted with a random score sheet was documented. High scores can prove differences were audible, but random scores can never prove that all amplifiers sound alike. Only the listeners' comments (see box on page 84) can express their disappointment at being wrong when they were sure they were right.

David L. Clark



Pioneer's SX-1500 receiver, rated at 45 watts per channel, is priced at \$219.95. With a 1-kHz test pulse, it produced a peak current output of 12.5 amperes.



The "high-current, high-voltage" NAD 2200, at \$548, is rated for 100 watts per channel with a dynamic headroom of 6 dB. It uses fully solid-state circuits.



Rated at 62 watts per channel, the solid-state DH-120 from the David Hafler Co. is priced at \$320. It is also available in kit form for \$260.

every listener was given a form that asked whether or not the test conditions were adequate to prove whether differences between the amplifiers were audible. After a preliminary round of listening, which lasted about an hour, all but three subjects signed these sheets. One of those who did not said conditions were not adequate, one had reservations, and one gave no answer.

After the sheets were handed in, the blind tests themselves were conducted, comparing in each case amplifiers chosen by the listeners. Tests ranged in duration from 45 minutes to 2½ hours, and some listeners took part in as many as three separate comparisons. Sceptics and Believers were never combined in

the same test, and the Believers' tests were conducted by an audiophile Believer.

After the formal tests, each listener was again asked whether or not the tests were adequate to reveal audible differences and also whether or not the tests could be considered relevant to consumers. In part this inquiry was simply for information, but in part it was also to gauge how attitudes toward the tests changed when the results were known. In a number of cases, Believers' feelings about the adequacy of the tests were modified or reversed.

One of the reasons for such changes in attitudes had to do with the first part of the test session itself.

Before the blind tests began, the listeners were allowed to hear each amplifier on its own for a reasonable period of time. The same musical selection was usually repeated for each amplifier, but this part of the test was not blind, nor did it involve any A/B comparisons.

Practically all listeners, including Sceptics, felt at this point that there were audible differences—some with satisfaction, some with amazement. Even so, it was immediately apparent that whatever differences there were were tiny, although many of the Sceptics began to feel that they could now understand what the Believers had been talking about.

After this introductory part of the session, the listeners began to find things much more difficult, even in what should have been the most clear-cut case: the Pioneer receiver vs. the Futterman behemoth. Throughout the tests, listeners rarely claimed certainty in their choices, and the whole process was one of straining to hear tiny clues that might aid in selection. (At one point, however, the decisions seemed to be coming very quickly, until a listener queried the phase of the amplifier connection. It turned out to be incorrect; when this was remedied and the test restarted, the difficulties returned.)

In all, some fifty-four tests were run, most of them requiring sixteen choices by each listener (to save time, the cable-swap tests required only five choices). A total of 772 choices were made.

Out of all those decisions, one could expect 386 correct choices through chance alone. In fact, the overall score was 388. So for this panel of listeners, overall, and this group of amplifiers, no statistically significant audible differences were detected.

But that did not necessarily rule out the possibility that particular listeners might be able to distinguish one amplifier from another reliably, nor did it necessarily show that every pair of amplifiers was equally difficult to separate. Even given these results, it was still possible—although unlikely—that some listeners might have been more adept at hearing differences than others, but that their results were offset by subjects whose scores were worse. By the same token, the figures might not necessarily reveal a situation where some pairs of amplifiers were, in fact, audibly identical, while others were not.

AMPLIFIER LISTENING TESTS

SESSION	AMPLIFIERS	MAKEUP OF PANEL (1)	TESTING METHOD (2)	LISTENING TIME (3)	NO. OF CHOICES (CORRECT/TOTAL)	PERCENT CORRECT	PROBABILITY RESULT DUE TO CHANCE (4)
1	Levinson vs. Pioneer	1 believer	ABX	Long	4/16	25	—
2	Counterpoint (5) vs. NAD	3 believers	ABX	Short	30/48	63	0.056
3	Hafler vs. Futterman	1 believer	ABX	Long	7/16	44	—
4	Hafler vs. NAD	8 skeptics	ABX	Medium	63/128	49	—
5	Futterman vs. Pioneer	8 skeptics	ABX	Short	74/128	58	0.046
6	Futterman vs. Levinson	8 skeptics	ABX	Short	63/128	49	—
7	Futterman vs. Levinson	5 believers	ABX	Long	43/76	57	0.151
8	Futterman vs. Pioneer	4 believers	ABX	Long	30/64	47	—
9	Futterman vs. Pioneer	4 believers	Cable swap	Short	10/20	50	—
10	Hafler vs. Levinson	4 believers	ABX	Medium	28/64	44	—
11	Hafler vs. Levinson	4 believers	Cable swap	Short	12/20	60	0.252
12	Futterman vs. NAD	2 skeptics	ABX	Medium	14/32	44	—
13	Futterman vs. Hafler	2 skeptics	ABX	Medium	21/32	66	0.055

COMBINED RESULTS

AMPLIFIERS	NO. OF CHOICES (CORRECT/TOTAL)	PERCENT CORRECT	PROBABILITY RESULT DUE TO CHANCE (4)
Counterpoint vs. NAD	30/48	63	0.056
Futterman vs. Hafler	28/48	58	0.156
Futterman vs. Pioneer	114/212	54	0.151
Futterman vs. Levinson	106/204	52	0.312
Hafler vs. NAD	63/128	49	—
Levinson vs. Hafler	40/84	48	—
Futterman vs. NAD	14/32	44	—
Pioneer vs. Levinson	4/16	25	—

INDIVIDUAL LISTENER DATA

LISTENER	PREDISPOSITION (1)	PREFERRED TESTING METHOD (2)	OVERALL SCORE (CORRECT/TOTAL)	PERCENT CORRECT	PROBABILITY RESULT DUE TO CHANCE (4)
1	Believer	Cable swap	13/32	41	—
2	Believer	ABX	30/48	63	0.056
3	Believer	ABX	7/16	44	—
4	Skeptic	ABX	23/48	48	—
5	Skeptic	ABX	22/48	46	—
6	Skeptic	ABX	28/48	58	0.156
7	Skeptic	ABX	23/48	48	—
8	Skeptic	ABX	25/48	52	0.443
9	Skeptic	ABX	25/48	52	0.443
10	Skeptic	ABX	27/48	56	0.235
11	Skeptic	ABX	27/48	56	0.235
12	Believer	ABX	10/16	63	0.227
13	Believer	ABX	7/12	58	0.387
14	Believer	ABX	8/16	50	—
15	Believer	ABX	9/16	56	0.402
16	Believer	ABX	10/21	48	—
17	Believer	ABX	12/21	57	0.332
18	Believer	Open	7/21	33	—
19	Believer	Cable swap	11/21	52	0.500
20	Believer	ABX	9/21	43	—
21	Believer	ABX	13/21	62	0.192
22	Believer	Cable swap	9/21	43	—
23	Believer	ABX	8/21	38	—
24	Skeptic	ABX	16/32	50	—
25	Skeptic	ABX	19/32	59	—

NOTES

Combining all results gives a total of 388 correct identifications out of 772 trials, for a success rate of 50.3 percent. The average result of random choices would be 50 percent correct.

1. Believers believe that amplifiers sound significantly different. Skeptics are skeptical of that claim.

2. Listeners chose between two methods of comparing the amplifiers: using the ABX switching box (which is double blind) or having the speaker cables unplugged from one amp and plugged into the other (which is single blind). At the end of the testing, they were asked which type they preferred (including "open" testing, where listeners know what they are listening to).

3. "Short" was under one hour. "Medium" was between one and two hours. "Long" was over two hours.

4. The probability that the results were due to chance, not to audible differences. Lower numbers indicate that the results were more likely to have been caused by audible differences. A probability figure was not calculated where the correct choices totaled 50 percent or less.

5. The Counterpoint power amplifier blew up during listening and a replacement could not be acquired in time for further tests.

To be statistically significant, any one test or combination of tests in which the score was better than 50 percent correct would have to have a probability of no more than 0.05, or one chance in twenty, meaning that scores higher than 50 percent correct would still be expected to occur one time in twenty purely by chance. Therefore, in any group of eighty tests with random overall results, one could expect to see as many as four that appeared to show an ability to tell one sound from another before the randomness was compromised. In the present project, 92 tests or combinations of tests were analyzed, but the number of apparently significant results was only three.

No single listener scored above the 0.05 significance level overall, although one came close at 0.056, and more than half had less than 50 percent correct answers. Two listeners had runs of twelve correct out of twenty choices within their overall results, which would represent a probability of 0.038. If you consider these results as meaningful in themselves, they still account for only two of the four.

In one test, involving eight listeners, the overall score showed a probability of 0.046, which represents one response better than the 0.05 level and might be considered the third expected "significant" figure.

But when the same two amplifiers were compared in later tests, the correct answers were less than 50 percent each time, and the overall score was well below the 0.05 significance level. No other pairs of amplifiers yielded results that good, either in individual tests or in combinations of tests.

Further analysis revealed that scores obtained with the ABX system were no better or worse than those from the cable-swap tests, and the scores from short and long sessions were not appreciably different. All interpretations of these results, therefore, lead to the conclusion that correct choices were made totally by chance—there were no audible differences to be heard.

But this is very far from being a definitive answer to the amplifier-sound debate. The question of test procedures still remains, for instance. There is obviously no setup that will satisfy everybody completely, and it may be significant that in the post-test questionnaire a number of listeners changed their minds and stated that the test conditions were not adequate, or admitted to reservations about them. All of these were Believers whose beliefs had not been borne out, but they can be expected to represent a large group of audiophiles who will rush to deny the significance of this series of tests.

Nevertheless, a majority of listeners, including some of the Believers, approved of the test methods both going in and coming out, the amplifiers chosen varied widely in design and price, and the sample of listeners was diverse and large, as these things go. And the results indicated no audible differences.

So for these units, under these conditions, we believe the question has been resolved. But whether or not another group of amplifiers in a different situation would yield dramatically different results is still open to question.

This is just the beginning—few scientists would place a great deal of weight on the results of a single experiment, however extensive, and particularly not an early one. The testing techniques must, and will, be refined, and a larger body of data will be collected as more such tests are performed in the years to come. Readers, and the audio industry, will no doubt be free with their comments and advice about these procedures and findings, and STEREO REVIEW welcomes that.

But for now, the evidence would seem to suggest that distinctive amplifier sounds, if they exist at all, are so minute that they form a poor basis for choosing one amplifier over another. Certainly there are still differences between amps, but we are unlikely to hear them. □

LISTENER COMMENTS

At each stage of the tests—preliminary listening to the amplifiers without direct A/B comparisons, during the controlled blind (or double-blind) comparisons, and at the end of the tests, after receiving their scores—the members of the listening panels were asked to write down their subjective comments. Following are some samples of their reactions.

OPEN LISTENING

Futtermann: Sweetest top end (no pronounced highs), greatest depth, least metallic. . . . This amp's ability to increase the sound-stage width was amazing. . . . Violins excellent, clarinet very clear, woodwinds sounded very real. . . . Percussion crisp. . . . Great ambience retrieval. . . .

Hafler: Bass instruments are full range—a little hollow—clear but not crisp enough—voice less full. . . . Bass crisp. . . . Not clear, shrill. . . . Strident. . . . Better depth of voices, less bass, some stridency. . . . Flat sound. No depth. . . . Depth good to excellent. . . . Better than NAD and Pio-

neer—some muddiness. . . . A little more alive. . . .

Levinson: Sweeter top end. . . . Better bottom response than [Futtermann] OTL—more visceral impact. . . . Depth/sound stage excellent. . . . Good clarity on voice. . . . Strings and horns clear—quiet—percussion clear. . . . Leading edge of transient is excellent. . . . Could clearly hear ambience. . . . Lots of presence. . . . Gritty background noise. . . .

NAD: High frequencies more mellow than [Futtermann]. . . . Upper-mid edginess, stridency. . . . Percussion and bass seem dull. . . . Not as much air around instruments—not as distinct, not as enjoyable as [Futtermann]. . . . Flat sound, no real depth. . . . Fuzzy—distorted. . . . Violins not as clear as [Futtermann]. . . .

Pioneer: Less top end—blurry. . . . Crescendo attack a little shrill. . . . Harsh at times. . . . Less attack—no bottom—lacks bottom on voice—less string clarity. . . . Slight edginess. . . . Very good. . . . Constricted sound, not open, more distortion. . . . Seems distorted in sections of full amplitude. . . . Could hear some ambience. . . .

BLIND COMPARISONS

Pioneer vs. Levinson: Amps sound strikingly similar.

Futtermann vs. Hafler: Futtermann is cleaner, sweeter sounding.

Hafler vs. Levinson: I'm amazed at how close they sound. . . . I admit that I can hear very little difference.

Levinson vs. Futtermann: There were small differences, but not \$10,000 worth.

CONCLUSIONS

. . . A lot of Futtermann owners are going to be upset after reading this.

. . . Unfortunately, those elite [audiophiles] that do believe in degradation due to the ABX comparator are missing the most valid way to resolve the great debate.

. . . Blind listening showed me little difference in two top-quality amps.

. . . I prefer using the ABX switcher because the plug-unplug time limits the accuracy of my comments.

. . . The source material, different types of amplifiers and ancillary equipment would appear to be capable of showing differences. However, I was hard pressed to tell the differences.

THE BANGLES



PAUL RIDER/RETNA

BY ANN FERRAR

"We set our sights very high. We wanted to have hits on AM radio, but we didn't want to sound like everybody else. We wanted to do it our way."

It was the peak of Manhattan's evening rush hour, and traffic was all but gridlocked at First Avenue and 77th Street. A large truck was parked in front of Catch a Rising Star, the small but famous club where an aspiring singer named Pat Benatar once crooned Top 40 songs. Roadies were unloading a band's equipment, and there was much more of it than you'd expect.

Soon a tour bus ground to a halt behind the truck, and when the door opened, out stepped the Bangles, a young, all-woman pop band from Los Angeles with a road map already charted for success. Riding high on their hit single *Manic Monday* and their second LP, "Different Light," the Bangles were scheduled at the club that even-

ing for a set that would be broadcast live on FM radio.

While drummer Debbi Peterson and the roadies started the sound-check, I interviewed the three other Bangles—lead guitarist Vicki Peterson (Debbi's sister), rhythm guitarist Susanna Hoffs, and bassist Michael Steele. I asked each of them how it felt to have made it to the "big time."

"Oh, yeah, we're really big," said Steele facetiously. "Just look at the size of that club." Madison Square Garden it wasn't, but then not every group of musicians in their mid-twenties gets more than an hour of airtime in the nation's toughest, and most crucial, radio market.

"Our ultimate goal when we first got together," said Vicki Peterson, "was to play at the Whiskey in L.A. That was five years ago. Then we set our sights very high. We wanted to have hits on AM radio, but we didn't want to sound like everybody else. We wanted to do it our way."

Their way bears little resemblance to bland AM fare. The Bangles' sound is closer to that of certain Top 40 groups of twenty years ago and more, groups like the Mamas and the Papas, Crosby, Stills and Nash, and, of course, that famous quartet from Liverpool whose legacy refuses to die. The Bangles molded their sound—and won an audience—with a style that closes doors at many record companies today. Steele said, "Before we started getting successful a lot of people were saying, 'I don't know about you guys. You're too "pop" to get on AOR, and you're too hard-edged for Top 40, so where are you gonna fit in?'"

SINCE the four Bangles share lead vocals, there is no single dominant presence. They emphasize full-bodied, multipart harmonies, chordal guitar arrangements, and melodies—distinct folk-music characteristics. "It's all set on top of a lot of noise," said Peterson, who writes much of the Bangles' material with Hoffs. "Loud drums, punchy bass, and distorted guitars. Underneath the pop melodies and folk-harmony structures it's really a classic rock setup."

When they cover other people's songs, which they like to do and do well, the original harmonies and guitar styles become "Bangles-ized." Peterson explained, "We'll rearrange the harmonies and favor open chords instead of intertwining



CARY GERSHOFF/REINA

linear things." Which probably explains why *Manic Monday*, written for them by Prince, bears hardly a trace of the composer's mark.

Peterson believes the Bangles' folksy guitar style may be the result of gender differences. "When the guys I know personally first picked up guitars," she said, "they did it because they wanted to learn Jimmy Page and Jimi Hendrix solos. With guys it's more of an ego thing. They're already thinking, 'I wanna be a guitar hero. I wanna meet chicks.' I learned to play lead by default because Susanna [Hoffs] is a great rhythm guitarist and she had no interest in playing lead."

And yet Hoffs and her bandmates

THE BANGLES

"When the guys I know personally first picked up guitars, they did it because they wanted to learn Jimmy Page and Jimi Hendrix solos. With guys it's more of an ego thing. They're already thinking, 'I wanna be a guitar hero. I wanna meet chicks.'" Photos: above, Vicki Peterson. Facing page: top, Susanna Hoffs, Michael Steele; middle, Vicki Peterson; bottom, Susanna Hoffs, Vicki Peterson.

have proved that teenage rock fantasies like air-guitar sessions are not solely male. Girls can, and do, play air guitar with the best of the boys. Hoffs said, "My mother [a film director] influenced me creatively. It was my experience while growing up that my best creative moments were always in collaboration with my girl friends, sitting around, making tapes, and so on. In high school I tried to get bands going with my brothers, but they never worked."

Hoffs, the Petersons, and Steele all started listening to rock music as soon as they were old enough to know how to switch on a radio. But weren't they awfully young? I mean, weren't they already tucked into bed when the Beatles appeared on *The Ed Sullivan Show*?

"We did experience the British invasion firsthand," said Peterson, "but we were too little to relate to it yet. When I was older, I was very discouraged by what was on the radio in the Seventies. I went through my older sister's record collection and rediscovered the Stones, Donovan, and the Beatles."

SURPRISINGLY, while Peterson was raiding her sister's collection, she was not captivated by the legendary girl groups of the early Sixties, even though many—the Supremes, the Shangri-Las, the Dixie Cups, the Ronettes, Martha and the Vandellas—had phenomenal hits. It was Motown's heyday, and girl groups were topping the charts, right along with the British Invasion bands.

"The girl groups didn't do the triple-header thing of writing the songs, playing the instruments, and singing great," said Steele. "They were sort of set up by some guys with an orchestra behind them. It was a different thing, so it had less of an impact on us."

The Bangles don't like to be called "a girl group" but simply a group. Peterson insists, "We could be anyone from the Beach Boys to the Troggs." And to drive home that notion, the Bangles closed their set that evening with a mean version of the Seeds' *Pushin' Too Hard*.

Just as they are unlike the Sixties girl groups, they are in a different league from such female rock contemporaries as Bananarama and the Go-Go's, a now-defunct L.A. band. "Bananarama is more of an Eighties incarnation of the Sixties," Peterson said. "They look good, they move well, they sing catchy pop songs. We knew when we were starting out

that we'd be compared to the Go-Go's, but we never took that as an insult because they're very talented, and we admire them."

It seems that the Bangles, however, have taken what the Go-Go's did several steps further. While the Go-Go's had just one lead vocalist, Belinda Carlisle, whose range was perhaps limited, the Bangles have four strong singers, and that alone has opened up wider possibilities for the evolution of their sound.

"We all have very different personas," said Hoffs. "I remember being fascinated by the Beatles and going through a John Lennon phase, then a Paul McCartney phase, listening to the songs where each of them sang lead. You've got that with the Bangles. One person's voice may appeal, or another person's style of lyrics or songwriting may interest someone else."

Well then, might the Bangles have just as well called themselves the Fab Femmes? Actually, they are no more guilty of ripping off the Beatles than any other band alive. As Steele pointed out, "You'd be hard-pressed to find a group that hasn't been influenced in one way or another by the Sixties."

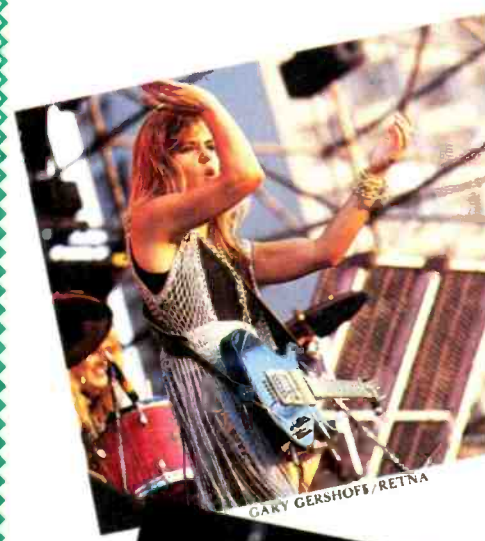
Despite the more obvious parallels, the Bangles are very much rooted in the current mentality of many college- and post-college-age people today. They know who they are and where they're going, so well that they speak of success as a "career goal." Their album "Different Light" bears the signs of slightly-too-much engineering, a textured, note-perfect style that favors palatability over freshness and clarity. And their "career goal" has been given a push by knowing the right people, like Prince and Miles Copeland, who became their manager after seeing them at a club.

Yet the Bangles seem unspoiled by the limelight, so far at least. At an outdoor concert the same week as their appearance at *Catch a Rising Star*, they were the opening act in front of thousands. The press photographers clicked at them frantically because the Bangles in their mini-skirts, stretch pants, and body suits were more photogenic than the usual garage band.

But suddenly, after just a couple of songs, all the photographers were chased away. And when they were gone, behind me I overheard a bouncer tell a male fan who'd been gaping at the stage, "Don't stare. You'll mess the band up." □



CARY GERSHOFF/RETNA



CARY GERSHOFF/RETNA



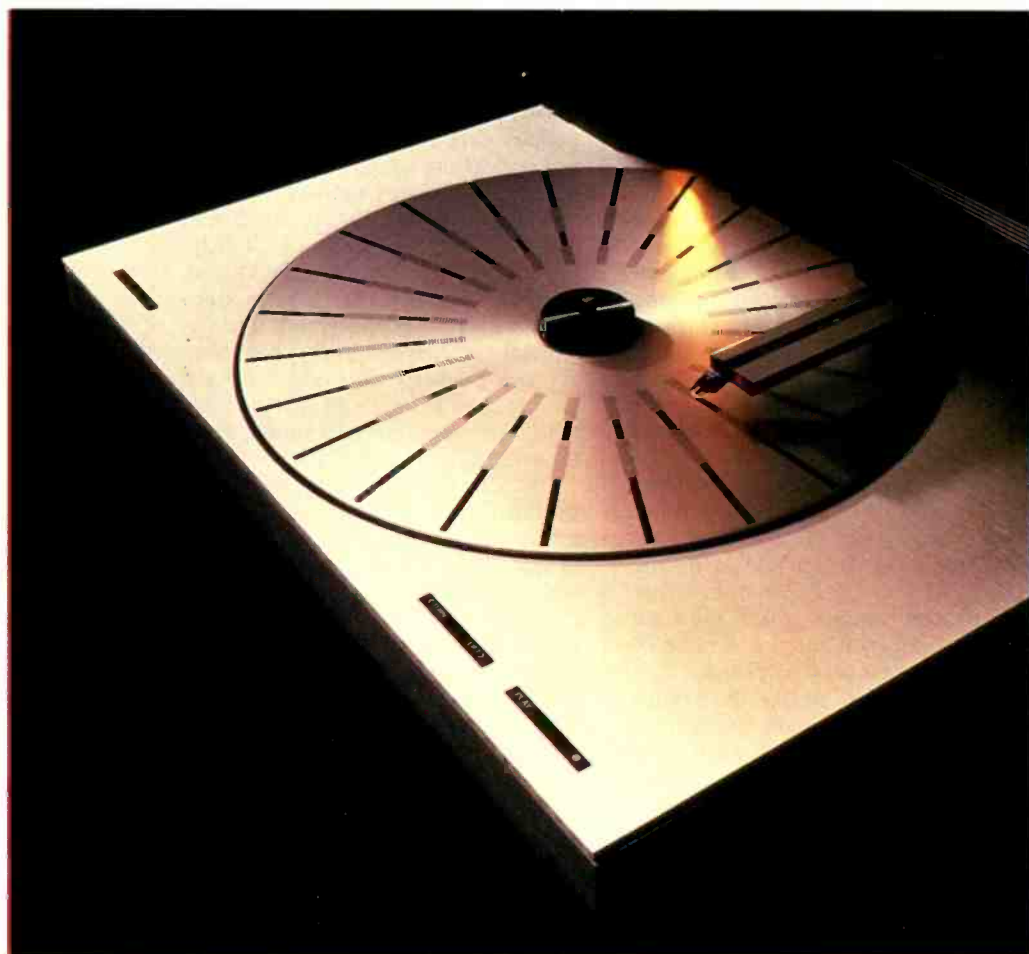
TOM REUSCHE



by Michael Smolen

CHOOSING A TURNTABLE

The LP record is still outselling the compact disc—and there has probably never been a better time to shop for a new turntable.



B&O.....
Bang & Olufsen's belt-driven Beogram RX2 incorporates a new pendulum-suspended chassis with greater mass that increases protection from external vibration. Price: \$199.

WHILE many hi-fi enthusiasts are being led to believe that the compact disc has signaled the death of the record player, the turntable is still alive and spinning. In fact, the CD has *helped* the turntable industry by forcing manufacturers to build better products to compete with the incredible sound quality of the compact disc. The beneficiary is the consumer, and the time has never been more ripe to buy a high-quality turntable for a relatively low price.

There are well over fifty manufacturers making high-quality turntables, and the list of options is as long as ever. You must choose between different drive systems, different tonearms, and different degrees of automated performance. Physical make-up is also an option: some turntables now work vertically, some offer front-loading drawers, and some can even be carried around and used with headphones.

Without a doubt, there are far more vinyl records being pressed than compact discs, and they still cost about half the price. And if your taste in music lies anywhere out of the mainstream, the chances of finding compact discs with your kind of music on them may be slim or nonexistent. So whether you're out to buy a \$49 changer or a \$2,500 laser turntable, you should know your options.

Drive Systems

The principal differences in turntable drive systems have to do with how the motor's speed is regulated, how its torque is coupled to the platter, and what means are used to suppress unwanted vibration. Not long ago, a turntable's electronics consisted of an AC power cord, a motor, and a switch to turn it on and off. Its mechanics featured bearings, pulleys, a rubber belt to rotate the platter, and whatever springs, gears, and levers were needed to provide various levels of automation. Many of today's highest-priced turntables still fit that description, although progress has also introduced Hall-effect magnetic sensors, phase-locked-loop (PLL) feedback control, quartz-crystal oscillators, optical servos, and CMOS logic integrated circuits.

With all this in mind, however, there are still only two ways to transfer the motor's torque to the platter: *belt drive* or *direct drive*. In a belt-drive system, a motor spin-



SONY.....
A fully automatic, linear-tracking turntable, the Sony PS-LX520 has an anti-resonance suspension to dampen acoustical and mechanical vibrations and a platter that is directly coupled to a quartz-servo DC motor for low wow-and-flutter. Its start, stop, and cueing functions can be operated remotely from any Sony receiver using Sony's Unicommander remote control. Price: \$210.

TECHNICS.....
Beneath the spectacular finish of Technics's SL-MA1 are some equally impressive mechanics. Combining a conventional static-balanced tonearm with automated microprocessor control, the Technics Electronic Drive Tonearm system has an optical sensor that detects the tonearm's position, then passes the data on to a microcomputer that controls its movement. Price: \$325.

ning at several hundred rpm is mounted in the turntable's base and is connected to the platter by means of a pulley and a thin rubber belt. Usually the belt runs around an inner platter that has a circumference precisely nine times that of the pulley; this ratio provides the required step-down of speed from a typical 300-rpm motor to the $33\frac{1}{3}$ -rpm platter.

The advantages of a belt-drive system are its low cost (the simplicity of the design permits manufacturing economies without a sacrifice in performance), its low rumble level (because the belt serves as an efficient mechanical filter to prevent the motor's vibration from reaching the platter), and the ease with which good isolation from external vibration can be obtained (the platter can be mounted separately within the base). The disadvantages of a belt-drive system are its slow start-up time, the chance for the belt to slip if there is any drag on the platter, and its susceptibility to speed inaccuracies.

In a direct-drive system the platter rests directly on the motor. The turntable's spindle is actually the motor's main shaft, so the motor must turn at exactly $33\frac{1}{3}$ rpm. Direct-drive turntables usually employ electronic circuitry for speed regulation rather than depending on power-line frequency. This circuitry allows for refinements such as a quartz-crystal oscillator for absolutely exact speed, variable pitch control for fine-tuning the speed, or a servo system to measure platter speed and automatically correct any variations.

The advantages of direct-drive systems are their ability to get up to speed almost instantaneously (that's why they are universally used by radio stations), precise speed control despite any introduced drag (such as from cleaning devices), and design freedom. Direct-drive systems allow manufacturers to design turntables that stand vertically on edge, "clam-shell" portable players that are actually smaller than an LP, and mini-turntables with slide-out drawers.

The direct-drive system also has its disadvantages. Without a belt to isolate the vibration from the platter, a direct-drive system requires sophisticated engineering to prevent the motor from delivering its torque in a series of pulses, or "cogging," rather than a smooth flow of power. Cogging and its associated vibration can be picked up as rumble by the



DENON.....

In Denon's DP-47F, low-frequency resonance caused by the cartridge compliance and the effective tonearm mass is electronically damped both horizontally and vertically, effectively suppressing crosstalk and intermodulation distortion. The turntable also features a record-size detector and an automatic speed selector. Price: \$400.



YAMAHA.....

Yamaha's PF-800 utilizes an exclusive twin-pipe, straight-line tonearm said to insure full stereo separation. Dynamic damping isolates the massive counterweight from the tonearm and prevents resonance and vibration transmission. The record mat forms an air pocket near the outer edge, and when the center clamp, which also serves as the 45-rpm spindle, is put into place, the disc and mat are securely held to each other. Price: \$499.

REVOX.....

The remote-controlled, linear-tracking Revox B291 automatically positions the stylus in the lead-in groove of the record. In addition, it has variable-speed capability (± 10 percent) and a "disco-start" feature that makes it possible to stop the platter motor while the cartridge is lowered. Price: \$725.



LUXMAN.....

The Luxman P-100 belt-drive turntable's straight-line, low-mass tonearm uses high-grade needle bearings for very low friction and the ability to move freely in any direction for total cartridge compatibility. An FG-type servomotor and a precision-balanced platter minimize rumble and noise. Price: \$250.

ACOUSTIC RESEARCH

The AR ES-1 uses a three-point suspension system and a drive belt to isolate the platter and cartridge from external vibrations and mechanical noise. Its platter weighs 3.9 pounds, for low wow-and-flutter, and sits on a noise-free sapphire thrust bearing. A twenty-four-pole synchronous motor drives the precision-ground belt, and the whole suspension has been tuned for excellent sound quality. Price: \$475 with arm, \$350 without arm.



HARMAN KARDON

A unique sine-wave-driven AC motor system was designed for the Harman Kardon T65C. It is driven by a steady, smooth force rather than conventional DC pulses, turning the platter with pure, simple harmonic motion. A lateral balance weight cancels any imbalance created by the offset angle of the cartridge, and a capacitance-trim control optimizes cartridge performance. Price: \$575.



ADS

You've heard of three-motor cassette decks—how about a three-motor turntable? The ADS P4 employs a direct-drive, brushless DC motor in a quartz-controlled, phase-locked loop to spin the platter, a linear motor dedicated to tonearm indexing, and a cueing motor. The tonearm geometry of the P4 is claimed to give it a mean tracking error lower than most linear-tracking tonearms. Price: \$495.

stylus. In practice, this means that good direct-drive motors are expensive to manufacture, and direct-drive turntables therefore tend to cost more than belt-drive ones. Also, because few direct-drive turntables are designed with a highly compliant suspension to isolate the platter from external vibrations, on average they are more susceptible to acoustic feedback than a floating-subchassis belt-drive turntable.

Regardless of their theoretical advantages and disadvantages, both belt and direct drives work so well in most turntables that the platter drive system has no direct effect on sonic performance. The most important practical difference among turntables is not the drive system itself but the methods taken to control and suppress unwanted vibration from internal and external sources. When shopping, a simple way to test for the vibration resistance of any turntable is to turn the amplifier's volume control slightly higher than normal, place the stylus in the groove of a record, switch the turntable off to stop rotation, and lightly tap on the shelf it is resting on. The weaker and briefer the resulting "thud" from the speakers, the better the platter's isolation from external vibration.

