

# Stereo Review

OCTOBER 1987 ● \$2.25

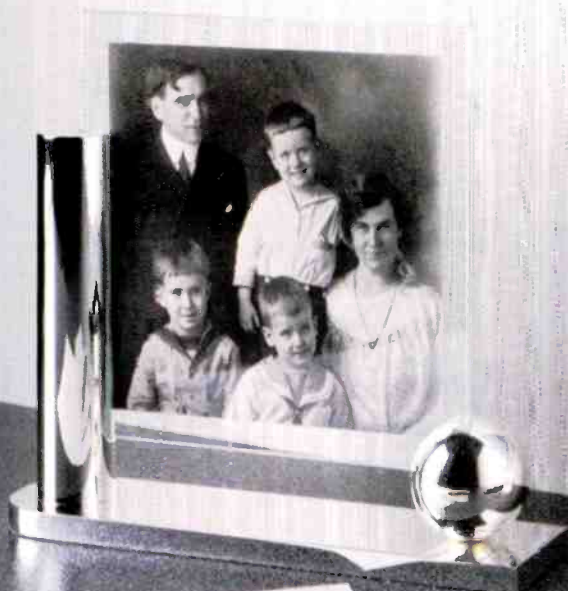
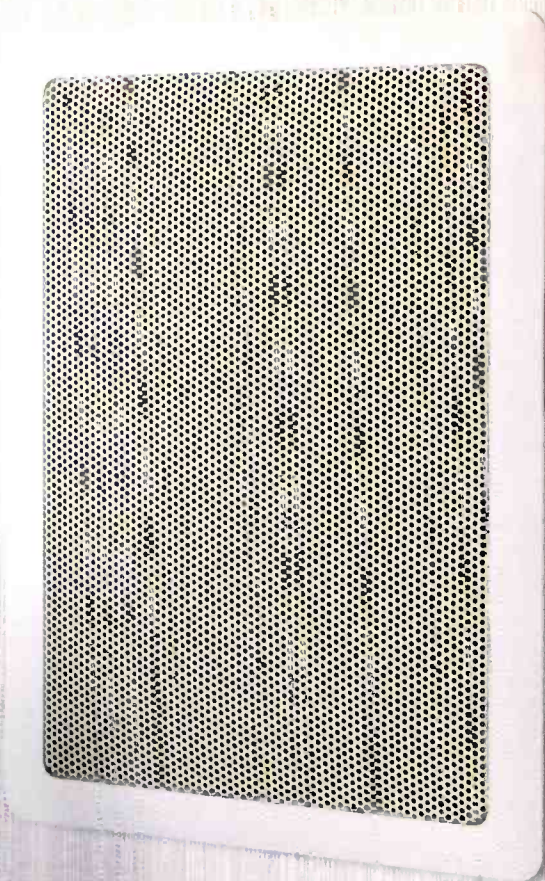
## THE DIGITAL REVOLUTION

THE SOUND OF THE FUTURE  
COMPACT DISC CHANGERS  
ANOTHER LOOK AT DAT  
VIDEO'S NEW IMAGE



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### CARVER'S GREAT AMPLIFIER CHALLENGE.

Last year, Bob Carver made an audacious offer to the editors of *Stereophile Magazine*, one of America's exacting and critical audio publications. He would make his forthcoming amplifier design sound exactly like ANY high-priced, esoteric, perfectionist amplifier (or amplifiers) the editors could choose. In just 48 hours. In a hotel room near *Stereophile's* offices in New Mexico! As the magazine put it, "If it were possible, wouldn't it already have been done? Bob's claim was something we just couldn't pass up unchallenged."

What transpired is now high fidelity history. From the start, the *Stereophile* evaluation team was skeptical ("We wanted Bob to fail. We wanted to hear a difference"). They drove the product of Bob's round-the-clock modifications and their nominees for "best power amplifier" with some of the finest components in the world. Through reference speakers that are nothing short of awesome. Ultimately, after exhaustive listening tests with carefully selected music ranging from chamber to symphonic to high-impact pop that led them to write, "...each time we'd put the other amplifier in and listen to the same musical passage again, and hear exactly the same thing. On

the second day of listening to his final design, we threw in the towel and conceded Bob the bout. According to the rules... Bob had won."

**BRAIN CHALLENGES BRAWN.** Below is a photo of the 20-pound, cool-running M-1.0t. Above it are the outlines of the pair of legendary mono



amplifiers used in the *Stereophile* challenge. Even individually, they can hardly be lifted and demand stringent ventilation requirements. And yet, according to some of the most discriminating audiophiles in the world, Bob's new design is their sonic equal.

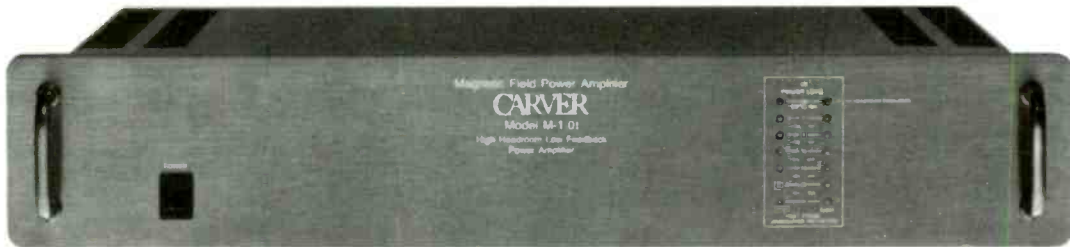
The M-1.0t's secret is its patented Magnetic Field Coil. Instead of increasing cost, size and heat output with huge storage circuits, Magnetic Field Amplification delivers its awesome output from this small but powerful component. The result is a design with the dynamic power to reproduce the leading edge attacks of musical notes which form the keen edge of musical reality.

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Cover: Pioneer PD-M90X compact disc changer (top) and Luxman LV-109 Digital Direct integrated amplifier. Design by Sue Llewellyn, photo by Irvin Blitz.

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 Please fill in if you bought equipment in the past thirty days.  
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by Christie Barter and William Burton

## ANTI-DAT LAW UPDATE

A subcommittee in the House of Representatives has approved a bill requiring that digital audio tape (DAT) decks include a circuit to prevent them from copying specially encoded recordings. The bill goes next to the House Energy and Commerce Committee.

## PRERECORDED DAT'S

Capriccio, an independent West German label, is releasing twenty classical titles on digital audio tape, for sale in Europe at a dollar equivalent of \$25 to \$27 each. The company will duplicate the tapes without using a CBS Copycode filter, as will Nimbus Records in the U.K., which is also preparing a DAT release. Other companies preparing to release prerecorded DAT's commercially are GRP, Telarc, DMP, Delta, Harmonia Mundi, and Classic Masters.

## NEW CD AT NEW LOW COST

Motown Records has released a CD sampler with a suggested list price of \$3.98, beating by a healthy margin the previous record low of \$6.98 established by Rykodisc and the Moss Music Group. Titled "An Introduction to the Motown Elite 9000 Series," the new sampler contains full-length tracks from albums by Smokey Robinson, Martha and the Vandellas, Marvin Gaye, and other top Motown acts included in the label's "mid-price" CD line.

## TECH NOTES

Look for a new line of high-end audio components made by Akai . . . Denon has introduced a high-bias C-100 cassette that will record 50 minutes on each side. According to Denon, the new C-100 will extend the recording time for dubbing CD's without the compromises in quality of C-120 cassettes. . . . Seattle Speaker Technology (SST) is taking over Speakerlab's production and distribution. . . . Four million compact disc players will be purchased by dealers this year, according to the Electronic Indus-

tries Association. That is a 33-percent increase over 1986 sales. . . . Fifteen to twenty 5-inch CDV (compact disc video) titles from each of several major labels are said to be on their way to record stores. . . . A new universal remote control from Pioneer, the CUAV100, comes already programmed with more than 150 commands for Pioneer components and can learn 211 more for others. List price is \$125. . . . An experimental Ford van includes a sound system with three stereo amplifiers (each rated for 40 watts per channel), a parametric equalizer, a CD player, subwoofers, and controls mounted on the steering wheel. . . . Proton Corp., known for its video, home audio, and car stereo products, is suing to prevent its name from being used on cars coming from Malaysia next year. . . . Anyone who buys a Sony ES series compact disc player between October 1 and December 31 will receive a free Telarc sampler CD featuring Liza Minnelli live at Carnegie Hall, the Cincinnati Pops playing *Back to the Future*, and other selections from Telarc's catalog.

## TAPE COMPANIES TEAM UP

Agfa, Philips, and Du Pont are joining forces to manufacture and market magnetic tape for audio and video uses. The new joint venture, as yet unnamed, includes PDMagnetics, an existing company owned by Philips and Du Pont. In addition, Agfa is working with BASF on research and development of tape-coating technology and cost-effective production methods.

## MUSIC NOTES

Shortly after the release of the four Elvis Presley albums in RCA's "Commemorative Issue," two of them, "The Number One Hits" and "The Top Ten Hits," entered *Billboard's* Top Pop album chart. . . . Leonard Bernstein has been decorated with the Grand Order of Merit of the Federal Republic of Germany in acknowledgment of his outstanding services to that country. . . . The *Beverly Hills Cop II* soundtrack album re-

leased by MCA holds the decade's record-to-date for having three simultaneous Top 10 singles—George Michael's *I Want Your Sex*, Bob Seger's *Shakedown*, and *Cross My Broken Heart* by the Jets. . . . Semyon Bychkov, music director of the Buffalo Philharmonic, will become music director of the Orchestre de Paris in 1989. . . . England's popular Top of the Pops program was recently added to the CBS Network's late-night line-up on Fridays.

## EXPLICIT POP

The Parents' Music Resource Center recently issued a list of albums it found to be "violent, sexually explicit, or condoning substance abuse." Among them were albums by Mötley Crüe, Ozzy Osbourne, Anthrax, Poison, the Beastie Boys, and Simply Red. . . . As we went to press, Jello Biafra, founder and lead singer of the Dead Kennedys, went on trial in California on a misdemeanor charge stemming from the poster by surrealist Swiss painter H. R. Giger included in the band's 1985 album "Frankenchrist." Biafra was quoted as saying, "The inside foldout to this record cover [depicting male and female genitalia] is a work of art . . . that some people may find shocking, repulsive, or offensive. Life can sometimes be that way."

## ZAPIT BOOSTS REMOTE POWER

The Zapit remote-control power booster from Monster Cable is said to be zapping its way into many home audio and video systems. Priced at \$24.95, the unit attaches to any remote control and increases its power and range. According to Monster Cable, Zapit allows a user to control a component more than 100 feet away.



FERRY ALLEN

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**“They truly represent a breakthrough.”** *Rolling Stone Magazine*

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### Why SDAs Always Sound Better

Stereo Review confirmed the unqualified sonic superiority of Matthew Polk's revolutionary SDA Technology when they wrote, “These speakers *always* sounded different from conventional speakers — and in our view better — as a result of their SDA design.

Without exaggeration, the design principals embodied in the SDAs make them the world's first true stereo speakers. The basic concept of speaker design was never modified to take into account the fundamental difference between a mono and stereo signal. The fundamental and

basic concept of mono is that you have one signal (and speaker) meant to be heard by both ears at once. However, the fundamental and basic concept of stereo is that a much more lifelike three-dimensional sound is achieved by having 2 different signals, each played back through a separate speaker and each meant to be heard by only one ear apiece (L or R). So quite simply, a mono loudspeaker is designed to be heard by two ears at once while true stereo loudspeakers should each be heard by only one ear apiece (like headphones). The revolutionary Polk SDAs are the first TRUE STEREO speakers engineered to accomplish this and fully realize the astonishingly lifelike three-dimensional imaging capabilities of the stereophonic sound medium.

**“A stunning achievement”**

*Australian HIFI*

Polk SDA Technology solves one of the greatest problems in stereo reproduction. When each ear hears both speakers and signals, as occurs when you use conventional (Mono) speakers to listen in stereo, full stereo separation is lost. The undesirable signal reaching each ear from the “wrong” speaker is a form of acoustic distortion called interaural crosstalk, which confuses your hearing.

**“Literally a New Dimension in the Sound”**

*Stereo Review Magazine*

The Polk SDA systems eliminate interaural crosstalk distortion and maintain full, True Stereo separation, by incorporating two completely separate sets of drivers (stereo and dimensional) into each speaker cabinet. The stereo drivers radiate the normal stereo signal, while the dimensional drivers radiate a difference signal that acoustically and effectively cancels the interaural crosstalk distortion and thereby restores the stereo separation, imaging and detail lost when you listen to normal “mono” speakers. The dramatic sonic benefits are immediately audible and remarkable.

**“Mindboggling, astounding, flabbergasting”** *High Fidelity Magazine*

Words alone cannot fully describe how much more lifelike SDA TRUE STEREO reproduction is. Reviewers, critical listeners and novices alike are overwhelmed by the magnitude of the sonic improvement achieved by Polk's TRUE STEREO technology. You will hear a huge sound stage which extends not only beyond the speakers, but beyond the walls of your listening room itself. The lifelike ambience revealed by the SDAs makes it sound as though you have been transported to the acoustic environment of the original sonic event. Every instrument, vocalist and sound becomes tangible, distinct, alive and firmly placed in its own natural spatial position. You will hear instruments, ambience and subtle musical nuances (normally masked by conventional speakers), revealed for your enjoyment by the SDAs. This benefit is accurately described by Julian Hirsch in Stereo Review, “...the sense of discovery experienced when playing an old favorite stereo record and hearing, quite literally, a new dimension in the sound is a most attractive bonus...” Records, CDs, tapes, video and FM all benefit equally as dramatically.

**“You owe it to yourself to audition them.”** *High Fidelity Magazine*

SDAs allow you to experience the spine tingling excitement, majesty and pleasure of live music in your home. You must hear the remarkable sonic benefits of SDA technology for yourself. You too will agree with Stereo Review's dramatic conclusion: “the result is always better than would be achieved by conventional speakers...it does indeed add a new dimension to reproduced sound.”

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## LETTERS

### More on Copy Prevention

I am very pleased to see the Copycode issue addressed in July "Letters." You did a wonderful job of selecting contributions that express your readers' dismay. They expose the outrage of deliberately screwing up the recorded sound spectrum, the Big Brother atmosphere we would live in if we allowed corporate greed to be legitimized by legislation, the blatant unfairness of persecuting the honest consumer instead of the pirate, and the crippling of the new DAT medium before it ever gets off the ground.

But why are you letting your readers do all the talking?

JOE SUAREZ  
Cincinnati, OH

*We decided to let readers do some of the talking in July and in this issue, too—we've been talking about it for months.*

Perhaps a new symbol should be used for compact discs recorded with the Copycode scheme promoted by CBS Records: DUD instead of DDD.

DON DEGEORGE  
Falls Church, VA

Two thoughts about "Copycode": Didn't we just go through this whole issue with videotape? Just goes to show nobody learns from anything. And one reason I bought my compact disc player is that the frequency response of *all* CD players is essentially flat. Now CBS tells me that all players will have a response of, say, 4 to 20,000 Hz +0.5, -67 dB. That is *not* high fidelity but somewhat worse than I would expect from a portable AM radio in a thunderstorm.

WILLIAM C. SWENSON  
Princeton, IL

The discussions regarding copy-prevention schemes for DAT recorders are missing the point. The cat is already out of the bag. A topnotch cassette deck with Dolby C or dbx noise reduction can copy a CD so well that it is very difficult to hear the difference.

I very rarely copy a CD that I don't already own. When I do copy a CD borrowed from a friend, it's almost always a recording that I would not have purchased myself. And often I am so pleased with a CD I have copied that I purchase other CD's by the same new-found artist.

STEPHEN M. FOWLER  
Denver, CO

I have noticed that several small record stores around here are renting compact discs. I think it is obvious that the only reason someone would rent a CD is to make a cassette recording of it.

It would appear that all the attention the recording industry is giving to digital audio tape is misplaced. I guess the majority of the teeny-bopper record-buying public is not so critical of sound quality that they won't settle for a good cassette of a CD given that the average price of a CD is \$15.

To minimize lost profit, the recording industry needs to bring down the cost of CD's to the point that it isn't worth the trouble to rent and copy them. The cost of DAT decks will be high enough that I find it hard to believe that there will be widespread use of them. But as the CD rental business begins to grow, I can see where the recording industry could have a real problem on its hands.

STEVE LEE  
Tulsa, OK

Most people I know copy friends' albums. I am one of the few I know of who will not. It makes me angry every time one of my friends asks to copy one of my CD's. I have paid \$13 for it, and if they bought a legal copy, that price might be lower. Some people I know have entire collections made up of bootlegged tapes.

What do I lose if the Copycode system is passed into law? Right now I make (legally, under "fair use") one copy of each of my favorite discs for my car. Okay, so I don't get to make that copy. Perhaps a few years after the law is passed, the prices of CD's and tapes will be low enough that I can buy one of each of the same title for the price of one of today's CD's.

Will quality suffer because of the frequency notch? The system cannot be heard during certain parts of music, and it needs only 13 seconds to work. Surely the record companies can find 13 seconds in most of their music into which they can slip the notch unnoticed. And if a piece doesn't have any parts during which the encoding would not be noticed, why should the company care about encoding it? Surely they realize that leaving 5 or 10 percent of their records unencoded would not affect their sales too much.

Perhaps you are going about this all wrong. The real way to win this battle for the right to tape would be to eliminate all copyright laws. At one time there was a good reason for those laws, but maybe DAT is a better reason to eliminate them.

NELSON PITLOR  
Rochester, NY

Is it true that if I use my DAT deck only for live recordings that that insane Copycode thing will still be monitoring the incoming signal? My God! What if the thing "thinks" it detects a Copycode while I'm taping a once-in-a-lifetime

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supplied by four high quality amplifier sections which can also deliver 100 watts per

channel in stereo mode.

Finally, our new audio/video receiver comes with the RC-AV7M Universal Programmable Remote Control, which assures full system remote control capability with multiple brands of equipment.

No other receiver on the market offers the outstanding performance and remarkable feature combinations the TX-SV7M does. It truly is an audiophile receiver that's a videophile dream.



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## LETTERS

performance and shuts down my recorder?

Yikes! I'm writing my congressman!  
DONALD DEATHERAGE  
Lost Hills, CA

*Yes, it's true. If the proposed copy-prevention system becomes law, whenever a DAT deck is in the record mode, any incoming signal will be passed through the built-in detector chip.*

### *Celebrating Gershwin*

The Gershwin anniversary tribute by William Livingstone in August was most informative and enjoyable. I am disappointed, however, that Mr. Livingstone excluded mention of the very best of Gershwin's so-called serious works, the Concerto in F.

WILLIAM GUNTHER  
Bronx, NY

I very much appreciated William Livingstone's article on recordings and performances commemorating the music of George Gershwin on the fiftieth anniversary of his death. I was a bit surprised, though, that no mention was

made of the elaborate tribute paid to Gershwin and his music this summer in London, from June 21 to July 15, at the Barbican Centre.

One of the highlights of this lavish celebration was the Gala Finale on July 5, which featured the London Symphony Orchestra and Chorus directed by Michael Tilson Thomas. Until you've heard the London Symphony Orchestra and Chorus do *Swanee*, you ain't heard nothin' yet.

EARL L. DACHSLAGER  
The Woodlands, TX

*William Livingstone replies: The article was not intended to be an encyclopedic survey of all commemorative programs or recordings, or even all of Gershwin's works, merely to take note of the kinds of tribute being paid to George Gershwin last summer—and to pay a little tribute myself.*

### *European Audio*

I thoroughly enjoyed Ian Masters' "Special Report: European Audio" in the August issue. It's too bad many of these high-quality components aren't

more commonplace in the American hi-fi market!

Incidentally, Mr. Masters doesn't have to wait for the "near future" to see metal-dome midrange drivers employed—Per Kirksaeter [of West Germany] has used such drivers for years in his top-of-the-line speakers.

GEOFF RUSSELL  
Newport News, VA

### *The Basic Repertoire on CD*

Richard Freed's pamphlet, "The Basic Repertoire on Compact Disc," is really useful, but I must disagree with some of his advice. Why, for example, does Mr. Freed almost totally ignore the noble, heroic recordings of Carlo Maria Giulini, who is surely one of the world's greatest conductors? Giulini's Brahms First (DG 410 023-2) is a deeply moving testament that puts most other versions to shame. And all of the adjectives Mr. Freed uses to describe Carlos Paita's Tchaikovsky Sixth could also be applied to the phenomenal Giulini version with the Los Angeles Philharmonic (DG 400 029-2).

By the way, David Hall made an error



## LETTERS

in the August issue on page 74 by referring to "Joel" Levi. Maestro Levi's first name is Yoel.

MARK JORDAN  
Shelby, OH

Thank you for making available the pamphlet, "The Basic Repertoire on Compact Disc." I appreciate Richard Freed's sensitivity in choosing the best performances of orchestral works and concertos. I especially agree with his recommendations of the Beethoven Symphonies Nos. 1 and 2 by Herbert von Karajan and the Berlin Philharmonic, the CBS disc of Beethoven's Piano Concertos Nos. 3 and 4 with Murray Perahia and Bernard Haitink, Tchaikovsky's Symphony No. 4 by Lorin Maazel and the Cleveland Orchestra on Telarc, Karl Böhm's Vienna Philharmonic recording of Mozart's Symphonies Nos. 40 and 41, and Bruno Walter's Brahms symphonies on CBS. I have been enjoying these discs over the past several months and will doubtless find Mr. Freed's discography helpful in selecting future discs.

ALAN MAJESKA  
Bad Axe, MI

*Richard Freed's pamphlet is still available. To receive a copy, send a self-addressed business envelope stamped with 39¢ postage and a check for \$1.50 to Stereo Review, Basic Repertoire, 1515 Broadway, New York, NY 10036.*

### Compact Disc Video

This new format, CD video (CDV), has me confused. Five minutes of music video followed by twenty minutes of audio only sounds kind of dumb to me. What happens when the video is finished? Does your screen just go blank?

CLARENCE E. ANDERSON  
Caledonia, WI

*The format allows the CDV producers two options: The disc will either switch your TV/monitor to a blank blue screen for the duration of the audio portion, or there will be a freeze-frame containing a track listing for the disc, information about the performers, or a still photo.*

### "Mesomusic"

The "important Latin American critic and musical sociologist whose name,

alas," escaped Eric Salzman in his April review of "The Birth of Rhapsody in Blue" was an Argentinian, Carlos Vega. He coined the term "mesomusic" in 1966 in the magazine *Polifonia*.

ALBERTO FALASCHI  
Bariloche, Argentina

### Corrections

The caption accompanying the photo of five ADS speakers on page 67 of the September issue was incorrect. The three tower speakers are in the ADS M series, and the two bookshelf models are in the CM series. Prices for those shown range from \$500 to \$2,750.

The manufacturer's suggested list price for the Magnat MSP 300 speakers that Julian Hirsch tested for the August issue is now \$1,490 a pair, not \$1,390. The price of the Boston Acoustics T830 speaker, tested for September, is \$480 a pair, not \$450, and the company's A40II is \$160 a pair, not \$220 as reported on page 64 in September.

Finally (we hope), there was a misprint in Mark Peel's review in September of "Boi-Ngo" by Oingo Boingo. It is the group's *fifth* album, not, as printed, the first.

## PERFECT MARRIAGE

New SA-XG is TDK's exclusive SA-X formulation—the world's quietest tape—technomiously joined together with TDK's most sophisticated mechanism ever—the RS-II.

Our unique 3-layer RS-II mechanism is specifically designed to suppress the generation of modulation noise. A precision die-cast alloy frame and molded tape guide block are sandwiched between two transparent precision-molded shell halves made of a special hard plastic, which also incorporate 4 precisely machined metal guide pins. The RS-II's rigidity of construction, accuracy of fit and superior thermal resistance assure unerring tape travel, optimum tape-to-head contact and reduced modulation noise. The result is virtually true-to-source sound quality.

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program up to 80 songs on any combination of eight magazines for instant recall.

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## NEW PRODUCTS

### Hitachi

The Hitachi MXW-50 compact stereo system combines an AM/FM receiver, a double cassette deck, and a compact disc player all in one wedge-shaped component. A pair of three-way tower speakers (not shown) complete the system. They have 8-inch woofers and measure 10 inches wide, 30 inches high, and 10 inches deep. The amplifier section of the MXW-50 delivers 50 watts per channel. The CD player features thirty-two-track programmability, a repeat function, index search, skip and scan in both directions, and a three-spot laser. The tape deck features high-speed



dubbing and Dolby B and Dolby C noise reduction. A headphone jack is provided. Price: \$799. Hitachi, Dept.

SR, 401 W. Artesia Blvd., Compton, CA 90220.

**Circle 120 on reader service card**



### Polk Audio

Polk Audio's tower-style RTA 111 loudspeakers have a pair of 6½-inch tri-laminate-polymer bass/midrange drivers, a 1-inch polymer-dome tweeter, and a pair of 8-inch passive radiators. The minimal frontal area of the speaker is said to reduce diffraction for outstanding imaging and freedom from coloration. The bass/midrange drivers are symmetrically arrayed above and below the tweeter for further imaging improvements and to reduce reflections. The RTA 111 is compatible with amplifiers delivering between 10 and 250 watts per channel. Rated frequency response is 18 to 26,000 Hz, and nominal impedance is 6 ohms. Each speaker measures 10½ inches wide, 39 inches high, and 14¾ inches deep. Price: \$850 a pair in wood-grain vinyl finish; \$1,020 a pair in natural walnut or oak. Polk Audio, Dept. SR, 5601 Metro Dr., Baltimore, MD 21215.

**Circle 37 on reader service card**

### Bang & Olufsen

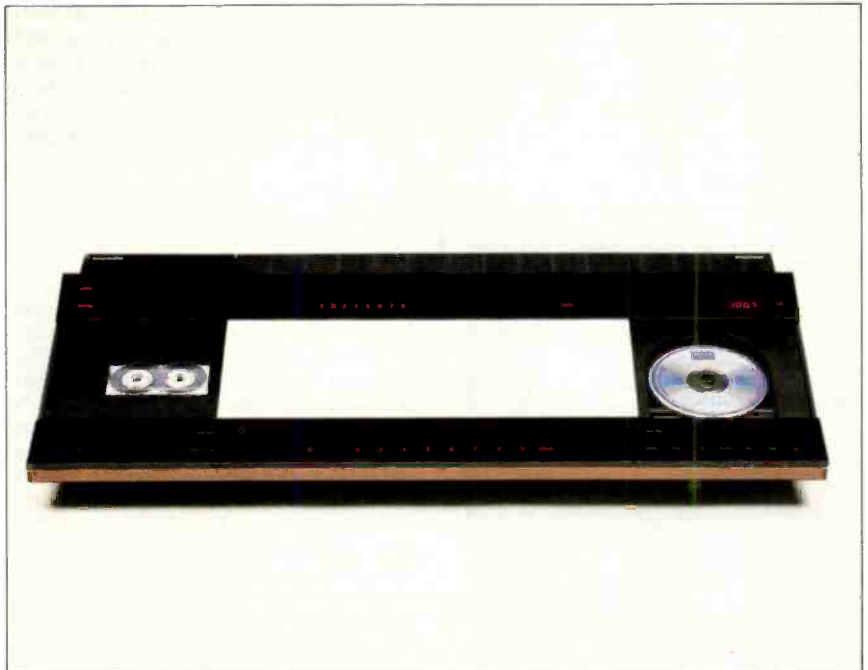
The Bang & Olufsen Beocenter 9000 is a complete music system including a compact disc player, an AM/FM tuner, an autoreverse cassette deck, and an integrated wireless remote control. The system is compatible with B&O's Master Control Link multiroom components. The tuner section features automatic station scan, manual search, and twenty station presets. The CD section has 16-bit quadruple oversampling, track skip, and variable-speed scanning. Up to thirty tracks can be programmed for playback in any order.

The cassette section features the Dolby HX Pro recording system and Dolby B and Dolby C noise reduction. It detects the presence of noise-reduction

encoding on a tape and sets itself automatically. Up to twenty-three selections from either side of a cassette can be programmed, and the music-search feature works in either direction.

A built-in digital clock allows users to program up to twelve events for playback and six for unattended recording. The Beocenter 9000 has inputs for a turntable, a second cassette deck, and an auxiliary source. The built-in amplifier is rated to deliver 30 watts per channel into 8 ohms with less than 0.1 percent total harmonic distortion. Overall dimensions are 30 inches wide, 4½ inches high, and 13½ inches deep. Price: \$2,995. Bang & Olufsen, Dept. SR, 1150 Feehanville Dr., Mount Prospect, IL 60056.

**Circle 121 on reader service card**



## NEW PRODUCTS



### Akai

The Akai VS-M930U-B VHS Hi-Fi VCR uses a new Quick Start transport that keeps any VHS videotape in fully threaded position after the cassette is inserted, reducing on-screen access time from any operating mode to 1½ seconds from the 5 to 8 seconds typical of conventional VHS VCR's. Special-effects playback—including variable slow motion, still frame, and frame advance—is

improved through the use of digital circuitry. A digital index-coding system allows users to "mark" up to twenty-four segments on a tape, and the first 8 seconds of each indexed segment can be previewed using the Intro Video Scan system. The remote control has a built-in microprocessor that allows it to "learn" the infrared control signals used by any TV set. The remote unit also has a built-in LCD screen with menu-type prompts for flexible programming.

The VS-M930U-B has four video heads, a 167-channel cable-compatible tuner with six-event/one-year on-screen programming, a built-in MTS stereo decoder, the VHS HQ picture-enhancement system, and a real-time tape counter. Price: \$849. Akai, Dept. SR, 225 Old New Brunswick Rd., Piscataway, NJ 08854.

**Circle 122 on reader service card**



### Bush Industries

Part of Bush Industries' Oak Elegants line, the AV1675 audio/video cabinet is designed around a soft-edged 2½-inch solid-oak frame. It will accommodate most 27-inch monitor receivers and all smaller monitor receivers or TV sets while providing room for additional audio and video components. The adjustable shelves can also be used to store accessories, compact discs, cassettes, videotapes, and records.

The sides and top are covered with select oak veneers finished with a double lacquer top coat. Features include brass accents, through-the-glass brass hardware, concealed fasteners, and safety-tempered glass doors etched with a subtle silk-screened pattern. The AV1675 measures 49¼ inches high, 49⅞ inches wide, and 20 inches deep. Price: \$529.95. Bush, Dept. SR, One Mason Dr., P.O. Box 460, Jamestown, NY 14702-0460.

**Circle 123 on reader service card**



### Technics

The Technics SL-P1000 compact disc player uses separate power supplies and transformers for each channel, double oversampling, gold output jacks, and both optical and electrical digital outputs. (A fiber-optic cable is supplied.) The digital and analog sections are completely isolated, which is said to reduce RF leakage. Its three-layer base, special damping materials, and floating suspen-

sion system are said to eliminate resonance, vibration, and skipping problems. Convenience features include two-speed search, ten-key random track access, twenty-track programming, a two-position dimmer for the front-panel display, and a volume control on the supplied wireless remote unit. Price: \$1,000. Technics, Dept. SR, One Panasonic Way, Secaucus, NJ 07094.

**Circle 124 on reader service card**

### Pinnacle

The bass response of the Pinnacle PN-5+ speaker is said to be enhanced by a diagonal ducted port located on the rear. The port utilizes an elliptical vent that is angled deep into the speaker's enclosure to allow for proper port length and tuning. The PN-5+ has a 5¼-inch polypropylene woofer and a ¾-inch polycarbonate dome tweeter with ferrofluid cooling. It is compatible with amplifiers delivering from 10 to 50 watts continuous rms. Dimensions are 6¾ inches wide, 11¼ inches high, and 6⅞ inches deep. The PN-5+ is finished in hickory-grain vinyl veneer. A seven-year limited, transferable warranty is



included. Price: \$149 a pair. Pinnacle Loudspeakers, Inter-Ego Systems, Inc., Dept. SR, 517 Rt. 111, Hauppauge, NY 11788.

**Circle 125 on reader service card**



# FIRST CAME THE CD THEN CAME THE SPEAKER

## SPL **monitors**

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

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

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

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

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

**'FIRST CAME THE CD, THEN CAME THE SPEAKER'  
SPL MONITORS.**

CIRCLE NO. 45 ON READER SERVICE CARD

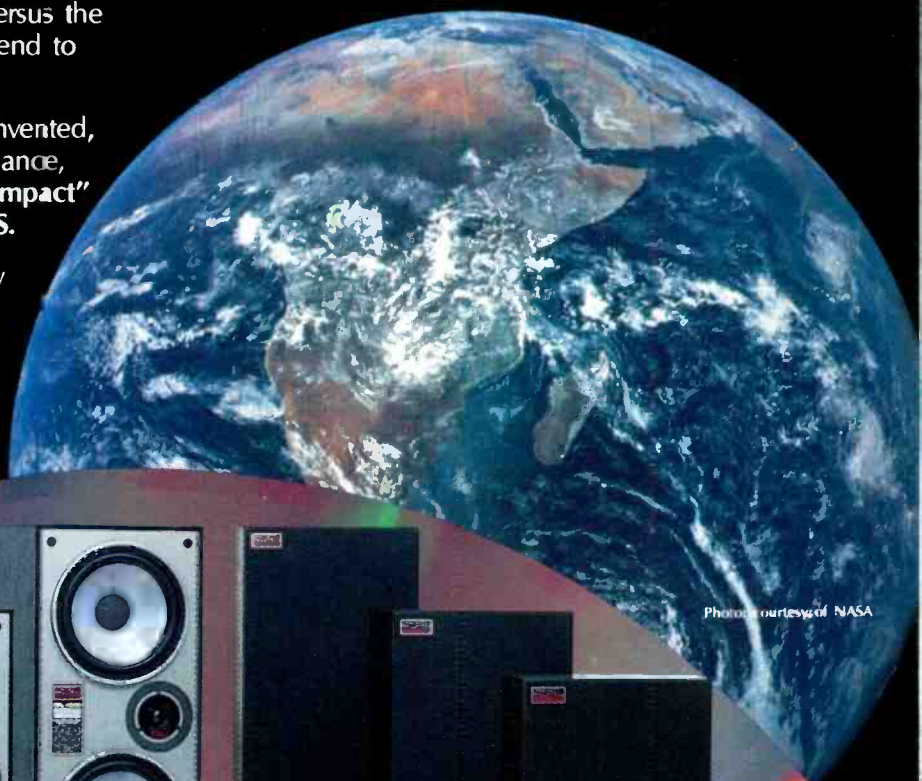


Photo courtesy of NASA



## SPL **monitors**

## NEW PRODUCTS



### *a/d/s/*

The a/d/s/PA4 power amplifier, rated for 150 watts per channel into an 8-ohm load from 20 to 20,000 Hz with less than 0.02 percent total harmonic distortion, is part of the manufacturer's Atelier series of components. It can be bridged for mono use. The power supply incorporates a toroidal transformer, and transient-intermodulation distortion is said to be eliminated through the use of high-speed amplifier circuits. The

output stages employ ten power transistors in each channel. The PA4 uses no integrated circuits, only polypropylene capacitors.

Two pairs of speakers can be connected to the PA4 using the back-panel speaker terminals, and a front-panel speaker selector is provided. The front panel also has a red LED clipping indicator for each channel. Price: \$1,000. a/d/s/, Dept. SR, One Progress Way, Wilmington, MA 01887.

**Circle 126 on reader service card**



### *Now Hear This*

The Now Hear This Model I speaker system uses an angled front baffle to direct the output of its 6-inch treated woofer and 3/4-inch dome tweeter. The baffle is said to reduce excessive wall reflections, maintain a realistic sound stage, and limit interaural cross-correlation. Accurate imaging is said to be preserved whether the Model I is used in wall, shelf, or floor-standing installations.

The Model I is an acoustic-suspension system rated for use with amplifiers delivering from 20 to 150 watts. Frequency response is given as 65 to 23,000 Hz  $\pm$  3 dB. The speaker measures 7 inches wide, 12 inches high, and 10 3/8 inches deep. It is available with genuine white-oak, maple, or walnut veneer. Price: \$299 a pair. Now Hear This, Dept. SR, P.O. Box 1228, Fullerton, CA 92632.

**Circle 128 on reader service card**



### *Harman Kardon*

The Harman Kardon TU920 Active Tracking AM/FM tuner uses low-group-delay filters with discrete wideband differential amplifiers between stages in its IF section to improve FM sound quality without sacrificing interference rejection. The Active Tracking system, first used in Harman Kardon's Citation Model Twenty-Three tuner, tracks the carrier modulation of the tuned frequency with a PLL circuit; it is said to

provide excellent adjacent- and alternate-channel rejection without degrading stereo separation or increasing total harmonic distortion. Adjacent-channel selectivity is rated as 30 dB with Active Tracking engaged. Convenience features include sixteen presets, muting, auto seek and manual tuning, and a five-segment signal-strength indicator. Price: \$350. Harman Kardon, Dept. SR, 240 Crossways Park W., Woodbury, NY 11797.