Tonearms

The tonearm's job is in principle a simple one: to hold the cartridge in position in the groove with just the right downward force on the stylus and to move the cartridge across the record in response to the groove's inward spiral.

Although there are a number of esoteric tonearms available, the choice for consumers generally lies between a pivoted arm, sometimes called an S-type or J-type because of its shape, and a straight-line-tracking (SLT) arm, sometimes called a "linear" or "radial" type. The pivoted arm is the more common (and generally less expensive) of the two, and little of its basic design has changed over the years.

The SLT arm moves in a straight line across the radius of a record. The front end follows the stylus in the groove, while the back end rides either on a low-friction bearing or (more commonly) on a carriage driven by a servo-controlled motor. Once very expensive, SLT's now can be found on turntables costing as little as \$100, although current separate, add-on SLT arms can cost well over \$1,000.

As with drive systems, whether



**Before we
broke the rules,
we wrote the rule book.**

Anyone can build a revolutionary speaker. But try and find one that sounds like music. You'll end up listening to the MGC-1 from Acoustic Research. We're the company responsible for most of the principles that define a modern loudspeaker: Acoustic Suspension bass loading, the dome tweeter, and the long-throw woofer.

The MGC-1 takes this technology one step further. Angled away from the listener, a second set of drivers

produces electronically time-delayed ambience. Does it work? Ask Stereophile's Anthony H. Cordesman.* He called it "the most musically convincing illusion of the ambience of a live performance of any speaker to date." And we couldn't agree more with his conclusion: "any audiophile owes it to him or herself to hear it." To hear it for yourself, write to us.

AR
ACOUSTIC
RESEARCH

Research Series

MASTERPIECE:

A work of notable excellence.



Hitachi introduces electronics so technologically refined, they offer something remarkable. Reality. Sound so true, you'll never miss a note.

Like our new CD player with built-in dual cassette deck and AM/FM Digital Receiver. Compact disc performance and tape versatility, together at last. TV monitors with



broadcast stereo reception that rival the finest high fidelity systems. And Hi-Fi/HQ video recorders so incredibly advanced, they'll shock your senses.

If you're ready to appreciate the fine art of home entertainment, make a sound investment in quality. Make it a masterpiece.

 **HITACHI**

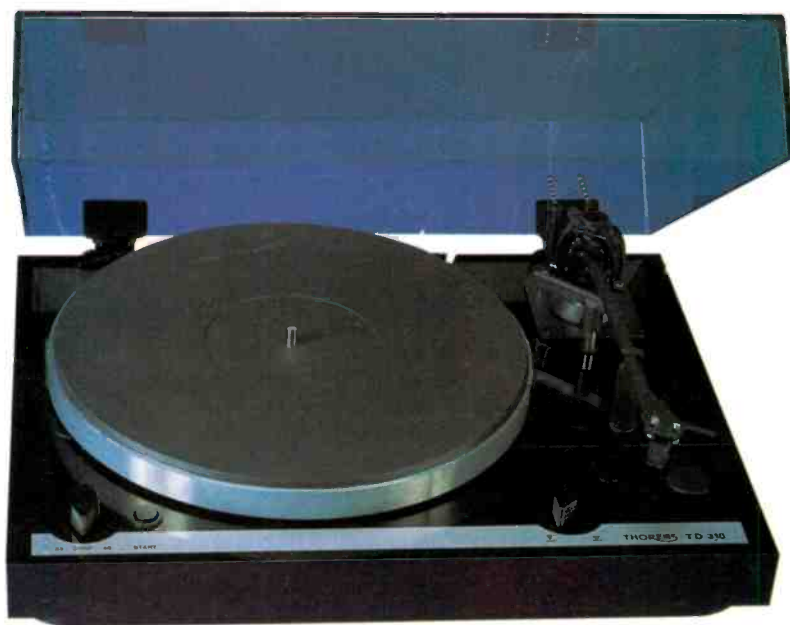
A World Leader in Technology

CIRCLE NO. 13 ON READER SERVICE CARD



HEYBROOK

Superb craftsmanship and sonic excellence through simplicity of design make the British-made Heybrook TT2 an outstanding performer in its price class. The hand-assembled turntable features a belt-drive, two-speed synchronous motor, a massive two-piece platter, an adjustable three-point spring-suspension cast-aluminum chassis, and a real walnut finish. Price: \$480 with arm, \$398 without arm.



THORENS

The dual chassis of the Thorens TD 318 is made of aluminum material, which absorbs resonances and results in a cleaner, more precise sound. The first chassis carries the motor and controls, while the second, which is isolated by three adjustable leaf springs, carries the platter and tonearm. An acceleration clutch prevents the belt from stretching, thus reducing start-up time and eliminating chassis vibration. Price: \$350.

there are any sonic differences between the two types of tonearms is open to speculation. Audiophiles are fond of claiming that an SLT arm sounds better, with tighter bass, a more stable stereo image, improved tracking, and greater immunity to warps and vibrations. The decision, as with most other hi-fi components, lies with you. One thing is certain, however: with an SLT arm controlled by a servo, it's much easier to add turntable convenience features such as programmable selection of individual cuts.

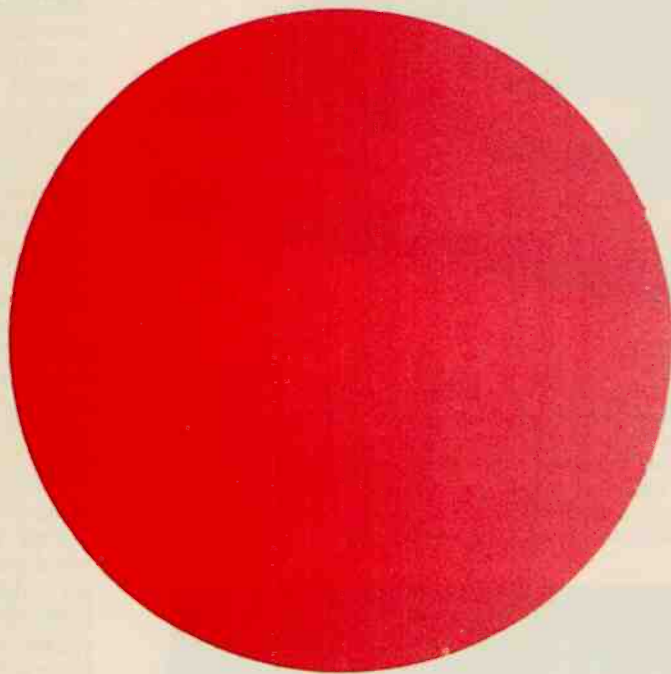
Turntables range in price roughly from \$100 to upwards of \$15,000. Good, affordable models are available from many companies, including ADC, Akai, Dual, Harman Kardon, JVC, Kenwood, Marantz, Nikko, Onkyo, Parasound, Pioneer, Realistic, Sansui, Sherwood, Sony, and Vector Research. If you're still a vinyl maniac and are *not* on a budget, topflight turntables that can rival the sound of a CD can be purchased from ADS, Alphason, AR, Bang & Olufsen, Mitchell A. Cotter, Denon, EMT-Franz, Entec, Heybrook, Kyocera, Linn, Luxman, Merrill Audio, J. A. Mitchell, Micro Seiki, MRM Audio, Oracle, Pink Triangle, Revolver, Revox, Sonographe, Sota, Technics, Thorens, VPI, C. J. Walker, Well-Tempered Lab, Win Research, and Yamaha.

If you take a look, you'll find that there are actually just as many (probably more) options available when it comes to turntables as there are with compact disc players. With turntables, besides the differences in drive systems and tonearms (and the number of arms found on a single turntable), there are differences in substructures, isolation methods, size, weight, chassis design, and programming options. Don't be overwhelmed, though. Once you've made up your mind, just remember how many more recordings are available on vinyl than on compact disc. And besides, audio purists are still convinced that the vinyl record sounds better (more "natural") than the CD. □



JAPAN

AUDIO FAIR



A special report from Tokyo
by Bryan Harrell

THE big news at the 1986 Japan Audio Fair can be summed up in three letters: DAT, which stands for digital audio tape. Though much has been reported on DAT already, the fair was the Japanese public's first chance actually to see equipment in this exciting new record/playback digital audio format. Consequently, attendance was up 12 percent at this year's fair, with some 317,559 attendees flooding through the turnstiles. According to Sho Nagasawa, secretary general of the Japan Audio Society, which sponsors the fair, "From an extensive survey of fairgoers, most said they came specifically to see DAT." But apart from DAT, there wasn't much new under the rising sun.

Visitors to the fair got to see what they came for, as fifteen major audio manufacturers proudly displayed DAT decks and five companies displayed DAT blank tape. Though fairgoers were able to get their hands on actual working models and could see any number of technical exhibits and explanations about DAT, the Japanese manufacturers were tight-lipped about when DAT decks will be put on sale—and at what price.

Over at the larger Electronics Show, taking up the other nine pavilions at the Harumi International Exposition Grounds, a representative from Canon said his company was currently supplying standard 30-mm DAT heads to several un-





named audio manufacturers, and he predicted prices of 300,000 to 400,000 yen (\$1,960 to \$2,615) for first-generation DAT machines. He also said Canon was working on a smaller 15-mm DAT rotating head that will likely find use in portables. (At the time this report was written, the exchange rate of the yen was 153 to the dollar.)

From what I could see at the audio fair, however, DAT is boxed and ready to go. Though all DAT decks and blank tapes were marked "prototype" and "for exhibit," most of them looked like production units, right down to the model numbers printed on the front panels. DAT blank tapes were snug in beautifully printed cellophane wrappers, while Alpine/Luxman went even further with its LV-109 integrated amplifier, which features a built-in digital-to-analog (D/A) converter to allow direct input of digital signals at DAT's 32-kHz and 48-kHz frequencies.

It's well known in industry circles that DAT technology has been ready for years, and that DAT decks could have been introduced as early as mid-1985. But at last year's fair, DAT was mysteriously absent. Blame was placed on the Japanese retailers, who apparently urged the industry not even to show DAT prototypes for fear that consumers would delay purchase of merchandise already on the shelves in favor of new DAT equipment.

This year, the Japanese industry is pointing the finger at Europe. Apparently Philips is putting pressure on Japanese manufacturers to hold off on DAT, worried that the release of component DAT decks will cut into the now strong sales of compact discs and CD players. The Japanese press counters that Europe isn't ready for DAT production and is worried about another flood of new audio products from Japan. And on the sidelines, artist copyright associations in Japan and abroad are concerned about royalty issues stemming from the possibility that DAT will bring about a new breed of high-tech software pirates.

Despite the continuing controversy, Japanese audio manufacturers don't want to wait another day in getting DAT on the market. Aiwa president Heitaro Nakajima, head of the DAT industry standards committee and one of the key Japanese developers in the commercialization of the CD format, feels that DAT will actually encourage CD sales, with DAT and CD growing

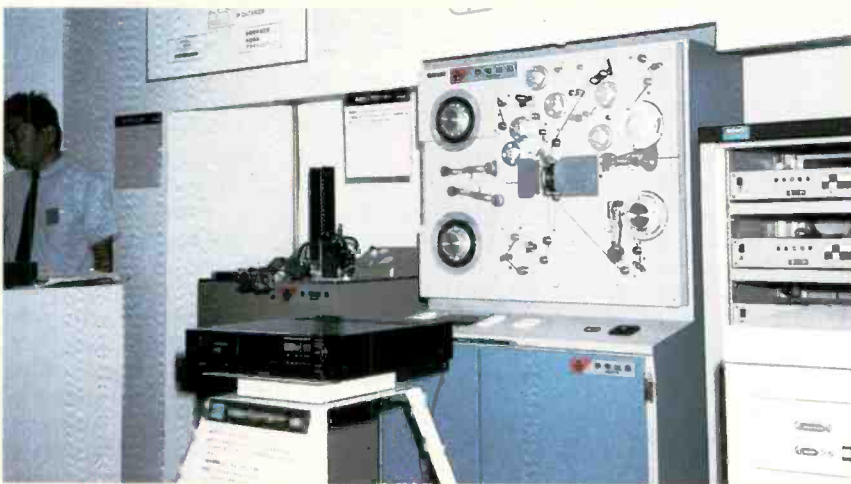
ILLUSTRATIONS: LEAD, BOB SCOTT; SPOTS, JOO CHUNG



Rear entrance of Harumi Fairgrounds, site of the Audio Fair.



Astonishing neon effects from the Marantz display.



Sony's DAT display (it says "display prototype" in Japanese).





together in harmony. Other industry representatives share his opinion that DAT will be to CD

what the conventional audio cassette is to the analog LP.

Japan's neighbors may be another reason Japanese manufacturers are anxious to market DAT equipment. Sinbang Electronics of South Korea was a new face at this year's fair, displaying its Haitai line of components in a modest booth in the L Pavilion. According to Joong-Ho Lee, general manager of marketing and purchasing, Sinbang has the lowest price on CD players for sale to manufacturers, though he declined to give any figures. The Japanese, by going into higher-tech DAT equipment and the like, will enjoy some cushion of sales comfort as their low-production-cost neighbors slug it out with the slim profit margins of lower-priced VCR's, CD players, and one-brand systems.

While the DAT affair proves that business is stronger than technology, it's still not clear how much longer the consumer will have to wait. Rumors are now circulating that DAT decks will finally be marketed this spring. Hard pressed by the fattening yen, Japanese audio manufacturers are in trouble and desperately need to bolster declining profits by recouping their expenses in DAT development.

The Yen Also Rises

In the U.S. and other major export markets, the prices of Japanese goods have been only nominally marked up in comparison with the yen's catastrophic rise. In keeping prices down, the Japanese audio manufacturers are swallowing substantial losses, and will be for a few years to come, in hopes of hanging on to their shares in competitive overseas markets so painstakingly developed over the last two decades. Here in the land of the rising sun, with the yen at high noon, many Japanese audio manufacturers are leaving town to set up production facilities in neighboring countries. One example is Aiwa, which is transferring a major portion of production to its Singapore factory.

DAT on Parade

Sony, expected by many to be the first to market DAT, showed three interesting DAT models. The DAT-77 component deck looked like another addition to

Sony's ES Series, while the car audio DAT-128 featured DIN dimensions. Sony also showed the DAT-7 portable, hands down the most interesting DAT unit at the fair. Apparently intended for professional on-site recording, the DAT-7 featured a wired remote-control module with a large liquid-crystal display. Aiwa also showed a portable DAT recorder, the DAT-2000 prototype, which was slightly smaller than a paperback book. (Apparently both Aiwa and Sony are mindful of the fact that the CD took off in Japan only after the introduction of hand-held portables.)

Kenwood displayed its L-Z9 DAT component deck, along with a special car-like booth containing the automotive DAT-10. The Alpine/Luxman exhibit also included a DAT car deck, the DIN-size Model 5700, and again featured the red Italian Lamborghini Countach that is the company's car stereo "flagship."

The Technics SV-D1000, equipped with separate A/D and D/A converters for each channel, three motors (two direct-drive), and an automatic programming function, was said to have a search speed two hundred times normal. The SV-D1000 also has a wireless remote control with a ten-key pad for programming. Sansui's DR-1000 was equipped with search programming and a ten-key pad on the front panel, while Teac's ZA-5000 DAT deck boasted direct drive, front-panel selection for pre-emphasis, a digital source monitor, and a digital copy function. Among other DAT models shown were the Hitachi DAT-9000, with a front-panel digital in/out selector, and the NEC DAT-X01, which has an analog/digital input switch.

CD Finally Catches Up

In the first half of this year, CD's edged out LP records in Japan in terms of sales volume: 36.69 billion yen vs. 36.34 billion yen. Compact disc production is up 114 percent this year, while LP output is down 23 percent. In 1984, LP's outsold CD's 9 to 1, in 1985 the ratio was 5.5 to 1. The CD is even stronger now, particularly in classical music, where the ratio is 7 to 3. Although some 43,000 LP titles still remain in the catalog, CBS-Sony announced in September that it will withdraw from the market 20 percent of its current analog recordings, totaling some 3,662 LP, single, and prerecorded-cassette titles.

It is estimated that there will be a CD player in 10 percent of Japanese residences by the end of this year. Industry-wide CD production capacity in Japan is now nearing 10 million discs per month, while more than 10,000 CD titles are currently available.

Let Your Lasers Do the Walking

One of those new CD titles must be seen to be believed. Designed to show data on a computer rather than play music on an audio system, this CD version of the Tokyo business telephone directory contains the complete telephone listings of 1.1 million Tokyo businesses. In its analog form the directory is a 5½-inch stack of four books totaling approximately 4,000 pages. This CD-ROM (read-only memory) was recently developed by Dai Nippon Printing Co., Ltd. for Nippon Telegraph and Telephone Corporation. The first Dai Nippon development was the three-volume *Dictionary of Science and Technology*. The significant potential of this application is important news for CD enthusiasts, as it will further contribute to the continued presence of the CD format.

CD Players

While DAT waits in the wings, CD players are a hot market item, and many new versions with marginal improvements were on display.

Sony did it again. The new D-100 Discman (49,800 yen, or \$325, in white or black) is only 19.8 mm thick, compared to 27 mm for the D-50MkII. In actual use, however, it's somewhat thicker because a flat battery pack is needed. Sony calls the new CDP-C10 (110,000 yen, or \$720) a "CD juke" because it holds a ten-disc magazine, apparently sharing the same mechanism as the CDX-J10 car CD changer. (Again, these approximate prices are based on an exchange rate of 153 yen to the dollar.)

Also new are Sony's CDP-555ESD (150,000 yen, or \$980) and CDP-333ESD (89,800 yen, \$585), both with digital outputs and full-blown programming systems, along with the CDP-222ES (66,800 yen, \$435), CDP-510 (49,800 yen, \$325), and the CDP-M30 (39,800 yen, \$260). Another novel Sony CD player, incorporated into the V505 one-brand system (125,000 yen, \$815), uses a large slide-out tray the width of the component that holds





five CD's in separate sections (sort of like cookies on a baking sheet) for sequential playback.

Pioneer's PD-703LTD (69,800 yen, \$455) features a "honeycomb and copper-plated chassis," a digital filter, and a separate power supply for its D/A converters. And Pioneer's CLD-7 (158,000 yen, \$105) also plays LaserDiscs.

Sansui's CD-Alpha 707 puts the optical pickup and spindle motor on a separate chassis, isolated by resonance dampers and stainless-steel-coil springs. Separate power supplies are used for the servo, digital, and analog sections. Incidentally, photos of Brooke Shields dominated the Sansui exhibit, as she's just been signed on for Sansui's advertising in Japan.

JVC's XL-M700 (89,000 yen, \$580) holds seven CD's, one in an independent tray and six in a special cartridge, making possible programmable multi-disc playback. The Technics SL-P1200 (160,000 yen, \$1,045) is a large desk-type top-loading model with remote control and looks much like the professional model SL-P50 (300,000 yen, \$1,960). The new ultra-compact SL-XP5 programmable portable (49,800 yen, \$325) and RX-FD80 boom box with CD player (74,800 yen, \$490) were also on display. In car CD, Technics showed the programmable DP-5 (128,000 yen, \$835) and DP-1 (94,000 yen, \$615).

The aptly named CDP Quattro from Stax incorporates four-times oversampling and long stilt-like feet to help block out external vibration. Teac introduced seven new CD players, most interesting of which were the two that incorporate auto-reverse cassette mechanisms, the AD-5 (99,800 yen, \$650) and the remote-controlled AD-7 (119,000 yen, \$775) for direct dubbing from CD to cassette. Edging the price barrier was the Teac PD-250 (39,800 yen, \$260), a programmable CD player that includes a wireless remote control.

Alpine/Luxman's conservatively styled D-103 (65,000 yen, \$425), in the Brid series, features separate power supplies for its digital and analog sections as well as the company's S.T.A.R. (Signal Transit for Accurate Response) circuitry in the amplifier section, which is said to improve performance by supplying power directly to each stage.

In Onkyo's C-700 (138,000 yen, \$900), only six optical fibers connect the digital and analog sections,



New on the horizon: Haitai brand products from South Korea.



Onkyo's exhibit highlighted its fiber-optics technology.



The Technics DAT exhibit drew a good response from fairgoers.





while the C-500X (89,800 yen, \$585) incorporates six specially designed "optic modules" for "opti-coupling." The C-500X also uses a contactless light-sensitive power switch to "symbolize" Onkyo's light-transmission technology.

The Hitachi DA-006 (69,800 yen, \$455) incorporates a "vibration cut" metal chassis to damp out unwanted resonance. With a ten-key pad on the front panel, the DA-006 also comes with a twenty-key remote control. Hitachi's 121-stage five-times oversampling digital filters are used in its DAD-005 CD player (99,800 yen, \$652) and two D/A converter/CD player separates, the DAD-003 (180,000 yen, \$1,175) and the DAD-001 (600,000 yen, or \$3,920, on special order).

Sansui showed the car audio CD-X500 (78,000 yen, \$510), which features sixteen-selection random-access playback. And Yamaha's new CLV-1 is a low-priced (138,000 yen, \$900) LaserDisc player that also plays CD's.

Cassette Decks

Development and release of conventional cassette decks has slowed to a trickle, presumably because manufacturers have been busy readying DAT decks for the market. There were a few new models of note at the show, however.

Sony's new three-head TC-K555ESX (105,000 yen, or \$685, with wireless remote control) incorporates a new chassis layout that is said to reduce interference between the control, transport, and audio sections. The TC-K555ESX also features manual bias and recording-level calibration and three high-frequency equalization settings.

Dolby HX Professional circuitry is included in Teac's new V-770 three-head deck (69,800 yen, \$455) and in the Technics VS-B80R auto-reverse deck (79,800 yen, \$520), which features Technics Class AA circuitry in the amplifier section. Alpine/Luxman's three-head K-109 (160,000 yen, \$1,045) has a two-position metal-tape switch for both 70- and 50-microsecond equalization, along with separate manual bias and recording-level calibration controls for the left and right channels. The austere styled K-106 cassette deck (75,000 yen, \$490) incorporates both Dolby B and Dolby C as well as the dbx noise-reduction system.

The trend in double cassette decks is high-tech. Teac's new quick-reverse W-660R (69,800 yen, \$455) and unidirectional W-460C (59,800 yen, \$390) both feature random-program-dubbing and continuous-playback functions. The trend is best exemplified, though, by Sony's new TC-WR950 (95,000 yen, \$620), which boasts recording capability and LC-OFC LaserAmorphous heads in both decks, along with more buttons and functions than you can shake its wireless remote control at.

Other interesting double decks with wireless remote control were the National RX-FW67 (49,800 yen, \$325) and RX-FW57 (45,800 yen, \$300) stereo radio/cassette recorders from Matsushita. The palm-sized remote control operates the



Sayonara! Closing-time bows from attendants at Mitsubishi display.

record/play deck and has two large holes to allow storing it inside the cassette well when not in use.

Speakers

There was nothing much new in the area of speakers, as manufacturers scramble to adopt ever lighter and stiffer high-tech diaphragm materials, claiming sound improvements that prove to be both marginal and debatable. A refreshing difference was provided by the Daiken Wood Speaker from Daiken Kogyo, an Osaka-based manufacturer of housing materials. Priced at 1,000,000 yen (\$6,535) a pair, the speakers use acetylated wood diaphragms that are said to resist deterioration from insects and mold. Despite their cheerfully outdated 1950's look, they sounded pretty good in the demonstration.

Electronics

Some of the most impressive equipment in the electronics category was Yamaha's new 10000 Series

of big beautiful components with price tags to match. They were headed up by the impressive CX-10000 control amplifier (800,000 yen, \$5,230), which appears to incorporate DSP-1 sound-processor circuitry, complete with sixteen ambience settings. Also in the series are the MX-10000 power amplifier (800,000 yen, \$5,230), and the CDX-10000 CD player (400,000 yen, \$2,615).

Elsewhere in this area, the mood was definitely digital, giving rise to a lot of high-end tweak talk for some mid-fi amplifiers. An amusing new trend is the creeping spread of small paragraphs in English printed right on the front panels! Rather than go into too much detail about this year's new amplifiers, I'll let some of them speak for themselves.

"The class AA amplifier is equipped with four amplifiers, two voltage control class A amps and two current control drive amps, resulting in extremely low distortion and wide dynamic range."—the Technics SU-V80 (79,800 yen, \$520), which is available in what the manufacturer calls "accurate black" and features LED indicators for voltage control and output drive.

"Ultimate Fidelity Stereo Component By Pioneer"—the Pioneer C-90 preamp (170,000 yen, \$1,110), which uses three separate power supplies, and the M-90 power amp (200,000 yen, \$1,305), which uses two separate power supplies in its dual-mono construction.

The front panel of Alpine/Luxman's new LV-109 integrated amp (195,000 yen, \$1,275) is particularly verbose: "MOS-FET voltage controlled amplifier circuitry and S.T.A.R. circuit patterns guarantee precise, quality sound. The gigantic continuous power and large dynamic power amplifier easily reproduces music peaks of digital sound sources. . . . A built-in Digital-to-Analogue converter accepts direct digital output signals from CD players, DAT recorders and DBS tuners. An optimum sampling frequency is automatically selected per input source selection." The LV-109 also has digital direct and line straight switches. However, it doesn't have phono inputs, so Alpine/Luxman offers the LE-109 (80,000 yen, \$525) as an add-on for people who wish to use a turntable with the LV-109. Two other amplifiers in Alpine/Luxman's Brid se-

(Continued on page 152)



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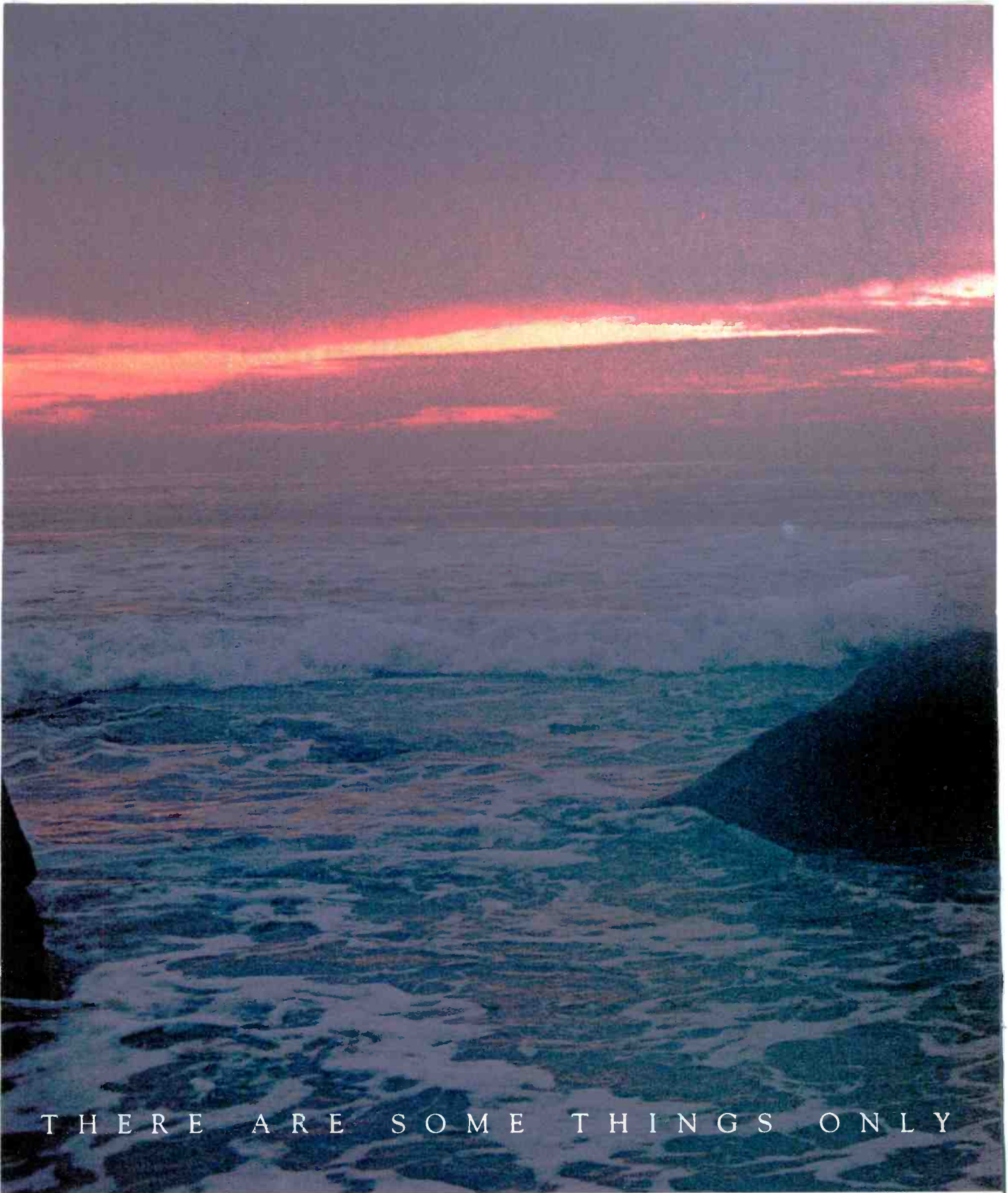
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*260 watts RMS per channel, both channels driven into 8 ohms, 20 to 20,000 Hz at no more than 0.003% Total Harmonic Distortion.



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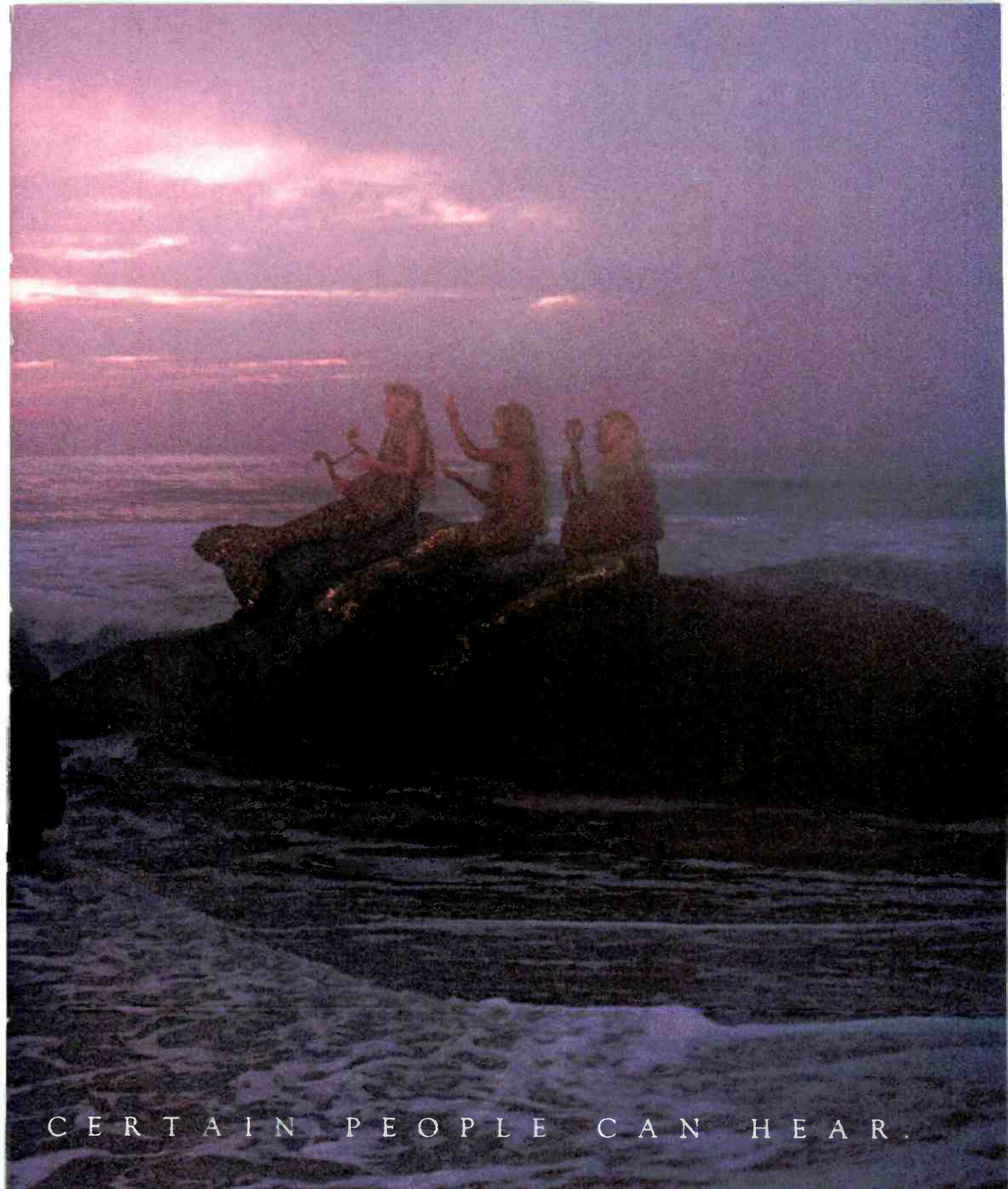


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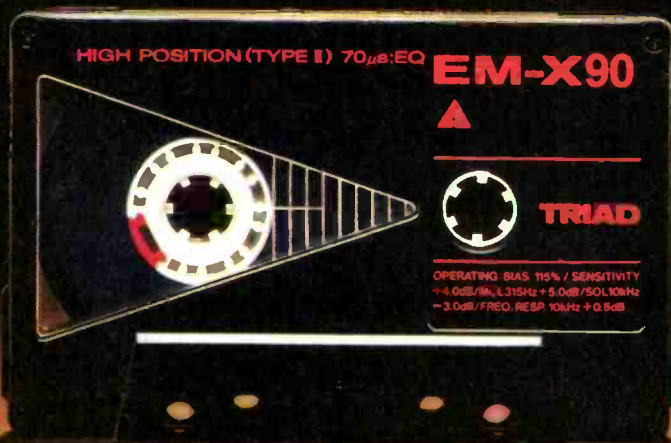
dealer, call 1-800-ALTEC 88. (In PA, 717-296-HIFI). In Canada call 416-496-0587 or write 265 Hood Road, Markham, Ontario, Canada L3R 4N3.