**Circle 127 on reader service card**



### *Perreaux*

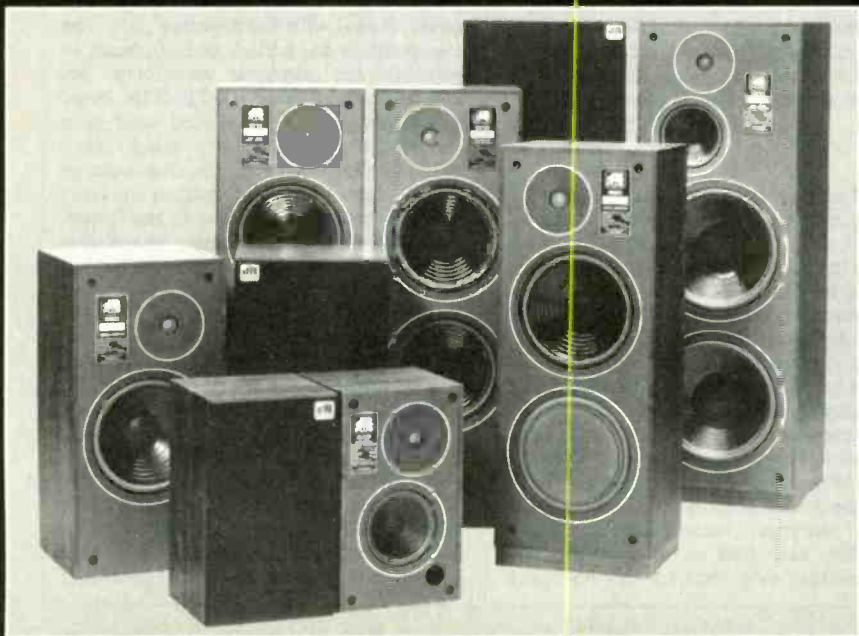
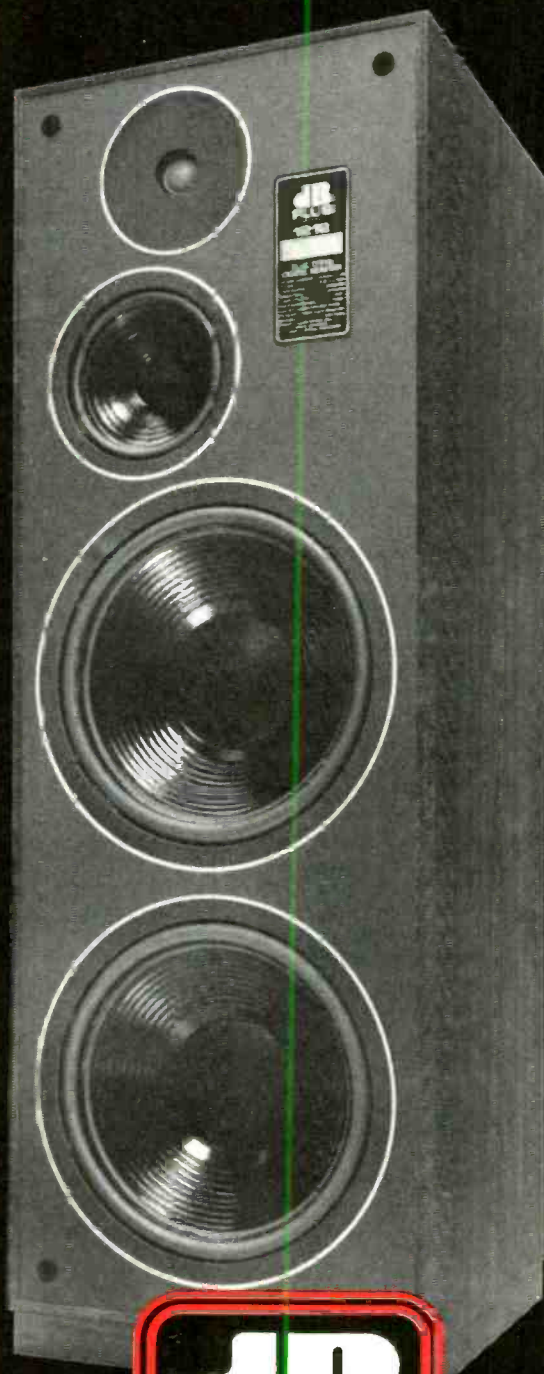
The output of the Perreaux PMF 5550 power amplifier is rated as 500 watts per channel continuous into 8-ohm loads with 0.03 percent total harmonic distortion, and it is said to operate in pure Class A mode up to an output of 50 watts per channel. Its special power-supply configuration gives it a rise time of less than 1 microsecond. Dynamic headroom is given as 2 dB, frequency response as 20 to 20,000 Hz  $\pm$  0.02 dB. As with other Perreaux components, the PMF 5550's aluminum front panel is glass-bead blasted, and it can be rack mounted. Price: \$4,295. Perreaux, distributed by Signet, Dept. SR, 4701 Hudson Dr., Stow, OH 44224.

**Circle 129 on reader service card**

# dB PLUS

**MEANS SO MUCH MORE**

- dB PLUS EFFICIENCY** *Up to 120 dB in a typical sound room (dB Plus 1212 full power.)*
- dB PLUS POWER** *Up to 400 watts RMS (see specification sheets dB Plus 1212).*
- dB PLUS DYNAMICS** *Astounding speed and dynamic range, virtually no ringing.*
- dB PLUS BASS** *Deep, tight, powerful, clean bass response 23 Hz (dB Plus 1212).*
- dB PLUS TWEETERS** *Unique, fast, smooth, musically very accurate, dB Plus Polyfoam™ Tweeter*
- dB PLUS OPENNESS** *Wide dispersion for easy listening to a large sound stage.*
- dB PLUS ACCURACY** *Smooth, clear, low distortion, low resonance, high definition.*
- dB PLUS QUALITY** *Designs so pure that we compare each one to the original.*
- dB PLUS WARRANTY** *We're so confident, it's ten years. See warranty cards.*
- dB PLUS CHALLENGE** *We challenge any speaker brand, any price range, to a sound comparison.*



by Ian G. Masters



## Clipped Signals

**Q** I understand that when a clipped signal is fed to a speaker, it can have a disastrous effect on the tweeters. How can this be when a speaker's overall power rating is greater than the amplifier's rated output?

MARTY BERGHAUS  
Tucker, GA

**A** Many people find this hard to understand because we intuitively expect high power levels to have destructive capabilities and lower ones to be safer. It is possible to destroy a speaker by feeding it far more electricity than it can handle, of course, and the power-handling rating of a speaker can help you avoid this. But most damage occurs because the amplifier being used has insufficient power.

Suppose a given piece of music requires an average power of 1 watt to sound appropriately loud with a certain set of speakers in a particular room (a fairly typical level, in fact). Then along comes a 20-dB musical peak, which briefly requires the amplifier's output to produce a level 20 dB higher than the average signal. That takes a hundred times the power, or 100 watts. Even an amplifier rated at less than that power output on a continuous basis will be able to handle 100 watts for a brief period, so the waveform will be reproduced cleanly and all will be well.

But a 20-dB peak is quite modest when you consider that the best record-

ing media can have dynamic ranges of 90 dB or more. To the extent that the peaks in a signal demand power that an amplifier cannot produce even briefly, the amplifier simply flattens the top of the waveform until the peaks go away—it "clips" off the signal peaks. The less reserve power an amplifier has, the more time it will spend clipping. In situations where relatively inefficient speakers are being used or a large space has to be filled with sound, the amplifier is likely to be turned up to the point where it is clipping for relatively sustained periods in an effort to achieve adequate listening levels.

Such long-term clipping has two related effects. In the first place, the formerly smooth waveform now looks like a square wave, containing massive amounts of high-frequency distortion that can easily damage tweeters. Second, the flattened part of the waveform is a type of direct current, and it causes the voice coils of the speaker's drivers to pause until the clipping is over. During this pause, the coil is not only carrying the full output power of the amplifier, but it is physically offset from the magnetic gap that functions in part as a heat-dissipation device. If the mismatch between amplifier and speakers is severe enough, this can be going on for much of the time the amplifier is operating, and under such circumstances not only tweeters but also woofers can fry.

## Digital Dubbing

**Q** When digital audio tape (DAT) recorders finally arrive on the market, I understand that the only way to make a recording from a compact disc would be to take the signal from the player's analog output and let the tape deck reconvert it to digital for recording. And yet some CD players do have digital outputs. Is there any way these could be used to avoid the double conversion?

EDLAND R. MCMULLIN  
Beaverton, OR

**A** There is no technical obstacle to doing this, and, indeed, some of the prototype DAT recorders shown in Japan in recent months have had digital inputs for just this purpose. But it's a very controversial question at the moment because the record companies, which own most of the material one would be likely to copy in this manner, are fearful that consumers' ability to make perfect copies of their recordings will hurt their industry severely.

To allay the record companies' worries, the manufacturers of the proposed DAT recorders established a digital sampling rate that is intentionally incompatible with that of the compact

disc—48 kHz instead of 44.1 kHz. And even though there was a suggestion that some manufacturers might offer a choice of inputs using the two different rates, and thus allow direct copying of compact discs, this feature has not been included in the machines that have gone on sale in the Far East.

## Amplifier Classes

**Q** I have been told that a Class A amplifier produces better sound quality than a Class AB one. What do these terms mean?

MICHAEL R. PUCKETT  
Antioch, TN

**A** An audio signal consists of both positive and negative components. If you were to plot a musical waveform on a graph, it would go above and below the 0 point. Amplifier output devices, whether tubes or transistors, can conduct electricity in only one direction, however, and therefore can deal with only half of the signal—unless some method is used to fool them into seeing the whole signal as positive.

One way is to add a bias signal to the audio to push the whole waveform into the positive region, converting the positive/negative swings to more-positive/less-positive ones. A design using this technique is called Class A, and it is often chosen for high-quality amplifiers because it results in very low distortion. But it is also very inefficient because the output devices have current passing through them all the time. Class A amplifiers usually have a relatively low power output and very high heat production—heat that must be dissipated.

An alternative is Class B, in which one transistor is used to amplify the positive part of the waveform and another to deal with the negative part. The two outputs are added, out of phase, to re-create the complete waveform. Because each transistor is off half the time, much less heat is produced, and thus the whole system is very much more efficient than Class A. There are drawbacks, however. The output devices work for much of the time at the lowest part of their operating range, where they are least linear, and this can cause distortion. Also, the switching back and forth between the positive and negative parts of the signal can result in what is called "crossover distortion," which can be audible.

To improve the system's linearity, most amplifier designers now use a hybrid circuit called Class AB, in which separate output devices are still used for the two halves of the waveform but a small amount of bias signal is added to each half to push the signal into a more linear part of the device's operating

# ENERGY 22

The Energy 22 Pro Monitor has been hailed by critics as one of the major loudspeaker design breakthroughs of the last decade.

In fact, the Energy 22 may well rank as a standard against which other speakers should be judged. Audition either the Energy 22 Pro Monitors or the Reference Connoisseurs and we think you'll agree that they are not only the most exciting speakers you've ever heard, but "a stunning achievement" indeed!



## "A STUNNING ACHIEVEMENT"

### Top Retail Experts Personal Views About The Energy 22

**New York, New York, The Listening Room, Ron Mintz – Owner.** "As one of the First dealers in the U.S. to realize the quality of the E-22, we continue to be amazed by the imaging and spaciousness of this speaker of such compact size & price."

**Hicksville, Long Island, New York, Designatron, John Thomas – Manager.** "Never before have we experienced a speaker system which exhibits the level of realism that the Energy 22 provides. The excitement generated by Energy speakers is only exceeded by the pleasure of owning them. The Energy 22 sets a reference standard by which all other speakers must be judged."

**Washington, D.C., Audio Associates, Mike Zazanis – Owner.** "The ENERGY 22 is a very musical speaker at a very inexpensive price that easily could cost a lot more money."

**Chicago, Illinois, Pro Musica, Ken Christianson, John Schwarz – Co-owners.** "The Energy 22 Reference Connoisseur & Pro Monitors simply outperform the competition. Musically satisfying to the most demanding listeners."

**Miami, Florida, Audio By Caruso, Don Caruso – Owner.** "The REFERENCE CONNOISSEURS are among the most neutral, uncolored, speakers we have found!!! They provide very relaxing listening."

**El Paso, Texas, Sound Room, Mark Pearson – Owner.** "Energy 22 pro monitor is the most three dimensional speaker ever."

**Phoenix, Mesa, Arizona, HI FI Sales, Dave Ross – G. Mgr.** "ENERGY 22. One of the most accurate, best imaging speakers we have ever heard."

**Los Angeles, California, Christopher Hanson Ltd., Christopher Hanson – Owner.** "The Energy 22 is very musically involving - 'Absolutely Brilliant!'"

**San Diego, California, Stereo Sound Co., Bob Kokley – Owner.** "Over the years we have heard many promises of new breakthroughs in speakers with disappointing results. The ENERGY 22 is one of the only products which performed beyond those promises. A job well done!"

**Berkley, California, The Sounding Board, Jeff Smith, Jim Serena Co-Owners.**

"The Energy 22 is an outstanding speaker. What's incredible is the value, compact size and its performance level!"

THE DEALER'S #1 CHOICE

# ENERGY 22

Energy Loudspeakers, 135 Torbay Road, Markham, Ontario  
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range. This means that each is handling slightly more than half of the total output, and there is still the possibility of crossover distortion, but the system retains much of the efficiency, and economy, of the pure Class B design.

## Sampling Rate

**Q** *What happens when a compact disc and the machine it's played on have different sampling frequencies?*

ASHUR DAVIDA  
Chicago, IL

**A** Many of today's CD players specify a sampling frequency of 88.2 kHz or, in a few cases, 176.4 kHz. Since the standard for the discs themselves is 44.1 kHz, there may seem to be some incompatibility here, but the higher rates are simply multiples of the standard. Players using the higher frequency, called "oversampling," simply read each bit of information on a disc two or four times, as the case may be.

One of the byproducts of digital audio is a lot of spurious high-frequency information that must be filtered out of the final analog signal before it goes to your amplifier. The 44.1-kHz sampling frequency is only slightly more than an octave above the upper limit of the audio spectrum, so to make sure that the spurious byproducts don't creep into the output, a very sharp filter must be used just above 20 kHz.

Such filters tend to induce some phase shift in the audio signal. The steeper the filter action, and the closer it is to the desired audio information, the worse the phase shift. To minimize phase shifts, CD player designers use oversampling, which allows a more gradual rolloff and, in some cases, a turnover frequency farther from the audible band.

There is some difference of opinion about the audibility of the phase shift even in the worst cases, but since it can be reduced effectively by the use of oversampling, a significant number of manufacturers have elected to employ the technique.

## Stereo Imaging

**Q** *With stereo recordings, I can understand why a solo voice or an instrument such as an oboe might seem to move about the "sound stage." But why does the same thing sometimes happen with a piano?*

JOHN W. KUNTZE  
Charlotte, NC

**A** Occasionally it is the result of an artistic decision by the recording engineer. In much popular music, for example, there is no particular virtue in

having an instrument sound exactly as if it were present in your listening room. If a producer can create an interesting effect—tonally by using equalization or spatially by manipulating the imaging—he often will do so, even if it bears little resemblance to reality.

The effect you hear may also, however, be a flaw in the recording technique. Even in classical recordings, engineers often choose to place their microphones very close to their subjects. As singers or oboists turn their heads, or slightly alter their relative distance from the microphones, they may seem to leap back and forth across the stage. Pianos can seem to be 20 feet wide, with bass notes coming out of one speaker, treble ones out of the other.

It is also common to use a number of separate microphones for each instrument, "placing" the sound in the correct apparent location later by electronic manipulation. Slight adjustments of the controls during mixdown can often make the instrument seem to wander back and forth.

Such unstable images are normally tolerable unless they are emphasized by the playback equipment. Speakers with less-than-perfect imaging may make it difficult for a listener to localize on a center image, with the result that an adequately recorded instrument may seem to move back and forth between speakers.

## Recording Bias

**Q** *I have heard a tape recorder's bias described as "a signal that promotes flat frequency response" and "a signal that helps the tape record loud and soft sounds evenly and proportionately." Which, if either, of these is the function of bias?*

STEVE TURNER  
Pepperell, MA

**A** Both, sort of. Any audio device, including a tape recorder, should not only have flat frequency response—two or more signals going in should have comparable levels coming out, whatever their frequencies—but it should be flat at all levels. There are, of course, maximum intensities beyond which distortion becomes unbearable or the device ceases to function, but below that point the response should be equally close to flat whether the signal is loud or soft.

With most audio components this is fairly easy to achieve; if the response is flat at high levels, it will be flat at low levels too. But recording tape behaves differently: While flat response can be achieved at relatively high levels, tape is notoriously nonlinear at the lowest levels. Since the greatest part of any audio

signal is quiet, the louder peaks only occurring briefly, most of it falls in the region where tape is least accurate.

To overcome this limitation, a high-frequency signal called bias is added to the audio signal before recording to raise the overall level (including silence) to the point where the tape's response is linear. Since the bias frequency is typically more than 100 kHz, it does not interfere with the audio signal, causing intermodulation distortion, nor is it audible on playback. Each tape formulation has its own bias requirement, so tapes must be carefully matched to recorders if the full potential of the system is to be achieved.

An extra benefit of the addition of bias is that it moves the audio signal well above a tape's normally high noise levels. On the other hand, it also brings everything closer to the tape's saturation level, thus restricting the available dynamic range.

## Washing Records

**Q** *The liquid record-cleaning system I was using seemed to leave a residue on my records that made them sound terrible, so I have recently been washing my albums in lukewarm water and lightly drying them with a bath towel. Is this a wise thing to do?*

DAVE VANDER ARK  
Fresno, CA

**A** Only as a last resort. I have occasionally used the same technique when the only alternative was scrapping the record (as when a guest spilled a soft drink on a disc and returned it to its sleeve—definitely a former friend!). Unless you use distilled water, a mineral residue can be left on the surface of your records, and some towels may leave minute bits of lint behind. There is also some evidence that water, particularly if a small bit of liquid detergent is added, can degrade the vinyl, and this would have a cumulative effect if you often cleaned your records this way.

For everyday cleaning, a dry brush is usually all that's necessary. Use it every time you play a record to prevent small bits of grit from being ground into the surface, and if possible remove any build-up of static electricity so that further contaminants are not attracted. Particularly dirty records can be cleaned with liquids designed for the purpose, but this should be necessary only very rarely. Some such cleaners do seem to leave lingering audio effects, but it has been my experience that these only occur if the record is played immediately after cleaning; a day later they're gone. You may want to check the records you think you have ruined—they're probably fine. □



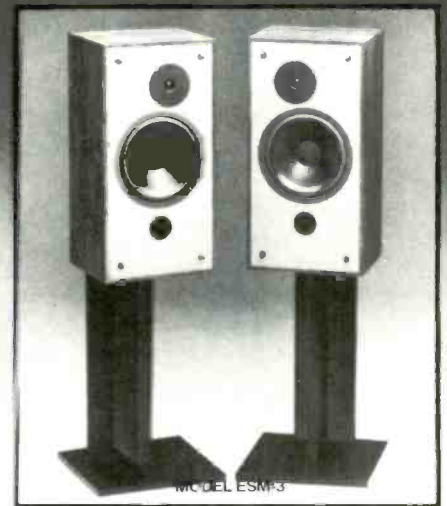
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*Stereo Review* February 1986, on the ESM-3

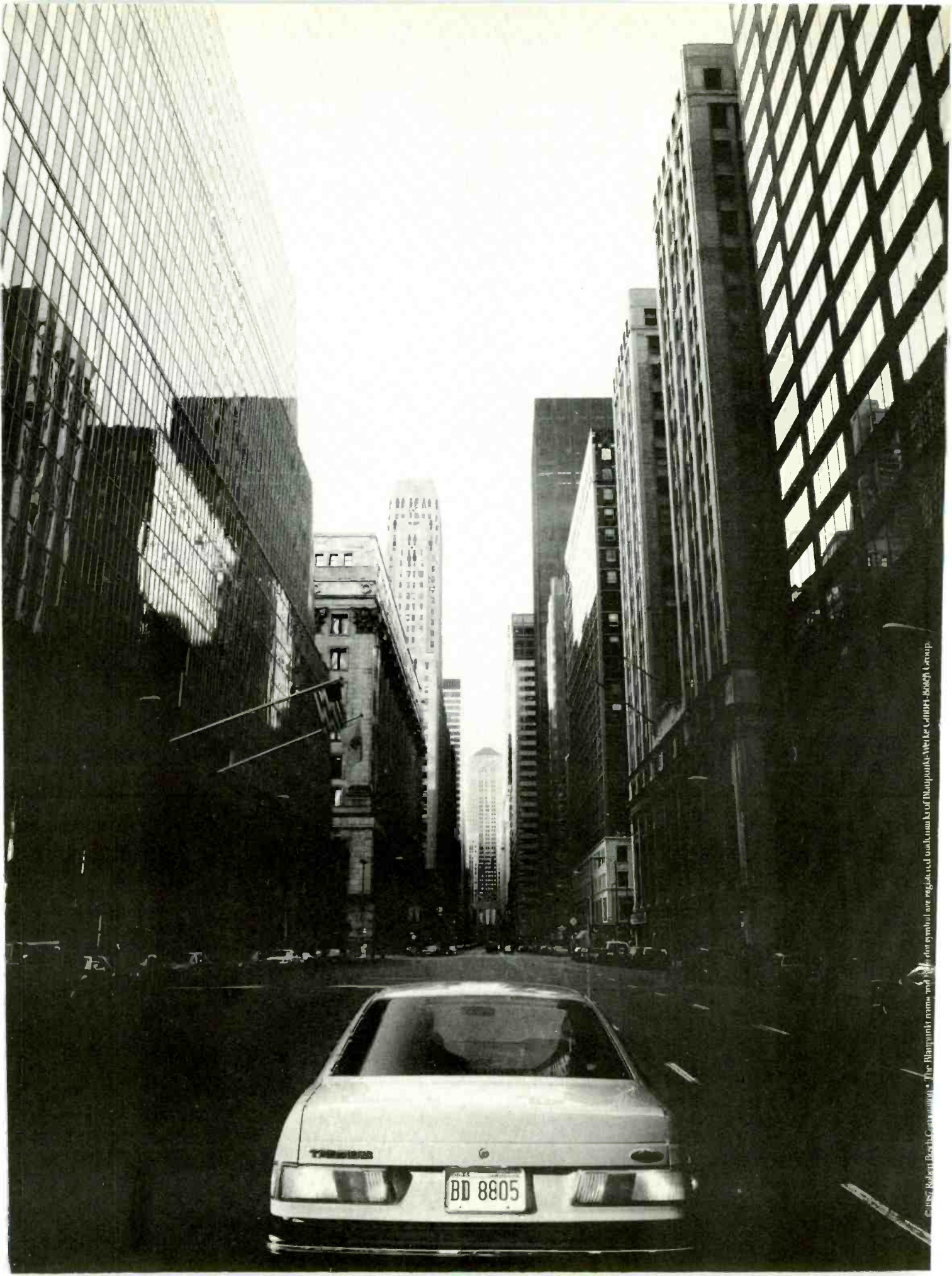
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*High Fidelity* January 1986, on the ESM-2

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*Audio Ideas*, 1985 edition, on the ESM-2





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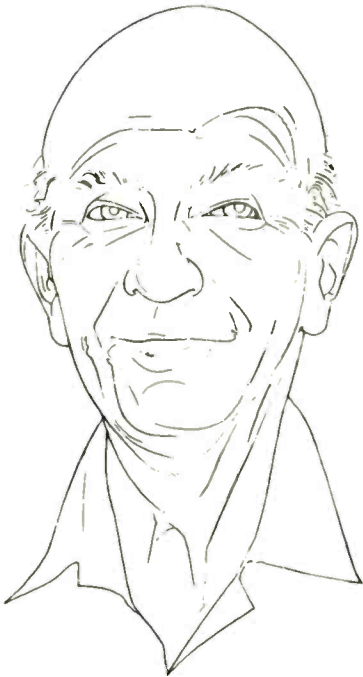
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by Julian Hirsch



## Digital Audio Tape

**T**HE process of creating a standard for digital audio tape (DAT) was started about four years ago by an ongoing world-wide conference of interested companies, currently totaling about eighty-five in number. Two different approaches were considered: one using rotary-head technology similar to that of a VCR (R-DAT) and the other a stationary-head structure (S-DAT). Since the S-DAT system has not yet been realized in a practical form, the R-DAT system is now usually referred to simply as DAT.

Developmental models of DAT machines have been demonstrated by several Japanese manufacturers during the past few years, and last spring a number of them were introduced to the Japanese market. DAT's projected arrival in the United States has been delayed by a bitter legal battle between representatives of the recording industry and the electronics manufacturers. Essentially, the recording companies are concerned that the presumed ability of a DAT deck to make perfect copies of compact discs repre-

sents a serious threat to their copyright-enforcement capabilities. The effect of the controversy has been to prevent introduction of consumer DAT recorders for public sale in this country pending the outcome of congressional action. But it seems likely that DAT decks will eventually become available here, so it's worth understanding something of how the new format works and what it can—and cannot—offer the home recordist.

Basically, the DAT recording format uses pulse-code modulation (PCM), just as compact discs do, but the digital signal information is stored on magnetic tape as a pattern of microscopic magnetized areas instead of pits on the surface of a disc. The magnetized areas, indicating "ones" in the digital binary code, are recorded to the saturation level of the tape, which minimizes the effects of tape differences.

The mechanical aspects of the DAT recording and playback processes are identical in principle to those of a VCR. The metal-particle-coated tape is the same width (3.81 millimeters) as that in a standard audio compact cassette, but it moves only about one-sixth as fast. The tape is wrapped around 90 degrees of a small head drum, 30 mm (or slightly over 1 inch) in diameter, that rotates at 2,000 rpm. The heads on the drum, two or four in number, scan diagonally across the width of the tape and are able to record an extremely high information density (considerably higher than that used in home VCR's).

In its mechanical design, the DAT cassette resembles a miniature videocassette. A hinged cover panel across the tape opening protects the tape from contamination by touch or from being scratched. Though only about half the size of a compact audio cassette, a DAT cassette can hold up to 120 minutes of program (shorter tapes are available).

When the cassette is loaded into a recorder, the mechanism moves mechanical releases within the cassette shell, opening the panel so that a pair of guides can pull the tape out and wrap it around the head drum. Because of the relatively small wrap angle, the tape can safely remain in contact with the drum during high-

speed search at speeds up to three hundred times normal playing speed. This feature makes it possible to use digital cues, as in the track-skip or direct-access mode of a CD player, to access specific portions of a tape.

The DAT standard allows the use of three different sampling frequencies: 48 kHz in the standard record-playback mode, 32 kHz for optional extended-time operation (typically for recording future direct satellite broadcasts), and 44.1 kHz (the CD standard) for *playback only* of pre-recorded digital tapes. The 48- and 44.1-kHz modes use 16-bit digital encoding, like CD's, but the 32-kHz mode is allowed to use either 16- or 12-bit encoding. Like a VCR, which can play tapes recorded at any of several speeds, a DAT deck senses the sampling rate of a tape and switches automatically to the correct frequency for decoding.

In addition to having analog recording inputs and playback outputs, DAT machines can, and currently do, also have digital inputs and outputs, which can be used for direct copying of digital programs without unnecessary D/A (digital-to-analog) and A/D (analog-to-digital) conversions. Since all CD's, and presumably all prerecorded DAT's, already contain digital copy-inhibit codes, they cannot be copied in digital form on consumer DAT decks.

Independently of the digital program recorded on the tape, the DAT format allows ID subcodes to be added, during either recording or playback, to identify key portions of the program, such as the start of each program section. The tape can then be cued automatically, in fast forward or reverse, to play or skip any recorded selection.

Like an optical (CD) recording, magnetic tape is subject to minute drop-outs and other imperfections that could cause portions of the program to be lost. Sophisticated error-correction and error-concealment circuitry, functionally similar to that used in CD players, is therefore used in the DAT system. While detailed specifications and features of various DAT machines will differ somewhat, they should all be capable of audio performance virtually identical to that of a CD player. □

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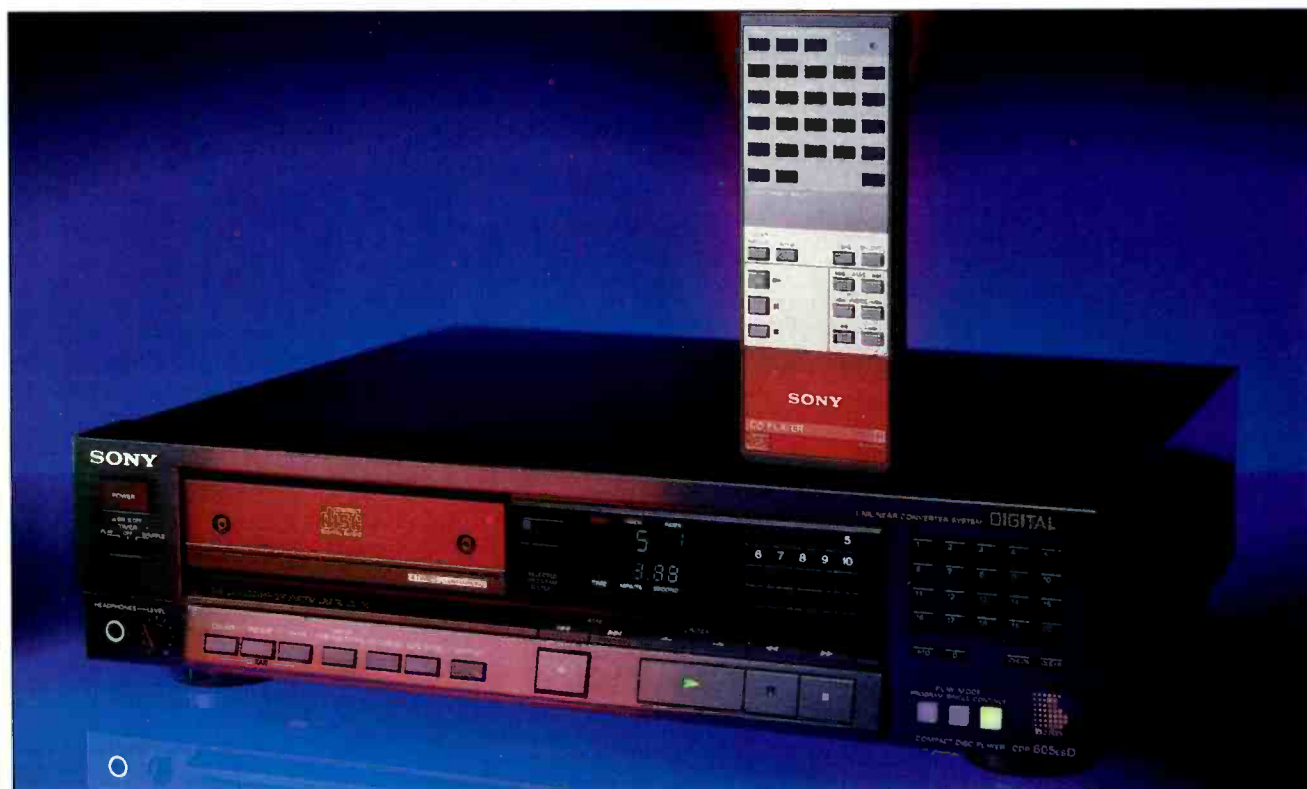


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## SONY CDP-605ESD COMPACT DISC PLAYER

*Julian Hirsch, Hirsch-Houck Laboratories*

**S**ONY'S ES series of reference standard CD players consists of three models incorporating the latest technological advances from the Sony Research Laboratories. These advances include a highly linear, high-speed 16-bit digital-to-analog (D/A) converter and a new large-scale integrated circuit for digital signal processing that incorporates a quadruple-oversampling digital filter.

All three ES players have dual D/A converters (one for each channel), discrete third-order analog low-pass filters with linear group-delay characteristics, and a number of proprietary circuit developments that reduce spurious signals and noise and improve the system's error-correction capabilities. Separate power supplies are used for the analog and digital circuits, and in addition to the usual analog outputs, a digital

output is provided for use with an external D/A converter.

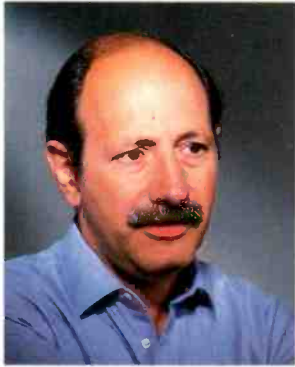
The Sony CDP-605ESD is the middle unit in the ES series. Like the others, it is constructed on a heavy chassis using a rigid metal frame, high-density injection molding, a thick baseboard, and special isolating feet. The laser pickup, driven by Sony's noncogging linear motor, is rated for access to any part of a disc in less than 1 second.

The CDP-605ESD has all of the usual CD player operating amenities. Its versatile and easy-to-use programming system can play up to twenty selections in any order, and a shuffle-play mode programs all the tracks of a disc in random order. An AUTO PAUSE button places the machine in pause mode after each track, and AUTO SPACE inserts a 3-second delay between tracks. The repeat function indefinitely repeats

a selection, a disc, or a sequence. There is also a REPEAT COUNT button that allows any of these to be repeated a selected number of times, from one to nine.

The front-panel display of the CDP-605ESD is exceptionally versatile. When a disc is loaded, it first shows the total number of tracks and total playing time on the disc, then switches to show the current track and index numbers and the elapsed time on the track. The TIME button switches this readout either to the remaining time on the current track or the number of unplayed tracks on the disc and their total time. Programming and direct track selection are done using the MUSIC CALENDAR display, a grid of twenty numbered squares, and the corresponding matrix of twenty pushbuttons. Tracks above No. 20, up to No. 99, can be selected using the +10 button.

Below the track selectors are three PLAY MODE buttons, which are illuminated when engaged: CONTINUOUS, to play a disc from beginning to end; SINGLE, to play one selected track; and PROGRAM, for a sequence of tracks. Other buttons are used to



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"We make all these drivers under our own roof, using specialized machinery and jigs that we've designed or adapted ourselves. This helps us maintain consistent high quality, and save through efficiency.

"For the enclosure, we used the same dense, non-resonant structural material as in our highest-priced system. To keep the cost down we used wood-grain vinyl instead of costly wood veneer. It looks rich, and makes absolutely no difference in sound quality.

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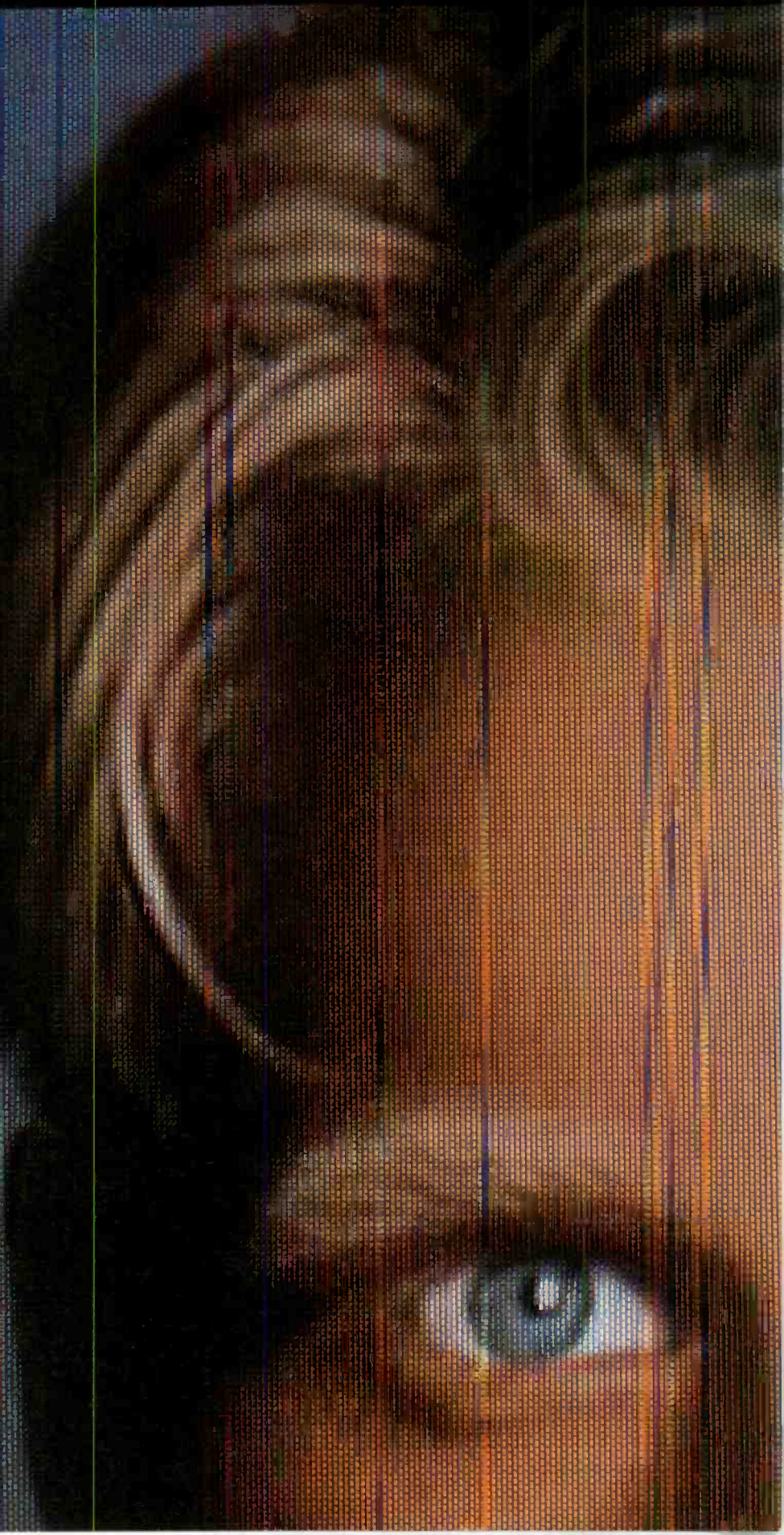
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## TEST REPORTS

check the programmed sequence and to clear program selections.