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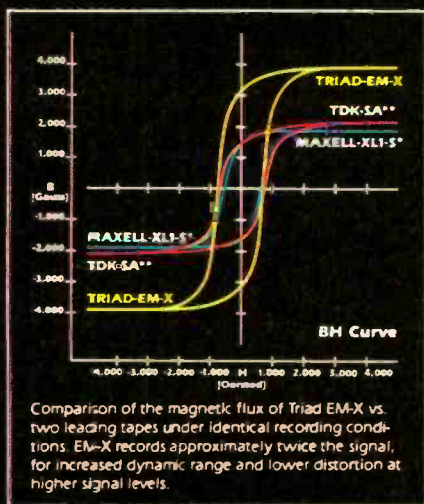
TAPE IT TO THE LIMIT.



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The digital age has pushed recorded sound to the limit. Now Triad Digital Transcription Tape takes you there, too. It's the first totally new tape for your deck in a decade.

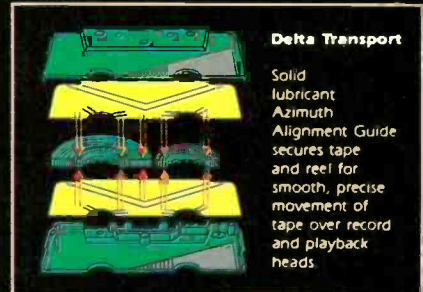
Triad's exclusive, patented metal tape formulations deliver maximum performance with a composition of exceptionally dense, uniform ferrous hydroxide particles. Their increased surface area holds more signal with less distortion than previously possible.

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A revolutionary tape deserves a revolutionary tape housing. Triad's exclusive built-in Azimuth Alignment Guide guarantees precise tape-to-head contact for minimal tape skewing, extended



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Triad MG-X's high retentivity and coercivity are optimum for metal position transcription of digital material. For true metal quality in the high (CrO₂) position, the EM-X's reduced coercivity and controlled retentivity deliver more high frequency headroom and dynamic signal with higher overload levels than any other Type II tape. And for the widest dynamic range with the flattest frequency response in the normal position, it's the cobalt-doped Triad F-X.

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Stereo Review's critics choose the outstanding current releases

CZIFFRA'S INCOMPARABLE LISZT

DURING all the to-do around the Liszt centenary last year, and particularly in so much that was written about recordings of Liszt's piano music, many of us seemed to lose sight of one of the towering figures among today's interpreters of that repertoire. It is understandable, perhaps, because Georges Cziffra has had no presence in our country for some time, either in person or on records. (The only item in domestic circulation in the last few years was a Philips cassette of his Chopin waltzes.) Recently, however, EMI's French affiliate issued on LP a powerful reminder of Cziffra's Lisztian stature (it will be released

here on CD by Angel). It is not a restoration of earlier recordings but a new collection, recorded in 1985 and in the centennial year itself.

In terms of repertoire, the program is an intriguing one, balancing the familiar and the unfamiliar, bravura pieces with poetic ones. In terms of performance, it is on that heady level where an artist defines his own standards and renders comparisons pointless. The sequence does not build to the *Mephisto Waltz* No. 1 but opens with it, in a realization that is both so genuinely exciting and so meticulously detailed that you become aware, as if for the first time, of how specifically and utterly pianistic the piece is after all, without any orchestral echoes. The two other waltz pieces—the sixth of the nine *Valses caprices* on Schubert material that make up the *Soirées de Vienne* and the grandly salonish *Valse impromptu* refined from two of Liszt's own earlier pieces—exude an aristocratic charm and tasteful affection for the respective models that can make the listener forget all about an interpretive middleman.

Separating the big waltz from the two smaller ones is a subtle and poetic account of *Les Jeux d'eau à la Villa d'Este*, and side two opens with a quite electrifying performance of the second of the two St. Francis Legends, which Cziffra now takes a bit more broadly than in his Philips recording of the Sixties, thereby enhancing the majesty of the big climax and the conclusion. The *Transcendental Etudes* Nos. 12 and 9 are invested with similar levels of drama and poetry. Having these pieces in such a collection rather than as parts of the larger works to which they belong may not be the most convenient approach for collectors who want the complete *Années* and *Transcendental Etudes* without duplications, but I can't imagine anyone resisting Cziffra's stunning performances. And he brings the sequence to a rousing conclusion with a real rarity: *Gaudeamus igitur*—not the student-song paraphrase of 1843 but a *Humoreske* fashioned from a little cantata Liszt composed in 1869.

The recorded sound is close up and big, but very clean, and the DMM processing helps make the LP sound like an especially good CD. My only complaint is that the pauses between pieces are inadequate—only four or five seconds according to my watch—and that may be corrected when the recording actually appears on CD.

Cziffra, who as a naturalized Frenchman now signs himself "Georges," has dedicated this album to the memory of his son György (whose name he writes in the Hungarian form), who died in a tragic accident just as he was beginning to make a career of his own as a pianist. It is an eminently worthy tribute to the memory of Franz Liszt as well. *Richard Freed*

Georges Cziffra: one of today's towering figures



EMI PATHÉ MARCONI

LISZT: *Mephisto Waltz No. 1; Les Jeux d'eau à la Villa d'Este; Valse impromptu; Soirées de Vienne, Valse caprice No. 6; Saint François de Paule marchant sur les flots; Transcendental Etude No. 12 ("Chasse-neige"); Transcendental Etude No. 9 ("Ricordanza"); Gaudeamus igitur, Humoreske.* Georges Cziffra (piano). LA VOIX DE SON MAÎTRE/EMI PATHÉ MARCONI ● 2704171 \$12.98 (from International Book and Record Distributors, 40-11 24th St., Long Island City, NY 11101).

TIMBUK 3: EXCEPTIONALLY HAUNTING



Barbara K and Pat MacDonald

AN Austin-based high-tech folk duo who perform with prerecorded backing tracks (various drum machines and such, which sound utterly organic), Timbuk 3 has come up with one of the sharper debut albums of the year. The basic sound in "Greetings from Timbuk 3" is a sort of sardonic, bluesy, neo-folk rock, with occasional forays into peripherally related styles like reggae. It will also remind you of early J. J. Cale, middle Elvis Costello, and the recent T-Bone Burnett, without really sounding like any of them.

The songs, all by Pat MacDonald, whose partner in the duo is identified only as Barbara K, are exceptionally haunting in a sort of High Plains way, and the lyrics are never less than intriguing. Among them are what must be the world's first rockabilly ode to an undergraduate physics major, *The Future's So Bright I Gotta Wear Shades*, and a provocative look at the relation between high fashion and moral values, *Hairstyles and Attitudes*, that asks, "Can you judge a crook by his cover-up?"

All in all, it's a really wonderful record and despite its state-of-the-art production values, a genuine example of the folk process in action. Not to be missed. *Steve Simels*

TIMBUK 3: *Greetings from Timbuk 3*. Pat MacDonald, Barbara K (vocals and instrumentals). *The Future's So Bright I*

Gotta Wear Shades; Life Is Hard; Hairstyles and Attitudes; Facts About Cats; I Need You; Just Another Movie; Friction; Cheap Black & White; Shame on You; I Love You in the Strangest Way. I.R.S./MCA IRS-5739 \$8.98, IRSC-5739 \$8.98.

A SUPERB, REVELATORY NEW "FIGARO"

MOZART'S *Le nozze di Figaro* is so familiar that we tend to take it for granted until, to our delight, we come upon a performance that strikes us as a revelation of its genius. A new recording from Philips brings us such a performance. It is as if the conductor, Sir Neville Marriner, and his fine roster of singers had never encountered the opera before but, being the artists they are, all set to work on the score, the libretto, and the characterizations as if for a world première. The result is an "integral" and superb *Figaro*.

The cast is of uniform strength, all in the best of voice. Ruggero Raimondi sings a suave Count Almaviva with a welcome degree of vocal fluidity, and the accomplished Lucia Popp is at her stylish best as the Countess. Popp is a natural Mozart



Sir Neville Marriner: special

soprano with a sure sense of the composer's legato and an ability to "throw away" the coloratura passages effortlessly. Barbara Hendricks, as Susanna, sings with a purity of tone and ease of control not often encountered. Her "*Deh, vieni, non tardar*" is lovely.

As Figaro, José van Dam is truly winning, and Agnes Baltsa employs her limpid mezzo-soprano to its best advantage in Cherubino's two famous arias. Felicity Palmer is allowed Marcellina's Act IV aria (always omitted in staged performances), and she sings it very well. Robert Lloyd's blustering Bartolo is musically polished, as he makes evident in his Act I entrance aria, and the remaining members of the cast fully sustain the high standards set by the principals. The ensemble singing is excellent throughout.

There is, also, an additional quality this *Figaro* evokes that sets it apart, namely, one's awareness of the unfolding of a theater piece: the listener cannot resist becoming involved because of the engagement of the artists. We have no need to see the *dramatis personae* or to watch them as they move about the stage—it is all there in the recorded performance: character interplay, plot evolution, ebullient fun making, touching sorrow, intrigue, every element that makes *Le nozze* a unique achievement.

One has come to expect of Sir Neville a special kind of performance, one of polish, grace, and balance—one that captures not only the notes but also the flavor of a given musical period, one that is thoughtful and meticulously prepared. In this recording these expectations are entirely fulfilled within a context I can only describe as joyous. The recording itself is crisp, well balanced, and very clear, and the accompanying booklet, containing a four-language libretto, artists' biographies, and unusually stimulating notes, is well produced.

Recommended? Indeed, a *must*.
Robert Ackart

MOZART: *Le nozze di Figaro*. Ruggero Raimondi (bass-baritone), Count Almaviva; Lucia Popp (soprano), Countess Almaviva; Barbara Hendricks (soprano), Susanna; José van Dam (baritone), Figaro; Agnes Baltsa (mezzo-soprano), Cherubino; Felicity Palmer (mezzo-soprano), Marcellina; Robert Lloyd (bass), Bartolo; Neil Jenkins (tenor), Don Curzio; others. Ambrosian Opera Chorus; Academy of St. Martin-in-the-Fields, Neville Marriner cond. PHILIPS ● 416 370-1 three discs \$29.94, ● 416 370-4 three cassettes \$29.94, ● 416 370-2 three CD's no list price.

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Talking Heads (from left): Weymouth, Byrne, Frantz, and Harrison

“TRUE STORIES”: TALKING HEADS AT THEIR BEST

DAVID BYRNE'S *True Stories* is a better idea than it is a movie—Albert Brooks has done this kind of dead-pan film study in the absurdity of everyday life much better—but the Talking Heads album called “True Stories” is one of the group's best. Byrne set out to create the ultimate avant-garde statement about the lives of ordinary people, using a small Texas town and tabloid headlines as his source material. The songs these stories inspired, an American-made gumbo of rock-and-roll, gospel, Tex-Mex, and mariachi, are simple yet absorbing in the peculiar way of the Heads' best music, dissecting the facts and perceptions of the characters' lives and rearranging them in strange, unreal ways.

While not really a soundtrack album (in the film the songs are performed by the actors, not the Talking Heads), each song on “True Stories” is meant to take on the character of its subjects. Typically, the familiar is rendered unrecognizable. On *Love for Sale*, a straight-ahead, power-chording rocker, Byrne sings, “I was born in a house with the television always on. I grew up too fast.” True enough for most of us. But then he continues, in a progressively more sneering, gangly, and ostrich-like voice, “I forgot my name . . . I get two for one, for a limited time.” On *Hey Now*, a slowly swinging, Tex-Mex celebration of

shopping malls, Byrne chortles a litany of consumer goods he covets. *Papa Legba*, sung by Pa Staples in the movie, deals with a secret ceremony—part voodoo, part evangelical, idolatrous and vaguely sexual. On the album, Byrne drones and dribbles as if fading in and out of consciousness. *Radio Head* is about a Mexican who works on a microchip assembly line and claims he can tune in to the sexual vibrations of women by taking their hands and pressing them against his temple. Try that one on the girls at the office.

Every song is odd yet convincing. My favorite—and a Talking Heads classic—is the gospel rave-up *Puzzlin' Evidence*. A revival meeting turns into a rally against the Trilateral Commission, with the preacher and his flock chanting a spirited call-and-response litany of conspiracies in the media, packaged consumer goods, and the military-industrial complex. Byrne rocks the house, even though the “house” was the Bert Cross Choir, recorded in Dallas, Texas, some 1,500 miles from the New York studio where the basic track was laid down. A true story. But just one of many amazing things about this record.

Mark Peel

TALKING HEADS: *True Stories*. David Byrne (vocals, guitar); Chris Frantz (drums); Tina Weymouth (bass, backing vocals); Jerry Harrison (keyboards, guitar, backing vocals); vocal and instrumental accompaniment. *Love for Sale; Puzzlin' Evidence; Hey Now; Papa Legba; Wild Wild Life; Radio Head; Dream Operator; People Like Us; City of Dreams.* SIRE/WARNER BROS. 25512-1 \$8.98, © 25512-4 \$8.98, © 25512-2 no list price.

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- **BERG: *Lulu.*** Stratas; Boulez. DG 415 489-2 (three CD's). “Wonderful—and complete for the first time” (March 1980).
- **GRIEG/SCHUMANN: Piano Concertos.** Bishop-Kovacevich, C. Davis. PHILIPS 412 923-2. “An ideal team” (March 1972).
- **MOZART: *Clarinet Concerto; Clarinet Quintet.*** Goodman; Munch; Budapest Quartet. RCA RCD1-5275. “Easy-swinging” Mozart recorded in 1956 (concerto) and 1938 (quintet).
- **SIBELIUS: *Symphonies Nos. 1-7.*** C. Davis. PHILIPS 416 600-2 (four CD's). “Perceptive and powerful” (March 1978).

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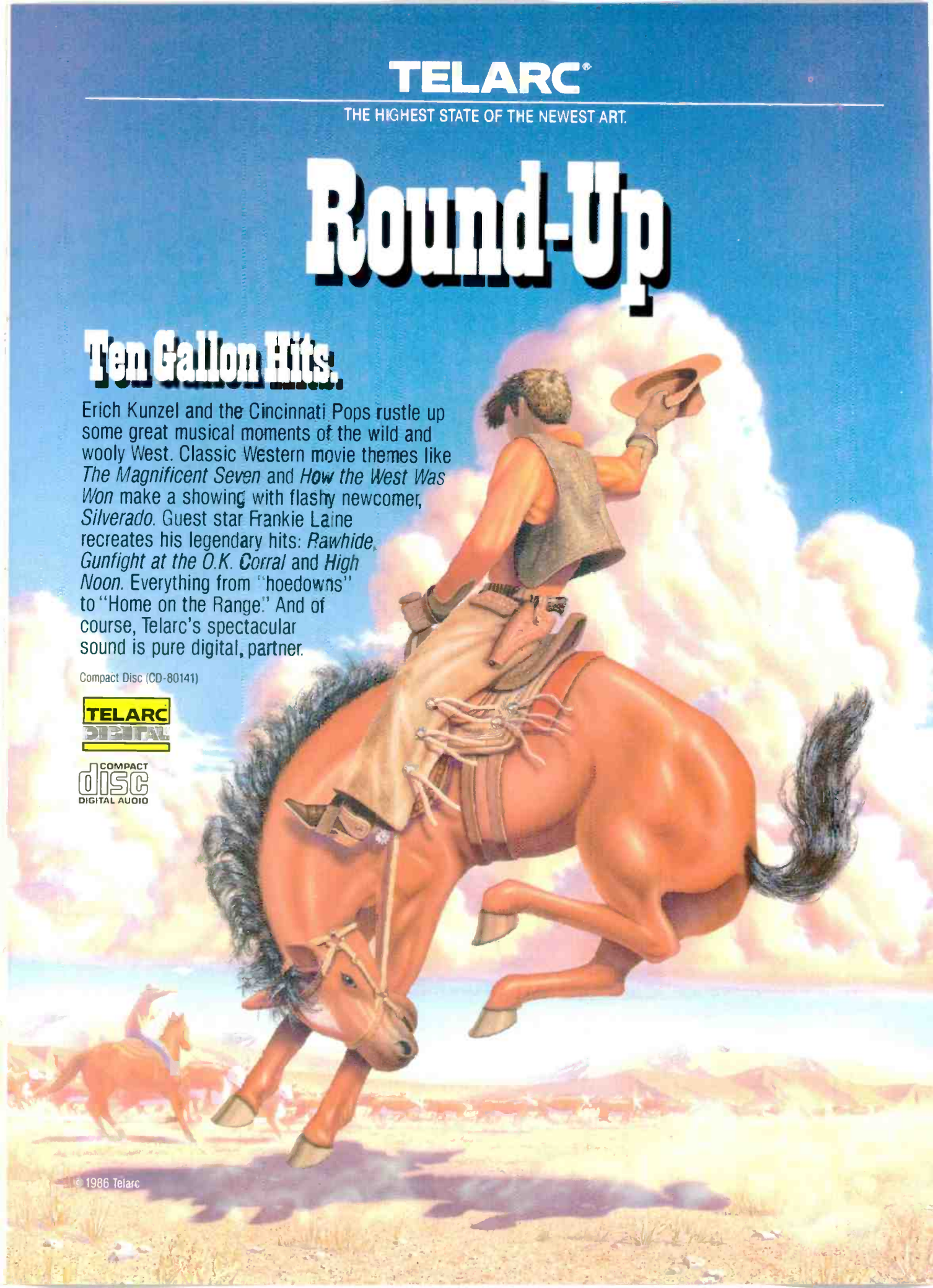
THE HIGHEST STATE OF THE NEWEST ART.

Round-Up

Ten Gallon Hits.

Erich Kunzel and the Cincinnati Pops rustle up some great musical moments of the wild and wooly West. Classic Western movie themes like *The Magnificent Seven* and *How the West Was Won* make a showing with flashy newcomer, *Silverado*. Guest star Frankie Laine recreates his legendary hits: *Rawhide*, *Gunfight at the O.K. Corral* and *High Noon*. Everything from "hoedowns" to "Home on the Range." And of course, Telarc's spectacular sound is pure digital, partner.

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BSR's Endangered Colossus

Prepare for bone jarring bass and dramatically clear highs from these newly developed 15" 3-way 5 speaker systems that nearly missed their chance to charm an audiophile's ear. BSR moved its dbx and ADC divisions into one facility and these speakers almost became orphans. So now, they're yours at a close-out price.

By Drew Kaplan

It's a shame. But, it's also a great opportunity to get a pair of 15" audiophile loudspeakers with the newest in stereo imaging at a market-breaking price.

Imagine a precisely matched mirror image pair of top-of-the-line BSR speakers that can effortlessly recreate the cataclysmic impact of a full orchestral crescendo at full volume and yet offer flawlessly subtle sound detail to 21,500hz.

You'll thrill to thunderous bass all the way down to 26hz. Incredibly rich, full, vibrant sound at low volume will explode with life as you increase the volume.

But before we examine the front speaker complement, the twin overlapping crossovers and the top mounted sonic placement and ambiance speakers, let's see why they were almost orphaned.

You see, BSR, the half billion dollar electronics giant, is the parent company of two of the best names in up-scale audio, dbx and ADC.

Last year dbx developed a new multi-thousand dollar speaker system called the Soundfield One which lets you sit virtually anywhere in your room and have full stereo imaging and terrific sound.

BSR decided to consolidate ADC and dbx into one building (still 2 companies) and put all its speaker efforts into dbx.

POOR JACK

Well, while dbx's engineers were off designing their multi-thousand dollar masterpieces, BSR's Senior Acoustical Engineer (he had been Fisher's Chief Engineer for 10 years during its top end component stereo days), was designing BSR's radically new speaker line.

The revolutionary top of the line 15" stereo imaging pair pictured above will let you enjoy superb stereo imaging without sitting directly in front of your speakers.

But unfortunately, in the consolidation move, BSR's speakers went by the wayside, and so did Jack.

Enter DAK. After a few fearful negotiations and considering the engineering costs BSR had already expended, they agreed to make the speakers just for DAK.

Because there's virtually no BSR overhead left on these speakers, and the R&D was all but complete, we've gotten these speakers for virtually the component costs plus a little BSR labor.

And don't worry about Jack. BSR had him finish the engineering (they really are great people) and they'll pay him a royalty on each speaker we sell. Besides, by the time you read this, Jack is sure to be snapped up as the Chief Engineer at another esoteric audio company.

WHAT'S STEREO IMAGING?

Stereo imagery is the logical separation and interaction between channels. It's the successful creation of a panoramic wall or stage of music rather than the confined, easily located 2 speaker sound. IT'S WHAT'S INSIDE THAT COUNTS

Imagine the full thunder of a kettle drum, or the pluck of a string bass being explosively recreated in your living room. BSR's 15" sub-bass acoustic suspension driver will revolutionize your concept of

low clean bass.

Its magnetic structure weighs a thundering 48 ounces. But that's not all. The magnetic field is developed by the rare earth metal Strontium for state of the art massive but flawlessly controlled bass.

A 38mm voice coil with a 200° centigrade temperature capacity, will handle the most demanding digital or analog recordings. And, a new super rigid cabinet design virtually eliminates coloration due to uncontrolled cabinet resonance.

At low volume, the bass will fill in and envelop you. At high volume, your room, your walls and your neighbors will shake. (Not for apartment dwellers please.)



MATCHED PAIRS

The mid-range and high end of BSR's speakers are truly unique. Front mounted 8" polypropylene mid-range drivers provide rich sound while top mounted 5" polypropylene mid-range drivers provide an open, lifelike ambiance.

Front mounted exponential horn tweeters provide awesome brilliance to 21,500hz, while top mounted tweeters enhance separation because they are mounted to the outside edge of each speaker.

So, this system has a specific left and a specific right speaker. You'll find wide, but interactive separation that will vastly widen your ideal listening area.

The imagery will give the illusion of musicians actually playing in front of you. Your music will take on a three dimensional quality. You'll enjoy superb stereo imagery regardless of each speaker's specific placement in your room.

MORE SPECIFICS

The exponential horn tweeters, both in front and on the top of these systems, employ 25mm rigid phenol diaphragms for stability and accurate response.

Polyamid-imid binders and ferro-fluid coolant allow for a 300% increase in heat dissipation so you can drive the voice coils up to 200° centigrade.

Now, the mid-range. Both the 8" front firing and the 5" top firing polypropylene drivers reproduce the mid-range frequencies like no ordinary speakers.

It's amazing that so many speaker manufacturers simply slap in 5" paper mid-ranges to reproduce what's really the major portion of the sound spectrum.

BSR's 8" and 5" polypropylene mid-ranges are rigid, exacting drivers that deliver incredibly pure uncolored sound.

They have matched 25mm voice coils, also protected by ferro-fluid and polyamid-imid to 200° centigrade. They are driven by powerful barium ferrite magnetic fields.

NOT QUITE FINISHED YET

To prevent phase shift and cancellation, two totally separate crossover networks are employed in these speakers.

All frequencies below 800hz are directed to the 15" woofer. The front system routes frequencies above 800hz to the 8" mid-range to take full advantage of its superb reproduction capabilities. Frequencies above 3400hz are routed to the horn tweeter.

The top mounted system routes only frequencies above 1200hz to the 5" polypropylene ambiance mid-range driver, and frequencies above 3400hz are routed to the top sonic placement tweeter.

There are level controls for both the top and front mounted speakers so that you can voice the speakers to match your musical taste and environment.

Note: Only the top tweeters are mounted at the the edges. The front mounted tweeters are conventionally mounted for acoustical symmetry.

Each speaker is fuse protected for up to 200 watts peak, 150 watts continuous power. You can operate these super efficient speakers with as little as 20 watts.

AND OH WHAT A PRETTY FACE

The speaker systems are 30" tall, 19¼" wide and 10½" deep. Their lovely oak wood-grain appearance is enhanced by the dark removable grill cloths that beautifully contrast with the rich wood-grain tones. They're a statement of audio elegance when placed in any room. They're backed by BSR's 2 year limited warranty. A COLOSSAL DREAM COMES TRUE

RISK FREE

You'll hear depth of sound at low levels that was previously unobtainable. And yes, when you crank up the volume, your music will explode with realism and drama.

Try these speakers in your own system. Then compare them at any Hi-Fi Store with any pair of speakers up to \$1000. If they don't beat all the competition hands down, simply return them to DAK in their original boxes within 30 days for a courteous refund.

To order your matched pair of BSR top-of-the-line 15" 3-way 5 speaker systems with unique stereo imaging risk free with your credit card, call toll free or send your check for DAK's market-breaking price of just \$298 for the MATCHED PAIR plus \$22 for Postage and Handling. Order No. 4352. CA res add tax.

It's a dream system for an audiophile. Sonically pure, thunderously powerful, these BSR speakers will make your future listening years an on-going fabulous, if not earthshaking experience.



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Smart Sound Detonator

Obliterate the wall between you and the individual instruments in your music. Infuse your own stereo system's sound with a breathtakingly vibrant 30 to 50% improvement in sound quality that you can measure with this superb BSR Equalizer/Spectrum Analyzer limited \$149 close-out.

By Drew Kaplan

Close your eyes. Touch a button. And you'll hear your stereo system literally explode with life.

You'll hear the gentle brushes on a snare drum, the startling bone-jarring realism of a thunder clap, or the excitement of a full cymbal crash.

You'll hear string basses and other deep low instruments emerge from bass (that will sound murky by comparison), with such clarity and such definition that you'll feel you can almost touch each instrument.

This astoundingly distinct yet powerful bass adds such a full bodied warm feeling to your music, you'll feel as if you've been lovingly wrapped in a warm soft blanket on a cold winter's night.

But don't take my word for the sound quality improvement. With the Pink Noise Generator, Calibrated Electret Condenser Mike and the 220 Element Spectrum Analyzer, you can instantly measure each and every improvement you make.

Plus, there's more. A subsonic filter effectively adds the equivalent of many watts onto the power of your amplifier.

Plus, with its provision for two separate tape decks including two way dubbing, you'll have much more than just greatly improved sound.

You can count on great sound from this top of the line Equalizer/Analyzer. It has a frequency response from 5hz to 100,000hz \pm 1db. And, it has an incredible 100db signal to noise ratio.

BSR, the ADC equalizer people, make this super Equalizer/Analyzer and back it with a 2 year standard limited warranty. Our \$149 close-out price is just a fraction of its true \$379 retail value.

**FIRST THE EQUALIZER
YOUR STEREO'S HIDDEN SOUNDS**

Your stereo can sound incredibly bet-

ter. Just a 5db roll-off at the high end, up around 14,000hz to 16,000hz, can just decimate the harmonics that give you the open feeling you'd experience at a live concert. A similar roll-off at 60hz, causes the fundamental bass notes to just fade away into the 'murk'.

An equalizer isn't some magical device that manufactures sounds that don't exist. Most of the frequencies that will make your music really vibrant, are actually already recorded in your music.

You'll be able to prove this with a few simple tests we'll try when we discuss the Spectrum Analyzer.

You see, certain frequencies are simply not reproduced with as much volume as are the mid-range frequencies which stretch from about 800hz to 2,000hz.

An equalizer simply lets you establish accurate control of all frequencies to fit your equipment, your recordings, your taste, and your listening environment.

TOTAL MUSICAL CONTROL

And, what a job it can do. It's totally unlike bass and treble controls which simply boost everything from the mid-range down for bass, or everything up for treble. You can boost the low-bass at 31.5hz, 63hz and/or 125hz to animate specific areas or instruments.

And, when you boost the part of the bass you like, you don't disturb the mid-range frequencies and make your favorite singer sound like he has a sore throat.

The high frequencies really determine the clarity and brilliance of your music. The problem is that highs are very directional. Wherever you move in your listening room, you'll find a big difference in high end response, as you'll see when we test the Analyzer.

No recording engineer or equipment manufacturer can even begin to control your listening environment.

You can control the highs at 4,000hz, 8,000hz and/or 16,000hz, to bring crashing cymbals to life at 16,000hz while at the same time you can cut tape hiss or annoying record scratches at 8,000hz.

But there's more. Don't leave out the mid-range. You can boost trumpets at 300 to 500hz or a clarinet at 1000hz. You can boost or cut any part of the frequency spectrum a full \pm 15db.

TAPE DECK HEAVEN

You can push a button and transfer all the equalization power to the inputs of two tape decks. Now you can pre-equalize your cassettes as you record them and get all the dramatically enhanced sound recorded right on your cassettes.

This is an especially great feature when you play your cassettes on bass-starved portables or high-end starved car stereos.



SIMPLY PLUG IT IN

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks.

Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver or preamp. We even supply the cables.

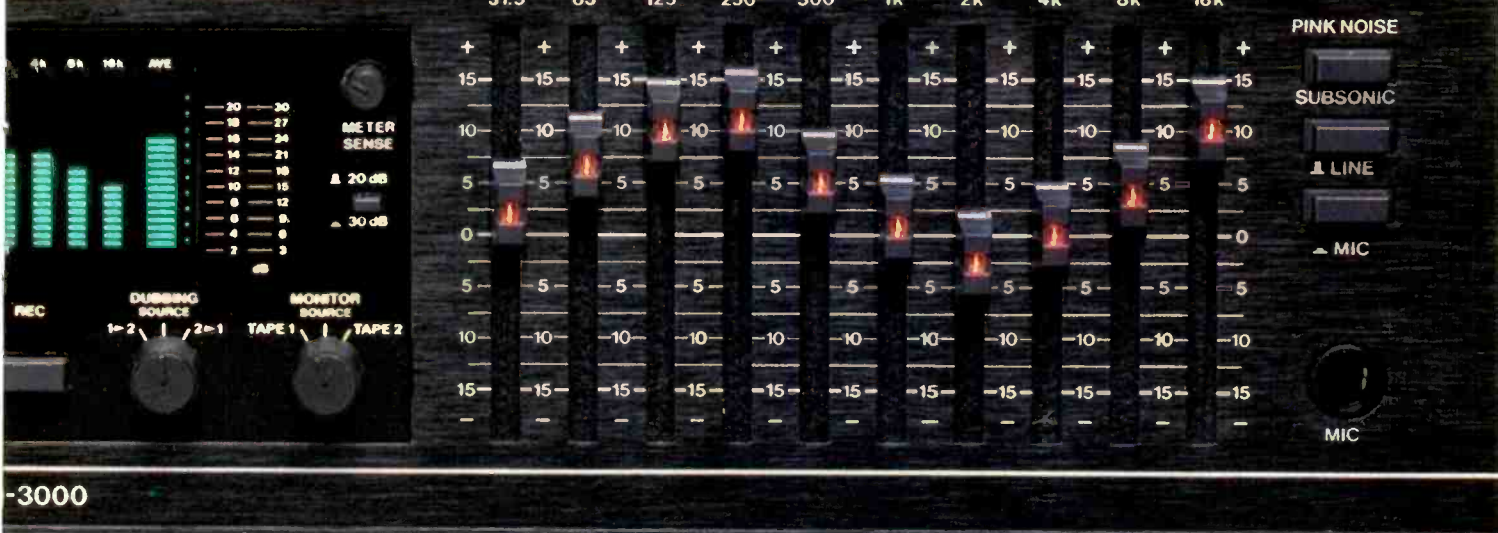
As you listen to your records, FM or any 'Aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

The output from your receiver is always fed directly to your tape deck(s) for recording, and with the touch of a button, you can choose to send equalized or non-equalized signal to your deck(s).