The rear apron of the CDP-605ESD contains the two analog output jacks and a two-channel digital output jack, which can be used with Sony's external DAS-703ES D/A converter or with amplifiers that have built-in D/A converters. A slide switch adjacent to the digital jack connects the digital output and mutes the analog outputs.

The Sony CDP-605ESD is supplied with a wireless remote control that duplicates almost all of its front-panel functions. The player measures 17 inches wide, 13½ inches deep, and 4¾ inches high, and it weighs about 18½ pounds. Price: \$1,000. Sony, Dept. SR, Sony Drive, Park Ridge, NJ 07656.

### Lab Tests

The virtually perfect performance specifications of the CDP-605ESD turned out to be generally conservative, and for the most part checking

them was barely within our measurement capability. For example, the rated harmonic distortion (at 0 dB) is 0.0025 percent, exactly what we measured. The signal-to-noise ratio (S/N) and the dynamic range, rated at more than 106 dB and 97 dB, respectively, measured as 108.5 and 99 dB. Channel separation at 1,000 Hz, rated as better than 100 dB, measured 126 dB (it was 104 dB at 20,000 Hz). The frequency response, which is rated as  $\pm 0.3$  dB from 2 to 20,000 Hz, was a barely measurable  $\pm 0.025$  dB in the audio range.

Added to this virtuoso performance were the closely matched output levels of the two channels, within 0.04 dB of each other at a 2.03-volt level, and an interchannel phase shift that was too low to measure with any accuracy at most frequencies, less than 0.7 degree from 1,000 to 10,000 Hz and only about 1.6 degrees at 20,000 Hz. Like most such circuits, the linearity of

the D/A converter showed some errors at low signal levels: the output was down 1.8 dB at  $-90$  dB and 2.3 dB at  $-100$  dB. Considering the inaudibility of those program levels, however, these errors are nothing to worry about.

Like most recent CD players, the Sony CDP-605ESD had no difficulty tracking the largest calibrated errors on the Philips TS5A test disc, and it made the transition between two program tracks having no separation interval without a hitch. Sony's fast-slewing laser carriage went from Track 1 to Track 15 of the Philips TS4 disc in less than 1.5 seconds—slightly slower than its rating because of a delayed startup of the program in Track 15. Going the other way, the slew time was less than 0.6 second.

One of the most outstanding properties of the CDP-605ESD is not easily quantified. It doesn't care very much about how roughly it is handled while playing. We induced mistracking only with a *hard* open-palm slap on either the top or side of the cabinet. Rapping it with knuckles or fist didn't seem to bother it at all.

### Comments

Ho, hum! Another super CD player from Sony—the company makes it look easy. This machine's response flatness, channel separation, and S/N were all absolutely terrific, near the limits of measurement. It was totally lacking in the occasional detectable, though hardly significant, flaws that we find in most of the CD players we test. If the Sony engineers have not quite achieved perfection with this product, they have certainly come very close to doing so.

All of the Sony player's features worked with the silence, smoothness, and lack of surprises that we expect and appreciate from any piece of good audio equipment but, unfortunately, do not always find. Individual taste being what it is, no doubt some people will find things about this machine that they wish had been done a little differently. Frankly, though, it is hard to be very critical of something that performs like the CDP-605ESD. It is a gem.

**Circle 140 on reader service card**

### FEATURES

- Quadruple oversampling
- Separate 16-bit D/A converter for each channel with "deglitcher" circuit to keep undesired noise bursts out of analog signals
- Separate digital filters and linear-phase third-order analog filters for each channel
- Separate power supplies for analog and digital circuits
- Linear-motor laser transport for fast cueing
- Programming for up to twenty tracks in any order
- Direct keypad access to any track up to No. 99
- Track stepping, index stepping, and fast search (with audible sound) in either direction
- Shuffle-play (random) mode
- Repeat single track, entire disc, programmed sequence, or any selected portion (phrase repeat) indefinitely or from one to nine times
- Auto space to insert 3 seconds of silence between tracks
- Auto pause for pause after each track
- Complete display of track and time information and operating status
- Gold-plated phono jacks on rear for selectable analog and digital audio outputs
- Facility for operation by external timer
- Wireless remote control for almost all front-panel functions
- Front-panel headphone jack with volume control

### LABORATORY MEASUREMENTS

**Maximum output level:** 2.03 volts  
**Total harmonic distortion** at 1,000 Hz: 0.0025% referred to 0 dB, 0.0047% referred to  $-10$  dB, 0.018% referred to  $-20$  dB  
**Signal-to-noise ratio** (A-weighted): 108.5 dB  
**Dynamic range:** 99 dB  
**Channel separation:** 126 dB at 1,000 Hz, 104 dB at 20,000 Hz  
**Frequency response:**  $\pm 0.025$  dB from 20 to 20,000 Hz

**Maximum phase shift:** 3.6 degrees at 20 Hz, 1.6 degrees at 20,000 Hz  
**Cueing time:** 1.5 seconds maximum, 0.6 seconds typical  
**Cueing accuracy:** A  
**Impact resistance:** top, A; sides, A  
**Defect tracking:** tracked maximum-defect levels on Philips TS5A test disc



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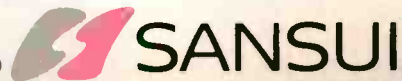
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### INFINITY REFERENCE STANDARD 8 KAPPA SPEAKER

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HE Reference Standard Kappa series of speaker systems from Infinity features newly developed drivers that are said to provide exceptional performance in all portions of the audio frequency spectrum. The Kappa series currently consists of three models using similar drivers in different configurations. The

middle speaker of the group is a four-way system designated the 8 Kappa, or 8k.

The Infinity 8k presents an unusual and very attractive appearance. The hand-rubbed and oiled oak cabinet measures 47½ inches high and 20½ inches wide, but only 6½ inches deep. Each speaker weighs almost 90 pounds (a pair is

shipped in a single carton about the size and weight of a moderate-size refrigerator!). The cabinet has rounded and fluted sides, and the supplied pedestal—which is only partially visible from the front and does not raise the speaker significantly from the floor—tilts the cabinet backward a few degrees. Most of the front of the system is covered by a removable black cloth grille whose plastic spacers position it about 1¼ inches from the speakerboard.

Each of the Infinity 8k's four drivers has a design unique to the Kappa series, and they are unconventional in appearance as well as function. The cone of the 12-inch woofer, which operates in a sealed enclosure, is injection molded from polypropylene and graphite fiber for a high stiffness-to-mass ratio and improved bass performance, and it is mounted on a rugged cast frame. The first crossover, at 90 Hz, is to a 5-inch Polygraph k dome driver that is optimized for the principal region of musical fundamental tones (80 to 500 Hz). Its dome is formed of very thin polypropylene on a reinforcing frame of graphite fiber.

The sound from 700 to 5,000 Hz is radiated by a 3-inch Polydome k polypropylene dome driver. The dome formulation combines very low mass with effective damping, and its voice coil uses flat, edge-wound wire. The tweeter, operating above 5,000 Hz, is an improved version of Infinity's EMIT (electromagnetic induction tweeter) design. The EMIT k is a planar-magnetic driver whose film diaphragm weighs half as much as those of its predecessors and operates in a powerful magnetic field generated by rare-earth neodymium magnets. According to Infinity, the EMIT k offers improved transient response and a high-frequency response out to 44,000 Hz.

A second EMIT k tweeter is on the back panel of the cabinet, radiating rearward. Also on the rear of the cabinet are continuously adjustable level controls, with an indicated "flat" position, for each of the higher-frequency drivers. There are separate pairs of five-way binding-post connectors for the bass and high-frequency portions of the system. Nor-

## TEST REPORTS

mally joined by heavy wires, these give the user the options of bi-amplifying the system or of simply biwiring (running separate pairs of wires from a single amplifier to the speaker's low- and high-frequency drivers) as well as a conventional connection through a single pair of conductors.

The four drivers in front are vertically aligned on the center of the speakerboard, with the tweeter at the ear level of a seated listener. The entire surface of the board is covered with a felt-like flocking material to minimize diffraction effects that can alter the imaging qualities of the speaker.

The manufacturer's ratings for the 8k include a frequency response of 33 to 44,000 Hz  $\pm 3$  dB, nominal impedance of 4 to 8 ohms, an efficiency (sensitivity) of 87 dB sound-pressure level (SPL) at 1 meter with 1 watt input, and a recommended amplifier power of 50 to 250 watts. Price: \$899 each. Infinity, Dept. SR, 9409 Owensmouth Ave., Chatsworth, CA 91311.

### Lab Tests

The room-response curve of the Infinity 8k showed a powerful and relatively uniform low bass (from 100 Hz down to about 25 Hz), a broad depression centered at 500 Hz, and a narrower one at 5,000 Hz. The output above 6,000 Hz was strong and uniform all the way to our 20,000-Hz measurement limit. Close-miked measurements of the woofer and upper-bass drivers showed a similar shape, although they were very smooth within the operating range of each driver. The composite curve we created by splicing these measurements to the room-response curve varied  $\pm 2$  dB from 130 to 6,000 Hz. The output variation was  $\pm 1.5$  dB at higher frequencies, from 6,000 to 20,000 Hz. The bass response, flat within 2 dB overall from 37 to 115 Hz, was approximately at the same average level as the 12,000- to 20,000-Hz range and about 6 dB above that level between 150 and 5,000 Hz.

All of these measurements were made with the level controls of the speaker set to their indicated flat positions. The huge number of possible response curves that could be

produced with the three controls made a thorough evaluation of their effects impractical. Our listening tests, however, established that their adjustment ranges were mod-

*The Infinity 8k had an open, clear sound quality with a noticeably extended, well-dispersed, and powerful top end. And its low bass performance was truly exceptional for the size of the woofer and its enclosure.*

erate, suitable for a fine trimming of response without making a major change in the sound character of the speaker.

Quasi-anechoic FFT response measurements indicated a very extended and uniform response, within  $\pm 2$  dB at 1 meter on-axis from 1,000 to 27,000 Hz (the approximate upper limit of our IQS analysis system). The phase linearity was excellent, with a group-delay variation of considerably less than 0.1 millisecond in the tweeter range, 5,000 to 27,000 Hz, and about 0.5 millisecond down to 1,500 Hz.

The horizontal dispersion of the front EMIT k tweeter was very good. Its responses on-axis and 45 degrees off-axis were virtually identical up to about 14,000 Hz and differed by a mere 6 dB at 20,000 Hz. We also compared the response of the front tweeter with that of the rear one; there did not appear to be any systematic difference between them.

The speaker's measured sensitivity of 86 dB SPL was close to the rated value. Its impedance curve was unusual, with a range of variation that made it difficult to categorize. The minimum impedance was 1.3 ohms, at 40 Hz, one of the lowest we have measured, and it varied between that value and 4 ohms over the range from 20 to 250 Hz. The maximum, 9.5 ohms, was reached at 1,000 Hz, and the impedance was a nearly constant 2.4 to 2.8 ohms from 1,800 to 20,000 Hz.

Setting the level-adjustment controls to their limits had a small effect on the impedance above 200

Hz but made no essential changes in its range of variation. We would consider a rating of 8 or even 4 ohms for this speaker to be unrealistic; the impedance was typically 3 ohms or less over most of the audio range. We had no difficulty in driving it with several different amplifiers, but it is conceivable that some amplifiers would not take kindly to the load it presents.

We measured the bass distortion at a drive level of 3.2 volts, corresponding to a 90-dB SPL output from the system. The distortion was low and nearly constant over most of the low-bass range, measuring between 0.5 and 1.4 percent from 100 Hz to below 40 Hz and only 3.9 percent at 30 Hz.

The peak power-handling ability of the speaker, using single-cycle tone bursts, was very good. The woofer began to rattle slightly at a 100-Hz input of 562 watts. At 1,000 and 10,000 Hz, our amplifier clipped (at respective power inputs of 725 and 2,400 watts) before the speaker's output showed any signs of nonlinear distortion.

### Comments

The Infinity 8k is a very good-looking speaker, and it sounded good, too. It had an open, clear sound quality with a noticeably more extended, better-dispersed, and more powerful top end (above 10,000 Hz) than our regular reference speakers, which are considerably more expensive. Its low bass performance was truly exceptional for any 12-inch woofer in an enclosure of this size.

The response of the 8k over most of the audio range can be divided into several segments, each of them very flat over an octave or more but differing from the level of its neighbors by 3 to 5 dB. This "shelved" response characteristic sometimes, depending on the program material, made one or another portion of the spectrum appear to be emphasized or diminished. But these occasional deviations from a flat response were by no means always objectionable.

If your amplifier can handle the low impedance of the Infinity 8k, it offers good value. It sounds a lot more expensive than it costs!

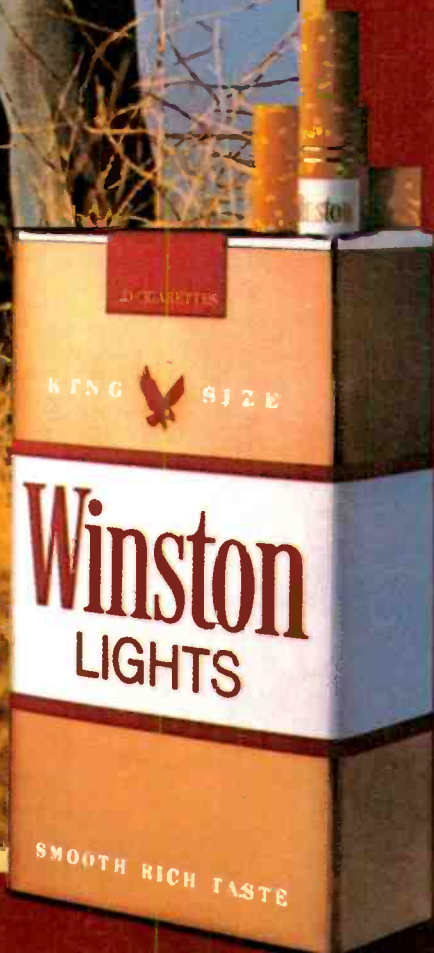
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*Steeped in audio breakthroughs and advanced designs, Harman Kardon's Citation division introduced the world's first Ultrawideband amplifier in 1963—the Citation 2 vacuum tube amplifier. In 1972, the Citation 14, the first FM stereo tuner with Phase Locked Loop (PLL) MPX decoding*

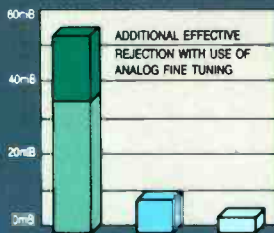
*was introduced. In 1977, the 150-Watt-per-channel Citation 19 became the first power amplifier to feature low negative feedback. 1981 saw the introduction of the Citation XX, its exclusive High Instantaneous Current Capability (HCC) design provided the instantaneous current required to precisely drive and control any loudspeaker system.*

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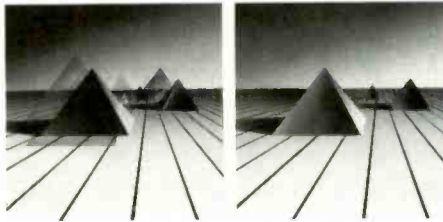
## THE TX-11a COMBINES CARVER'S REVOLUTIONARY ASYMMETRICAL CHARGE COUPLED FM DETECTION CIRCUITS WITH AN AM STEREO SECTION CAPABLE OF FM-QUALITY RECEPTION.

The Carver TX-11a Stereo AM-FM Tuner is the most complete high fidelity broadcast reception component ever offered. It is a technical tour-de-force which further distances Bob Carver's unique products from traditional electronic components. First, by eliminating forms of FM distortion and interference that even the most expensive tuners available can't correct. And second, with a unique additional tuning section capable of making AM stereo sound as good as FM!

**THE SILENT TREATMENT.** While AM stereo may not yet be available in your area, you can receive FM stereo. Including stations so fraught with interference and distortion that you may be tempted to return to mono AM. That's why the TX-11a includes the first circuitry to remove hiss, "picket fencing" and the myriad other unpredictable noises which often disturb FM listening. Without reducing stereo imaging, frequency response or dynamic range.

Part of the FM signal, the left minus right portion, is extremely prone to "ghosting," or multipath interference caused by hills, buildings and other obstructions. Bob Carver's Asymmetrical Charge Coupled circuitry cancels distortion-causing "dirty mirror" images before they can reach your ears. It filters out noise and restores the part of the signal

needed by our ears and brain to construct stereo imaging. Reintroduced into the mono (L+R) signal matrix, a net reduction of 93%—or better than 20dB of noise reduction—is achieved. All ambient and localizing information is recovered. Only hiss and



distortion are left behind. Or, as *High Fidelity* magazine put it, "...clean, noise-free sound out of weak or multipath-ridden signals that would have you lunging for the mono switch on any other tuner."

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

*Audio* magazine called it, "An FM tuner breakthrough."

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When Bob switched back and forth, most listeners had difficulty distinguishing between the straightwire CD player and the TX-11a's over-the-air AM stereo reception! Many could tell no difference at all!

**HUMAN ENGINEERED FEATURES AND CONVENIENCE.** The TX-11a is designed to make enjoying FM and AM easy, not dazzle you with flashing light and complex programming. Thirteen presets, wide/narrow band selection, automatic/manual scanning as well as Multipath and Noise Reduction buttons are inset into the burnished anthracite metal face. Full instrumentation including digital display, 6-step signal strength LEDs and other monitor functions are tastefully recessed, visible but not garish. The result is performance without theatricality, access without complication.

**CLEAR THE AIR** by visiting your nearest Carver dealer. Ask to hear the most expensive tuner they sell. (It probably won't be the Carver TX-11a). Tune a multipath-ravaged, hiss-filled FM station on it; then the same station on the TX-11a Stereo AM-FM Tuner. Now press the Carver Multipath and Noise Reduction buttons. You'll hear why *High Fidelity* Magazine called it, "By far the best tuner we have tested..."



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## SOUND CONCEPTS SSD550 TIME-DELAY SYSTEM

*Julian Hirsch, Hirsch-Houck Laboratories*

**F**OLLOWING the demise of quadraphonic equipment, which originally had been expected to provide more realistic home music reproduction than conventional stereo, time-delay techniques emerged as yet another way to bring some measure of "concert hall" ambience to the home listener. These techniques had the advantage of not requiring specially made recordings.

Most recordings are made with a certain degree of ambience—the complex pattern of reflected sounds in a concert hall that give the overall sound a feeling of space. The short delay times in a typical home listening room are usually inconsistent with the longer delays in the original recording environment, however,

so that a recorded performance heard as taking place at the front of the room will have its own ambience unnaturally distributed in that region.

An improvement in ambience, at least in theory, can be obtained by delaying the original program and playing the delayed signals through auxiliary speakers at the rear or along the sides of the room. By choosing the appropriate delay time(s), and by recirculating the signal several times to add additional longer-delayed components, it is possible to impart a worthwhile sense of realism to many recordings. The most effective delay systems have provided a wide range of delay times, control over the recirculated signals and their relative levels in

the overall program, and shaping of the frequency response of the delayed signals to conform to the "real world" situation, in which a considerable amount of high-frequency energy is lost by absorption with each reflection.

Despite the benefits of time-delay enhancement, the technique fell into disuse, in good part because of its considerable cost. The delay unit itself might cost \$500 to \$1,000, and it required at least one more stereo power amplifier and two or more additional speakers distributed along the sides and rear of the listening room.

One of the earliest time-delay processors was the Sound Concepts SD-550, which has continued to exist in a nearly dormant state for many years. The popularity of the Dolby Surround system for motion-picture and TV use, however, has now restored the SD-550, slightly modified and called the SSD550, to active status. Instead of being offered primarily as a four-channel surround-sound generator, it now

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also incorporates a true Dolby Surround matrix, with the required Dolby B noise reduction, and can be used to decode Dolby Surround-encoded video programs.

In its basic time-delay mode, the SSD550 operates, separately for each channel, on signals taken from the tape-recording or external-processor outputs of an amplifier or receiver. After being sent through 10,000-Hz low-pass filters, the signals are pre-emphasized, compressed at a rate of 2:1, and delayed. Following the delay, the signals are expanded at a ratio of 1:2 and deemphasized. This "componder" (compressor-expander) action restores the program's original dynamic range and effectively eliminates any noise added during the delay process.

Like digital delay systems, the Sound Concepts device uses large-scale integrated circuits, but here they are charge-coupled analog delays—a "bucket-brigade" system—whose delay time is continuously variable between 5 and 50 milliseconds. A longer delay time, up to 100 milliseconds, is also provided by a switch that connects the output of one delay channel to the input of the other. In this mode the two rear channels are paralleled (converted to mono).

The delayed signals are delivered, at an adjustable level, to the rear-output jacks of the SSD550, and after external amplification they are sent to the rear speakers. Normally the front-speaker signals are unmodified, but controls on the SSD550 can blend an adjustable amount of the delayed program into the front outputs if that is desired. And to enhance the reverberant qualities of the program, a controllable amount of each channel's delayed signal can be returned to the input of the opposite channel's delay circuit. Since longer delays result in a loss of high frequencies, a high-frequency trimming control, calibrated in both milliseconds and decibels, is provided to maintain the desired frequency balance.

In the SSD550's Dolby Surround mode, the front-channel signals are processed by a Dolby decoder whose outputs go to the rear-channel jacks. The level and mid-bass

response of the rear outputs are increased, and the center front channel's output is greatly reduced. Unlike ordinary time-delay enhancement, in which the rear channels should not be heard as separate sound sources, the best effect in the Dolby Surround mode requires comparable front and rear levels.

The Sound Concepts SSD550 is furnished with a clearly written and informative instruction manual that should enable any user to set it up for optimum results. The variable controls on the front panel are clearly calibrated, easy-to-use vertical sliders. Four rocker switches select the delay range, send either delayed or rear-input signals to the rear outputs, supply the front outputs with an unmodified signal or one mixed with a delayed component, and select either normal or Dolby Surround operation.

The front panel is finished in a dark satin gray with white markings. The SSD550 measures 15½ inches wide, 9 inches deep, and 3½ inches high, and it weighs 7 pounds. It has no power switch and is meant to be left on at all times (it consumes only 10 watts of power). Price: \$789. Owners of older SD-550's can have them upgraded to an SSD550, including a complete cleaning and recalibration, for \$75. Sound Concepts, Inc., Dept. SR, 27 Newell Rd., Brookline, MA 02146.

### Lab Tests

Ordinary bench tests of a signal-processing device such as the Sound Concepts SSD550 are difficult to perform in any meaningful way. Since its effects are entirely subjective, we were limited to measuring its signal-level limitations, noise level, frequency response, and time-delay variation range. The rear outputs clipped at 5.8 volts at 1,000 Hz into a standard EIA load of 10,000 Hz in parallel with a 1,000-picofarad capacitor.

The maximum rated distortion at 1,000 Hz and a 1-volt output is 1 percent. We measured it as 0.16 percent, and it was only 0.82 percent at 5 volts, just before clipping occurred. The A-weighted noise level was -94 dB referred to a 0.5-volt output (rated -85 to -90 dB), and the time-delay range was 5 to 50

milliseconds, as rated. The frequency response at the rear outputs was about  $\pm 1$  dB from 20 to 6,500 Hz, and its variation at 10,000 Hz using the HI-FREQ ROLLOFF control was close to the panel calibrations, from -3 to +6 dB. When the control was set to match the delay time, the overall response change for delay variations between 5 and 50 milliseconds was no more than 3 dB. Switching to the Dolby Surround mode increased the rear output by 4 dB over most of the audio range and rolled it off at low frequencies to -3 dB at 40 Hz and -9 dB at 20 Hz.

### Comments

We were quite familiar with the Sound Concepts SD-550, having had one in our own system for many years. The SSD550 appeared to be identical to the older version except for its Dolby feature, and it sounded essentially the same in normal operation. Time-delay enhancement is something that must be done with considerable subtlety to be effective, and when the SSD550 is set up optimally the rear speakers cannot be heard as distinct sources of sound. Nevertheless, switching off the rear speakers can have a dramatic effect on the sound, which collapses into the front of the room without their contribution.

Time-delay enhancement of conventional stereo programs may be more expensive than it is worth for many listeners, although it is hard to live without once you are accustomed to its presence. Being able to use the same system for TV sound enhancement is a sizable plus, however, and changes the value-per-dollar balance considerably.

While we did not have an audio/video installation that permitted effective tests of the SSD550's Dolby Surround system, we have heard enough demonstrations of Dolby Surround's capabilities to know that anyone who watches current movies on videotape or videodisc can benefit greatly from this sort of enhancement. It won't do much for old Chaplin silent films, but if your taste runs to *Top Gun*, *The Empire Strikes Back*, or the Indiana Jones tales, a decoder such as the SSD550 is nearly indispensable.

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- 356287. Suzanne Vega—*Solitude Standing*. (A&M)
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- 348458. Dvorak: Cello Concerto—Yo-Yo Ma, Maozel, Berlin Philhar. (Digital—CBS Masterworks)
- 347955. Huey Lewis & The News—*Fore!* (Chrysalis)
- 349985. Johnny Mathis/Henry Mancini—*The Hollywood Musicals* (Columbia)
- 348979. Tina Turner—*Break Every Rule* (Capitol)
- 352633. Dolly Parton/Linda Ronstadt/Emmylou Harris—*Trio* (Warner Bros.)
- 281493. Stravinsky: *Rite Of Spring*—Mehta, cond. (CBS Masterworks)
- 324822. Ravel: *Bolero; La Valse; Rhapsodie Espagnole*—Maozel, cond. (Digital—CBS Masterworks)
- 346643. Andreas Vollenweider—*Down To The Moon*. (CBS)
- 346478. Madonna—*True Blue*. (Sire)
- 356576. John Adams: *The Chairman Dances*—DeWart, San Fran. Sym. (Digital—Nonesuch)
- 343319. Janet Jackson—*Control* (A&M)
- 349571. Boston—*Third Stage* (MCA)
- 351692. Beastie Boys—*Licensed To Ill*. (Def Jam/Columbia)
- 343715. Vivaldi: *Four Seasons*—Maozel, cond. (Digital—CBS Masterworks)
- 347252. Kronos Quartet: *Sculthorpe/Sallinen/Glass/others*. (Digital—Nonesuch)
- 339226. Gershwin: *Rhapsody In Blue*, more. Thomas, Los Angeles Phil. (Digital—CBS Masterworks)
- 316604. Tchaikovsky: 1812 Overture; *Marche Slava*; Beethoven: *Wellington's Victory*—Maozel, cond. (Digital—CBS Masterworks)
- 287003. Eagles Greatest Hits 1971-1975 (Asylum)
- 347492. Glenn Miller Orchestra—*In The Digital Mood*. (Digital—GRP)
- 345751. Paul Simon—*Graceland*. (Warner Bros.)
- 293597. Led Zeppelin—*Houses Of The Holy*. (Atlantic)
- 350736. Rolling Stones—*Reward*. (Rolling Stones Records)
- 346957. Steve Winwood—*Back In The High Life*. (Island)
- 319996-399998. Motown's 25 #1 Hits From 25 Years. (Motown)
- 314443. Neil Diamond's 12 Greatest Hits, Vol. 2. (Columbia)
- 356683. U.N. Benefit Concert—*Glossic Aid*. Maozel, Williams, etc. (CBS Masterworks)
- 356279. Gloria Estefan And Miami Sound Machine—*Let It Loose*. (Epic)
- 308049. Creedence Clearwater Revival Featuring John Fogerty/Chronicle. 20 greatest hits. (Fantasy)
- 343582. Van Halen—*1550*. (Warner Bros.)
- 345553. Branford Marsalis—*Romances For Saxophone*. (Digital—CBS Masterworks)
- 326629. Bruce Springsteen—*Born In The U.S.A.*. (Columbia)
- 342097. Barbra Streisand—*The Broadway Album*. (Columbia)
- 219477. Simon & Garfunkel's Greatest Hits. (Columbia)
- 354100. Crowded House. (Capitol)
- 348649. Pachelbel Canon & Other Digital Delights—Toronto Chamber Orch. (Digital—Fantasy)
- 348318. The Police—*Every Breath You Take—The Singles* (A&M)
- 346312. Billy Joel—*The Bridge*. (Digital—Columbia)
- 336222. Dire Straits—*Brothers In Arms*. (Warner Bros.)
- 341073. Steely Dan—*A Decade Of Steely Dan*. (MCA)
- 349373. Beethoven: *Symphony No. 9* (Choral) Bernstein, NY Phil. (Digitally Remastered—CBS Masterworks)
- 314997-394999. Stevie Wonder's Original Musiquarium I. (Tamla)
- 351122. Europe—*The Final Countdown*. (Epic)
- 346544. Kenny G—*Duotones*. (Arista)
- 344721. Lionel Richie—*Dancing On The Ceiling*. (Motown)
- 355156. Vladimir Horowitz *Plays Favorite Chopin* (Digitally Remastered—CBS Masterworks)
- 355115-395111. Prince—*Sign 'O' The Times*. (Paisley Park)
- 357186. Hooters—*One Way Home*. (Columbia)
- 356873. The Outfield—*Bangin'*. (Columbia)
- 356329. Randy Travis—*Always & Forever*. (Warner Bros.)
- 355636. Ozzy Osbourne—*Randy Rhoads Tribute*. (CBS Assoc.)
- 355529. Philip Glass—*Dance Pieces*. (Digital—CBS)
- 355362. Whitesnake. (Geffen)
- 354829. Lisa—*Lisa And Cult Jam With Full Force—Spanish Fly*. (Columbia)
- 345777. Peter Gabriel—*Sa*. (Geffen)



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## TEST REPORTS



### DAHLQUIST M-905 SPEAKER

*Julian Hirsch, Hirsch-Houck Laboratories*

**D**AHLQUIST'S first speaker, the DQ-10, was—and still is—an unconventional product: a free-standing system whose drivers are not mounted in the usual box enclosure. Reduction of coloration from box resonances and maintenance of an accurate phase relationship between its drivers are the key features of the DQ-10, which has been on the market for fourteen years and has been acclaimed for its sound quality.

The Dahlquist line has since been expanded to include a number of box-type speakers. Despite their familiar appearance, they have also been designed to be as free as possible of the usual box colorations. Moreover, they have the high sensitivity and linearity needed to reproduce the dynamic range of digital recordings. Typical of Dahlquist's current line is the new M-905 High Performance Monitor, a moderately priced two-way system.

The walnut-veneered cabinet of the M-905 measures 24 inches high, 13½ inches wide, and 12¼ inches deep. The black cloth grille has solid-walnut trim strips and is retained by plastic snaps. Each speaker weighs 35 pounds, and for optimum results they should be mounted on Dahlquist ST-9 stands (\$80 a pair), which match the finish of the speakers and support them about 11 inches above the floor, with a backward tilt of 3.5 degrees for optimum coverage of the listening area. Like

*In our listening tests, the Dahlquist M-905's revealed a very wide-range and balanced sound, and their measured room response was among the best we have seen.*

most free-standing speakers, the M-905 gives its best performance when it is placed at least a foot from the wall and angled slightly inward toward the listener.

The 8-inch woofer of the M-905 is a polyvinyl-acetate-laminated cone operating in a vented enclosure. The outlet of its tuned port is on the front panel of the speaker cabinet. At 2,500 Hz there is a crossover to a 1-inch soft-dome tweeter.

The nominal system impedance is 8 ohms (6 ohms minimum), and the M-905 is recommended for use with amplifiers rated to deliver from 20 to 125 watts per channel. The five-way binding-post terminals recessed into the rear of the cabinet will accept dual banana plugs. The drivers are protected by individual fuses (0.8 ampere for the tweeter and 3 ampere for the woofer). The system's sensitivity is rated as 91 dB sound-pressure level (SPL) at 1 meter when the speaker is driven by 1 watt at 1,000 Hz. The rated frequency response is 40 to 24,000 Hz.

Dahlquist refers to the cabinet of the M-905 as an "Un-box" enclosure, likening its construction to that of a violin. The wall panels are of varying thickness, and there is special internal damping and bracing designed to suit the individual characteristics of the drivers in the



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## TEST REPORTS

system, all to minimize coloration of the sound by the box. The front panel is coated with a black flocking material whose thousands of fibers are electrostatically aligned perpendicular to its surface during application. The flocking and the flush-mounting of the tweeter are said to minimize diffraction from front-panel discontinuities, preserving image focus. Price: \$590 a pair. Dahlquist, Dept. SR, 601 Old Willets Path, Hauppauge, NY 11788.

### Lab Tests

Preliminary listening tests of the Dahlquist M-905 speakers—installed on the ST-9 stands, as recommended—revealed a very wide-range and balanced sound whose smoothness and lack of coloration were far beyond what we would have expected from speakers in their price range. In fact, the sound from the M-905's would be more than acceptable at several times the price. In view of this, we were not too surprised to find that with respect to flatness and freedom from peaks and holes the measured room response was among the best we have encountered.

The close-miked woofer (and port) response was also considera-

bly flatter than we have measured from most speakers, with a very small bass-resonance peak. At the system resonance of 60 Hz, the output was only about 2 dB above its average level in the upper part of the woofer's range, and even that minor output variation was spread over almost two octaves. When the bass curve was spliced to the room-response measurement, the resulting composite frequency response was flat within about  $\pm 2$  dB from 26 to 20,000 Hz. The horizontal directivity of the tweeter was only discernible in the room measurement above 10,000 Hz.

We measured the sensitivity of the M-905 as 87 dB SPL, which was lower than the rated 91 dB but still about average for speakers of its size. The difference may have been a result of different test conditions since we used a full-range pink-noise signal while Dahlquist's rating was made at 1,000 Hz. The system's minimum impedance was about 4.8 ohms in the 8,000- to 10,000-Hz region, and it measured 7 ohms at 150 to 200 Hz. Its maximum impedance was 28 ohms at 60 Hz, and there was a broad peak of 18 ohms in the vicinity of 1,500 Hz.

We measured the woofer's distor-

tion with a 4-volt drive level, corresponding to a 90-dB SPL at 1 meter. The distortion was less than 1 percent from 100 Hz down to almost 60 Hz, the effective crossover to the port. Below that crossover the distortion rose to 5 percent at 45 Hz and 9 percent at 35 Hz. In high-power tests with single-cycle tone bursts, the woofer began to sound "hard" at about 350 watts into its 8.5-ohm impedance at 100 Hz. At higher frequencies the amplifier clipped—at outputs of 490 watts at 1,000 Hz and 1,380 watts at 10,000 Hz—before distortion became visible on the acoustic waveform.

Quasi-anechoic FFT measurements showed an overall group-delay variation of about 0.1 millisecond between 4,000 and 20,000 Hz and 0.5 ms between 1,000 and 20,000 Hz, convincing evidence of the attention paid to the phase characteristics of the M-905.

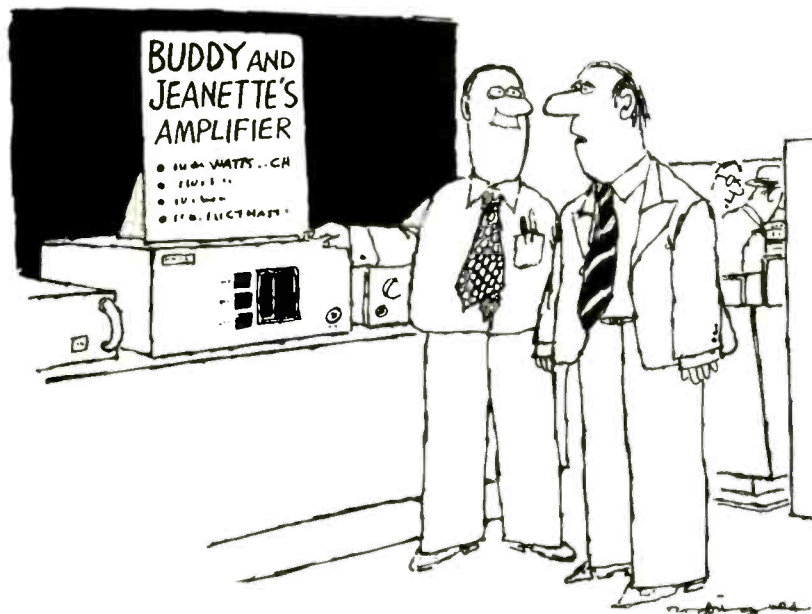
### Comments

Although we have often commented on the difficulty of correlating the measured response of a speaker with its sound, the Dahlquist M-905 seems to be an exception: whether you look at its response curves or listen to its sound, it has an extraordinarily smooth, uncolored response. We tried to find some recording that would reveal a weakness, but we soon realized that was a fruitless quest.

As so often happens, there is little in the speaker's external appearance, or in the manufacturer's description of its internal design, that would give a clue to its remarkable performance. Many speaker manufacturers claim unique qualities for their creations, which only too often turn out to be "just another speaker." The M-905, however, really does what Dahlquist says it does, and we were very impressed by the way a two-way speaker with an 8-inch woofer could perform.

The best way to sum up our reaction to the M-905 is to say that it sounded like a far more expensive speaker than it is, especially in the middle and high frequencies. Regardless of its physical size and its price, its sound says, unmistakably, that it is a top-quality speaker.