When you want to listen to a tape deck, just select which tape deck you want, turn the switch on the equalizer,

\$149 CLOSE-OUT

ER / SPECTRUM ANALYZER



and your tape deck will work exactly as it did before. Except, now you can listen with or without equalization.

Look at this. You can dub tapes from deck 1 to deck 2, or from deck 2 to deck 1 with or without equalization.

THE SUBSONIC FILTER

Much of the power drawn from your amplifier is used to drive your woofers. When you drive the amplifier too hard, it clips and you end up with distortion.

A subsonic filter removes a lot of non-musical material you can't hear that exists below 20hz. So, it relieves your amplifier of a lot of work. It doesn't actually create more watts (Please, no letters from my 'technical' friends) for your amplifier.

But, it's like turning off the air conditioning in your car. It saves you using about 7hp of what you have. And therefore, you'll have more watts for clean powerful sounding music.

THE SPECTRUM ANALYZER

Now you can scientifically analyze your stereo listening room and test your equipment by using BSR's Real Time Frequency Spectrum Analyzer.

Plus, you'll see your music not as a single level on a VU meter, but as a kaleidoscopic parade of 10 individual 20 element VU meters.

Each is tuned to a specific octave of the sound spectrum. An eleven 20 element meter averages all levels.

The effect is awesome. You can visually isolate a string bass or cymbal, and actually see each individual instrument almost as a wave moving across the 220 individual florescent elements.

THE MOUTH AND EARS

It talks. The Analyzer speaks with a voice of pure calibrated Pink Noise. Pink Noise is the standard composite 'sound' of all frequencies used for testing in labs around the world. All frequencies from 20hz to 20,000hz are generated at the exact same level at the exact same time.

It listens too. If you are testing a cassette or a component in your system, use the 'Line Button'. If you're testing your whole system with speakers, use the matched calibrated electret condenser

microphone (included). Either way, you'll have a quick, easy and accurate way to evaluate the total sound of your system.

HOW TO TEST

SPEAKERS, EQUIPMENT AND TAPE

Testing your speakers in your listening room is the really crucial test. Simply place the calibrated microphone where you normally sit to listen to your stereo.



At the end of an 18 foot cord is the ear of the system. Just clip the mike wherever you sit and test your room.

Turn on the Pink Noise. You can switch to Left Channel, Right Channel or both. There's a meter range button, a sensitivity control, and even a switch that lets you freeze the meter.

Just sit down at the equalizer. Start with one channel. You'll see all 10 octave bands on the meter. Just slide the corresponding controls to increase or decrease any area that needs help.

You have now set up your system to its maximum capability. But as you'll see, location is very important. Move the microphone 5 feet to the left or right.

Then turn on the Pink Noise and check the Spectrum Analyzer. Now you can see why the specifications that come with your system are only a starting point.

Here's a way to test your tape deck and tape. First record Pink Noise for 3 minutes at -20VU. Then play it back and note the readings on the meters.

Now, record the Pink Noise again at 0VU or +3. Wait till you see how much the high end falls off. Now you'll see why all specifications are listed at -20VU.

With the Equalizer/Analyzer you can enjoy the finest stereo sound from your system and be a test lab too.

WHY SO CHEAP

BSR now only sells equalizers under their ADC name. Well, as Detroit comes out with new cars each year, ADC comes out with new equalizers. We got them to supply us with just 30,000 of last year's

ADC model before they shut it down.

They had already paid for all the tooling, all the research and design, so we were able to buy these for less than half the normal price, for cold hard cash.

THE FINAL FACTS

There are 20 slide controls, each with a bright LED to clearly show its position. Each control will add or subtract up to 15db. (That's a 30db range!)

There are separate sound detonation slide controls for each channel at 31.5hz, 63hz, 125hz, 250hz, 500hz, 1,000hz, 2,000hz, 4,000hz, 8,000hz, and 16,000hz.

BSR backs this top of the line Graphic Equalizer/Spectrum Analyzer with a 2 year standard limited warranty. It is 1 7/8" wide, 3 1/2" tall and 8 3/4" deep.

MAKE YOUR MUSIC EXPLODE RISK FREE

It's startling. Music so vibrant with life you'll swear it's 3 dimensional. Sculpture your music any way you want it. If you're not 100% satisfied for any reason, simply return it to DAK within 30 days in its original box for a courteous refund.

To order your BSR EQ3000 Smart Sound Detonator 10 Band Graphic Equalizer with Real Time Spectrum Analyzer and Calibrated Mike, with Subsonic Filter and Two Way Tape Dubbing risk free with your credit card, call toll free, or send your check, not for the \$379 retail value. Don't even send the \$227.97 dealer cost. Send just \$149 plus \$8 for postage and handling. Order No. 4100. CA res add sales tax.

The sound of your stereo will explode with life as you detonate each frequency band with new musical life. And, you can see and measure exactly what you've done.

DAK INDUSTRIES INCORPORATED

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For credit card orders call 24 hours a day 7 days a week
CALL TOLL-FREE. . . 1-800-325-0800
8200 Remmet Ave., Canoga Park, CA 91304

SAME OLD DOG, BRAND NEW SUBWOOFER

15" Thundering Subwoofer

Man's best friend meets the audiophile's best friend at an earthshaking bone jarring new price. Now you can add the impact of a 15" subwoofer to any stereo system for just \$99⁹⁰.

By Drew Kaplan

A puppy may be man's best friend. Woof, Woof. . . But, now I've got a new friend you can add on to your stereo system. It doesn't need to be taken on walks, washed or fed. But, it makes a great cocktail table for you when you're being fed. And, oh what a woof it has.

GREAT SOUND FOR EVERYONE

It's called a subwoofer. And, normally it is the beloved pet of only the most ardent audiophiles.

It's not generally understood that it can be used with virtually any speaker system in any stereo. And, in addition to substantially increasing and perfecting the bass response, it has a significant impact on the mid-range clarity too.

Before I tell you exactly how marvelous your stereo will sound when you connect this subwoofer to it, there are two things you should know.

First, you'll be getting your new friend at a phenomenal price. DAK has sold over 10,000 of Cerwin-Vega's 12" subwoofers. They had a retail price of \$332, but we sold them for \$164⁵⁰.

Second, your new friend comes complete with a paid up health insurance policy in the form of a 2 year limited warranty from its father, BSR.

By the way, the puppy sitting on top of the subwoofer is the same puppy I used with Cerwin-Vega's, but wait till you hear what's under him now. You'll have BSR's 15" massive infusion of explosive bass, added to your system for just \$99⁹⁰.

But don't be misled. BSR bass is clean and tight; never sloppy or overpowering. It adds a feeling of depth and fullness to your music that you simply can't get with two or 3-way speaker systems.

HERE'S WHAT IT DOES

Basically, the problem with most speaker systems is that the bass overpowers the system. In a 3-way system, a woofer may be crossed over at about 800hz. And, in a 2-way system as high as 3000hz.

So, the woofer must handle movements of up to an inch at frequencies below about 80hz, while at the same time attempting to reproduce the very fine vibration type movements of the mid-range frequencies.

It is this difference in movements that causes both the bass to be weak or not precise, and the mid-range to become muddy (intermodulation distortion).

Even the best 3-way systems fall prey to these problems. And, it's why a subwoofer can do so much for your mid-range clarity as well as your bass.

PROBLEM SOLVED

BSR's subwoofer has a specially engineered crossover network that sends frequencies above 120hz to your regular speakers and reproduces just the mammoth movement frequencies from 120 hz down to 22hz with a special floor firing dual wound super subwoofer.

If you have downstairs neighbors, this subwoofer isn't for you. The woofer is a very special hybrid. It has a mammoth one and one half inch voice coil which allows the speaker to make the very large



movements required to reproduce the very low frequencies.

But, it would do a lousy job of reproducing mid-range, which is why, cost aside, manufacturers don't put big voice coils in normal 10" or 12" woofers.

To make the massive movements accurate, this woofer has a very large magnetic structure. This magnetic structure also makes the subwoofer system extremely efficient. (The sensitivity is 91.5 db at 1 watt at 1 meter.)

So, whether you have two or three-way speaker systems, with 8", 10" 12" or even 15" woofers, you'll find the sonic improvements staggering.

You'll hear and feel the awesome effect of thunder rumbling through your home. You'll hear a depth and dramatic fullness to your music that won't be heavy but will thrill you with its massive strength.



Here's a 'floor's eye view' of the subwoofer. You'll feel and hear bass so alive, you'll think it is.

EASY HOOKUP

It's easy to connect. Simply run the right and left speaker wires from your amplifier to the input terminals of the subwoofer. It works with any system from 20 to 150 watts per channel.

Then, you simply connect the speaker

wires from your two standard 8 ohm stereo speaker systems to the output terminals on the subwoofer. They receive the exact signal that they did before except that everything from 120hz down is routed only to the subwoofer.

Placement of your regular speakers is just as critical as usual for stereo imaging, but the subwoofer can be placed anywhere because low frequency material is totally non-directional.

The subwoofer makes a perfect cocktail or end table. Its rich wood-tone appearance matches any decor. It is 24½" long, 16¼" high and 20" wide.

TRY AUDIOPHILE'S BEST FRIEND RISK FREE

The fullness, richness and depth is awe inspiring. Wait till you connect this subwoofer to your system and experience truly massive force from your music.

If you aren't 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order BSR's Thundering Subwoofer with its dramatic 15" Dual Wound Voice Coil Subwoofer risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just \$99⁹⁰ (\$14 P&H). Or, No. 4514. CA res add tax.

You can't replace the love and softness of a warm puppy. But, wait till you experience the richness and depth this subwoofer will add to your bass and the clarity you'll hear in your mid-range.



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8200 Remmet Ave., Canoga Park, CA 91304

The Observers

At the office or at home, you can scrutinize up to 4 separate areas with both picture and sound. New technology allows a single cable to both power a camera and carry the audio and video signals. There's even an automatic switcher for up to 4 cameras. It's all yours at an amazing new price.

By Drew Kaplan

It does it all. And, it's absolutely terrific. You can monitor loading docks or swimming pools. You can watch for pilferage, shoplifting or accidents.

And, there's even an output for a video recorder so you can make a permanent record. Now you can see who comes and goes. And, you'll see **what they do.**

The system comes with a 12" video monitor, a sequential switching system that allows you to view up to 4 cameras from 4 to 60 seconds each, a camera complete with microphone, and an infinitely adjustable mounting arm.

You'll also get 57 feet of cable and you can add up to 300'. You can even add a weather resistant case for outside use.

LOOK AT ALL IT DOES

The technological breakthrough that allows you to make a single wire installation lets you have **sound and picture monitoring** of all types of areas.

Risk areas: Monitor secluded side doors, corridors, equipment yards, tool cribs and other storage areas.

Hazardous areas: Prevent accidents or get help for one fast. You can see when people do unsafe things.

Supervision: You can't be everywhere at once. Now you can see who comes and goes. Monitor an entire night crew if you're on the premises, or have an 8 hour tape you can view in about 1 1/4 hours using high speed search on your VCR.

Retail Protection: Don't leave your employees alone in your store or in your parking lot or structure. Now the manager can be there to assist. And, you can have a recorded audio and video record.

Theft: From shoplifting to employee theft to vandalism, anonymity is the culprit's protection. With observation cameras, no one knows when they are being watched or when a recording is being made. It's a safety feature to protect employees from danger and to protect the company from all sorts of crime.



NOT JUST FOR WORK

You can monitor your front door, your back yard and your pool. You can even monitor the animals in your barn or your baby in the bedroom. So, if you raise animals or children, you can always keep an eye on their safety.

And what a secure feeling for teachers, to be able to see the children on the yard at a nursery school. It's a perfect 'parent group' gift to your school or church.

Always check local laws which may restrict some types of observation.

EFFORTLESS INSTALLATION



From 3 lux to 30,000 lux, you can watch what's happening with this superb new system. You'll be amazed at how sensitive it is at low light levels.

And, whatever you monitor, you'll have a superbly detailed high contrast picture.

While I wrote this ad, I had a camera aimed out the window. As it got dark, I couldn't see down the street. But the camera's automatic sensitivity adjusted, so I could see the street on the monitor almost as well as I had in the afternoon.

And best of all, the cameras are incredibly easy to install. You don't even need AC plugs where you mount them.

And, the infinitely adjustable mounting arms attach with only 3 screws to floors, walls or ceilings.

Switch on the monitor and press a camera button. All power for the entire system comes from the monitor/switcher.

You can have one or all 4 cameras connected. And, connecting the cameras is the simplest thing of all.

This system uses standard round coax type cable, just like your home's cable TV system. Through this standard cable, Magnavox sends power for the cameras.

And, the camera sends both **audio and video** signals back down the very same cable. So, installation consists of simply running one standard video cable.

The monitor has a built-in electronic switcher. Most automatic switchers that I've seen in surveillance, cost hundreds of dollars. With Magnavox it's included.

You set it to lock onto any camera for a minimum of 4 seconds and a maximum of 60 seconds, or pick one camera.



The signal (both audio and video) from all cameras being viewed can always be sent to your VCR for a permanent record.

And there's more. By simply running a standard video cable, you can also watch the output of the monitor on other

TVs in other rooms.

ENDLESS USES

Think of the feeling of safety you'll have when you can monitor both the front and back of your home from the kitchen or the bedroom, or both.

The monitor is 12" wide, 11 1/2" tall by 1 1/2" deep. Each camera is just 9" deep, 4.5" wide and 2 1/2" tall and weighs 2 1/2 lbs. It's made by Magnavox and backed by their standard limited warranty.

OBSERVE YOUR WORLD RISK FREE

Use it to protect your business or home, your employees, your family and your possessions. If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Magnavox's Observation System, complete with 12" Monochrome Monitor, 4 Station Electronic Automated Switcher, Black and White Camera, 57' of Cable, and Infinitely Adjustable Mounting Arm risk free with your credit card, call toll free, or send your check for only **\$299** (\$11 P&H). Order No. 4415.

Each Extra Camera with Built-in Microphone, 57' Cable and Mounting Arm is just **\$169** (\$4 P&H). Order No. 4549.

Weather Resistant Cases are just **\$39⁹⁰** (\$3 P&H). Order No. 4550. CA add tax.

57' extension cables are just **\$19⁹⁰** (\$2 P&H) Order No. 4551. **Note: a pair of cable ends is included, so you can make your own cable, up to 300'.**

You'll have a new sense of security when you can see and hear what's happening. And, by connecting a video recorder, you can have a permanent record of the comings, goings and actions of everyone on your property.



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The \$999 Typewriter/Computer
BOMBSHELL

Unfair Competition?

An Unfair Challenge to IBM's Typewriters and Computers

What if you and every secretary in your office could have powerful computers that were as easy to use, but cost less than IBM electronic typewriters? What if they also ran IBM compatible software? Well, now you can get this 256K IBM PC Clone, the Amber Monitor, the Letter Quality Printer, and The \$400 Software Library for just \$999.

By Drew Kaplan

Look around your office. Are your secretaries wasting time typing and re-typing letters and documents?

Well, throw out your dumb typewriters. Now typing on an IBM compatible computer can be as easy, and yes, cheaper than using an IBM electronic typewriter.

Every word you type can be stored in the 256,000 character memory or on floppy disks. So, when you make corrections to a letter or document, you'll never need to retype the whole letter again.

30 MINUTES TO PRODUCTIVITY

In 30 minutes you or your secretary will be comfortably typing letters faster than on any typewriter. This computer is so easy to use that there's no 'computer fear' from non-computer typists.

But, if you're looking for computing power, get ready to blast off. It is so powerful that it will run Lotus 1-2-3, Flight Simulator and every other IBM compatible program that we've tested.

In fact, the manufacturer states in the Operator's Guide that, "The computer is ultimately and completely compatible with the IBM Personal Computer."

Actually, typing letters is child's play for this sophisticated machine. But for \$999, it's sure to be the most popular typewriter in any office or even at home.

So, compare it to the typing ease and durability of say the new IBM Wheelwriter 5 at about \$1045, or a Xerox Memory-writer 625 at about \$1595.

Or compare just the computer section to the agility, speed, and intelligence of an IBM computer. Then, check our price.

FORGET LIFT OFF CORRECTION

Think about making a change in the first paragraph of a letter you have dictated. Just mark up the draft copy and give it back to your secretary.

She can bring the letter back onto the 80 column 25 line Amber Monitor, make the corrections, touch one button and

the letter will automatically print out with your corrections and additions.

You'll never have to reread or re-proof retyped letters again for errors. And instead of spending 15 minutes retyping and re-proofing, your secretary can be working on your next project.

A typewriter-type word processing program whose commands flash on the screen, when needed, makes this the ideal transition from typewriter to computer.

Look how easy it is to use. Simply touch the F1 key at the left of the keyboard to delete a character. F2 deletes a word. And, F3 deletes a whole line.

F5 turns this machine into a line by line typewriter for typing directly onto envelopes or forms. F6 prints out anything on screen at any time.

This is a magnificently simple program that you or your secretary will be comfortable with in 30 minutes.

But when you are comfortable, you'll want to open our sophisticated \$400 Software Library that lets you really start to use the power of this computer.



(DAK's added Software shown with Included Visual Manuals)

You can type in lists of your customer's or employee's names and addresses. Then create a letter, select which names you want to receive the letter, and the computer will automatically print out individualized letters for each person.

So if you want 5 people or 500 people

to be notified personally of your newest product or policy, now it's all automatic.

There's also a Budget Program, a Calendar Program and even a Portfolio Management Program we have included.

Of course you can use any IBM compatible PC programs from Lotus 1-2-3 to Norton Utilities. Or, you can buy other even more sophisticated word processing programs that even correct your spelling or give you an on-line thesaurus.

MORE THAN A TYPEWRITER

This IBM compatible computer with its two 360 kilobyte drives, 256K random access memory (more is available), composite video and yes, even RGB full color graphics output, is made by Visual, the 5th largest manufacturer of office graphics terminals.

Visual's computer is loaded. It has both a Centronics parallel printer output (we've included a superb daisy wheel letter quality printer) and an RS232 serial communications port (yes, you can add a modem to access outside data banks, or your main frame computer).

Visual's 1985 price list shows a list price of \$1895 for this computer. And, that doesn't include the Amber Monitor, the Printer, or the Software Library that we've added. It just includes the computer and of course the IBM compatible MS DOS 2.1 operating system.

WHY SO CHEAP?

Visual makes terminals. They thought they'd design a superb IBM Clone and sell it with their terminals.

Well it turned out that Visual's salesmen weren't equipped to sell computers and Visual had put too much money into these computers (the built-in color graphics, TTL output, 2 floppy disk drives and lots of other features) to sell them at today's stripped down prices.

So, Visual has sold them all to DAK and has taken an enormous loss. (But don't worry about Visual. They are a

large company and 'dumping' these computers just lets them get back to concentrating on their main terminal business.)

So, you'll save a fortune and that's why this is an unfair comparison to IBM.

You see, you're saving money only because Visual lost money. IBM not only needs not to lose money, but needs to make a profit as well.

And, don't worry about ending up with an orphan. Unlike small computer companies that come and go, as long as Visual makes terminals, they will be around to protect your investment. Plus, they use the Sorbus Network for service. **TAKE YOUR WORK HOME TOO! Wow!**

With the addition of a \$149 optional 25 line 80 column LCD display, you can take this computer home. It's a full monitor display screen complete with graphics.

So, when it gets to be 6:00 and there's still work to be done or files to be studied, just take the computer home or send it home with your secretary.



And, with the addition of a modem, you can even transmit files from home to the office. Or, you can log onto data bases like CompuServe or Dow Jones.

THE GOOD, THE BAD, & THE BEAUTIFUL

From your first touch of the rugged sculptured keys of this computer, you'll appreciate the built-in rugged quality.

There's even a 10 key numeric pad. The 83 key keyboard is identical to IBM's PC, except for the addition of lights on the 'Cap Lock' and 'Number Lock' keys.

The contoured keyboard is extremely comfortable. But, I must warn you that if you've never typed on an IBM PC, they've made the Shift keys and Return Keys slightly smaller than on a typewriter and it will take you a few minutes to adjust.

The computer has two floppy disk drives that use double sided double density 5¼" floppy disks. Each floppy disk holds 360,000 characters.

As a free gift from DAK, we're including a box of 10 disks. You can store 3,600,000 characters.

The computer uses a 16 bit 8088 Intel processor with a 4.77 MHz clock speed. It is AC powered and UL and FCC listed.

There is 256K of installed random access memory (RAM) for you to use as compared to 128K for most computers and the 7K on the IBM Wheelwriter 5.

We've included Magnavox's latest 80 column 25 line 12" non-glare Amber Monitor. It has 900 lines of horizontal resolution and 350 lines of interlaced vertical resolution to display graphics.

You can also connect an RGB (red green, blue) monitor for full color graphics. With most computers, the internal 'color card' can cost you several hundred dollars. Visual's has it built-in.

You can expand this computer by adding custom cards. There is an expansion port that can be directly connected to an IBM expansion chassis. Of course, the computer is infinitely expandable by running IBM compatible software.

Here's another bad point. This system is bigger than a typewriter. The computer is 18" wide and 15½" deep. And, with the monitor sitting on top, it is 14½" tall. Actually, the computer really isn't any bigger than a typewriter.

But don't forget the printer. It can be placed up to 6' away, but it really belongs next to the computer so that you can easily put in paper, envelopes etc. It is 15½" wide and 12½" deep.

So for most productive use you need a return on your desk that is about 33½" long. Of course, the printer can sit on a typing stand next to your desk or even your credenza. You'll be amazed at the increase in your productivity.

THIS IS NOT A CHEAP STARTER COMPUTER. Forget our price. Put it side by side with a similarly equipped IBM, run the same programs and you'll get the same results.

In fact, it's so compatible that you can interchange disks of your letters and programs between Visual's computer and an IBM PC whenever you wish. Wow!

THE PRINTER

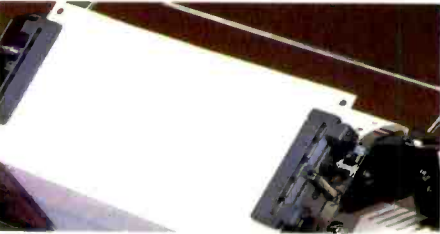
This Silver Reed daisy wheel printer will type on your standard letterhead, envelopes, 3 X 5 cards or mailing labels.

It uses the same type interchangeable daisy wheel direct impact print system as typewriters (heavy duty of course).



The printer prints at 10-12 characters per second bidirectionally. You can set horizontal spacing, 'pitch', for expanded or contracted letter spacing. You can underline automatically and you can print normal or Bold.

But, don't worry. You can simply put in your paper and type. You can even use continuous form tractor feed paper with the optional \$69 tractor feed.



Or, use your own letterhead with the optional \$99 cut sheet feeder.



FINAL NOTES

Both the Silver Reed Printer and Magnavox monitor are backed by their respective manufacturers' limited warranties. The Visual Computer is backed by Visual's limited warranty and serviced by Sorbus (or Visual).

DON'T FORGET IT'S PORTABLE

For just \$149, you'll get the factory installed 80 column 25 line (graphics capable) LCD display which simply lifts off when you're using the Amber Monitor.



You may not take your computer home or to another office every day, but the versatility is phenomenal.

ACCEPT OUR TYPEWRITER COMPUTER CHALLENGE RISK FREE

Wait till you see this state of the art computer marvel on your desk. And wait till you see what its incredible computing power can do for your productivity.

If you're not 100% satisfied with its typing or computing ability, simply return it to DAK in its original boxes within 30 days for a courteous refund.

To get your Visual 256K IBM Compatible Computer with Two 360K Floppy Disk Drives, Composite and RGB Outputs, Amber Monitor, Silver Reed Letter Quality Daisy Wheel Printer, \$400 value Software Library, 10 Free Double Sided Double Density 5¼" Disks and connecting cables for the monitor and the printer risk free with your credit card, call toll free or send your check for DAK's limited Close-Out price of just \$999 plus \$24 for P&H. Order No. 4500. CA res add tax.

OPTIONS

If you're into massive spreadsheets and the largest programs, order the 512K upgrade which doubles the 256K memory. It's installed by the factory for an additional \$129 (\$5 P&H) Ord. No. 4625.

Add the Factory installed 80 column LCD 25 line display so you can move Visual's computer and work wherever you want. It's just \$149 (\$5 P&H) Order No. 4626.

If you want to run continuous forms, from mailing labels to checks to letterhead, the Silver Reed Tractor feed snaps on and off in about 30 seconds. It's just \$69 (\$3 P&H) Order No. 4345.

Use your standard letterhead automatically with the cut sheet feeder. It feeds paper like an automatic copier tray. It's just \$99 (\$5 P&H) Order No. 4627.

Standard 300,000 character black poly ribbons are just \$6 (\$0.50 P&H) Order No. 4346. You'll never see a lifted off correction mark that shows where errors have been removed again. You'll get 'Presidential Quality' letters that you'll be proud to mail every time.

IBM & IBM Wheelwriter 5, Lotus & Lotus 1-2-3, Flight Simulator, and Xerox & Xerox Memorywriter 625, are registered trademarks of International Business Machines, Lotus Development, Microsoft, and Xerox Corporation respectively.



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8200 Remmet Ave., Canoga Park, CA 91304

\$49⁵⁰ BREAKTHROUGH!



When you are at rest, so is your heart. A low resting heart rate usually means you're in good condition. Have you checked yours?



When you exercise, you should reach your heart's target zone. But, have I reached my exercise target zone, or just had too much coffee?

Heart Window

Now you can exercise, rest, swim or go out to dinner wearing the latest in computer pulse takers on your wrist. Plus, it's a talented sports watch and a formal dress watch too.

By Drew Kaplan

It's a fact. You can tell a lot about yourself from your heart rate. You can evaluate the condition you are in, how much stress you are under, and how hard you should be exercising.

Think about it. How fast does your heart beat when you climb a flight of stairs? And how long does it take for your heart rate to return to normal?

Well, if you're at all like me, you may be a little out of shape. While I'm only 37, several friends of my own age have recently had heart attacks. And frankly, I'm getting just a bit worried.

You see, I am getting past the point where I can simply say, "I'll get back into shape next year."

So, whether you're a long distance runner (this is the ultimate jogging companion), or just a few pounds overweight like I am, your heart rate will give you a picture of your heart and body's condition.

Now you can take your heart rate anytime, anywhere with the newest in sophisticated electronic pulse takers.

And best of all, this heart computer is contained in a beautiful 24 hour alarm, 24 hour chronograph, LCD watch, that you will be as proud to wear with a coat and tie as you are when you're running.



YOUR HEART'S TARGET ZONE

Your heart, just like any other muscle in your body, requires exercise. Unfortunately, unlike your arms, you can't see your heart's condition just by looking.

The type of exercise called aerobic exercise is specifically designed to exercise your heart. The purpose of aerobics is to reach your heart's target zone.

So what is your target zone? Your target exercise zone is between 60 and 80% of your maximum heart rate. And here's an easy way to figure it out.

Simply subtract your age from 220 beats per minute. So, for me at 37, my maximum heart rate is (220-37) or 183.

So when I exercise I should get my

heart rate up to at least (183 X 60%) or 110 beats per minute, and no higher than (183 X 80%) or 146 beats per minute.

With the Heart Window to help me, I can be sure that my workouts are valuable for my heart and neither dangerous escapades or total wastes of time. Of course, before beginning any exercise program you should consult your own doctor. Note: The Heart Window is designed to indicate your pulse rate and aid your exercise, not to make medical diagnoses. **BUT ISN'T EVERYONE DIFFERENT?**

Here's the really exciting part. The worse shape you're in, the faster you'll reach the target zone and the less work you'll have to do to stay in the zone.

You see, as you get in shape, your heart doesn't have to beat as hard to do the same amount of exercise. Just as when you work out with weights your arms become stronger, your heart becomes stronger with aerobic exercise.

So the Heart Window is safe for the beginner or the athlete. And, you'll really see your improvement as you exercise. But you don't have to exercise. Just wearing the Heart Window and using it at the office when you're under stress, after you've walked up some stairs or around the block, will make and keep you aware of your body's physical condition.

And look at this. Sit down at your desk and take your pulse. Then drink a couple of cups of coffee and take your pulse again. You'll see just what your morning 'pickup' actually picks up, and if, God forbid, you smoke, take your pulse before and after a cigarette. Wow!

ALL ELECTRONIC

With Innovative's new Pulsemeter watch, you'll have supreme accuracy. It's like a direct electronic line to your heart.

You see, unlike other pulsemeters that use a light shining through your finger, or a microphone to take your pulse, this instrument actually measures the electrical impulses that cause your heart to beat.

The back of the watch is one receptor, and the metal touch sensor on the front of the watch acts as the other sensor. Just touch the sensor, and you'll see your pulse on the large LCD Display.

IS IT A DRESS OR SPORTS WATCH?

Innovative Time thinks that everyone interested in their pulse must be a pro-

fessional athlete. So, they've built this watch with all the athletic extras.

It's not only water resistant, it's guaranteed to 60 feet (although you can't actually take your pulse underwater). It has a stopwatch, a lap timer, and dual finish mode. Its band is made of very tough polymers. So, it's a sports watch.

But wait, I don't like black watches for dress. So, I've gotten Innovative to add a deluxe matching stainless bracelet to the watch. It's rendered in stainless and black and is a perfect high fashion choice. So, it's a dress watch.

Plus, there's a 24 hour alarm and an hourly chirp. The stainless band is great for sports or dress. So, you'll get the watch with the black band on it and the high fashion band packed with it, compliments of Innovative Time's superb engineering and DAK's good taste.

The Heart Window is backed by Innovative Time's 1 year limited warranty and comes with a 1 year battery in place.

TRY THE HEART WINDOW RISK FREE

Now you can look at your heart as easily as the time. You'll see how you react to stress, foods and exercise. Don't let DAK's low price confuse you. Take this pulse watch to your own doctor and have him test it.

Try the Heart Window risk free. Try exercising and then check your cardiac recovery rate. If you don't like what you see, you'd better keep the watch. But if you just don't like the pulse watch, simply return it within 30 days in its original box for a courteous refund.

To order your Heart Window, Pulse Sports/Fashion Watch, complete with 2 bands risk free with your credit card, call toll free or send your check for just \$49.50 plus \$3 for postage and handling to DAK. Order No. 9844. CA res add sales tax.

In the gym, at the track or at the office, you'll have a direct connection to the condition of your heart.



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Fat Watcher Plus

Now you can walk or jog around the block, walk around the office or even around a trade show, and know how far you've traveled and how many calories you've burned. Use the alarm to set calorie and distance goals.

By Drew Kaplan

No, you don't have to be fat. And no, you don't have to be a marathon runner. However, if you are, you're going to marvel at the feedback you'll get from this new electronic Body Monitor.

Before we explore how you can use this Body Monitor's capabilities to aid you in losing weight (as it is me) and to measure your training achievements, let's look at some interesting curiosities.

If you're like me, you've probably wondered just how far you go when you walk around the block. And, every year I attend the Consumer Electronics Show and I've always wanted to know how far I walk.

Since my plane always seems to be at the last gate at every airport, I've wondered just how far I go. I've also been curious about how much ground I cover in an average day at the office.

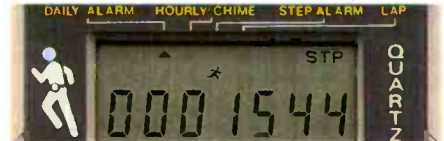
Well now, not only will I know how many steps I've taken, I'll know how many miles or hundredths of miles I've gone and how many calories I've burned.

Now we will know it all. And, with the ability to set goals, we can use this monitor to help achieve our desired fitness.

ONE STEP AT A TIME

It all starts out with one small step. Just clip the Body Monitor on your belt or waist band and away you go.

First it counts your steps. As you can see below, I've taken 1544 steps.



It knows how far you've gone because you set it to your particular stride length. As you can see, I've got mine set at 2½ feet. But you can set yours from 0 to 7'.



Because it knows your stride length, it automatically calculates the distance you travel. Just touch a button, and as you can see, I've traveled 0.58 miles.



Push the button again, and you can see how many calories you've burned. The Body Monitor has a built-in table that calculates an average of how many calories you've burned, based on the number of steps you've taken.

And, you can be even more accurate by adding your exact weight to the body meter's reading. A formula is included.



What's really great is that you can set a target for yourself to achieve. Here I've set 2500 steps. When I reach 2500 steps, an alarm will sound to tell me that I've achieved my goal.



But steps aren't very interesting, so you can set the alarm to let you burn 100 calories or go 3 miles. It's all calculated through the steps, so it's really easy.

Let's say I want to eat an ice cream sundae. It has 260 calories. So, I'd have to walk 5200 steps. I'm forgetting the ice cream sundae, but I may have a piece of cheese or maybe even a cookie.

Using the Body Monitor for running or walking lets you see just what you've accomplished. And while I can't speak for you, I personally work and play best when I set goals.



The Body Monitor lets me set and achieve goals. So, it's been a terrific aid in my personal fitness program.

By the way, it's 1.03 miles around my block and I burn about 105 calories.

I'm really excited about finding out just how far I walk at the Consumer Electronics Show, but I'll have to wait till it opens in January to find out.

SO MUCH MORE

It may look small, but it has so much inside. It has a built-in clock with hourly chime, so you don't have to wear a watch.

It has a stopwatch, accurate to 1/100th of a second resolution. And not only does it have a lap timer, it has first and second place finishes.

But, with all its frills and all its great curiosity satisfiers, it's really a precision fitness aid.

So, if you walk, jog or exercise, the Body Monitor can aid in measuring what you've accomplished. It comes with a one year battery, and it's backed by a one year limited warranty by Innovative Time, the Pulse Watch People.

SATISFY YOUR CURIOSITY RISK FREE

I've been dieting and exercising for years. I use my pulse watch all the time and it tells me how I'm doing. Now the new Body Monitor gives me feedback as to what I'm accomplishing.

And, I particularly like the goal setting alarms. Now, instead of watching my watch to see when I've run enough, an alarm sounds when I'm through. Plus, it's really neat to know how much ground you've covered around the office or around the block.

If you're not 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order Innovative Time's Body Monitor with Step Counter, Mileage Counter, Calorie Counter, Stop Watch and Goal Setting Alarm, call toll free, or send your check for DAK's breakthrough price of just \$39⁹⁹ (\$3 P&H) Order No. 4651. CA res add tax.

It's great for fitness, but I'm wearing mine to work and even around the house. It's small in size, but it sure feeds back a lot of exciting information.



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8200 Remmet Ave., Canoga Park, CA 91304

Remote Control Blowout

Command Consoles, Modules & Computer Interfaces

Burglars will think you've got a family of 10 at home when you're out. And, you'll feel like you've got a butler, 2 maids and a security guard when you're home. And now, for just \$19⁹⁰ you can interface your computer.

By Drew Kaplan

It's late at night. You're in bed. The lights are romantically low. The stereo that is playing in the background, as well as your lights, will be automatically turned off after you're asleep.

As you peacefully drift off, you'll be secure in the knowledge that to a burglar on the prowl, your family still appears to be moving about.

CHEAP THRILLS

Romantic lighting, burglar deterrents and energy saving controls, are just the beginning of this remarkable, installation free, remote control system.

Now you can remotely turn on, off and dim your lights, thwart burglars, and even turn the lights on or off in an unattached garage or barn.

It's exciting. Just imagine effortlessly retrofitting your home for remote control without running a single wire.

From my own nightstand, I can dim the lights in the bedroom, turn off my son's TV and turn on our outside security lights or all the controlled lights in the house. Wow!

This instant remote control system simply plugs-in in seconds and consists of inexpensive space age control modules and command centers.

It actually uses your existing house or office wiring. And if you can plug in a lamp, you can plug-in this system.



super low price, you can put Command Consoles in as many rooms as you wish.

No matter where a Command Console is, you can control lights, fans, TVs, and stereos anywhere in or around your home.

HERE'S HOW IT WORKS

As you push each button on the command console, a powerful but silent, encoded signal is sent down its AC cord into your home or office wiring.

This safe, silent encoded signal, travels throughout your electrical system. And, it won't disturb your TV or your FM.

It can even reach your unattached garages, barns, sheds and even your pool light, porch lights and yard lights.

Wherever you want to control a light or appliance, all you have to do is plug-in one of the system's controller modules.

Each module has a rotary dial numbered from 1 to 16. Just dial in a number to match one of the 16 number buttons.

Then, just plug the module into the wall and the lamp or appliance into the module for instant remote control.

Important note: You will still have local control of all your lights and appliances by just using their normal switches, even though they are plugged into modules.

Each module actually senses when you turn the controlled unit's switch and automatically relinquishes control.



There are separate modules for lamps that have full range dimming capability from 0% to 100%, and handle up to 300 watts. There are appliance modules that have no dimming but can handle up to 500 watts, or 1/3hp motors.

And, there are even light switch modules that have both full dimming and 500 watt capability which you can install instead of your present wall switches.

You can move the modules from place

to place or change their code numbers in seconds. And of course, if you move, your system goes with you.

THE TIMER

This sophisticated electronic brain can perform 32 tasks. Just plug it in and you're in operation.

Select the module number you want to control, then decide if you want the controlled device to come on or off.

If you only want something to happen once, just push the 'Once' button.

There is a 'Daily' button that lets what you've programmed occur every day.

There's a 'Security' button. You can program lights and radios to give your house a lived-in look when you're away.

With The Timer, you can set your window air conditioning to come on an hour before you return from work.

Or, you can have your porch lights come on so you'll never enter a dark house. You can set your hall light to come on at 11PM and off at 6AM. And you can have your electric blanket shut off at 7AM and come back on at 10PM.

TELEPHONE CONTROL TOO

You can even phone home and control anything. Just plug it into both your AC line and any modular phone jack in your home or office.

Then just call your regular phone number, hold up its 'beeper controller', give your 3 digit code that you set yourself, and start controlling.

You can call home and turn on your lights before you leave work or before you leave a midnight party. It's a great security device.

SOME NEAT IDEAS

You'll find the system changes and bends to meet your exact needs. You can set several modules to the same number so that the front and rear lights can come on together.

Or, you can set all the lamps in a room to come on and even dim together.

You're sure to want a module in your dining room. Eating by subdued light is a real pleasure. And it's important to remember that not only do you get full remote control, you get 0% to 100% brightness control of your lights.

It's like getting free dimmers thrown . . . Next Page Please



THE COMMAND CONSOLE

Imagine that you're watching TV. You can dim the lights from your easy chair. If you hear a noise, touch a button and your outside flood lights jump to life.

It's all easy when you have this top of the line Command Console, shown above, sitting next to you. It can let you control up to 16 different lights and appliances.

You can turn each on or off. You can dim or brighten lights. And look at this. You can turn all your controlled lights on or off for instant security with the 'All On' and 'All Off' buttons on the console.

You can even move it from room to room because its total installation consists of simply plugging it in. Or, at DAK's



...X10 Continued in with your remote control system. So, for bedside lamps, swag lamps, ceiling lights, track lights and garage lights, you'll be in full command.

And, you'll automate your fans, coffee-maker, humidifiers, and crock-pots.

With a little imagination, you can adapt other electronic devices that will let you water plants, control green houses, and of course, make use of audio cassette decks with 'timer ready' switches.

And, if you own a second home, now you can activate pipe heaters if there's an early frost, or 'switch on' the house so it's warm or cool and lit when you arrive.

QUITE A SYSTEM

As you get into bed tonight, think about what you'd do if you heard a noise outside or downstairs. Just push a button.

Think about how nice dimmed lights would be in your bedroom or living room. If you're at all like me, you'll love all the 'plug-in' things you can do with X10.

19⁹⁰ COMPUTER CONTROL TOO

It's amazing. Look at your computer screen. Pick a lamp anywhere in your home and touch a button. Both the lamp on the screen and the 'real' lamp will jump to life. And, it's yours for just \$19⁹⁰.

You can choose 10% to 100% intensity. And, not only can you turn anything you choose 'on' or 'off' right now, you can program the device to come 'on' or turn 'off' multiple times today, tomorrow, or any day(s) you wish during the week. **USE YOUR COMPUTER-DON'T LOSE IT**

What's really neat is that you can operate the system directly from your computer, but you store all your programmed instructions in X10's 80C48 microprocessor based Control Center.

And look at this. The Control Center instantly connects and disconnects from your computer without tying it up.

The control center has battery back up (9V battery not included), and you can back up all your stored commands on the copyable X10 master disk.

So, not only is your programming protected, but you can store summer, winter, and vacation schedules on disk.

In fact, although the included software supports at least 95 devices (minimum, depending upon which computer you own), you'll have access to 256 command capabilities. So, you can program anything you like. Imagine all the excit-

ing things you can program your computer to do. Wow!

FULLY COMPATIBLE

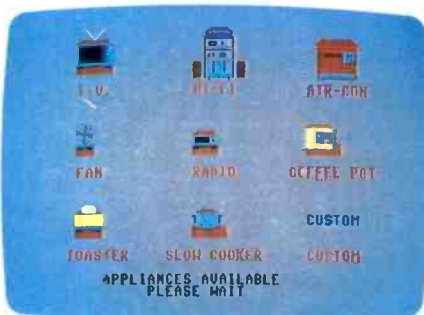
DAK has over 70,000 customers with X10 systems. The standard modules that you already own are 100% compatible. So, for \$19⁹⁰, how can you go wrong?

How is it done? Well, your computer tells the Command Center what you want done. The Command Center then sends a silent encoded signal throughout your home's electrical system.

If it says, "Number 7 module turn on to 40%", only number 7 will respond. Of course, groups of modules can be controlled and you can assign several lights, such as outside flood lights, to the same number. It's all easy. It's all flexible.

BACK TO THE ACTION

OK, you're sitting at your Commodore or Apple IIE or IIC Computer. You'll see pictures of a variety of rooms. Just tell your computer what types of devices you'd like to control.



Whenever you would like to place a lamp or appliance, just choose one from a screen like the one shown above. These pictures, or ICONS as they are called in computerese, will appear. There are many types of devices to choose from.

If you were at your IBM PC you'd see text. (You can even control your whole office or factory.) If you were at your Macintosh, you can draw your own rooms, even using Macpaint. Wow!

So, with Command Consoles or with your computer, or with both, you'll have control never before possible of electrical devices in your home or office.

Wait till you feel the power of your computer surging through your home. A security mode can make your lights come on and off at random times for security. You can even manually control 8 devices

\$19⁹⁰ BLOWOUT
Computer Interfaces were originally \$129 for:
● IBM ● MACINTOSH
● APPLE ● COMMODORE



from the Console itself.

All Command Consoles, Modules and Computer Interfaces are backed by X10's standard limited warranty.

FINAL CLOSE-OUT RISK FREE

It's simply thrilling to use. It's security. It's convenience. And, it's fun.

If you aren't 100% satisfied, simply return any component to DAK in its original box within 30 days for a refund.

To order Any Combination of Command Consoles, Modules and Computer interfaces call toll free, or send your check for the amounts shown below.

Order any combination of Command Consoles and modules you desire.

1) The Control Console-Lets you control up to 16 different modules. On/off/dim/all on/all off. Just \$19⁹⁰ (\$2 P&H). Order No. 4622.

2) 32 Event Clock Timer-Lets you control 8 modules with up to 2 on and 2 off commands to each. Also acts as a command base plus sleep and security extras. Just \$26⁹⁰ (\$2 P&H). Or. No. 9777.

3) Telephone Responder-Phone home and control 8 devices. It's also a base. It's just \$39⁹⁰ (\$3 P&H). Order No. 9778.

4) Lamp Module-Controls/Dims lamps up to 300 watts plugged into walls. Just \$11⁹⁰ (\$1 P&H). Order No. 9779.

5) Wall Switch Module-Controls/Dims lights now controlled by wall switches. 500 watt capacity. Just replace your wall switch with this automated module. Just \$12⁹⁰ (\$1 P&H). Order No. 9780.

6) Appliance Module-Control stereos, TVs, or anything with motors. 15 amps, 500 watts, 1/3hp rating. Just \$11⁹⁰ (\$1 P&H). Order No. 9781.

An X10 Computer Home Controller complete with Appropriate Software Disk and Cable is just \$19⁹⁰ (4 P&H).

7) For your Commodore 64 or 128, it simply plugs in. Use Order No. 4378.

8) For your Apple IIE or IIC, use Order No. 4379. Note: For the Apple IIE only (the IIC has one built-in), you'll need a serial interface (same as for a modem). It's just \$79 (\$2 P&H). Order No. 4380.

9) Most IBM PCs & Clones have a serial port, so X10 should simply plug in. Use Order No. 4410.

10) For your Macintosh, the X10 simply plugs in. Use Order No. 4411.

Commodore, Commodore 64 & 128 and Apple, Apple IIE, IIC, Macintosh & Macpaint. IBM & IBM PC are registered trademarks of Commodore Electronics Ltd and Apple Computer and International Business Machines.

\$99⁹⁹ EARTHSHAKER



Crooning Titan Plus

You'll experience melodious but thunderous sound at home or on the road from this bi-amplified audiophile portable with subwoofer, 7-band equalizer and dual high speed dubbing cassette decks.

It's rich. It's deep. And it's powerful. This portable has the sound and features you'd expect from home stereo.

In fact, when you are at home or at the office, it makes a great second stereo system, with its rich thundering bass and vibrantly alive highs.

You'll have superb sounding FM stereo, AM and sequentially playing cassettes.

COLOSSAL SOUND

Forget boom box sound. Now you can have bi-amplified, equalized and enhanced deep bass sound wherever you are.

The Equalizer. Most portables have 'Tone' controls or, at best, some have bass and treble controls.

Now you can infuse your bass with life at 50hz for the very low bass and at 100hz for mid-low bass. String basses, drums and orchestral crescendos will literally throb with life.



Cymbals, or brushes on a snare drum, will take on life and excitement as you boost this equalizer's 15,000hz control.

And best of all, you won't make your favorite singer's voice sound raspy when you boost the highs or muddy when you boost the lows, because an equalizer lets you sculpture just the areas of the frequency spectrum you want to enhance.

The 7-band EQ lets you sculpture the sound at 50hz, 100hz, 300hz, 1,000hz, 3,000hz, 7,000 hz and 15,000hz.

Thundering Subwoofer. Just switch in the separate electronically crossed-over amplifier & 'super woofers' to add earthshaking depth and fullness.

By separately amplifying (bi-amplifying)

the low bass, and not letting it clip (overload) the left and right channel amplifiers, you can maximize the acoustical detail of your mid-range and high-end sound while you infuse your bass with life.

Because this electronic crossover allows some frequencies as high as 400hz to reach the mid-range amplifiers, it may be pushing credibility to call it a true subwoofer. But, you'll be amazed at the power, punch and tightness of the bass.



EVEN BIGGER THAN IT LOOKS

The speakers across the front provide a continuous 22½" wall of sound. The woofers in the center don't affect stereo separation, because very low frequencies are totally non-directional.

The outer mid-range speakers produce clean, solid mid-range that will let you enjoy your favorite music without coloration. And outermost, are the powerful piezo tweeters which widen your perception of stereo and produce crystal clear, vibrant highs.

ALL THE MUSIC

Powerful AM and FM tuners with a large slide rule dial, let you pull in even distant stations. At home or away, you're going to have great reception.

Dual Cassette Decks. Now you can copy cassettes at normal or high speed. Now you can listen to one cassette and then another, automatically.

The twin decks in this portable are perfectly matched for great sounding recording and playback.

You can make great sounding recordings from its built-in tuners or from its built-in mike. You can also plug in your own external mikes. You'll also have

One Touch Record, Auto-Stop, Automatic Level Control and a Tape Counter.



And don't forget, these decks play sequentially. Just put tapes in decks 'A' and 'B'. When the first tape is finished, the second tape will automatically begin.

You can operate this portable on AC (cord included), by standard D batteries (not included), or by 12V DC from your car (cord not included). It's made by Unitech and backed by their limited warranty.

A DUAL CASSETTE CROONING TITAN RISK FREE

This silver-tongued music maker will amaze you with both its purity and its power. It's perfect for the bedroom, den, office or out in the yard.

If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Unitech's Crooning Titan Plus Portable with 7-Band Equalizer, Bi-Amplified Subwoofer, and High Speed Dubbing, Sequentially Playing, Dual Cassette Decks, risk free with your credit card, call toll free, or send your check for DAK's earthshaking price of just \$99⁹⁹ (\$7 P&H). Order No. 4637. CA res add tax.

Why be tied down to one room to listen to your favorite cassettes or radio stations? Now you can have really great sound and high speed dubbing anywhere in your home or in the great outdoors.



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Any Other Inquiries. . . . 1-800-423-2866

8200 Remmet Ave., Canoga Park, CA 91304

\$169⁹⁰ MARKET BUSTER



Remote Sound Blaze Plus

Like the blazing flash and violence released by a lighting bolt striking earth, your stereo system's sound will explode with life. With a 95db signal to noise ratio, a 95db dynamic range, and a 5hz to 20,000hz frequency response, Emerson's new programmable remote CD player is sure to stagger your perception of audio.

By Drew Kaplan

There's no warning. There's no record noise, no tape hiss. Vibrant but finely detailed music just explodes from your stereo system. The sound is like a shock-wave reverberating through your home.

This is the experience you can expect with your first introduction to digital audio. Forget any experience you've ever had before with stereo. CD audio is an awesome advance that dwarfs the switch we made years ago from 78s to LPs.

Imagine listening to music with a frequency response from 5hz to 20,000hz +0.5db -1db. Wow! Imagine sound so pure that harmonic distortion is just 0.003%. And, if you're into zeros, flutter and wow is "unmeasurable".

The sound quality, and yes, the sonic violence will thrill you. I've spent over 15 years on the test bench and in the studios, and the only equal I've heard to this sound is 'live sound'.

And, live sound doesn't mean the sound you hear at a concert where you are simply listening to the auditorium's PA system. Live sound means sitting right in the middle of the orchestra.

I know, I'm a cellist. And, there's just no sound experience like the sound we hear in 'the pit'.

NO SOUND AT ALL

CD gives you a signal to noise ratio of 95db. There is, for all intents and purposes, absolutely no hiss, no scratch, and best of all, no surface noise.

You've got to experience the silence during very quiet passages to comprehend the sonic adventure of the music. It's as if your stereo isn't even on and then, suddenly, a thunderclap explodes!

Conventional records and tapes have a dynamic range of perhaps 50db. Dynamic range is simply the difference in sound level (volume) between the softest and loudest recorded sounds.

CD gives you a 95db dynamic range, which is roughly equivalent to the difference between absolute silence and

standing next to a jet engine.

Your music will be dramatically more exciting. You won't have to carefully compare CD to conventional sound. From the very first note, you'll be in shock.

NOT PERFECT?

CD isn't perfect. Or rather, it is, and that's a problem. You'll hear everything. You'll hear every note, every instrument, as if you were sitting in the orchestra.

When CD first came out, there were three complaints. 1) It could sound harsh or hard. 2) There weren't enough CDs released. 3) Not all CD discs were really recorded digitally. **Here are the answers.**

1) Early discs did sound harsh. A characteristic of pressing LPs is that they drop off from 5-10,000hz, so recording engineers boost those frequencies.

A few cuts with an equalizer bring the first discs back to super smooth sound. 2) True again. CDs were in short supply. Now there's a virtual avalanche of thousands of titles, and more each week.

3) True again. Not all CDs come from digital masters. CDs from digital masters can sound phenomenally better than a conventional LP. (It's earthshaking.)

But, when analog (conventional) masters are recorded in the studios, they are recorded on two inch wide tape at 15 inches per second. They sound great.

Most sound quality is lost in pressing records and copying cassettes. A CD from an analog master isn't quite as good as from a digital master, but its superiority over an LP is still like day and night.

CDs are now a standard format. There's no stylus to wear out and the disc doesn't wear out because nothing touches it.

INFRARED REMOTE CONTROL

You can sit in your favorite easy chair and simply touch buttons. You can hear a track again, or skip to the next.

You can program up to 15 tracks randomly from the remote. And, of course, you can 'Play', 'Pause', 'Stop', and continuously 'Repeat' all from the remote.

WHY EMERSON?

This CD disc player is the latest Japanese made second generation type.

It has a 3-beam, laser servo system with heavy sampling for superb sound. Plus, it's loaded. You can select up to 15 tracks in any order you like. There's even a repeat button. So, you can repeat selected tracks or the entire disc, forever.

Just touch a button and you can skip to the next track during play, or repeat the track you are listening to. You can even playback indexed passages within a track. A display shows you the track that is playing, the elapsed time, or the total time of the disc.

Installation consists of simply plugging it into any 'aux' input on your receiver or preamp. It's backed by Emerson's standard 1 year limited warranty.

TRY EXPLOSIVE SOUND RISK FREE

Plug it in. Experience music with a thrilling frequency response and sonic range. Plus, you'll be thrilled by the hiss, and background noise you won't hear.

If you're not 100% satisfied, simply return it to DAK within 30 days in its original box for a courteous refund.

To order Emerson's Top Of The Line Infrared Remote Control, Fully Programmable CD Disc Player and experience the sonic thrills of a lifetime, call toll free, or send your check for DAK's market breaking price, of just \$169⁹⁰ (\$7 P&H). Order No. 4640. CA res add sales tax.

It may strain my credibility to describe any device I'm offering for only \$169⁹⁰ as providing sound many times better than anything you've ever heard before. But, use DAK's risk free trial to experience this bigger than life sound for yourself.



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8200 Remmet Ave., Canoga Park, CA 91304

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

THE ALMOST BROTHERS. Steve Mosto, Mike Ragogna (vocals); vocal and instrumental accompaniment. *Adventures in Love; Birds of a Feather; I Don't Love Her Anymore; Life Without Women; When a Man Loves a Woman; What Goes Wrong When Love Is Right; My Heart's at the Borderline*; and three others. MTM/CAPITOL ST-71056 \$8.98, © 4ST-71056 \$8.98.

Performance: *Almost artists*
 Recording: *Good enough*

The Almost Brothers, Mike Ragogna and Steve Mosto, are like a thousand other pop acts you've heard through the years—singers who craft catchy little singles for radio airplay but whose sound is totally derivative and devoid of originality. On this album, for example, we have a tune called *I Don't Love Her Anymore*, which is a dead-on Everly Brothers clone; *My Heart's at the Borderline*, which sounds a lot like the Righteous Brothers' (*You're My Soul and Inspiration*); and *What Goes Wrong When Love Is Right*, which, vocally, could pass for Simon and Garfunkel on an off night. Maybe that's why the promotion material says the Almost Brothers are "influenced by all the great duos of the past." None of the great duos wrote lyrics like these, however: "I miss the perfume on my pillow/There's too much room in my bed/Does the wind still make your dresses billow/My shoulder's lost without your head." Ah, the work of an almost poet. *A.N.*

ASHFORD AND SIMPSON: *Real Love*. Nick Ashford (vocals); Valerie Simpson (vocals, piano, synthesizers); Stevie Wonder (harmonica); other musicians. *Count Your Blessings; Real Love; Nobody Walks in L.A.; Relations; What Becomes of Love*; and three others. CAPITOL ST-12469 \$8.98, © 4ST-12469 \$8.98.

Performance: *Some high points*
 Recording: *Excellent*

Ashford and Simpson offer up eight songs here that range from the splendid-

ly satisfying to the instantly disposable. For some odd reason, they named the album after the junky little dance ditty called *Real Love*, whereas the honor should have gone to the opener, *Count Your Blessings*, which they deliver with a stunning display of the sort of inspired soul singing that first brought them fame. It is nothing less than thrilling to hear their interplay as they build to a climax that is a harmonized, gospel-derived shout. Similarly outstanding, though in a different vein, is the tongue-in-cheek *Nobody Walks in L.A.*, featuring a bouncy beat and a wonderful harmonica solo by Stevie Wonder that you'll want to hear again and again. Also choice is *10th Round*, which sounds like some sort of message song but is really about a lover's quarrel. Fortunately, there are enough gems here to offset the dross. *P.G.*

GEORGE BENSON: *While the City Sleeps*. George Benson (vocals, guitar); vocal and instrumental accompaniment. *While the City Sleeps; Kisses in the Moonlight; Shiver; Love Is Here Tonight; Teaser; Secrets in the Night; Too Many Times; Did You Hear Thunder?* WARNER BROS. 25475-1 \$8.98, © 25475-4 \$8.98.

Performance: *In superb voice*
 Recording: *Excellent*

Producer and arranger Narada Michael Walden has risen to the occasion here by doing for George Benson what he did for Aretha Franklin a year or so ago when he produced her "Who's Zoomin' Who?" album. In both cases, he was working with a performer with enormous talent who hadn't had a recent hit. While Benson's last two albums have sold well, they did not always make best use of what he has to offer. That certainly is not the case with this set, on which everything seems custom made to suit Benson's subtle style. Admittedly, there is no jazz here, but there is an abundance of good popular music. Benson's splendidly lustrous voice is kept to the fore throughout, with background instrumentals and vocals truly supportive. Best of all, there are times when he engages in his special manner of singing in unison with his agile guitar improvisations.

Most of the goodies fall on the first side. The title song, with its captivating melody and surging dance beat, is well worth the price of the album, and the most musical selection is the ballad *Love Is Here Tonight*, which Benson composed and sings in his best velvety romantic style. The only misfit is *Secrets in the Night*, a trite song written and produced by Kashif. But even when the songs are less than brilliant, Benson gives them classy performances. You can't ask for too much more—except, perhaps, for a little jazz. *P.G.*

THE B-52'S: *Bouncing Off the Satellites*. The B-52's (vocals and instrumentals). *Summer of Love; Girl from Ipanema Goes to Greenland; Housework; Detour thru Your Mind; Wig; Theme for a Nude Beach*; and four others. WARNER BROS. 25504-1 \$8.98, © 25504-2 \$8.98.

Performance: *Goofy*
 Recording: *Good*

The B-52's have always been 99 percent put-on, and "Bouncing Off the Satellites" won't make us take them any more seriously. I mean, what are we supposed to make of a song called *Girl from Ipanema Goes to Greenland*? Or an ode to dusting and vacuum-cleaning (*Housework*)? Most of "Bouncing" recalls soda-pop jingles from the Fifties—perky, rhythmically animated, and implausible.

I feel a little silly playing this record when anyone else is around, but I sneak a listen whenever the opportunity presents itself in order to enjoy the likes of *Detour thru Your Mind*, a spoof on psychedelia in which Fred Schneider takes us on the nerdiest "trip" through the hallucinogenic psyche since Ted Nugent and the Amboy Dukes ("Who am I? Where am I going? How much will it cost? Will I need any luggage? Oh, wow . . ."). And *Wig*, a high-speed romp through "the mean side of town," with stops for Keith Strickland's electric-sitar solo and a half-dozen bad wig jokes. And anything sung by Schneider, who sing-speaks with the feigned disingenuousness and enthusiasm of a Christopher Street kitsch seller. But you didn't hear any of this from me. *M.P.*

SUZANNE CIANI: *The Velocity of Love*. Suzanne Ciani (synthesizers); instrumental accompaniment. *The Eighth Wave; Lay Down Beside Me; The Velocity of Love; Malibuzios; History of My Heart*. RCA AML1-7125 \$9.98, © AMK1-7125 \$9.98, © RCD1-7125 no list price.

Performance: *Electric Aphrodite*
 Recording: *Good*

Composer and electronic keyboardist Suzanne Ciani is a New Age artist, and, as with most New Age music, you've got to take the good with the bad on "Velocity of Love." The good is an emphasis on melody and harmony—though at the expense of rhythm and counterpoint—and swirling, airy song structures that are gently molded rather than chiseled. The bad is that there's nothing to grab hold of. "Velocity of Love" is either hypnotic or monotonous depending on your metabolism, I guess. But a two-chord phrase repeated over and over for the duration of an eight-minute song like *Lay Down Beside Me* is monotonous in my book.

Ciani is clearly trying to create a soundtrack for a love affair with this

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music. What she ends up with, though, is the kind of gauzy, breathless stuff a "ladies' man" puts on to go with a candlelit dinner—or what Billy Dee Williams plays for that woman after she shows up for the Colt 45. *M.P.*

JUDY ERON: *Reach Across the Miles.* Judy Eron (vocals, guitar, upright bass); Dianne Davidson (background vocals); vocal and instrumental accompaniment. *Can I Be Famous First?*; *So Many Goodbyes*; *The Female Farm*; *Agging Parents*; *My Fault*; and nine others. BARLEO JP-108 \$9 (from Barleo Records, P.O. Box 120935, Nashville, TN 37212).

Performance: *Worth checking out*
Recording: *Good*

Judy Eron says her music "speaks of women, of mothers, fathers, children, of relationships . . . of the rites of passage, including times we knocked them dead, and times we would have if our slip hadn't been showing." A songwriter who is also a psychotherapist, Eron writes witty, charming lyrics about social situations and phenomena and affecting, memorable songs about the darker corners of life like rape and incest. She also produces her folk-oriented albums—this is her second—with a deft ear for eccentric instrumental touches and clever arrangements that seem homemade, but not amateurish. A favorite on the women's-music circuit, Eron really speaks to a larger audience. For example, *Can I Be Famous First?*, a satire on the star system, ought to be adopted as the theme song for the city of Nashville. An altogether delightful and satisfying LP. *A.N.*

EVERYTHING BUT THE GIRL: *Baby, the Stars Shine Bright.* Tracey Thorn (vocals); Ben Watt (guitars); chorus and orchestra, Nick Ingman cond. *Come On Home*; *Don't Leave Me Behind*; *A Country Mile*; *Cross My Heart*; *Don't Let the Teardrops Rust Your Shining Heart*; and five others. SIRE/WARNER BROS. 25494-1 \$8.98, © 25494-4 \$8.98.

Performance: *Cool*
Recording: *Very good*

I hope no one tells Ben Watt it's 1986, not 1960. The British guitarist and songwriter seems to be caught in the Verve era, when West Coast giants like Stan Getz and Jerry Mulligan were wedding cool jazz to Brazilian rhythms. On "Baby, the Stars Shine Bright," Tracey Thorn sings the Astrud Gilberto parts against Watt's arrangements for guitars, keyboards, strings, brass, chorus, and a small rhythm section. The early Sixties might seem an odd time to recreate—the lush arrangements given performers like Getz, Wes Montgomery, and the Modern Jazz Quartet are



King, Prater, Almaas, Schunk: clean licks, no gimmicks, no hurry

BEAT RODEO

THE concept was interesting—country - and - western hooking up with East Village punk—but Beat Rodeo's first album, "Staying Up Late," was rather long on wisecracks and short on execution. The new one, "Home in the Heart of the Beat," makes the concept work. Beat Rodeo has added a permanent rhythm section (drummer Lewis King and bass player Dan Prater) and nailed down their Flying Burrito Brothers Meet The Ramones sound. The result is a thoroughly satisfying LP—clean licks, no gimmicks, no hurry.