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JOCK LEUNG

### DENON DRA-75VR RECEIVER

*Julian Hirsch, Hirsch-Houck Laboratories*

**D**ENON'S DRA-75VR is primarily a high-quality AM/FM stereo receiver, but it also has video switching facilities that allow video and audio programs from separate sources to be combined for listening/viewing or for recording on a VCR. Since its video features are limited to switching, however, we would consider it an enhanced stereo receiver rather than a true "audio/video" receiver.

The amplifier section of the Denon DRA-75VR is rated to deliver 65 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.015 percent total harmonic distortion. For a receiver, it has an unusually high dynamic-power rating: 150 watts into 4 ohms or 175 watts into 2 ohms. The amplifier features Denon's "Non-Switching Class A" circuitry, which

is designed to minimize the crossover distortion typical of Class AB or Class B amplifiers.

The receiver's preamplifier section controls three high-level audio inputs (auxiliary, CD, tuner) and a phono input whose gain and input impedance can be switched for either moving-magnet (MM) or moving-coil (MC) cartridges. Separate preamplifier-output and power-amplifier-input jacks in the rear of the receiver, normally joined by jumper links, permit inserting an external processor into the signal path without using a tape-monitor loop. There are two tape loops, each of which can be used for either a VCR or an audio tape deck for playing, recording, or dubbing from either machine to the other.

The Denon DRA-75VR uses a microprocessor to store the settings

of its digital-synthesis AM/FM tuner, input selectors, and digital volume control. Each time the receiver is switched on, the previous control settings are restored. Although pushbuttons are used for the tuning and volume adjustments as well as

*The Denon DRA-75VR has an unusually high dynamic power rating for a receiver, 150 watts into 2 ohms, and the two tape-monitor loops, each usable for either a VCR or an audio tape deck, make dubbing in either direction possible.*

selection of program sources and preset stations, the DRA-75VR has conventional knobs for its bass and treble tone controls, balance control, and loudness control.

## TEST REPORTS

The loudness control operates independently of the volume setting. The response is flat at the knob's clockwise limit, and turning it counterclockwise reduces the volume over a limited range while simultaneously boosting the bass and treble responses. This system allows almost any degree of compensation to

be used at any volume setting, making the loudness control's usefulness reasonably independent of speaker efficiency.

The highly informative display window on the front panel is visually subdued and tasteful. In addition to showing the selected program source, preset channel number, sta-

tion frequency, stereo reception, and relative signal level, it has an upward-sloping row of dots that indicates the volume setting. Most of the receiver's display lighting is pale yellow-green, clearly visible but not obtrusive.

The Denon DRA-75VR is furnished with a wireless remote control that duplicates all of its digitally operated front-panel controls. The receiver's stand-by power circuit keeps its memories intact and allows full power to be switched on or off from the remote control. The remote control can also operate certain other Denon components, including several CD players and a cassette deck, giving it full system-control capability.

The Denon DRA-75VR, which is finished in black with white markings, measures 17 $\frac{1}{8}$  inches wide, 14 $\frac{7}{8}$  inches deep, and 5 $\frac{7}{8}$  inches high, and it weighs 22 $\frac{1}{2}$  pounds. Price: \$500. Denon, Dept. SR, 27 Law Dr., Fairfield, NJ 07006.

### Lab Tests

The rated FM usable sensitivity of the Denon DRA-75VR is 9.3 dBf (0.8 microvolts, or  $\mu$ V), which is somewhat optimistic—we have never tested a tuner whose sensitivity even approached that figure! Nevertheless, its *measured* sensitivity of 13.4 dBf (2.6  $\mu$ V) should be more than adequate for almost any receiving situation. Its distortion performance and signal-to-noise ratio (S/N) were both excellent, and, like most of the other tuner measurements, they were close to the rated values.

The tuner's stereo and muting thresholds were identical at 31 dBf (19.5  $\mu$ V), a reasonable value in view of the tuner's other performance characteristics. Two of our measurements produced surprising results: the 19-kHz stereo pilot-carrier leakage into the audio was suppressed to a record-breaking -90-dB level (a more typical figure would be about -70 dB), and the image rejection of 33 dB was possibly the lowest we have ever measured. Even the receiver's rated 42-dB image rejection would be marginal near airports, where air-to-ground transmissions fall on the image frequencies of some FM sta-

### FEATURES

- Nonswitching Class A power amplifier
- Digital-synthesis AM/FM tuner
- Sixteen station presets (eight keys assignable to two frequencies each)
- Pushbutton volume control
- Separate loudness-control knob
- Bass, treble, and balance control knobs
- Pushbutton input selection for phono, tuner, CD, auxiliary, two audio or video tape recorders
- Simulcast function for combining video and audio programs from separate sources
- Connections and switching for two pairs of speakers
- Front-panel phono-preamplifier switching for MM or MC cartridge
- Separate preamplifier outputs and power-amplifier inputs
- Mono/manual FM tuning or stereo/auto scan with interstation muting
- Dubbing from either tape recorder to the other
- Luminous display of tuned frequency, preset number, input source, volume setting, signal level, stereo reception
- Front-panel headphone jack
- Two AC outlets, one switched
- Rear jack for F-type 75-ohm antenna input
- Binding posts for 300-ohm FM antenna and detachable pivoted AM loop antenna

### LABORATORY MEASUREMENTS

- Tuner Section** (all measurements FM only except frequency response)
- Usable sensitivity (mono):** 13.4 dBf (2.6  $\mu$ V)
- 50-dB quieting sensitivity:** mono, 14.5 dBf (2.9  $\mu$ V); stereo, 37 dBf (39  $\mu$ V)
- Signal-to-noise ratio at 65 dBf:** mono, 84.7 dB; stereo, 76.3 dB
- Harmonic distortion** (THD + noise) at 65 dBf: mono, 0.089%; stereo, 0.137%
- Capture ratio at 65 dBf:** 1.0 dB
- AM rejection at 65 dBf:** 66 dB
- Selectivity:** alternate-channel, 55 dB; adjacent-channel, 3 dB
- Image rejection:** 33 dB
- Stereo threshold:** 31 dBf (19.5  $\mu$ V)
- 19-kHz pilot-carrier leakage:** -90 dB
- Hum:** -75 dB
- Stereo channel separation at 100, 1,000, and 10,000 Hz:** 44, 48, and 35.5 dB
- Frequency response:** FM, 30 to 15,000 Hz  $\pm$ 0.65, -0.1 dB; AM, -6 dB at 29 and 2,700 Hz
- Amplifier Section**
- 1,000-Hz output power at clipping:** 90 watts into 8 ohms, 120 watts into 4 ohms, 140 watts into 2 ohms
- Clipping headroom** (relative to rated output): 1.4 dB (8 ohms)
- Dynamic power output:** 120 watts into 8 ohms, 190 watts into 4 ohms, 240 watts into 2 ohms
- Dynamic headroom:** 2.7 dB (8 ohms)
- Harmonic distortion** (THD + noise) at 1,000 Hz into 8 ohms: 1 watt, 0.0125%; 10 watts, 0.0068%; 65 watts, 0.015%
- Maximum distortion from 20 to 20,000 Hz into 8 ohms:** 0.023% at 65 watts (20,000 Hz)
- Slew factor:** 2.5
- Sensitivity** (1-watt output into 8 ohms): CD/auxiliary, 18.5 mV; MM phono, 0.33 mV; MC phono, 0.035 mV
- Phono-input overload:** 152 to 175 mV
- A-weighted noise** (referred to a 1-watt output): CD/auxiliary, -88 dB; MM phono, -81.5 dB; MC phono, -69.5 dB
- Phono-input impedance:** 46,000 ohms in parallel with 125 picofarads
- RIAA equalization error:**  $\pm$ 0.2 dB from 20 to 20,000 Hz
- Tone-control range:**  $\pm$ 7.5 dB at 100 Hz;  $\pm$ 7.5 dB at 10,000 Hz
- Loudness boost** (maximum): 7 dB at 100 Hz; 5 dB at 10,000 Hz

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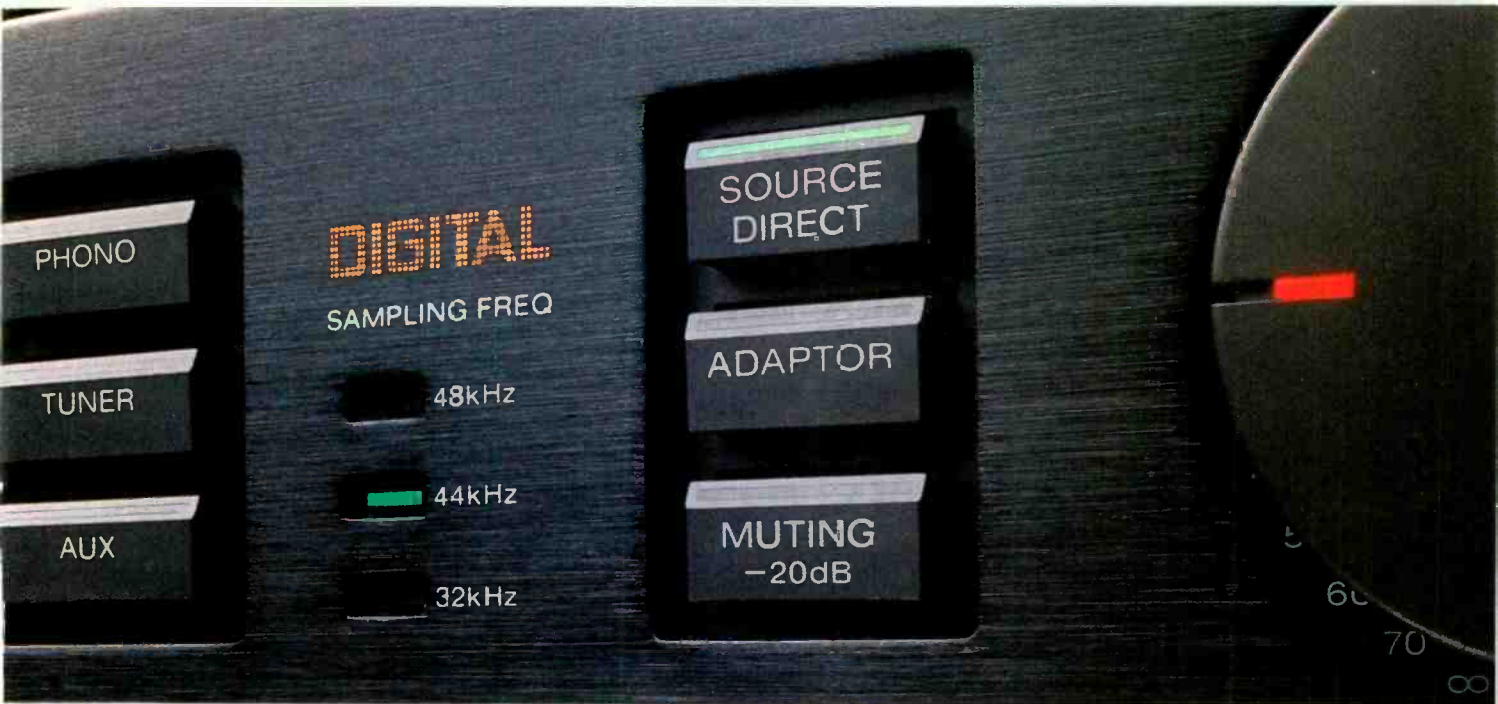
interfacing with both current and future digital components, plus decoding at three different sampling rates. It also has a digital processing loop for high-quality recording.

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affecting the analog circuits. Direct coupling of the D/A converter simplifies the signal path and minimizes internal interference.

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## TEST REPORTS

tions, and the measured 33-dB image rejection might be a problem in such areas.

The top of the receiver became moderately hot during the amplifier section's 1-hour preconditioning period at one-third power. The power ratings of the Denon DRA-75VR proved to be extremely conservative—it clipped at 90 watts continuous output into 8-ohm loads and 140 watts into 2-ohm loads (for which it does not carry a continuous-power rating). The 20-millisecond tone bursts of the dynamic-power test permitted maximum unclipped outputs ranging from 120 watts into 8 ohms to 240 watts into 2 ohms (well above its 2-ohm dynamic-power rating of 175 watts). The receiver did not shut down or blow any fuses during our rigorous testing of its power amplifier.

The amplifier's distortion was also very close to its ratings, typically measuring a constant 0.016 percent at rated power over most of the audio range and reaching a maximum of 0.023 percent at 20,000 Hz. At reduced power levels the distortion curve was similar, but the actual readings decreased with the power (with many amplifiers, dis-

tortion increases at very low output levels). This effect can probably be credited to Denon's "non-switching" amplifier design, which evidently does eliminate crossover distortion just as the manufacturer claims.

The preamplifier section matched the quality of the power amplifier, with an A-weighted S/N of 88 dB (referred to 1 watt) through a high-level input and 81.5 dB through the MM phono input. The MC phono input had an S/N of 69.5 dB, which is probably adequate though not as notable as the other measurements. The phono-overload limit for MM cartridges was about 170 millivolts, and both the input sensitivity and overload level were about ten times lower for the MC input.

The RIAA phono equalization was extremely accurate. On our usual plotting scale the variation was barely detectable, and with the expanded scale that we use for plotting CD player responses we could see that the variation was a mere  $\pm 0.2$  dB from 20 to 20,000 Hz. The digital volume control had a range of about 80 dB, operating in steps of approximately 2 dB over most of that range.

### Comments

The Denon DRA-75VR is an interesting receiver with some strangely contrasting performance characteristics. In some respects it is outstanding, especially the power amplifier, whose actual capabilities were far beyond the manufacturer's ratings. The FM tuner's performance in general was at least competent. It had better-than-average quieting, good separation, and exceptional stereo pilot-carrier suppression, and the capture ratio and AM rejection were above average. Image rejection was poor, but selectivity was about average for a receiver.

The preamplifier had superb phono-equalization accuracy and high gain. The tone-control characteristics were mild and not intended to produce extreme changes in system frequency response, but they were nevertheless useful for adjusting the tonal balance of programs without creating bizarre effects. The loudness compensation was excellent, boosting both lows and highs as it reduced the midrange level by a maximum of about 15 dB. Its ability to introduce any desired degree of boost at any listening level makes this one of the better loudness controls we have used.

In most cases, this receiver should be more than satisfactory. The compact yet uncluttered remote control is convenient to use, especially since the receiver's last operating conditions are "remembered" and restored each time it is turned on. Although we did not use the DRA-75VR with other compatible Denon products, the potential usefulness of its remote control as a system controller cannot be overlooked.

Our only criticism of the design of the Denon DRA-75VR concerns its mixture of pushbutton and knob controls (particularly for volume and loudness). Although we tend to prefer knobs for these functions, it is possible that using buttons for both (or neither) would be preferable, from an ergonomic standpoint, to the present hybrid arrangement. A small point, perhaps, but it says something for the performance of this receiver that this is the strongest criticism it elicits from us!

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# DIGITAL REVOLUTION

FROM COMPACT DISC TO DIGITAL AUDIO TAPE — AND BEYOND



BY IAN G. MASTERS

FIFTEEN years ago, or thereabouts, the word “digital” started creeping into the audiophile vocabulary. To most of us it seemed like a bit of futuristic fantasy, like holographic television or cars guided automatically by wires embedded in the roads. The prospect of an audio system that would do away with the traditional curses of noise, wow-and-flutter, and distortion, while offering a dynamic range approaching that of live sound, seemed too good to be true. And yet, even then, digital audio was hardly a fantasy—at least one major European broadcasting system was sending its FM signals to transmitters around the country digitally.

One of the promised benefits of digital sound was that the medium of transmission or storage would have negligible effect on audio quality. As long as a receiver or playback device could detect the presence or absence of a signal at a particular time, nothing else mattered—any noise, distortion, or speed irregularity that the system added en route would simply be ignored. And the dynamic range attainable was simply a matter of the size of the digital “word” that the system used.

The one critical requirement for digital audio, however, was that the system had to have extremely wide bandwidth, a megahertz at least, and no one had yet come up with the technology to make a recorder suitable for the consumer market. Audio manufacturers of the day were struggling to squeeze 50 kilohertz of information onto a vinyl record in order to produce four sound channels; their success was only modest, so the prospect of being able to record something like thirty times that frequency seemed very distant.

Nevertheless, a few of the smaller record labels began to experiment with professional digital recorders, either specially designed transports offering extremely high tape speed and a large number of tracks or modified video equipment, which was the only thing that could

handle the extremely high frequencies. A number of classic “audiophile recordings” resulted from these efforts, but the final product available to consumers, the LP, was still analog.

It was the introduction of the consumer video recorder that made the development of digital sound a commercial reality. As video equipment, the early VCR’s may have offered only barely acceptable performance, but they did boast a bandwidth somewhat greater than was necessary for digital audio. While the use of the VCR as a digital audio recorder never caught the public’s imagination—the equipment was too expensive, and there were no available pre-recorded tapes—a couple of audio companies did introduce systems that represented the first consumer digital equipment. Sony brought out several PCM (pulse-code modulation) adaptors for its Beta recorders, and Technics produced a deck that could *only* be used for digital audio recording, even though it was built around a VHS transport.

Videotape recording almost inevitably led to videodiscs, and while these have never been wildly successful, the technology that made them possible could fairly easily be adapted to digital sound. When the developer of the videodisc, Philips, and the company with perhaps the greatest experience in digital audio technology, Sony, put their heads together, the compact disc was born. Somewhat to the surprise of the companies involved, and the audio community in general, digital audio became a mass item almost overnight.

## *Fine-Tuning the CD*

Philips and Sony developed what they presumably considered to be a finished system, one that would need none of the tinkering that has refined other areas of audio over the years. In some respects they were right; the basic performance characteristics of the compact disc approach a theoretical ideal, at least potentially. But no first-generation technology is perfect, and audio designers have made a number of





*Luxman's LV-109 integrated amplifier offers two digital-direct inputs and a built-in digital-to-analog converter to help eliminate noise and distortion. With 150 watts per channel, the LV-109 retails for \$1,500.*



*The D102 CD player from SAE incorporates features such as digital filtering, quadruple oversampling, and the company's exclusive Direct-Line circuit technology, which dramatically shortens the signal path. Price: \$549.*



*Massive construction and newly developed Twin Class AA circuitry are just two of the numerous factors that contribute to the exceptional performance of the Technics top-drawer SL-P1200 CD player. Price: \$1,295.*

improvements in the overall CD system, mostly with regard to disc playback.

To turn an analog signal, such as the output from a microphone, into a digital one, the original must be chopped up into a number of tiny "samples"—44,100 every second in the case of the compact disc—and the voltage level of every sample must be measured. Each of these measurements is then converted to a digital "word" containing a certain number of digits, or "bits." The more bits there are in each word, the greater the number of discrete voltage levels that can be recorded and the greater the dynamic range (it works out to 6 dB per bit). Both the sampling rate and the number of bits in a particular system are fixed.