The alliance between pop, punk, and country creates what I can only call a mournful playfulness—the country in Beat Rodeo wants to make these songs sad, but the pop keeps winking at you. Steve Almaas's songs are like elaborate riddles, examining love and heartache and confusion in a succession of quick impressions, as though he'd rattled them off on a psychiatrist's couch. Almaas is such an unaffected, convincing singer that this is one of the few records where the songs made more sense *before* I read the lyric sheet. The real treat here, though, is quick-change artist Bill

Schunk, whose lead guitar moves easily from the hyper-punk attacks of *Twin Hometowns* to the lazy twang of his rhythm playing on the ballad *Everything I'm Not* to the elegant, restrained ornamentation he gives the shuffling *New Love* and the resonant, spaghetti-Western reverb of *It Could Happen Here*. Throw in the steady, swinging back beat and "Home in the Heart of the Beat" is hard to resist—one of the big surprises of the year. Don't miss it.

Mark Peel

BEAT RODEO: *Home in the Heart of the Beat.* Steve Almaas (lead vocals, guitar, harmonica); Bill Thomas Schunk (lead guitar); Dan Prater (bass, vocals); Lewis King (drums, percussion); George Usher (keyboards, vocals); vocal and instrumental accompaniment. *Twin Hometowns*; *Everything I'm Not*; *New Love*; *It Could Happen Here*; *(I Have) Everything I Need*; *I'm Not Afraid (Doesn't Matter to Me)*; *In the Summertime*; *Home in the Heart of the Beat*; *Song for an Angry Young Man*; *It's Been Too Long*; *While We're Apart*. I.R.S./MCA IRS-5774 \$8.98, © IRS-5774 \$8.98.

considered by many the low-water mark in jazz history. But while it may not have been great jazz, it was a terrifically evocative kind of pop music—haunting, sad, and romantic. Russia had "The Bomb," and love would never be the same.

There's not a lot new to say about what can happen between a man and a

woman, but "Baby, the Stars Shine Bright" restates the familiar with poignancy, through a series of arresting vignettes—the drunk voice of an ex-lover over the phone or the sad reflections of a woman who for years had left her husband and children each night to be with her lover. There are arresting lyrical images, too: on *Come On Home*, Thorn

stopped me cold with the lines, "Every day's like Christmas without you—It's cold and there's nothing to do."

After a promising debut album and a brooding, inaccessible follow-up, "Baby, the Stars" is a welcome return to form for Everything But the Girl, a group that may have missed its time by twenty years. I know a few music lovers who feel the same way. M.P.

JOHN FOGERTY: *Eye of the Zombie*. John Fogerty (vocals, guitars, keyboards); Neil Stubenhaus (bass); Alan Pasqua (keyboards); John Robinson (drums); other musicians. *Goin' Back Home; Eye of the Zombie; Headlines; Knockin' on Your Door; Change in the Weather; Violence Is Golden*; and three others. WARNER BROS. 25449-1 \$8.98, © 25449-4 \$8.98.

Performance: *Unmemorable*
Recording: *Okay*

John Fogerty's new album is the first he's ever done with session players, and if nothing else it answers a question that has always puzzled me: Was the certain rhythmic stiffness I noted even on the guy's best records a result of a conscious aesthetic decision or simply the inadequacies of his former collaborators? On the basis of "Eye of the Zombie," in which the hired help is the best that money can buy, it now seems safe to say that the rhythmic stiffness was, and is, definitely deliberate.

That burning issue disposed of, however, I'm hard pressed to say anything interesting about the record; it's the least memorable of the man's career. The title track, which was released as a single in advance of the album, should have been a giveaway. Not only does its central metaphor miss the mark—golly, do you suppose the zombie in question is supposed to represent something in society at large?—but the lyrics basically recycle those of several earlier, better songs, and the music that supports them is Fogerty's patented swamp-rock schtick reduced to a bare-bones formula.

The rest of the album, essentially a midtempo r-&-b excursion with occasional forays into semi-heavy-metal and reggae, is similarly secondhand. While I have nothing against self-plagiarism in principle (hell, Ray Davies has been doing it for years, often with brilliant results), the songs here are so dull that it's a real chore to get through them.

I'm glad Fogerty is writing about the real world again, as in *Headlines* and *Violence Is Golden*, but I'm sorry to report that he seems to have lost his Creedence-era knack for turning the topical into the universal. The quasi-political cast of these songs sounds forced at best and simply silly at worst. In fact, whenever Fogerty waxes dark and apocalyptic here, I am reminded of somebody's description of Jane Fonda as "one of the deepest thinkers in Hollywood."

Fogerty's voice and guitar work remain as distinctive and likable as ever,



Rebbie Jackson: teasing

but "Eye of the Zombie" is a snoozer, the sound of a genuine rock original approaching self-parody. S.S.

PHYLLIS HYMAN: *Living All Alone*. Phyllis Hyman (vocals); vocal and instrumental accompaniment. *Living All Alone; First Time Together; If You Want Me; Slow Dancin'; Old Friend; You Just Don't Know*; and three others. PHILADELPHIA INTERNATIONAL/MANHATTAN ST-53029 \$8.98, © 4ST-53029 \$8.98.

Performance: *One of her best*
Recording: *Very good*

A stylishly statuesque woman, Phyllis Hyman has been through more than her share of changes in a career marked by frequent shifts of approach. In the Seventies she was a jazz singer. Then she recorded pop-flavored jazz ballads with Norman Connors, an association that opened the door to recording contracts. But the commercial material she was provided did not exploit the full range of her talents. A boost came when she appeared on Broadway in *Sophisticated Ladies*, for which she earned a Tony nomination, but her subsequent recordings were often little more than mediocre.

Let the word now go out, however, that Phyllis Hyman has found her true element. Produced by Kenneth Gamble, Leon Huff, and Thom Bell, "Living All Alone" plays up the finest qualities of Hyman's lusty, full-throated voice and sensual delivery with songs that reflect a full range of moods in tasteful, rhythmically varied arrangements. And Hyman, obviously feeling comfortable with what has been offered her, sings as she seldom has before. The title song and *Old Friend* become haunting in her expressive treatments, and none of the other selections fall far behind the high standard these two set. Perhaps Phyllis

Hyman has found a firm artistic base at Philly International. P.G.

JAMES INGRAM: *Never Felt So Good*. James Ingram (vocals); other musicians. *Always; Never Felt So Good; Red Hot Lover; Lately; The Wings of My Heart; Right Back; Tuff*; and three others. QWEST/WARNER BROS. 25424-1 \$8.98, © 25424-4 \$8.98.

Performance: *A mismatch*
Recording: *Satisfactory*

If there were a section of purgatory set aside for record producers who abuse the talents they work with, I would nominate Keith Diamond for a long sojourn in that hot spot for the injustice he has done James Ingram on this album. Since Ingram's strongest suits are a gorgeously sweet voice and a knack for sensitive love songs, why give him a batch of raucous, bang-bang thumpers any rusty-voiced croaker could have handled? Yet there are three selections that provide welcome relief from the sledgehammer approach, including *The Wings of My Heart*, which is sublime in Ingram's sweet treatment, a fine ballad titled *Love's Been Here and Gone*, and a stylish uptempo strutter called *Right Back*. The last shows that Ingram can handle the faster stuff with style—if the song is worth singing. Many of these aren't. P.G.

REBBIE JACKSON: *Reaction*. Rebbie Jackson (vocals); vocal and instrumental accompaniment. *Reaction; Ain't No Way to Love; Ticket to Love; You Don't Know What You're Missing; You Send the Rain Away; Always Wanting Something*; and three others. COLUMBIA BFC 40364, © BFT 40364, no list price.

Performance: *Some spark here*
Recording: *Good*

There's no need to think that Rebbie Jackson, first-born of the reigning musical dynasty, has decided to make a record just because everybody else in the family has done so except the pet llama. This woman has more than a little appeal, and when the material is right, she can generate plenty of excitement. Maybe it's my imagination, but she reminds me a bit of brother Michael with her high, light voice and teasing delivery—and that is an asset. She has been given the sort of elaborate production befitting her lineage. Of the several producers involved, the best just happens to be her brother Tito, who fashioned the album's best track, a surging, bass-driven, midtempo serving of sassiness called *Ain't No Way to Love*. Another item of interest is a duet with a somewhat rusty Isaac Hayes, but this is Rebbie's album, and it has enough high points to insure that she won't be dismissed as just another Jackson. P.G.

JAMES: *Stutter*. James (vocals and instrumentals). *Skullduggery; Scarecrow; Johnny Yen; Summer Song; Withdrawn; Black Hole; So Many Ways; Just Hip; Really Hard; Billy's Shirts; Why So*

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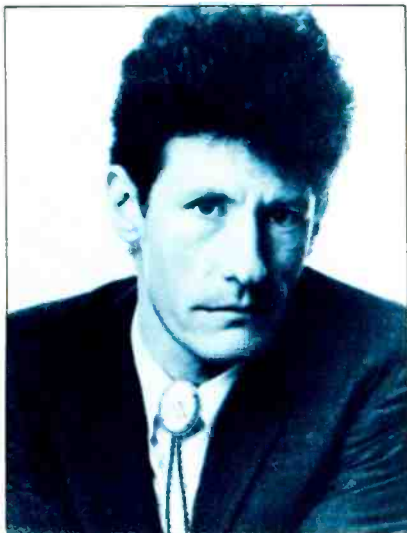
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LYLE LOVETT



LYLE LOVETT's face looks like the face of a complaint-department desk clerk who's just been brought back a refrigerator full of rattlers. First there is the element of shock that registers across the eyes. And then the delicious perversity of the humor of the situation. For Lovett, you see, is used to quirky eccentricity. Thrives on it, in fact.

Lovett is a Texas-born singer-songwriter who, with only one album, is being hailed as one of the shining new saviors of country music. One spin through his debut album and you are a true believer. Already dubbed a "Lone Star Tom Waits," Lovett is a peephole poet, a street-corner bluesman, and a back-booth philosopher. He is as comfortable at a rodeo as he is at a wedding

catered by a funeral parlor. He can compose an almost surreal lyric that compares an old Texas porch to a greasy plate of steaming enchiladas. And he can dig down in his pockets and find a waltzing fool or a jive jazz rapper. Sophisticated and sinewy whether he's writing about twisted love or the high and low life of society, he has a lot of the New Breed of Nashville scared silly.

Still, there is something about Lovett, with his warm, low-key vocal style, that reminds you of Jesse Winchester, if not Guy Clark. Clark, in fact, says in the liner notes that the first time he met Lovett he thought he was a French blues player. There is something in that face, again, that suggests the European way. But Lovett is pure American, an Eighties update of the Beat Generation, with 100-proof "cool" running through his veins. And producer Tony Brown, no fool himself, has let Lovett have his way, keeping the production lean and lithe, using the basic tracks that Lovett brought to Nashville on his demos.

Lovett is the sort of artist whose album will either make you go out and buy six copies for your friends or force you back into the bedroom with your Ronnie McDowell records. In the meantime, though, Lyle Lovett is writing his name in the history books.

Alanna Nash

LYLE LOVETT. Lyle Lovett (vocals, guitar); vocal and instrumental accompaniment. *Cowboy Man; God Will; Farther Down the Line; This Old Porch; Why I Don't Know; If I Were the Man You Wanted; You Can't Resist It; The Waltzing Fool; An Acceptable Level of Ecstasy (The Wedding Song); Closing Time.* MCA ● MCA-5748 \$7.98, © MCAC-5748 \$7.98.

Close? SIRE/WARNER BROS. 25437-1 \$8.98, © 25437-4 \$8.98.

Performance: *Brilliantly quirky*
Recording: *Good*

James is a British band of four men working in the art-rock tradition, and you know from the opening lines of the first song here—where insects crawl into a man's ear and eat away his brain—that you're in for a *different* kind of record. In the course of eleven songs, for example, we find two about people setting themselves on fire and two about what it's like to be a corpse.

At times reminiscent of Jethro Tull—in that the band operates from a folk base but builds on a masculine, multi-textured framework—James is a highly bold and experimental outfit featuring a lead singer, Timothy John Booth (sounding somewhat like Al Stewart), who achieves the right mix of music and theatricality. All in all, this is a most challenging and creative romp through a lyrical and melodic house of mirrors where you never know what kind of twisted image waits around the corner. Not for the faint of heart. A.N.

HUEY LEWIS AND THE NEWS: *Fore.* Huey Lewis and the News (vocals and instrumentals). *Jacob's Ladder; Stuck with You; Whole Lotta Lovin'; Doing It All for My Baby; Hip to Be Square; I Know What I Like;* and four others. CHRYSALIS OV 41534, © OVT 41534, © VK 41534, no list price.

Performance: *Amiable*
Recording: *Good*

Good-time bands like Huey Lewis and the News aren't supposed to make it this big. You expect to see them working up a sweat in places with names like the Surf Club, not in the *Billboard* Top 10. But Huey Lewis's "Sports" climbed to No. 1, and "Fore" is going to sell a few records too. Why? Well a lot of it has to do with his being a regular guy. While British synth-pop asks you to be an aloof aesthete and heavy-metal insists you lock yourself in your room, turn up your stereo, and burn your sister's homework, Huey Lewis lets you be yourself. You can hold down a job, come home and watch the ball game, open a beer, put on "Fore," and feel right at home. Or, as Lewis puts it, "It's

hip to be square." It sure beats paying twenty bucks to get into a club where the music doesn't start till 1:00 a.m.

Like "Sports," "Fore" is an amiable album of blue-eyed rhythm-and-blues, street-corner soul, country rock, and doo-wop. But Huey's real roots aren't so much in any musical tradition as they are in the high-school gym, where if everything works out right, the wisecracking of *I Know What I Like* gives way later in the evening to the slow dancing of *Stuck with You*. These tunes are meant to be fun or comforting in a homey kind of way, songs you can listen to while cruising with the top down or hoisting a few at the End Zone after the football team loses.

What Huey Lewis lacks in artifice ("I'm tired of these girlie magazines, I want to get back to the real thing") he makes up for in enthusiasm ("I like the sound of breaking glass—and if you don't believe me, why'd you ask?"). His husky, good-old-boy vocals glide through the band's swinging rhythm and brass arrangements like an Ace comb through Kookie Byrnes's DA. With the Tower of Power horns at the hot end and the News's patented a cappella vocals at the cool end, there's plenty of material here for all those prom bands out there. M.P.

LUBA: *Between the Earth & Sky.* Luba (vocals and instrumentals). *Strength in Numbers; How Many; Even in the Darkest Moments; Back to Emotion; Act of Mercy; Take It Like a Woman;* and four others. CAPITOL ST-12472 \$8.98, © 4ST-12472 \$8.98.

Performance: *Hot-blooded*
Recording: *Very good*

The name Luba suggests something you need to have done to your car, and, in truth, the singer who lends her name to this Canadian band is a pretty well-oiled entity. As the woman in front and the brains behind the band—she also writes all the material—Luba turns out intense, moody, and quite stylish pop. Throughout the album, she screams and pants and exorcises her demons, seeming perpetually to teeter on the rim of transcendence. Much of the material comes filtered through the golden age of Motown (with a pit stop in disco), but it's intelligently updated and reprocessed *à la* Culture Club.

Not everything is a winner—some of the songs don't seem to wind up anywhere—but *Take It Like a Woman* successfully goes for the heart, *Lay Down Your Love* aims for something lower, and *Even in the Darkest Moments* and *Back to Emotion* will positively make your head swoon. As a bonus, the record is produced by Pierre "Baz" Bazinet and the Luba group itself, with loving attention to the emotion of sound. A.N.

JOHN SCHNEIDER: *Take the Long Way Home.* John Schneider (vocals); vocal and instrumental accompaniment. *At the Sound of the Tone; The*



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Broken Promise Land; She's Ready for Someone to Love Her; Sounds Like Something I Would Say; and six others. MCA ● MCA-5789 \$7.98, © MCAC-5789 \$7.98. © MCAD-5789 no list price.

Performance: *Not up to par*
Recording: *Good*

John Schneider, the former Bo Duke on *The Dukes of Hazzard*, turned to singing country music several years ago, scoring a fistful of No. 1 singles and a hit album, "A Memory like You." On this outing, his fourth LP, Schneider applies his considerable vocal gifts to a passel of formulaic country songs—several with the kind of hokey hooks Nashville can't get enough of—and at least one decent MOR ballad, *Sounds Like Something I Would Say*. Schneider used to have one of those big, booming musical-comedy voices, but now he tends to sound a lot like John Conlee. I suspect that no matter how convincingly he cries over lost love and the auctioning off of Daddy's farm, he'll feel better on his next career stop, whatever it may be. *A.N.*

TALKING HEADS: *True Stories* (see Best of the Month, page 108)

TIMBUK 3: *Greetings from Timbuk 3* (see Best of the Month, page 106)

TOTO: *Fahrenheit*. Toto (vocals and instrumentals); vocal and instrumental accompaniment. *Till the End; We Can Make It Tonight; Without Your Love; Can't Stand It Any Longer; I'll Be Over You; Fahrenheit*; and four others. COLUMBIA FC 40273, © FCT 40273, © CK 40273, no list price.

Performance: *Tops*
Recording: *Excellent*

Toto might have been a better band if its members hadn't been such good musicians. Truly an all-star group, with drummer Jeff Porcaro and guitarist Steve Lukather at the top of their professions and keyboardist David Paich near there too, Toto has always been able to take mediocre material and make it sound great. So that's what they ended up doing.

"Fahrenheit" has a little too much of that cookie-cutter, Grammy Awards Night rock for my taste, but I confess I found myself liking this album a good deal thanks to four outstanding tracks that seem to pull the rest up by their bootstraps. *Till the End* is a well-drawn study of a confrontation between lovers, a song with more guts and less whining than anyone should expect from AOR. *Can't Stand It Any Longer* is a great tune—funny lyrics from a guy who's fed up with his nagging, cash-hungry girl friend and tireless playing from Lukather, who's worth listening to closely not just on the lead break or fills but on every second of this track. The guy just won't quit. *Somewhere Tonight* is a nice tempo change, a jazzy track that features Michael Porcaro's walking



Tina Turner: playing it safe

bass moving in step with Jeff Porcaro's imaginative percussion work. Finally, *Don't Stop Me Now* is an instrumental that wouldn't be much more than run-of-the-mill fusion were it not for a cool, lyrical guest trumpet solo by Miles Davis. I'll bet Toto still can't believe he played for them.

This band is never going to blaze new trails or, for that matter, surprise anyone. But "Fahrenheit" at least begins to show songwriting ability that approaches the level of Toto's tremendous musicianship. *M.P.*

TINA TURNER: *Break Every Rule*. Tina Turner (vocals); Terry Britten, Mark Knopfler, Bryan Adams, James West-Oram (guitars); Branford Marsalis (soprano saxophone); Phil Collins (drums); Steve Winwood (synthesizer); vocal and instrumental accompaniment. *Typical Male; What You Get Is What You See; Two People; Till the Right Man Comes Along; Afterglow; Girls; Back Where You Started; Break Every Rule*; and three others. CAPITOL PJ-12530 \$8.98, © 4PJ-12530 \$8.98.

Performance: *Playing it safe*
Recording: *Good*

"Break Every Rule" is Tina Turner's first new album since 1984's "Private Dancer," her multiplatinum comeback vehicle. Part of what made "Private Dancer" so remarkable was that she wasn't afraid to take chances on it, though the odds were against its ever taking wing. There were enough producers involved to cause a traffic jam in the control room, and the material sometimes seemed a gamble, with Turner cutting *What's Love Got to Do with It?* even though she didn't think it was her kind of song, then going on to record the dangerous *Private Dancer*, one of the most erotically lurid songs in the history of pop.

The surprise with "Break Every

Rule," however, is that there is very little surprise, very little growth or risk—even down to the repetition of autobiographical lyrics. It is an album that keeps every rule as a careful sequel to "Private Dancer," with essentially the same white, English writer-producer collaborators—Terry Britten, Rupert Hine, and Mark Knopfler—and new songs from David Bowie and Paul Brady, who also contributed to the last album.

In some respects it is a disappointment—especially from the point of view of an audience that expects Turner to be the hard-rocking fantasy woman of *Mad Max—Beyond Thunderdome*. The songs, mostly stylish pop with fewer rock-and-roll tunes than on "Dancer," don't sweat very freely or try to say very much, the shallow *Typical Male* proving a weak, if enjoyable, successor to *What's Love Got to Do with It?*

But if "Break Every Rule" is not an extraordinary record, it is still a very good one, and it succeeds admirably as a showcase for Turner's boundless vocal charms. On the best songs—*Overnight Sensation; What You Get Is What You See; Paradise Is Here; and Back Where You Started*—she is simply unstoppable. On the lesser material, such as *Two People*, or *I'll Be Thunder*, it is often Turner's impassioned, dramatic delivery—which displays far more insight than ever before—that makes the tunes listenable.

Unlike "Private Dancer," "Break Every Rule" has some fleeting moments of wry humor—a trio of kisses ("mwah, mwah, mwah") on *What You Get Is What You See* and outright laughter in *Overnight Sensation*. But in a way they seem like code words smuggled out on a prisoner's note. "I used to be a sweet little rock-'n'-roll singer," Turner intones with a hint of melancholia here. On her next album, she might try putting more energy into having fun and less into achieving a smoothly polished product. The idea of Tina Turner finally cutting loose is, after all, a fantasy almost beyond imagining. In the meantime, "Break Every Rule" is impressive and sometimes stunning. But it is also a portrait of a superstar playing it safe. *A.N.*

DENIECE WILLIAMS: *Hot on the Trail*. Deniece Williams (vocals); vocal and instrumental accompaniment. *Wiser and Weaker; Hot on the Trail; He Loves Me, He Loves Me Not; I Feel the Night; We're Together*; and three others. COLUMBIA FC 40084, © FCT 40084, no list price.

Performance: *Disappointing*
Recording: *Satisfactory*

Deniece Williams can usually be counted on for high-quality performances, but "Hot on the Trail" has too many trite songs and too little satisfying music. The best moments are when she brings her remarkable talent to bear on *We're Together* and *Healing*, both of which have veiled religious references

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and allow her to use her ability to build musical tension. But many of the other songs here are just boring. I'm tempted to suggest that Williams stick to gospel music, which seems to lie closest to her heart. *P.G.*

JAMES "D-TRAIN" WILLIAMS: *Miracles of the Heart.* James "D-Train" Williams (vocals); other musicians. *You Are Everything; Oh How I Love You (Girl); Miracle of the Heart; Misunderstanding; Let Me Love You; Ice Melts into Rain; I Got Your Number; Stand Up and Fight.* COLUMBIA

BFC 40465, © BFT 40465, no list price.

Performance: *Robust*
Recording: *Good*

James "D-Train" Williams has a powerhouse delivery in the tradition of the best r-&-b rockers and an assertive, strutting style that's well suited to the dance tunes that make up most of this album. Indeed, his performances are better than most of the music deserves, and the true extent of his talent shows only on the two songs that are several cuts above the others. *Let Me Love You*

has an irresistible pulse, and Williams creates a gripping rhythmic frenzy. *Ice Melts into Rain* displays his considerable gift for putting across an r-&-b ballad; he is so effective that you hold onto every passionate note. While most of this album will appeal only to those who like contemporary urban dance music, these two selections are so appealing that they could win a few fans for Williams in other quarters. *P.G.*

Collection

TELEVISION'S GREATEST HITS, VOLUME II. Themes from *The Three Stooges; Merrie Melodies; Rocky and Bullwinkle; Huckleberry Hound; Mighty Mouse; Courageous Cat and Minute Mouse; Pink Panther; Road Runner; George of the Jungle; Jonny Quest;* and fifty-five others. TEEVEE TOONS TVT 1200 two discs \$16.98.

Performance: *Mind-boggling*
Recording: *Variable*

The second in what is apparently an ongoing series of pop-culture archaeological digs, "Television's Greatest Hits, Volume II" is an album that, among other splendid accomplishments, validates Jung's theory of the collective unconscious. I mean, I had no idea I could hum along to the theme from *Underdog* (I don't even remember the show), but by golly I can!!! And so, I beicha, can you.

The brainchild of executive producer Steven Gottlieb, a man who probably didn't get out of the house much as a child, "Volume II," like its best-selling predecessor, presents actual soundtracks (or reasonably faithful recreations thereof) from some of the boob tube's most, er, memorable moments of the Fifties and Sixties. While the music ranges from the genuinely excellent to the surrealistically awful, there's never a dull moment.

And what an eclectic bunch of themes. There are Warner Bros. westerns and 77 *Sunset Strip* rip-offs (*Maverick, Hawaiian Eye*), sitcoms sublime (*Mary Tyler Moore*) and ridiculous (*My Mother the Car* returns from oblivion), cartoons highbrow (*Rocky and Bullwinkle*) and lowbrow (*Huckleberry Hound*), kids' shows (*Mister Rogers' Neighborhood*), spy epics (*The Avengers*), even cult classics (*It's About Time*, the lyrics of which Patti Smith used to quote in concert). High points for me are Nelson Riddle's marvelously jazzy *Route 66* and Dominic Frontiere's grandly eerie *Outer Limits*, but you will obviously have your own favorites (one of my friends nearly had a stroke from the excitement of hearing the main title from the old Lloyd Bridges *Sea Hunt*). And though some of the newly recorded versions of the old orchestrations sound a little undernourished, the album is by and large a landmark in the history of recording worthy of a place on your shelf somewhere between Mahler's Fourth and "Robert Mitchum Sings Calypso." Bring on Volume III! *S.S.*

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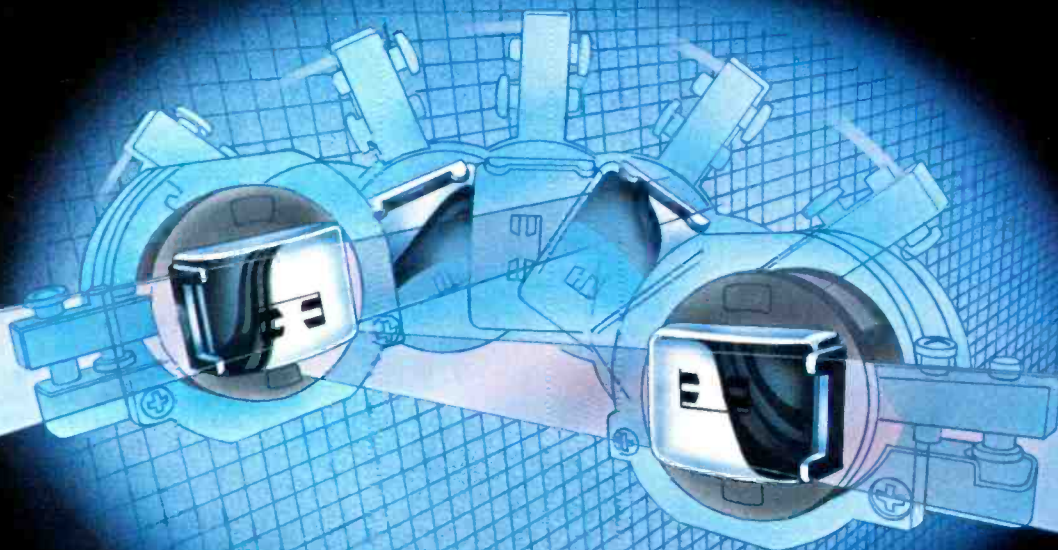
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CIRCLE NO. 21 ON READER SERVICE CARD

ROCK MUSIC ON COMPACT DISC



by Steve Simels

CHOOSING ten compact discs for someone who has just bought a player and is starting a CD library of rock presents some problems. How can you recommend a disc that sounds fantastic if you really aren't goofy about the music? And if state-of-the-art sonics determine your choices, won't that mean you can't include anything recorded before last year?

My solution to such problems has been to pick discs for no other reason than that I like them. A couple of them are new and high-tech, and I've included a couple from the Mesozoic Era (late Sixties, early Seventies) to remind people that music was not invented by MTV. This is not intended as a ten-disc history of rock, however, but simply a starter set I hope you'll enjoy. The order of listing does not indicate a ranking of quality. Playing times are given in parentheses.

PINK FLOYD: *Wish You Were Here.* CBS CK 33453 (44:15).

There's no denying the Floyd's consummate craftsmanship in the studio, and this album (about the tragic drug burnout of founding member Syd Barrett) is genuinely moving. Though by today's standards it's somewhat under-produced, it's still a super piece of record making, and the CD has tremendous sweep and unequalled clarity of sound.

THE WHO: *Who's Next.* MCA MCAD-37217 (43:14).

The albums of producer Glyn Johns, who's been making records since 1962, have always been among the biggest sounding and most impressive around. With this one, which features some of the Who's best songs, he more or less wrote the book on high-gloss production techniques in the first half of the Seventies, and it has hardly dated at all. The CD version has a hint of tape hiss that was undetectable before, but otherwise it sounds magnificent.

THE POLICE: *Synchronicity.* A&M CD-3735 (41:20).

Overfamiliarity has not dimmed the appeal of this pop masterpiece. The production is stripped down and basic so that it's the music you hear, and the results are gorgeous. If none of these guys ever record another note, their place in pop history is secure.

TALKING HEADS: *Little Creatures.* SIRE 25305-2 (38:46).

The Heads' most tuneful and pop-accessible effort, "Little Creatures" happens to be the first of their records I've liked unreservedly. What I've always admired most about this band is the deceptively simple, precision-tooled authority of their playing, and for me, the real pleasure of "Little Creatures" is the ensemble work. The instrumentals

are really a joy, and on the CD version they all come through with exemplary clarity. Not to be missed.

KATE BUSH: *Hounds of Love.* EMI AMERICA CDP-46164 (47:34).

The world's greatest Pre-Raphaelite rock star, Bush can border on the ludicrously overripe, but there's something weirdly compelling about her, and on tracks like *Big Sky* and *Running Up That Hill* her everything-but-the-kitchen-sink approach can really get to you.

JOHN COUGAR MELLENCAMP: *Scarecrow.* RIVA 824865-2 (41:07).

This is an uncommonly strong collection of songs, but the star of the album is the unorthodox production approach. Kenny Aronoff's drums function almost as the lead instrument, and the trebly snap of the backbeat fixed on tape by Melencamp and producer Don Gehman is like nothing else in rock.

THE WHO: *Quadrophenia.* MCA MCAD2-6895 two CD's (80:13).

Pete Townshend's gritty motorbike-realist look at the mid-Sixties British mod subculture is, strictly from a production standpoint, far more impressive than his mystical rock opera *Tommy*, and the CD version sounds overwhelming. Pretty great music too.

THE CARS: *Greatest Hits.* ELEKTRA 60464-2 (42:55).

The Cars is one of the greatest acts in musical history. Any band that can convince the public that songs derived from old Ohio Express bubble-gum hits are avant-garde is clearly qualified to sell ice to Eskimos. The Cars' songs are, in fact, fully as appealing as those old Ohio Express bubble-gum hits. Silly stuff, and I love it.

JONI MITCHELL: *Dog Eat Dog.* GEF-FEN 24074-2 (37:20).

Done in collaboration with synthwizard Thomas Dolby, this album may be the most lavishly produced of Mitchell's career. Her music here is forced to compete with the sounds of cigarette machines, burglar alarms, and Rod Steiger (as a Falwell-like evangelist). Still, the songs emerge unscathed from under the aural glitz. It's one of the most adventurous albums from a major artist in years.

ROLLING STONES: *Beggar's Banquet.* POLYGRAM 7539-2 (39:07).

Even today, after nearly twenty years, there are few albums on which the guitars and drums hit you with such snarling, primal intensity, and unless you are totally bored with the Stones, I can't imagine your wanting to be without it. The CD version, with its superior stereo imaging, is an exemplary mastering job.

Illustration: Jasper Johns's painting Color Numerical Series: Figure 7, courtesy of the National Gallery of Art.

If you can't afford it, spare yourself the heartache of listening to it.

We are all aware that money aside, it is an easy matter to upscale our quality of life, but difficult to lower it. In this regard, ignorance is bliss and strict abstinence is sometimes better than a taste of something finer that we can't have. So it is with Concord high-fidelity, high performance car audio. One listen, one taste, will significantly alter your demands for mobile high-fidelity.

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One listen to all of this and you will be exhilarated, and if you've read this far you are no longer blissfully unaware. Your taste has been improved. If you can afford it, you already *deserve*, and probably *demand* the best in design, engineering and of course—uncompromising performance.



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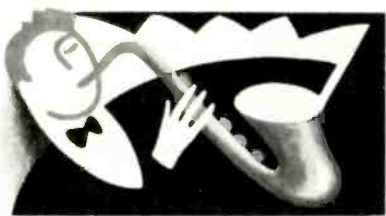
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JAZZ



NAT "KING" COLE TRIO: *Any Old Time*. Nat "King" Cole (piano, vocals); Oscar Moore (guitar, vocals); Johnny Miller (bass, vocals). *Little Joe from Chicago; Wouldn't You Like to Know?; Besame Mucho; Bacarolle; On the Sunny Side of the Street; The Man I Love*; and nine others. LEGEND GOJ 1031 no list price (from Legend Records, P.O. Box 1941, Glendale, CA 91209).

Performance: *Exquisite*
Recording: *Surprisingly good*

Nat "King" Cole is perhaps best remembered these days as a sophisticated pop balladeer or ultra-commercial hit-maker, which is too bad: he was a lot more than that. He was, in fact, one of the most preternaturally musical pop singers in any genre of the last fifty years, as well as a phenomenal pianist

and leader of one of the most influential small jazz combos ever (Ray Charles, among others, began his career doing note-for-note impressions of Cole's work with the trio). As critic Nick Tosches has argued convincingly, Cole was one of the transitional figures who paved the way for the development of rock-and-roll, and if that sounds far-fetched to you, recall that one of his signature tunes, *Route 66*, later fulfilled a similar function for the Rolling Stones.

This Cole Trio collection derives from a couple of radio transcriptions made in 1944 and 1945, and it's an absolute knockout. Romping through a collection of period pop tunes ranging from the sublime (*The Man I Love*) to the ridiculous (*Besame Mucho*), Cole and company demonstrate a group interplay that approaches the telepathic and a combination of near-patrician restraint and chicken-shack *elan* that I would describe as "awesome" if only the word hadn't been appropriated into ValSpeak. The only fly in the ointment: an occasionally intrusive ersatz hepcat announcer. An unexpected compensation: the mid-Forties sound, which is unexpectedly good on Legend's impeccable pressing. S.S.

DUKE ELLINGTON: *New Mood Indigo*. Duke Ellington and His Orchestra:

Jump for Joy; Mack the Knife; Wings and Things; West Indian Pancake; and three others. Mercer Ellington Septet: *Sassy; In the Alley*; and two others. DOCTOR JAZZ/CBS FW 40359, © FWT 40359, no list price.

Performance: *Tasty leftovers*
Recording: *Very good*

The Ellington recordings just keep on coming. This album consists of material Duke Ellington recorded between 1962 and 1966 as well as four tracks by the Mercer Ellington Septet, which includes Ellington musicians and, of all people, pianist Chick Corea. There is wonderful music in this collection, but it also contains some purely commercial efforts, like the two tracks featuring vocals by Ray Nance, *Mack the Knife* and *Jump for Joy*. I have always admired Nance, but he is a bit too close to Louis Armstrong's style here. The highlight is clearly the title tune, which really does represent a new approach to a tune Ellington first recorded thirty-four years earlier. This version does not retain the somber mood of the original but takes off on a flight fueled by Paul Gonsalves, Johnny Hodges, and Cat Anderson.

Because Ellington recordings are available in such abundance, this release, which has the earmark of a grab bag, loses some of the interest it might otherwise merit. C.A.

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OUT OF THE BLUE: *Inside Track.* Out of the Blue (instrumentals). *Cherry Pickens; E Force; Isolation; Hot House;* and three others. BLUE NOTE BT 85128 \$8.98, © 4BT-85128 \$8.98.

Performance: *Encouraging*
Recording: *Excellent*

There is certainly a flurry of activity on the jazz record market these days, with many of the great labels of the Fifties and Sixties being reactivated, and we have also seen an encouraging new crop of players dedicated to pure, unsynthesized sounds. One such group is Out of the Blue, a sextet of young musicians with traditional ideas. Like the Marsalis brothers and such young newcomers as Donald Harrison and Terence Blanchard, these six men are keepers of the flame lit by post-war modernists like Coltrane, Powell, and Miles Davis.

"*Inside Track*" is an excellent album by a group that has a borrowed style but plays with the kind of individuality that prompted someone—Whitney Balliett, I think—to call jazz "the sound of surprise." I urge any lover of good "modern" jazz to give this release the attention it deserves. It does not take a keen ear to predict that Out of the Blue has a bright future on the jazz scene, and though it echoes the last great period in jazz history, it sounds far fresher than so-called New Age music. C.A.

ROUND MIDNIGHT. Original-soundtrack recording. Bobby McFerrin and Herbie Hancock: *Round Midnight; Chan's Song (Never Said).* Dexter Gordon, Wayne Shorter, and Bobby Hutcherson: *Una noche con Francis.* Chet Baker: *Fair Weather.* Lonette McKee: *How Long Has This Been Going On?* John McLaughlin: *Bérangère's Nightmare.* And five others. COLUMBIA SC 40464, © SCT 40464, © CK 40464, no list price.

Performance: *Good*
Recording: *Good*

For the last year or so, the talk in jazz circles has often centered around a French film in the making called *Round Midnight*. A number of fine jazz musicians were involved in this production, which was loosely based on the experiences that the French artist Francis Paudras had with the late Bud Powell, whom he idolized. When the completed film was released here last October, most film critics received it well, but people close to jazz were quick to spot its flaws.

Only one of these flaws shows up on the soundtrack album: singer Lonette McKee, whose appearance as a thinly disguised Billie Holiday is as awkward as it is gratuitous. She sings *How Long Has This Been Going On?* with about as much jazz feeling as Linda Ronstadt

might have. Sandra Reaves-Phillips's Bessie Smith-style number would have been a better choice for the album, but she was bypassed altogether.

Except for a vocal by Chet Baker and Bobby McFerrin's imitations of Miles Davis, the album consists of instrumental tracks recorded during the actual filming—an unusual but, from a jazz standpoint, welcome procedure. Dexter Gordon, who deserves an award for his acting, actually does an excellent job of just being himself, in a Godfatherly sort of way. He is clearly the star of the film, but since he was ill when he made it, his tenor playing is not always up to par.

Even so, there is more substance to the music here than in most feature films. It is a soundtrack rich in jazz, with good work from Wayne Shorter, Chet Baker, John McLaughlin, Bobby Hutcherson, Freddie Hubbard, and rhythm sections headed by Herbie Hancock, the film's musical director, featuring either Pierre Michelot and Billy Higgins or Ron Carter and Tony Williams. This is not the best Dexter Gordon album of recent years, nor is it hard to find more satisfying jazz albums, but there has not been a better jazz soundtrack since the late Fifties, when Art Blakey and Miles Davis lent their talents to two other French films, *Ascenseur pour l'échafaud* and *Les Liaisons dangereuses*. C.A.

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Discs and tapes reviewed by
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Richard Freed
David Hall
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BACH: Suites for Orchestra (BWV 1066-1069). Aurèle Nicolet (flute); Camerata Bern. DENON © CO-1026/27 two CD's no list price.

Performance: *Sparkling*
 Recording: *Splendid*

BACH: Suites for Orchestra (BWV 1066-1069); Overture in G Minor (BWV 1070). Musica Antiqua Köln, Reinhard Goebel cond. ARCHIV 415 671-1 two discs \$19.96, © 415 671-4 two cassettes \$19.96, © 415 671-2 two CD's no list price.

Performance: *Clarion*
 Recording: *Excellent*

BACH: Suites for Orchestra (BWV 1066-1069). Stuttgart Chamber Orchestra, Karl Münchinger cond. LONDON 414 505-1 two discs \$19.96, © 414 505-4 two cassettes \$19.96, © 502-2 two CD's no list price.

Performance: *Gluey*
 Recording: *Thick*

If there is such a thing as three opposites, here they are. Everyone will like at least one of these recordings of the Bach suites. The one by Karl Münchinger and the Stuttgart Chamber Orchestra is for those who like a thick, legato string sound, dances that substitute cuteness for true dance rhythms, and ample ritards to polish everything off. Reinhard Goebel and the Musica Antiqua Köln will please those who like the thin, clear sound of early instruments played in a highly articulate manner and with brisk tempos. The Camerata Bern recording is for those who like an excellent ensemble of modern instruments that observes authentic performance practices.

In the Stuttgart recording the dotted rhythms are muddy and unarticulated, while the Musica Antiqua plays the dots as rests, emphasizing traditional rhythms to the point of jerkiness. The Bern players, too, observe the rests, but their slight modification of them retains the nobility of the music. In the celebrated Air for the G String from the Third Suite, the Stuttgart players sound

SERKIN'S REGER



It is altogether fitting that the release with which Rudolf Serkin is welcomed back as "artist laureate" to the CBS label, after an absence of several years, should present him in material that constitutes a real addition to the catalog rather than another remake of a favorite repertoire piece. The addition is Max Reger's very substantial Variations and Fugue on a Theme by J. S. Bach, and it is packaged with one of Haydn's finest and best-known keyboard sonatas, the one in C Major listed as No. 50 by Hoboken and as No. 60 by the late Christa Landon.

Serkin appears to be the only major pianist who has identified himself with Reger's music at all. He has been performing it, in fact, since he was a teenager, and he has recorded the Piano Concerto with Eugene Ormandy and the Clarinet Sonata with David Singer. The Bach Variations (on an aria from

the Cantata BWV 128, *Auf Christi Himmelfahrt allein*) is a splendid work that established the pattern Reger was to follow in his orchestral variations on themes by Mozart (Op. 132) and J. A. Hiller (Op. 100), both of which also conclude with large-scale fugues. While it may not encourage every listener to investigate Reger's other works, it is certainly a worthwhile discovery in its own right, and it could hardly be in better hands.

The Haydn sonata, too, is given an affectionate and authoritative performance, and the sound is crisp and clear, if occasionally a little brittle (more so in the Haydn than in the Reger, taped at a different site). The annotation, by Frederick Dorian and Judith Meibach, is exceptionally comprehensive, with the richness of background and detail that has made Dorian's notes for the Pittsburgh Symphony and the Marlboro Recording Society so valuable. My only complaint is with the side layout on the LP, which breaks the Reger after its fourteen variations (lasting a little over twenty-three minutes) and puts the concluding eight-and-a-half-minute fugue on side two with the eighteen-minute Haydn sonata. Now that we are getting a forty-minute Brahms or Dvořák symphony on a single side, this seems a gratuitous violation of the basic premise of the LP. European companies have been guilty of this sort of thing more frequently than American ones, but it is unwelcome from any source. The CD provides nothing to carp about in this regard, of course, and the availability of the Reger work in that medium should provide a real boost for the composer's cause.

Richard Freed

REGER: Variations and Fugue on a Theme by J. S. Bach, Op. 81. HAYDN: *Piano Sonata in C Major (Hob. XVI.50).* Rudolf Serkin (piano). CBS 41M 39562, © IMT 39562, © MK 39562, no list price.

like a band of Gypsies with their cloying, pressured legato, and the Musica Antiqua's thin sound, with its extreme use of decay, and busy harpsichord continuo take some getting used to, which detracts from the music. The Camerata Bern produces sheer beauty.

An overall recommendation is hard to make, personal preference plays so large a role, but at least two further points should be considered. Aurèle Nicolet, the flute soloist in the B Minor Suite with the Bern group, is superb. His elegant, warm playing only confirms his standing as one of the finest flutists performing today. And the Musica Antiqua Köln throws in a bonus work, the Overture in G Minor, which is certainly not by J. S. Bach but most likely by his talented oldest son, Wil-

helm Friedemann. It is a delight, nonetheless, and after several hearings of both complete sets by the Bern and Cologne groups, I have to admit that I've come to like the latter more and more. In any case, this is such familiar music that I think we should begin to accept it as it was meant to sound in performances true to the period. *S.L.*

BARBER: Violin Concerto, Op. 14. **MENOTTI: Violin Concerto.** Ruggiero Ricci (violin); Pacific Symphony Orchestra, Keith Clark cond. VARÈSE SARABANDE © VCD 47239 no list price.

Performance: *Lyric emphasis*
 Recording: *Mostly very good*

Neither of the two recent CD issues of Samuel Barber's youthful and intensely

EXPLANATION OF SYMBOLS:

- ① = DIGITAL-MASTER ANALOG LP
- ⊙ = STEREO CASSETTE
- Ⓢ = DIGITAL COMPACT DISC
- Ⓜ = MONOPHONIC RECORDING

lyrical Violin Concerto—this one by Ruggiero Ricci or the earlier Pro Arte recording by Joseph Silverstein, with Charles Ketcham conducting the Utah Symphony (reviewed in December)—can equal the memorable 1965 performance by Isaac Stern with Leonard Bernstein and the New York Philharmonic, which is still available on CBS, though not on CD.

Both Silverstein and Ricci offer more intimately scaled readings than Stern's, and of the two I find Silverstein's more urgent and, at least in the early pages of the slow movement, more sure-fingered. Keith Clark and his players give Ricci able and full-bodied support, but there is an occasional overprominence in the horn section—which may be the result of a resonant peak in the hall—that slightly mars the overall sound.

Where the Pro Arte disc is an all-Barber program, the Varèse Sarabande disc pairs the Barber concerto with the first stereo recording of Gian Carlo Menotti's Violin Concerto. It is, in fact, the first new recording of the work since its première on RCA with Tossy Spivakovsky and the Boston Symphony under Charles Munch.

The Menotti concerto falls between his operas *Amahl and the Night Visitors* and *The Saint of Bleecker Street*, but it is endowed with a beguiling charm and brilliance far removed from their Puc-

cinian melodrama. Ricci excels in communicating the lyrical essence of the first two movements and does splendidly in the elaborate cadenza that climaxes the second, but he is no match for Spivakovsky when it comes to the dash and wit of the finale. Except for the aforementioned horn problem, the sound is rich and wide-ranging. *D.H.*

BEETHOVEN: *Symphony No. 1, in C Major; Piano Concerto No. 1, in C Major.* Mary Verney (fortepiano); the Hanover Band. NIMBUS © NIM 5003 no list price.

BEETHOVEN: *Symphony No. 2, in D Major; Piano Concerto No. 3, in C Minor.* Mary Verney (fortepiano); the Hanover Band. NIMBUS © NIM 5031 no list price.

Performance: *Clean*
Recording: *Good*

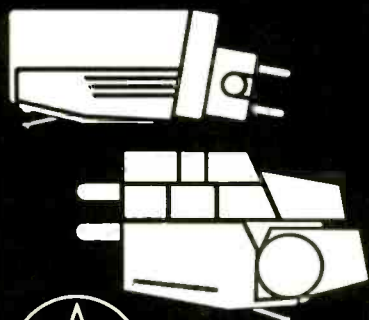
Playing authentic instruments, England's Hanover Band models itself on a typical early-nineteenth-century Viennese theater orchestra. Authenticity is extended even further by the use of the "leader," or concertmaster, and the soloist as conductors. (The credits also list an artistic director, Caroline Brown, whose duties are not specified.) They play very well, having conquered most technical difficulties, and their instru-

ments produce a clear, well-balanced sound in these recordings that serves Beethoven nicely.

Now that musicians have come to grips with early instruments and several orchestras using them are performing regularly, the beauty and validity of "authentic" sound has been demonstrated in crisp if sometimes impersonal readings. The time has come, however, to start shaping the repertoire in terms of musical interpretation and projection rather than using it for purposes of demonstration alone. The Hanover Band is still at the demonstration stage. Although what they demonstrate is excellent, it's now time that they take the next step.

Mary Verney performs on a fine 1798 Broadwood fortepiano, which does well in quick passage work. Its woody tone and lack of *sostenuto*, however, are frustrating in the two magnificent largos of Beethoven's First and Third Concertos. Verney also punches rather too hard at climactic moments, which only emphasizes the woodiness of the instrument's tone. She would sound much better on a Viennese fortepiano of the period, which would lack the volume of the Broadwood but possess a finer and more sustained tone. Nonetheless, these two compact discs bring us a real Beethoven sound, which is indeed a major step forward. *S.L.*

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Ora Electronics Debuts HQ Enhancer

Ora Electronics has introduced a new product for the video aftermarket—the HQ1000 Video Enhancer. The HQ1000 gives older VCRs the high quality of modern units. This inexpensive Enhancer solves the problem of tape-to-tape copying—poor audio and video reproduction quality. Video and stereo audio signals are greatly improved without customers having to pay for the expense of a new HQ VCR. For more information, write Ora Electronics at 800-431-8124 (outside California), or 800-527-4222 (inside California).



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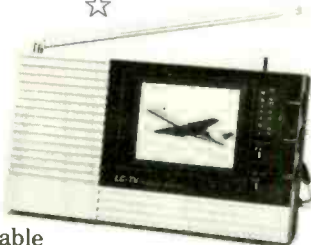


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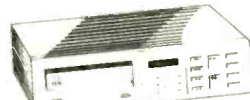


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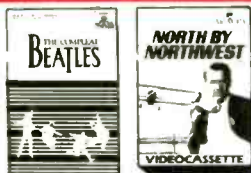


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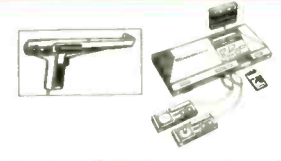
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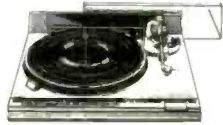
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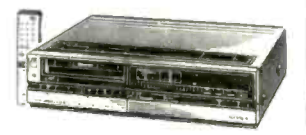
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DVOŘÁK *Sonatina in G Major for Violin and Piano, Op. 100; Four Romantic Pieces, Op. 75.* **SMETANA:** *From My Homeland.* Itzhak Perlman (violin); Samuel Sanders (piano). ANGEL ● DS-38134 \$11.98, © 4DS-38134 \$11.98, © CDC-47399 no list price.

Performance: *Outstanding*
Recording: *Warm and rich*

Forty minutes in not very generous playing time for either an LP (especially in terms of what Angel itself has encouraged us to expect in the last two years) or a CD, but the sort of music making here cannot be measured in terms of minutes per dollar. The music is as straightforwardly and consistently warmhearted as anything these beloved composers produced in any form, the Smetana going a bit farther in the direction of overt brilliance (particularly in the second of its two movements) than either of the more substantial Dvořák works. Itzhak Perlman is utterly and lovingly at home in all of this music, projecting its caressing Slavonic phrases comfortably and intimately, without the slightest suggestion of "laying it on" (though one imagines the temptation must be great in the brooding *largo* that concludes the *Four Romantic Pieces*). Why isn't all this music part of every violinist's repertoire? Just be happy it's part of Perlman's—and that he has as sympathetic a keyboard partner as Samuel Sanders as well as a recording that captures the warmth and richness of the performances as vividly as this one does. R.F.

FALLA: *El amor brujo.* Victoria Vergara (mezzo-soprano); Orquesta Sinfónica del Estado de México, Enrique Bátiz cond. **RODRIGO:** *Fantasia para un gentil hombre; Concierto andaluz.* Alfonso Moreno, Minerva Garibay, Cecilia López, Jesús Ruiz (guitar); Orquesta Sinfónica del Estado de México, Enrique Bátiz cond. VARÈSE SARABANDE © VDC 47219 no list price.

Performance: *Superb*
Recording: *Excellent*

The recordings of Spanish and Mexican material with which Varèse Sarabande introduced Enrique Bátiz to record collectors a few years back received the most enthusiastic welcomes, commanding respect for Bátiz, his fine Mexican orchestra, the outstanding sonics, and the exceptional packaging and documentation. Varèse Sarabande has yet to transfer the Mexican material to CD but has been very generous in transferring the Spanish titles. Bátiz's surpassingly convincing account of Falla's score for the ballet *The Three-Cornered Hat* is packaged with a similarly evocative one of *Nights in the Gardens of Spain* in which the soloist is his wife, the pianist Eva Maria Zuk (VCD 47210), and now the other Falla ballet turns up with two of Joaquín Rodrigo's attractive guitar concertos to provide a total of seventy-one and a half minutes' playing time. If this assortment of titles appeals to you,



Armin Jordan: impassioned Franck

you are not likely to find any of the three works more persuasively presented in any playback medium. Performances and recording are alike superb and call for the warmest recommendation. R.F.

FRANCK: *Le Chasseur maudit; Les Éolides; Psyché.* Basel Symphony Orchestra, Armin Jordan cond. ERATO ● NUM 75251 \$10.98, © MCE 75251 \$10.98, © ECD 88167 no list price.

Performance: *Idiomatic*
Recording: *Very good*

Armin Jordan's tour here last season with the Orchestre de la Suisse Romande, which he now heads, and his recent recordings of Dukas's Symphony in C and *La Peri* with that orchestra and the same composer's *Ariane et Barbe-Bleue* in a Radio France production, have done much to establish him as a major interpreter of the French repertoire. This Franck release adds to that impression and at the same time calls attention to the perhaps unexpected polish of the Basel orchestra.

The program is attractive and well contrasted, offering some of Franck's most dramatic and evocative writing, from the graphic excitement of *Le Chasseur maudit* to the diaphanous textures of *Les Éolides* and the voluptuous enchantment of *Psyché*. The last (represented here, as usual, by the four sections for orchestra without the chorus) has some marvelous tunes and shows a good deal more subtlety and imagination in the handling of the orchestra than in Franck's popular (and contemporaneous) Symphony in D Minor.

The performances here are impassioned yet tasteful and put all of the music's virtues in the strongest light. The recording itself is rich and powerful, with a degree of reverberance that suits the material. The one drawback is that the clanging bell in the concluding

section of *Le Chasseur maudit* is inaudible: you hear what appears to be an overtone for a few bars, and then no bell sound at all—a disappointing omission in this piece. Daniel Barenboim's analog recording for Deutsche Grammophon does not omit it, and his performances of both *Le Chasseur maudit* and *Psyché* come close to matching Jordan's. But on CD Jordan faces no competition in any of the three titles. R.F.

HINDEMITH: *The Four Temperaments; Nobilissima visione.* Carol Rosenberger (piano, in *Temperaments*); Royal Philharmonic Orchestra, James de Preist cond. DELOS © D/CD 1006 no list price.

Performance: *Good to fine*
Recording: *Good*

In reviewing the LP release of these recordings nearly nine years ago, I noted that *The Four Temperaments* had not been offered in stereo before and that no other recording of either work was available at the time. Since both titles continue to be otherwise unavailable (the Delos LP itself has been deleted), it is especially good to have these performances on CD. James de Preist still strikes me as lacking breadth in the opening movement of *Nobilissima visione* compared with the memorable recordings under Klemperer, Martinon, and Hindemith himself, but the rest of the work comes off quite well—the orchestral playing per se is on a consistently high level—and *The Four Temperaments* is first-rate from start to finish. The transfer to CD brings the expected aural benefits to the smooth, well-balanced recording. R.F.

HOLST: *The Planets, Op. 32.* Women of the Brighton Festival Chorus; Royal Philharmonic Orchestra, André Previn cond. TELARC © CD-80133 no list price.

Performance: *Intensely musical*
Recording: *Very good*

Aside from the opening *Mars* movement, which needs a blockbuster treatment and surely gets it here, André Previn eschews bombast in this reading of Gustav Holst's colorful astrological sequence, concentrating instead on its poetically evocative aspects. Though the conductor's 1974 Angel recording with the London Symphony has been transferred to CD, this new one has the advantage of top-of-the-line digital mastering, and the total absence of background noise works to the advantage of the quieter movements. *Venus* is here endowed with an almost Hollywood-like languor and sensuous quality. *Mercury* is an absolute tour de force of orchestral virtuosity and detailed texture, and *Neptune* has never, to my ear, sounded more otherworldly—indeed chilling, after the manner of the final pages of Vaughan Williams's Sixth Symphony.

The big movements come off splendidly as well, most notably the trickster-

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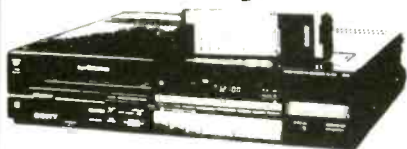
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ish *Uranus* with its interplay of winds and percussion, climaxed toward the end with a wild orchestral outburst and organ glissando. Subwoofer buffs will savor the organ pedals in *Mars* and in the final pages of the great *Saturn* movement. I wish that *Jupiter* had been a bit more uninhibited and that the great outcry at the climax in *Saturn* had been more intense, but these are minor cavils at what is otherwise one of the more distinguished realizations of a still fascinating, entertaining, and sometimes moving score. *D.H.*

LISZT: Piano Works (see Best of the Month, page 105)

MAHLER: Symphony No. 3, in D Minor. Ortrun Wenkel (contralto); Ladies of the London Philharmonic Choir; Southend Boys' Choir; London Philharmonic Orchestra, Klaus Tennstedt cond. ANGEL • DS-3902 two discs \$23.96, © 4Z2S-3902 two cassettes \$23.96, © CDCB-47404 two CD's no list price.

Performance: *Eloquent*
Recording: *Resplendent*

No recorded performance that I have encountered of Mahler's huge and enthralling Third Symphony has been anything less than good, and with five digitally mastered versions currently listed in Schwann, the prospective buyer is faced with an embarrassment of riches. Perhaps Jessye Norman's magnificent contralto in the fourth movement (Zarathustra's Midnight Song) might move one in the direction of the Deutsche Grammophon recording by Claudio Abbado and the Vienna Philharmonic, for this movement is the one weak point in what is otherwise a handsome and satisfyingly eloquent reading by Klaus Tennstedt, superbly recorded in one of EMI's early digital masterings at the now legendary Kingsway Hall.

The half-hour-long, proto-Ivesian first movement, propelled with a fine swing and exuberance, is notable for its effective projection of the moments of Panic terror. The succeeding *Tempo di menuetto* movement comes off with great charm and atmosphere, and the third movement, with its famous post-horn solo, stands out as one of the finest things in this performance—not only for the lovely solo playing but also for the wonderful handling of the distance effects. (Will someone please come up with an explanation for Mahler's use of the traditional *Jota aragonesa* tune, used by Liszt and Glinka in their Spanish pieces, in this posthorn solo? None of the Mahler literature I have studied sheds light on this point.)

Contralto Ortrun Wenkel is creditable if not fully satisfying in the Midnight Song movement, and the boys' and women's choirs put across the delightful "Bim bam" episode that follows with enormous verve. In the great slow-movement finale—almost a gloss at times on the slow movement of Bee-



Eliahu Inbal: outstanding Mahler

thoven's final string quartet—Tennstedt elicits a resplendently passionate response from the Royal Philharmonic strings.

Although, for sheer intensity, I would still give the edge to Leonard Bernstein's pioneering 1961 stereo recording with the New York Philharmonic, Tennstedt's reading and EMI's fine production place this version of the Mahler Third near the top of my list. *D.H.*

MAHLER: Symphony No. 4, in G Major. Helen Donath (soprano); Frankfurt Radio Symphony Orchestra, Eliahu Inbal cond. DENON © 33C37-7952 no list price.

Performance: *Fervent*
Recording: *Very good*

This most lovable of the Mahler symphonies has not lacked for distinguished recorded performances, ranging from the classic readings of Walter, Mengelberg, and Szell to those of Tennstedt, Karajan, Previn, and Haitink over the past decade. I would certainly add this latest installment of Eliahu Inbal's Mahler cycle to that company. His is an interpretation of great character and fervor, notable both for its attention to layered linear detail and for its command of the big line. The eerie *Ländler*-style second movement with its *scordatura* solo violin displays wonderfully differentiated timbres in this recorded performance, seeming to be a kind of outsize and utterly fascinating chamber music. The great double-variation slow movement maintains a spellbinding sostenuto quality throughout, and I can find no fault in the entrancing outer movements.

Soprano Helen Donath's performance in the *Heavenly Life* segment of the finale may not efface memories of the late Judith Raskin (with Szell) or Elly Ameling (with Previn), but the unmannered warmth of her delivery is thoroughly winning on its own terms. While Inbal handles the Mahlerian ru-

bato with great sensitivity, I find that in some of the more soulfully lyrical pianissimo episodes of the middle movements he verges perilously close to mannerism in his treatment of the Mahlerian string portamento. But this is a minor flaw in an otherwise outstanding interpretation.

I would not rank the Frankfurt Radio Orchestra in a class with the Vienna Philharmonic or the Concertgebouw, but the players do respond superbly to Inbal's direction. As with his recording of Mahler's *Resurrection* Symphony, I am impressed by the acoustic of the restored Alte Oper in Frankfurt and how well it both contains and projects the orchestral sound in *tutti* as well as solo episodes, though the inherent coloration of the hall is more evident here—particularly in the slow-movement climax—than in the earlier recording. In conveying the sound of the orchestra and its acoustic surround, the Denon recording is faultless. *D.H.*

MENOTTI: Violin Concerto (see BARBER)

MOZART: Clarinet Concerto in A Major (K. 622); Clarinet Quintet in A Major (K. 581). David Shifrin (clarinet); Chamber Music Northwest; Mostly Mozart Orchestra, Gerard Schwarz cond. DELOS • D/CD 320 no list price.

Performance: *Glowing*
Recording: *Fine*

How musicologists have arrived at these reconstructions of the original versions of Mozart's Clarinet Quintet and Clarinet Concerto makes for fascinating reading in the notes to this CD, but what truly distinguishes the disc is the glowing performances it contains. Clarinetist David Shifrin approaches both works in the highest *bel canto* style, with a seamless, long-line legato enhanced by a velvety tone. Both the Chamber Music Northwest (in the quintet) and the Mostly Mozart Orchestra (in the concerto) follow his lead and imbue the performances with a mellowness that does not obscure the melancholy lying below the surface of these late mature works. *S.L.*

MOZART: Violin Concerto No. 1, in B-flat Major (K. 207); Adagio for Violin and Orchestra in E Major (K. 261); Rondo in C Major for Violin and Orchestra (K. 373); Rondo in B-flat Major for Violin and Orchestra (K. 261a). Itzhak Perlman (violin); Vienna Philharmonic, James Levine cond. DEUTSCHE GRAMMOPHON • 415 958-1 \$10.98, © 415 958-4 \$10.98, © 415 958-2 no list price.

Performance: *Ravishing*
Recording: *Fine*

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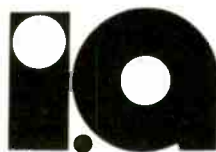
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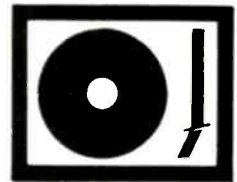
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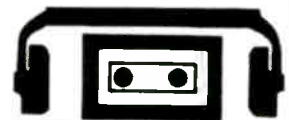
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a joy, then, to have these two delightful rondos and a soaring adagio in Mozart's most intimate vein. And what a joy it is also to have such beautifully phrased performances as Itzhak Perlman's, with such a sweet, finely focused sound. The B-flat Concerto, too, is beautifully played, and James Levine and the Vienna Philharmonic offer equal partnership throughout. S.L.

MOZART: *Le nozze di Figaro* (see Best of the Month, page 106)

RODRIGO: *Fantasia para un gentil-hombre; Concierto andaluz* (see FAL-LA)

SCARLATTI: *Sonatas. G Minor (K. 450); E Major (K. 531); C-sharp Minor (K. 247); A Minor (K. 109); F Major (K. 107); C Major (K. 132); E-flat Major (K. 193); F Minor (K. 481); F Minor (K. 184); B Minor (K. 87); E Minor (K. 233); B-flat Major (K. 544); G Major (K. 13); E Major (K. 20); G Minor (K. 8).* Alexis Weissenberg (piano). DEUTSCHE GRAMMOPHON • 415 511-1 \$10.98, © 415 511-4 \$10.98, © 415 511-2 no list price.

Performance: *Limpid*
 Recording: *Glassy*

Listening to Alexis Weissenberg play Scarlatti, you get the impression that he has never heard of the harpsichord. The music is played in such pianistic terms that Scarlatti emerges as an exquisite miniaturist; what is full-blooded virtuosic music on the harpsichord is reduced to the most delicate porcelain on the piano. Even the ornamentation (trills from the principal note and graces before the beat) harks back to the nineteenth century. Nevertheless, Weissenberg's pianism here is so exquisitely wrought, with subtle tonal shadings and inflections, that you forget the harpsichord and accept Scarlatti in purely pianistic terms. S.L.

SCHOENBERG: *Violin Concerto, Op. 36; Piano Concerto, Op. 42.* Pierre Amoyal (violin); Peter Serkin (piano); London Symphony Orchestra, Pierre Boulez cond. ERATO • NUM 75256 \$10.98, © MCE 75256 \$10.98, © ECD 88175 no list price.

Performance: *Very good*
 Recording: *Very good*

If Pierre Amoyal's name is new in the context of Schoenberg, you may safely judge him by the company he keeps. Pierre Boulez and Peter Serkin, of course, are old Schoenberg hands, and the high level of these performances should come as no surprise to anyone.

Amoyal, who has been heard up to now only in recordings of "safe" or "basic repertoire" concertos, really has the measure of the Schoenberg, but so does Zvi Zeitlin in his older recording with Kubelik (on Deutsche Grammophon). Zeitlin has been especially identified with this concerto for years, and he and Kubelik manage to give it a somewhat

greater sense of momentum and spontaneity by pacing it ever so slightly more briskly. Their recording is not nearly so richly detailed as the new Erato, but it has a substantial advantage in its companion performance of the Piano Concerto with Alfred Brendel as soloist.

Peter Serkin was more persuasive in his earlier recording of this work, with Ozawa on RCA, than in the new one with Boulez. He and Ozawa seemed to find a bit of a lyric quality in the concerto, and in general a greater sense of variety, which he and Boulez seem almost determined to suppress. Conversely, Brendel and Kubelik seem determined to explore a broader range of moods and colors. I shouldn't want to exaggerate these contrasts between the respective performances, for really they are all good ones, but I would forgo the richer sound on Erato for the richer performance of the Piano Concerto on Deutsche Grammophon. R.F.

SMETANA: *From My Homeland* (see DVORAK)

ZWILICH: *Symphony No. 1; Prologue and Variations for String Orchestra; Celebration.* Indianapolis Symphony Orchestra, John Nelson cond. NEW WORLD • NW 336 \$9.98, © NW 336-2 no list price.

Performance: *Spirited*
 Recording: *Exemplary*

The First Symphony of the American composer Ellen Taaffe Zwilich, which won for her the Pulitzer Prize in 1983, was originally titled Three Movements for Orchestra. It contains Coplandesque gestures here and there but offers much colorful use of percussion and string writing of great skill and agility. The high point of the work is the nocturne-like slow movement, with important roles for solo vibraphone and tuba. The finale is full of agitation and shows brilliant instrumental textures. The work as a whole is informed by an intensity redolent of Benjamin Britten at his most effective, yet there is no mistaking the composer's own skillful hand in music that is no faceless exercise but a genuinely personal statement.

The Prologue and Variations, composed for the Chattanooga Symphony, is notable for string-orchestra writing that is both volatile and intense. The opening is slow and brief, the four variations sharply contrasted in character. The soft marchlike figure at the very end haunts the mind. *Celebration* is a kind of orchestral toccata composed for the Indianapolis Symphony to open its new Circle Theatre concert hall. It's a resplendent display piece in which bell sonorities play the major role.

As with their previous New World recordings of works by Charles Martin Loeffler, John Nelson and the Indianapolis Symphony bring spirit, skill, and dedication to these performances. The recording, produced in a snug but not tight acoustic, is exemplary in its clarity and body. D.H.

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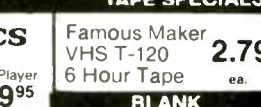
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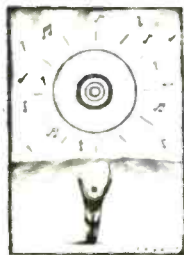
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(Continued from page 100)

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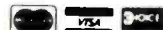
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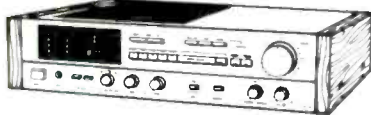
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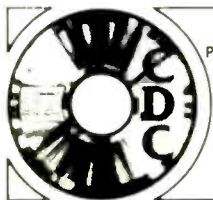
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by *Christie Barter*
& *Steve Simels*

FEW performing artists did more to honor the Liszt centennial in 1985 than the New York-born American conductor James Conlon. Music director of the Rotterdam Philharmonic, Conlon records with that orchestra for the Erato label, and his 1986 releases included Liszt's *Faust* Symphony, his *Dante* Symphony, his oratorio *Christus*, and an orchestral collection headed by the symphonic poem *Les Préludes*.

Conlon's not limiting him-

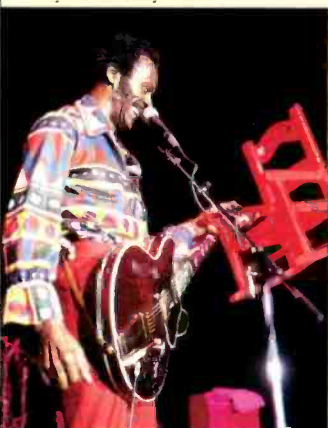


JACQUES SARRAT/ERATO

Conlon: back at the Met

self to orchestral repertoire, however. He's had a good deal of experience in the opera house since his debut at the Metropolitan Opera in 1976, and he returns to the Met next month to conduct Mussorgsky's *Boris Godunov*, which he will also conduct at Covent Garden in London next season. In 1987-1988 he will conduct at both the Met

Berry: birthday bash



FBI ROBERTS

and the Lyric Opera of Chicago, and in 1989-1990 he becomes chief conductor at the opera house in Cologne, Germany.

Between now and then, though, Conlon's come up with a real plum: he'll be conducting (and recording for future release by Erato) the soundtrack for a film version of Puccini's *La Bohème* starring **Barbara Hendricks** in the role of Mimi. Shooting begins in July at the Cinecittà studios in Rome. □

ROCK founding father **Chuck Berry's** recent sixtieth-birthday bash in St. Louis was the kind of all-star tribute that sounded like a dream on paper: performances by **Keith Richards**, **Julian Lennon**, **Linda Ronstadt**, **Eric Clapton**, and scads of rock and blues notables. And the whole thing was filmed by Taylor Hackford for a forthcoming documentary (*Hail Hail Rock 'n' Roll*) that similarly promised to be one for the time capsules. Unfortunately, according to our spies at the show, it was more or less a disaster. Hackford continually interrupted the performances to change camera setups, defusing any momentum on the part of the artists, and, even more crucially, Keith's and Chuck's guitars meshed about as well as oil and water. As of this writing, there's been no word about whether any part of the show will be restaged, but cross your fingers—Berry deserves the best. For a reminder of why, check out Chess/MCA's recently released second volume of Chuck's "Rock 'n' Roll Rarities," including revelatory versions of *Route 66* and other Berry standards. □

CONSUMER UPDATE: We caught **Marti Jones**, the Akron-based singer whose "Match Game" (A&M) we raved about last month, at Manhattan's Bottom Line club recently, and we're pleased to report that live she's even more impressive than her record. For starters, she's got more sheer lung power than the rather demure singing on the album suggests; she's also got a nice self-



Jones: impressive

deprecating, real-girl sense of humor, and she's prettier than her pictures. A lot prettier. High points of her set included a smashing version of a DB's song, *Lonely Is As Lonely Does* (great choice), and a *Your Cheating Heart* that Hank Williams should have lived to hear. Jones was so good, in fact, that we can almost agree with the unintentionally ambiguous assessment of the *New York Times* critic who called her "potentially the post-New Wave Linda Ronstadt." In any case,



Hampton (right): jamming with Hinton and Roach

if she plays your town, check her out. □

VIBRAPHONIST **Lionel Hampton**, the sole surviving member of the Benny Goodman Quartet, made headlines recently by being named the winner of BMI's first One of a Kind award—one of a kind in the world of

jazz. Hampton has been with the music-licensing organization for nearly thirty years and has clearly earned the citation recognizing his unique contributions to American jazz during a long and productive career.

The award was presented at a gala luncheon hosted by BMI at New York's Tavern on the Green and attended by many of Hamp's peers. And while music for the occasion was provided by some comparative youngsters, they were left in the dust when he got up to jam with the likes of bassist **Milt Hinton**, drummer **Max Roach**, and fellow vibraphonist **Gary Burton**.

Hampton's recent record releases include the Grammy-nominated "Ambassador at Large" on his own Glad-Hamp label, "Sentimental Journey" for Atlantic, and a Denon reissue on CD devoted to "Hamp's Blues," recorded in 1974. □

CLASSICAL recording artists in the news recently include pianist **André Watts**, who won a Grand Prix International de Disque Liszt from the Liszt Society of Budapest for his two Liszt recital albums on Angel, and pianist **Jorge Bolet**, who also won

one for his sixth volume of Liszt's piano music on London Records. . . . **Leonard Bernstein** received from CBS Records International its Golden Globe Award signaling the sales of over five million records and tapes worldwide (excluding the United States). . . . Among the winners of the prestigious

VICTORIA PEARSON/A&M

SAM SIEGEL/BMI



Edison Award this year in Holland were **Riccardo Muti**, for his Angel recording of Respighi's Roman trilogy with the Philadelphia Orchestra, and **Yo-Yo Ma** and **André Previn**, for their coupling of the Elgar and Walton cello concertos on CBS Masterworks. . . . The judges in Purina's 1986 Magical Musical Meow-Off held at Alice Tully



Lindsay, Plunkett: hit

Hall in New York included operatic baritone **Robert Merrill** and singer **Judy Collins**. They judged the cat with the most musical meow to be **Pumpkin**, an orange tabby from Waltham, Massachusetts. In addition to receiving a prize of \$25,000, he will be featured in Meow Mix commercials on television. □

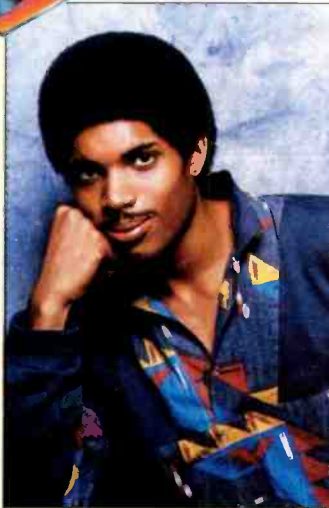
THE revitalized classical and theatrical division of MCA Records has recorded the American cast of *Me and My Girl*, Broadway's first musical hit of the 1986-1987 season. Starring **Robert Lindsay** and **Maryann Plunkett**, the show opened in New York just before Labor Day, preceded by glowing reports of the long-running London production—as well as an original-cast album derived from that production and released here by Manhattan Records. Obviously sensing that the U.S. revival of this venerable musical (dating from the Thirties) was due to enjoy an equally long life on Broadway, MCA decided that a new recording was in order. It should be in record stores by the time you read this.

Another London hit, *Les Misérables*, based on the Victor Hugo novel, is having its American première at the

Kennedy Center in Washington prior to a New York opening in March. And it, too, has been preceded by an original-London-cast album, which has already enjoyed particularly good sales in this country on CD. □

Billy Joel recently announced that his current tour of 20,000-seat arenas (we caught him at New York's Madison Square Garden) will probably be his last, and if you're wondering what the feisty singer-songwriter will be doing to take up the slack, we suspect that video will figure prominently. Case in point: the release of "Billy Joel: The Video Album Volume II," which, considering that Volume I entered the charts the same week, has got to be the fastest follow-up in video history. The new CBS/Fox tape is packaged in a format identical to that of its predecessor, although it does contain a slightly higher percentage of new-to-vintage material. High points: the spectacular Thomas Hart Benton-derived version of *Allentown*, which we still think is Joel's best-ever song; a duet with **Ray Charles** on *Baby Grand*; and the dancing-garage-mechanics treatment of *Uptown Girl*, featuring **Christie (Mrs. Joel) Brinkley**. □

Joel: into video



Jordan: into movies

SUDDENLY jazz musicians are all over the silver screen. Hot on the heels of **Dexter Gordon's** sure-to-be-Oscar-nominated performance in *Round Midnight* and Lounge Lizard **John Lurie's** comic turn in the hipper-than-hip *Down by Law* comes none other than **Stanley Jordan**, everybody's favorite Young Turk guitarist, appearing in Blake Edward's *Blind Date* along with **Kim Basinger** and **Moonlighting's** **Bruce Willis**. A busy guy, Jordan has also been in the studio readying material for a forthcoming LP on Manhattan/Blue Note, one of two projected follow-ups to his "Magic Touch" album, which recently spent a record-shattering forty-six weeks as the nation's No. 1 jazz record. □

ONE of the hottest names in music at the moment is that of Irish-born **Barry Douglas**, winner of the 1986 Tchaikovsky Piano Competition in Moscow. The first pianist from the West to achieve this honor singly (that is, without splitting it with a Soviet musician) since **Van Cliburn** did it in 1958, Douglas was beyond doubt the crowd's favorite at the play-off this past July. Russian groupies followed him in the streets, and a recording of his Moscow recital was an instant sellout.

Douglas won the Tchaikovsky Gold Medal with performances of Mussorgsky's *Pictures at an Exhibition*, the

Brahms First Piano Concerto, and the Tchaikovsky First—demonstrating to at least one critic, on London's *Daily Telegraph*, that he could rightly be described as "one of the most prodigiously gifted pianists of his generation."

And RCA's got him. They also got **Van Cliburn** back in the Fifties and picked up the record industry's first classical Gold Record with his recording of the First Piano Concerto of Tchaikovsky. Perhaps in the hope that history will repeat itself, at least with regard to sales, RCA recently recorded **Douglas** playing the same concerto with the London Symphony under **Leonard Slatkin**. The LP is a pre-Christmas release. □

SEVERAL years ago Deutsche Grammophon re-



Douglas: hot

leased on LP and tape a live recording of the gala New Year's concert in Vienna on January 1, 1980. **Lorin Maazel** conducted the Vienna Philharmonic in a program amply filled out with waltzes by the Strausses. The concert this year is being conducted by **Herbert von Karajan**. It will be carried live from Vienna by America's PBS network on Wednesday afternoon, January 1, 1987, with a repeat in the evening, and will again be recorded by DG. Happy New Year! □

ALAN BERLINER

EBET ROBERT'S

AARON RAPIPOFF

MALCOLM CROWTHERS/RCA

On The Road With The

B&W MASS CAR SPEAKERS

*by Christopher Greenleaf*

THE Modular Automobile Sound System (MASS) from B&W is a line of eleven electrically and aesthetically matched speaker components. Designed to facilitate a building-block approach to car stereo, these modules combine to form speaker arrays that range from the simple to the sophisticated. The MASS joins rather than replaces B&W's first venture into autosound, the LM1 speaker. While the LM1 can be either panel-mounted (as in most autosound applications) or used with its heavy zinc-alloy enclosure at home or on the road, the MASS modules are aimed primarily at the mobile listener. As with other panel-mount speaker systems, though, installation in walls and other home enclosures is an intended secondary use of this line.

The speakers, crossovers, and mounting accessories in the MASS line are all styled to present a unified and unobtrusive appearance. Only the tiny red, white, and black B&W logo injects a spot of color into the self-effacing black semi-matte lacquer finishes. With the exception of one tweeter, the sturdy speaker grilles are visually enhanced by circular reliefs over the drivers. The two crossover modules have no grilles, of course, but their design

nicely matches that of the speaker modules.

There is a choice of two modules to handle bass and midrange frequencies. By itself, each is rated to handle the frequency range from 45 to 15,000 Hz. B&W calls the simpler of the two, the LM50 (\$239 per pair), "the basis from which the simplest or most ambitious installation can be developed." It has a single 4 $\frac{3}{4}$ -inch Kevlar cone driver and a passive equalizer, and it also comes in a version without the protective housing (the LD50, \$189 per pair) that can be invisibly installed behind cloth screening. The 6 x 9-inch LM60 (\$299 per pair) has two 4-inch Kevlar drivers. Both speakers can be used alone but benefit from the addition of a tweeter, with or without a crossover module.

The LS20 subwoofer (\$269 per pair) extends the bass response a good half-octave below that of the two bass/midrange modules. Its rated frequency response is 30 to 2,000 Hz. The 8-inch cone is bonded to a high-temperature voice coil and also benefits from the lightness and stiffness of Kevlar construction.

Three high-frequency modules are in the MASS line. The least expensive of them is the LXT10 (\$119 per pair), which can be added

to the LM50 or LM60 without further componentry, as their equalization and crossover characteristics are matched. Its rated response goes up to 22,000 Hz. The LT30 has the same price but does not have the LXT10's built-in crossover. Instead, it has the TZ26 driver, the automotive version of the high-frequency driver found in B&W's home and studio monitors. The top-of-the-line tweeter module is the LT40 (\$239 per pair). Its nickel-cobalt driver is the same as the one used in B&W's famed Model 801 home speaker.

There are two crossovers, each tailored to the tweeter module bearing the same number. The LX30 and LX40 (\$159 per pair) employ third-order Butterworth networks and fast-acting signal-overload protection circuitry. To adjust off-axis tweeter response, there are three settings for the high-pass signal: -1.5 dB, flat, and +1.5 dB.

The LT40 mounts in a way that permits it to swivel in virtually any direction, but the orientation of the other two tweeter modules is limited to flush mounting or mounting on accessory plinths. Any of the module except the subwoofer can be fitted into the BR1 bridge mounting (\$99) for configuration as a single unit in a rear-deck installation.



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TDK. THE ART OF PERFORMANCE.

Given B&W's well-known concern with flat response and uncolored reproduction of the usable musical range, it is not in the least surprising that the only response controls are the tweeter-level adjustments in the crossover modules. However, the MASS components can accept equalization and crossover adjustment by other manufacturers' equipment. Indeed, if your power amplifier is intended for use with a specific type of crossover or a frequency-contouring network, these speaker modules can benefit from such response-shaping by the installer.

Something Else

My search for a typical, not-too-elaborate installation of most of the MASS components quickly turned up a thoroughly normal system in a decidedly exotic setting. I flew from the muggy air of New York in August to the high, clear weather of Lake Tahoe, where I met Bill Overhauser, B&W's West Coast representative. His car stereo installation is typical of any good, slightly expensive system using MASS modules, but the car . . . that is something else!

At one time in his colorful career, Overhauser was a race driver in active competition at such events as the Can-Am. Old habits, it seems, die hard, so his MASS system happens to reside in a 1969 Lamborghini Espada. Its twelve cylinders, 155-mph capability, and Bertone body put it well outside the normal car stereo realm, but the essentially simple installation of the MASS is just as I might have found it in many vehicles of lesser visual and visceral impact.

The installation features pairs of LT40 and LD50 or LM50 modules in front and back, a pair of subwoofers in back, and LX40 crossovers. Three Soundstream D200 power amplifiers, controlled by a Soundstream TC-308 head unit, provide 100 watts per channel to the front, the back, and the sub-bass drivers. The rear drivers are mounted in and on a special acoustic enclosure, while the amplifiers and Soundstream's DX1 Digital Crossover are mounted inside of the enclosure. The rear portion of the system is all the way at the car's rear, under the long and nearly horizontal glass hatch. Along with the unusually low and long configuration of the Lamborghini's passenger compartment,

this placement makes for an unusual listening situation, putting the brunt of responsibility for imaging and stereo impact on the front speakers. The car installation was specifically intended for demonstrating at electronics shows, so the extreme positioning of the rear transducers was deliberate.

Throughout my evaluation of the B&W system on the road and off, my strongest impression was of the transparency and effortlessness of the sound. All that amplifier power didn't hurt, naturally, but even unmusically loud and very dense passages from big choral or symphonic works remained extraordinarily clear. Between them, the Soundstream and B&W crossovers permitted fairly quick and easy adjustment of high- and low-frequency levels, so I was able to experiment with the various ways in which the system could be balanced.

The LT40 tweeters exhibited a precise and "present" quality I am simply unused to in a car. Being able to orient the front and rear pairs in any direction permitted me to listen alternately to direct, reflected, and off-axis tweeter sound. The sheer variety of available soundscapes was a revelation, not least because these are spectacularly fine transducers. Given reasonably competent installation, good deep-bass response in a car is relatively simple. Good treble is not so easy. The flexibility of the MASS system, especially of the LT40 tweeter, is a big plus if truly polished response and imaging are your goal. Besides, who could object to having one-third of a B&W Model 801 on the dash and in back?

The midrange was more problematic in the Lamborghini because it is

MASS modules in the Lamborghini



so long and low a car, but it was far less problematic than I had anticipated. In fact, some slight additional equalization would have cleared away most of my objections. In any case, that was an installation problem, not a driver/crossover inadequacy.

The roads in the Lake Tahoe area provide an endless variety of scenery in any season. More important for my listening tests (concentration was hard at times) was the limitless variety of road surfaces, from five-mile-per-hour surfaces to expressway stretches of spanking new asphalt. These road-noise sources and the insistent growl of twelve thirsty cylinders provided every kind of music masking I needed to get a feel for the car's acoustics and the sound system's abilities. The car was somewhat quieter than I had thought it would be, but it still succeeded in obliterating most parts of the musical spectrum at some times. Deep bass and high treble were the last to disappear, while the mid-bass and the lower midrange, as in any car stereo, were especially vulnerable to masking. With volume and equalization boosts, the drivers *could* have begun to sound unmusical, but that was never the case. The MASS speakers are thoroughly unflappable.

While very low bass and the difficult lower midrange came through with utter musicality, I repeatedly noticed the extraordinary transparency of the tweeter and its tendency to breathe air and space into the music. Believe me, there's enough sizzle and tinkle out there in autoland to fry all of our ears, but the LT40 is not about to add to it. Even at the lower end of its output it sounded smooth and tonally true. I was constantly astounded by the wealth of detail and crystalline precision from any signal I gave it.

When the time came to pry myself away from the B&W MASS modules in their elegant home, I was reluctant to leave. Of course, Tahoe's scenic magnificence and mountain air played some part in that unwillingness, but I will remember for some time the pleasure of spending a couple of days getting to know a car speaker system that is both musical and adaptable. Although the B&W MASS is among the more expensive systems around, it boasts sound and looks that would be an asset to any car—even a Lamborghini Espada. □



CAN YOUR SPEAKERS HANDLE THE EXTREMES?

It takes sophisticated engineering and pure craftsmanship to produce speakers that deliver the extremely wide dynamic range of digital recordings. The new EPI Time/Energy Series II speakers deliver *everything* that digital recordings have to offer; their quiet solos, thunderous finales and lightning quick transient response.

All this is made possible by the Time/Energy technology which involves making speaker cones and domes from special two layer materials. The combined physical properties of the two layers provide the performance that gets the most from *any* recording.

A case in point is the new EPI model T/E 280 Series II. It exemplifies the EPI tradition of achieving high levels of performance by using imag-

inative engineering and precision manufacturing, not complex designs and exotic, expensive materials. Its efficiency, power capacity, wide range response and just plain beautiful sound will make even the most die-hard technophile forget the graphs and specs and sit back to revel in the sound. And, with a suggested retail price of \$199.95, forget about what it cost to get it.

There is an EPI Time/Energy speaker for everyone regardless of their listening habits, their electronics or their budget. Each one gives dedicated music lovers the kind of performance, quality and reliability that will keep them listening for years to come. With the Time/Energy speakers you can literally hear today what you'll listen to in the future.

The EPI T/E 280 Series II. One of eight Time/Energy Series II speakers and Time/Energy Monitors offering EPI performance and value with suggested retail prices of from \$99.95 to \$299.95. Epicure Products, Inc., Newburyport, MA 01950, 800-225-7932, in Mass. 800-892-0565.



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JANUARY

NEW PRODUCTS

Boston Acoustics

The Boston Acoustics Model 797 car speaker system has a 6 x 9-inch long-throw woofer based on the design used in the company's top-of-the-line Model 793 home speaker. The flush-mount system also has a 2-inch midrange and a 3/4-inch-dispersion ferrofluid tweeter. Weatherproof copolymer diaphragms protect the drivers from environmental extremes, and matte-black perforated-metal grilles are supplied. Maximum power handling for the 4-ohm system is 80 watts. Frequency response is given as 36 to 20,000 Hz \pm 4 dB. Price: \$199.95 per pair. Boston Acoustics, Dept. SR, 247 Lynnfield St., Peabody, MA 01960.



Altec Lansing

The Altec Lansing Model 101 is a two-way acoustic-suspension bookshelf speaker system that has a 6 1/2-inch carbon-fiber woofer and a 1-inch titanium tweeter. The system is rated to handle up to 100 watts peak power per channel; nominal power handling is 50 watts. Frequency response is given as 50 to 22,000 Hz \pm 3 dB with less than 1 percent total harmonic distortion from 100 to 22,000 Hz. Each cabinet is finished in hand-rubbed walnut veneer and measures 9 1/2 inches wide, 17 inches high, and 8 1/2 inches deep. Price: \$340 per pair. Altec Lansing, Dept. SR, Milford, PA 18337.

Circle 130 on reader service card

Clarion

Responding to the "popularity" of car audio components with thieves, Clarion has introduced the slide-out 8825RT AM/FM stereo cassette receiver. It includes an autoreverse tape deck, a 25-watt-per-channel amplifier, and electronic quartz-locked PLL tuning. An Auto Store function automatically presets the six strongest available signals. Twelve FM and six AM channels can be

scanned without running through the entire radio band. Other features include Dolby B, individual bass and treble tone controls, metal-tape capability, four-way balance, and Automatic Program Control, a music-search feature. A preamplifier output with fader allows additional amplifiers, equalizers, and accessories to be connected. Price: \$429.96. Clarion, Dept. SR, 5500 Rosecrans Ave., Lawndale, CA 90260.

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—Ric Cecconi, KEF SENIOR DEVELOPMENT ENGINEER

ONE STEP IN THE MAKING OF A KEF

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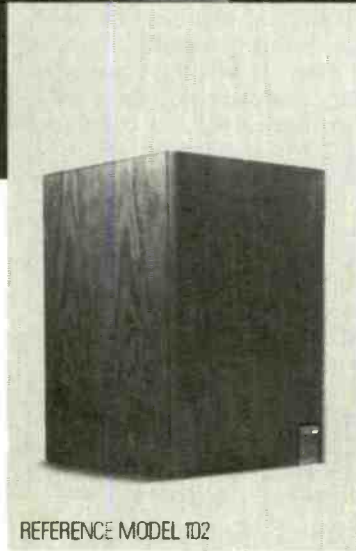
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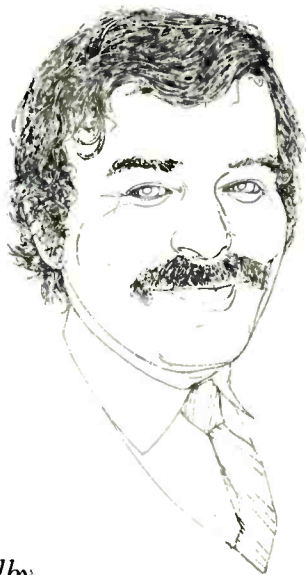
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REFERENCE MODEL TD2

KEF
The Speaker Engineers

by Ralph Hodges



Dolby

THE story probably isn't strictly true, but it's close, and it's also irresistible. It seems that in the mid Sixties Ray Dolby, returning to the U.S. after an extended tour of technical advisory duty in India, experienced an in-flight "Eureka!" and jumped off the plane in London to found a company. A lot of that company remains in London, although Dolby has since set up his headquarters in San Francisco.

By now, Dolby Laboratories has found its way into virtually every branch of audio entertainment, including phonograph records, analog tapes of every description except the worst, broadcast media, and, of course, cinema sound, where its triumph has been virtually complete—an amazing accomplishment considering how resistant the motion-picture industry is to outside innovation. Most recently, Dolby SR (Spectral Recording), a new noise-reduction process, promises to keep twenty-four-track analog recording studios competitive with their digital counterparts for a long time to come. And in the digital domain, the company is aggressively promoting a form of delta modulation for broadcast links that may well more than offset its loss of the stereo-TV "franchise" to dbx.

Given all this, it's interesting to

note that the original Dolby noise-reduction system was not conceived as an audio device at all. Ray Dolby had been deeply involved in the initial development of Ampex's videotape-recording system, and it was the problem of noisy ("snowy") pictures that was receiving most of his attention. The video industry did not respond to his attempts to sell it electronic noise-reduction processing, so, realizing that his fundamental principles had universal application, Dolby adapted them to audio and managed to capture the interest and enthusiasm of Decca Records' legendary Arthur Haddy. Bingo. When I last looked, however, video noise reduction was still under active development at Dolby Labs, although no one was prepared to say when or if the company would have time to take it to market.

Dolby, who much prefers to call himself an inventor rather than a scientist or engineer, tends to become passionate over things that have open-ended applications. "Look at the diesel engine," he exclaims. "It would take me all day to begin to list the things the diesel is doing or could do, and superbly well. Furthermore, it is a highly developed technology that you can pick right off the tree. You do not have to go back to the first square and solve an entirely new set of problems."

There are some aspects to this attitude that can lead to frustration, however. "I really have no special interest in the entertainment industry," says Dolby. "It is simply the market that first embraced the technology we have to offer. The company coalesced around the special requirements of that market and had to be run accordingly. At this time I would rather be pursuing new directions in which noise reduction can make an important and perhaps even vital contribution."

Some five years ago Dolby took a step that seemed to commit him to that course, reorganizing the company around a new president and retiring himself to his home laboratory. Since then we've seen Dolby C, Dolby HX Pro, the delta-modulation digital broadcast scheme, and Dolby SR—all entertainment oriented. It appears the entertainment industry just won't let him go.

Dolby Labs makes all of its professional and cinema products in-house, but none of its consumer products. This policy has led to a technology-licensing scheme for outside vendors that has become a model for the audio industry. Key to its provisions is that, essentially, nobody ever *pays* for the use of Dolby technology. You can make and sell as many Dolby processors as you like without much fear of legal interference. What you do pay for is the use of one of the Dolby logos. To earn that right of use, you must be prepared for a visit from a team of Dolby licensing engineers to scrutinize your operations. A thumbs-down reaction from them means either no logo (and no Dolby IC's) or a serious consultation with big-trouble lawyers.

By now, Dolby Laboratories has found its way into virtually every branch of audio entertainment.

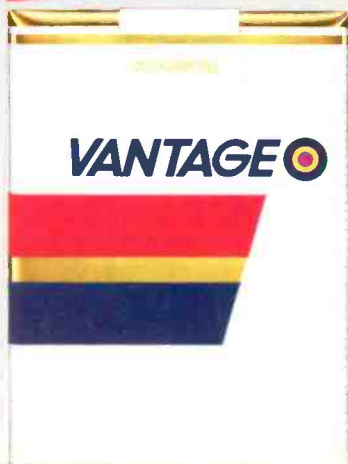
The system has worked well and profitably for the company, and it has, not coincidentally, led to advancement in cassette-deck performance that continues to be almost unthinkable. Dolby Labs loves its licensees but hates bad cassette decks.

And for good reason. Many audiophiles continue to be suspicious of Dolby noise reduction, asserting that it robs the program of high frequencies and blunts the transient attacks. Interestingly, many of their complaints fix on moments of music during which the Dolby circuits, according to their principles of side-chain operation, should not be in the signal path at all.

Still, the critical nature of Dolby calibration remains troublesome, and so far the company's engineers have resisted endorsing the idea of user-adjustable calibration controls, believing that consumer use of them is more likely to make things worse than better. Meanwhile, much of the world waits to learn whether Dolby noise reduction can really sound as good as claimed. But one thing is clear: without it, the world would sound much worse. □

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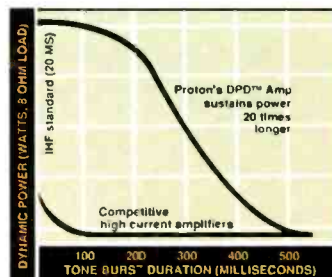
If you're running that terrific new CD player off an amplifier or receiver that's three to five years old, you're missing out on a great deal of clean, uncompromising sound. Most amps of that vintage just can't create the extra headroom that's necessary for accurate digital reproduction. Every time the music hits a peak, your amp will be gasping for breath. And you'll definitely hear about it. Unless you have a Proton 40 Series amplifier or receiver with our exclusive, patented DPD circuitry.

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