The data stream on a compact disc is made up of 16-bit words, yielding a potential dynamic range of 96 dB, but until quite recently the integrated circuits in CD players' digital-to-analog (D/A) converters could only handle 14-bit words. By manipulation of the data, a 14-bit signal could be expanded to approximate the performance of a 16-bit converter, but the result was always a technical compromise. Now, true 16-bit D/A chips are available, and most CD player makers are gradually including them in their newer machines. One company, Yamaha, has taken things a step further by applying similar manipulation to a 16-bit D/A converter with results said to match the performance of an 18-bit converter.

Another area of CD player design that has received considerable attention is the "anti-aliasing" filter. The signal produced by a D/A converter has basically the same shape as the original signal, but unlike the smooth, sinusoidal analog waveform, a digital signal has sharp corners. It is, in fact, a series of square waves, and, like all square waves, it contains large quantities of very high-frequency material that few amplifiers can handle comfortably. The "clock frequency" of 44.1 kHz is present in the output as well, and it could react with the audio frequencies to produce intermodulation distortion. All of this extraneous material must be removed, so a low-pass filter is inserted in the signal path just above the highest desired frequency.

Such filters have one negative effect that is measurable—and may

be audible to some people. Analog filters are inclined to cause some phase shifting, and the steeper the filter's slope, the greater the phase shift. Also, the closer the filter's "corner frequency" is to a particular part of the audio spectrum, the more that part is likely to be affected. It would defeat the purpose of the digital system to remove any part of the standard audio band, so the filter must begin to act at a frequency higher than 20 kHz, but since one of its jobs is to remove the clock frequency, which is only one octave above the top of the audio band, the filter must be very steep. The combination results in shifting of the upper frequencies.

To combat this effect, a technique called "oversampling" is used. If each digital word is read twice or four times, the result is a much higher clock frequency (88.2 or 176.4 kHz). Raising the clock frequency allows the D/A converter to use a more gradual slope, and in some cases to move the corner frequency up the spectrum as well, both of which reduce phase shifting. Cambridge Audio has taken the technique to an extreme (so far) by using sixteen-times oversampling in one of its CD players.

Many of the potential problems of the compact disc system are mechanical or optical. An immense amount of information is crammed into a very small space, after all, and the chances of mishap are large. The discs are remarkably hardy, to be sure, but they can occasionally become dirty or scratched, and the laser that reads the encoded data can be jarred out of position. Anticipating such problems, the CD's developers included a sophisticated error-correction system to counter them, and error correction is an integral part of all compact discs and CD players. Even so, there is room for improved methods of using the error-correction system to best advantage, and player manufacturers have come up with a number of refinements.

For one thing, a CD has no grooves, so the laser must be kept in position electronically. The recorded bit stream is encoded with positional information, and minor wanderings can usually be corrected before the error-correction system has lost track of what *should* be playing. Larger variations could occur, however, and a substantial amount of ingenuity has been ap-



*Sony's most recent portable CD player, the D-160, is supplied with a car cassette adaptor, a mounting plate, and a back-lit LCD. Price: \$250.*



*Clarion was the first company to produce a DAT player for automotive use. The unit has 32- and 48-kHz playback sampling and 16-bit quantization.*



*The Aiwa Excelia XD-001 digital audio tape recorder has joined the ranks of DAT machines currently available for sale to consumers in Japan.*



*The 16/2R CD player from ADC features full 16-bit D/A converters, outstanding isolation, and wireless remote control—all for only \$370.*

plied to their prevention. For example, many CD players employ a device that splits the laser beam into three parts, or spots, which are focused on the disc side by side. The middle spot reads the data, while the outside spots make sure that the middle one is centered on the spiral of bits—a very effective technique.

Several alternatives have come

along, however, that have led some manufacturers to return to the less complicated (and less expensive) one-spot system. Improved structural integrity has been one of the answers, and manufacturers of home CD players have in many instances taken a lead from designers of portable units in producing machines that are less susceptible to



shock. The less the laser strays from the proper path, the less the error-correction circuitry has to do.

The way the laser moves across the disc has been upgraded as well. Early players used a worm gear to move the laser/lens system, but it was relatively slow. More and more companies are now using linear motors, which enable the laser assembly to move very rapidly from one point to another. Not only does this allow for fine positional adjustments in connection with the error-correction circuitry, but it dramatically improves access time as well.

Various manufacturers have also addressed what they consider to be inherent flaws in the digital process. For instance, dbx includes a signal compressor to overcome one negative aspect of wide dynamic range, the disappearance of quiet passages at low listening levels, and an expansion circuit to enhance the dynamic range of CD's made from compressed analog masters. On the theory that analog records did certain things better than digital recordings, Carver's "Digital Time Lens" was designed to restore to CD's some of the sense of ambience inherent in the conventional disc. To reduce internal interference, Onkyo uses fiber optics to move the digital signal from the laser pickup to the D/A converter, and several manufacturers—Luxman, Denon, and Sony among them—have introduced amplifiers containing built-in D/A converters that can be fed from a CD player's digital output.

In the early days of CD's, manufacturing processes were not only very complicated and expensive but also resulted in very high rejection rates. This kept CD prices high and their supply limited. To counter such problems, Teldec in Germany came up with a method of mastering CD's directly in metal rather than by the normal photo-optical method. Direct Metal Mastering reduces the need for a clean-room environment, according to Teldec, and greatly increases turnaround time. General Electric has lowered CD rejection rates by reducing the tendency of the plastic disc to deform as it cools, and 3M has experimented with making CD's from cold plastic, rather than molten material, to solve the same problem.

### *Sons of CD*

The compact disc was an outgrowth of videodisc technology, and

it is now returning to its roots: the new CD Video (CDV) format combines digital sound with high-quality picture material. Most attention has been focused on the 5-inch version of CDV, which contains 5 minutes of audio plus video and 20 minutes of audio only, but the term CDV really applies to all forms of videodiscs with digital sound. The larger formats—the familiar 8- and 12-inch videodiscs—are increasingly including digital audio material, particularly in musical programs. The "combi-player," which can play all optical discs, including CD's, may well become the component of the future.

Digital audio is, of course, an application of computer technology. Unlike conventional data, however, audio requires the storage of an immense amount of information: about 1.5 million bits for every second of music. Thus, almost 800 megabytes are contained in a 70-minute CD, making the optical disc one of the densest storage media in existence. Understandably, the computer industry has shown a great deal of interest in adapting the compact disc for data storage.

Because the CD is a playback-only medium, it constitutes a read-only memory (ROM), and a small number of CD-ROM discs have already appeared. Perhaps the best known was the first: the complete card index of the Library of Congress on a single CD. Other similarly voluminous bodies of information lend themselves to CD-ROM storage, as do large programs for personal computers.

A variation on the CD-ROM theme is the interactive compact disc, or CD-I. Not yet a commercial reality, CD-I will allow owners of special players (which will also play audio CD's—the system's developers insist on compatibility) to access huge amounts of information. Thousands of still pictures can be stored on one CD-I, along with up to sixteen tracks of audio (low-fi) and a wide variety of graphics. Some observers feel that CD-I could be the consumer equivalent of CD-ROM, although others have suggested that many of the uses of CD-I may have been co-opted by CDV.

Compact discs of all sorts remain playback-only items. There has been considerable research into a recordable disc as well, although its consumer applications seem fairly far down the road. Companies such

as Teac and Denon have shown working prototypes, aimed primarily at the industrial and educational markets, and most of the Japanese electronics giants are working on their own versions. None so far is compatible with the conventional compact disc, and all are expected to bear high price tags, but there is no reason a consumer version couldn't be developed if there were enough demand. That demand is, however, more likely to be directed toward some means of digital recording on tape.

### *Digital Tape*

There is nothing new about recording digital audio on tape, of course; PCM adaptors for VCR's have been available for almost a decade. The cost of such equipment has put it out of the reach of most consumers, however, and until the rise of the compact disc there was practically no material the average user could record that would take advantage of the system's capabilities. Although the use of videotape to record digital audio is still very much with us, there is an important difference between the current recorders and those in use only a couple of years ago: The new models can record digital audio at the same time as video. Most machines with this capability are table-top models, but PCM recording is beginning to show up in portables as well, such as Sony's 8mm EV-S1.

Except as an adjunct to video recording, however, digital taping of sound will doubtless become the exclusive province of digital audio tape (DAT) recorders designed for the purpose. Video recorders have more information-storage capacity than is necessary for digital audio recording; by designing a machine that can handle the amount of data required for audio, but no more, audio manufacturers have come up with a recorder that is smaller and potentially cheaper than a VCR. A DAT deck works like a miniature videocassette deck, but all its electronics are dedicated to digital audio, with no video functions.

Technically, a DAT recorder could take a digital signal directly from a compact disc and convert it to tape with virtually no loss of quality. Anticipating the objections of copyright owners, however, the body of manufacturers that set the standards for DAT in Japan chose a

*(Continued on page 124)*





# DON'T STOP THE MUSIC!

## COMPACT DISC CHANGERS

BY WILLIAM BURTON

**H**ours and hours of uninterrupted music, one track after another, arranged just the way you want it—and you don't even have to point the remote control at the CD player unless you change your mind about something you've already programmed. Give a patio party without having to dash inside to change the music. Create a soundtrack for a romantic dinner. Play a long opera all the way through without having to reload the machine. Set up a listening session that lets you compare alternative recordings without leaving your chair. Compact disc changers have the same familiar features as other CD players—remote control, track skip and scan, programming, and so on—but they can handle several discs at a time, up to twelve in some models.

With most CD changers, you slip the discs into a special magazine that slides into the front of the player. Most changers also have a different magazine for single-disc play or even a separate slide-out drawer. More exotic changers use several single-disc trays, or a rotating carousel, instead of a loading magazine. If you want a varied musical program without having to make a lot of decisions, you can use the "shuffle play" feature that most changers offer. The machine itself automatically selects tracks in a random, unpredictable order, either from one disc at a time or by jumping back and forth among all the discs you've loaded.

The old record changers lost favor because they increased wear and tear on LP's, but CD changers have no such drawbacks. Sony, Alpine, and Technics even make CD changers for the car that handle the discs as carefully as you would yourself. Any way you look at it, the CD changer adds a new dimension of convenience to the CD medium.



**P**ioneer's PD-M90X can memorize favorite-track sequences for up to eight six-disc magazines, to a maximum of eighty tracks. Magazines can be reprogrammed at any time. Price: \$800; magazines, \$15 each.

With a six-disc magazine as well as a single-disc drawer, JVC's XL-M700 can hold seven CD's for sequential, programmed, or random play. A programmed sequence can include as many as thirty-two tracks from any of the seven discs. Price: \$600.



MUNG



A changer that does not use magazines, Fisher's DAC-205 has five thin trays that slide out like the drawers of single-disc CD players. The RANDOM PLAY feature shuffles tracks from all the discs, and you can program up to thirty-two tracks in any desired order. Price of the remote-controlled changer is \$499.95.



Onkyo's DX-C600 features a six-disc magazine, remote control, random play, thirty-two-track programming, two-speed search, digital filtering, a three-spot laser, and fiber-optic internal coupling. Suggested list price is \$600.

After loading five compact discs into the magazine of Mitsubishi's DP-409R, you can program up to thirty selections, from single tracks to entire discs, for continuous play. Price: \$550, including remote control (not shown).





A six-disc magazine and wireless remote control come with the Technics SL-P600C, which can mix tracks from all six discs in its random mode. It can also play up to thirty-two selected tracks from anywhere on the six discs. Price: \$500.



Its tray may look large enough for a 12-inch videodisc, but Sony's newest DiscJockey, the CDP-C5F, actually holds five CD's on its rotating carousel. Changing from one disc to another takes only 2 to 3 seconds. A remote control (not shown) is included. Price: \$450.

Holding six discs in each magazine, Hitachi's DA-C60 can be programmed to play thirty-two tracks with its front-panel buttons or the remote control. Price: \$399.



Sanyo's CPM1000 has two types of magazines: one holds ten discs for many hours of music, and the other holds just one for single play. An unusual feature is a microphone input that lets you sing along with your CD's. Price: \$480.

ANOTHER LOOK AT DAT

# ONKYO DT-2001

BY CRAIG STARK



**A**LTHOUGH digital audio tape (DAT) decks have been available for many months in Japan, the recording industry has been fighting to keep them out of the hands of American audiophiles until they include a proposed anti-copy chip. The Onkyo DT-2001, like the Sony and JVC DAT machines that Julian Hirsch reviewed in July, is not yet a full-scale production model for the American market. Its performance, however, should give us an idea of what we can expect from Onkyo DAT decks once the company decides to go ahead with U.S. distribution. And all indications are that Onkyo will be one of the first manufacturers to put DAT recorders on dealers' shelves.



Since the DT-2001 we tested is a prototype, an English-language instruction manual was not supplied and we had to feel our way through its various operations. The DAT cassettes, which look like tiny videocassettes (the dimensions are  $2\frac{7}{8} \times 2\frac{1}{8} \times \frac{3}{8}$  inches), are placed in a motor-operated drawer that operates much the same as the one in a CD player. Playback for prerecorded tapes made using the 44.1-kHz CD sampling rate is provided, but tapes recorded and played back on the DT-2001 must use a 48-kHz sampling rate. (Both CD's and DAT's use 16-bit linear quantization.) DAT machines use helical-scan heads like those in VCR's to achieve the high tape-to-head speed (3.1 meters per sec-

JOOK LUNG



ond) required for digital audio recording. The tape itself moves only about  $\frac{1}{3}$  inch (8.15 mm) a second. To handle the tape at regular and fast-winding speeds, rotate the heads, and operate the drawer mechanism, the transport uses five motors, four direct-drive.

A pair of sendust record-playback heads rotating inside a drum read or

*The Onkyo DT-2001 provides the kind of memory, search, repeat-play, and timer-activation functions that are familiar to cassette-deck users. Unlike most current cassette decks, however, it also provides wide-range microphone inputs with level controls.*

write alternate helical "tracks" whose 13.591-micrometer width is approximately one-tenth that of a human hair. The heads are aligned at azimuth angles of +45 and -45 degrees, which prevents adjacent track interference. A second pair of heads would be required for the equivalent of a three-head cassette deck's off-the-tape monitoring, although the digital recording process is so impeccable that we did not miss this feature. Because of the extremely high read-write frequencies, no separate erase head is required as it is in analog decks.

### *The Amenities*

Signal levels are displayed with twelve-segment-per-channel indicators calibrated from -50 to 0 dB. Above 0 dB a red OVER light comes on. Since even moderate digital overload distortion would be orders of magnitude worse than on conventional analog decks, Onkyo has designed its analog audio circuits to clip symmetrically just before the point where all sixteen digital bits will be used. The signal-level display also responds directly to the digital bit level rather than to the normal rectified peak audio levels. The DT-2001's display counter can be switched to read either linear units, absolute time, program time, or remaining tape time. The pro-

gram number, which can be set with a row of pushbuttons, is also indicated on the display. An additional set of buttons allows the user to assign his own identifying numbers (which are recorded on the tape's subcode field, apart from the audio) to any desired points on the tape.

Holding down the fast-forward or reverse buttons permits audible cueing of the signal in either direction, and pressing the buttons twice activates the very high-speed winding modes. The memory, blank-search, and repeat-play functions familiar to cassette-deck users are provided, as is external timer activation and a front-panel headphone jack with its own level control. A single pair of clutched, concentric knobs is used to set the recording levels; no overall playback level control is provided. Unlike most current cassette decks, however, the DT-2001 does provide wide-range microphone inputs. These have their own rear-panel level controls and can be mixed with the normal high-level inputs.

In addition to the line and microphone input and output audio jacks, the rear panel of the DT-2001 contains both digital and fiber-optic connectors. Indeed, all of the analog-to-digital (A/D) and digital-to-analog (D/A) stages inside the recorder are optically coupled rather than hardwired, which Onkyo says eliminates a source of digitally induced noise. While CD's cannot be dubbed digitally (both the difference in sampling rates and the setting of a copy-protect "flag" in the subcode field prevent this), two DAT decks can be hooked together directly, eliminating an entire cycle of digital-to-analog-to-digital conversions. We tried such a hook-up, using another DAT machine, and it made absolutely flawless dubs.

Compared with the usual cassette and CD players, the DT-2001 is rather large, measuring 18½ inches wide, 15½ inches deep, and 5 inches high. Its 31-pound weight reflects not only solid construction but also a sand-filled base. On the Japanese market the DT-2001 has a price of 250,000 yen (approximately \$1,650 at current exchange rates), which includes a full-function (thirty-five-button) wireless remote control. Prices for U.S. models have not yet been announced.

### *The Numbers*

We were able to obtain a Sony TY-7551 calibrated DAT test tape, which we used in conjunction with CD test discs and signals from our low-distortion signal generator to check various aspects of the recorder's performance. Unlike conventional cassette decks, in which the unit's output in the source position bypasses all (or most) of the recorder's own electronics, all audio signals fed into the DT-2001 pass through the complete A/D and D/A process whether or not they are actually written to and read from the tape medium. Moreover, the input stages of a DAT deck must include a very sharp low-pass filter to eliminate any possible audio components higher than 24,000 Hz (half the sampling frequency).

The frequency response of a DAT deck, unlike that of a cassette deck, is the same at all permissible signal levels. The Onkyo deck's response measured identically for record-playback and playback-only modes. As shown in the accompanying graph, response was down by 0.4 dB at 10,000 Hz and by 1.2 dB at 20,000 Hz. The "knee" of the nine-pole Chebyshev input filter began to bend a little above 22,000 Hz, and beyond 23,000 Hz the response dropped off precipitously to protect against alias distortion.

*The frequency response of a DAT deck is the same at all permissible signal levels, and the DT-2001 had an identical—and virtually ruler-flat—response in both the record-playback and the playback-only modes.*

Separate A/D and D/A converters for each channel eliminated measurable interchannel phase shifts, and the linearity of the Burr-Brown converters measured within  $\pm 0.2$  dB from 0 to -60 dB. Channel separation was extremely high, no doubt thanks in part to the use of separate power supplies for each channel. The A-weighted signal-to-noise ratios of 99.2 dB (playback) and 89.6 dB (record-playback) were

# ANOTHER LOOK AT DAT



## FEATURES

- Bidirectional Hewlett-Packard optical couplers between all analog-to-digital (A/D) and digital-to-analog (D/A) stages
- Separate Burr-Brown A/D and D/A converters for each channel
- Quadruple-oversampling, digitally filtered playback circuits
- Digital level indicators
- Pre- or post-recording subcode editing
- Microphone inputs with mixing facilities
- Full-function remote control
- Cue and review
- Memory search
- External-timer activation
- Multifunction timer display
- Five-motor transport
- Seven separate power supplies

## LABORATORY MEASUREMENTS

**Fast-wind speeds, 120-minute tape**  
(both directions): high, 68 seconds; low, 8 minutes, 19 seconds

**Fast-wind speeds, 90-minute tape**  
(both directions): high, 57 seconds; low, six minutes, 13 seconds

**Speed error:** none measurable

**Wow-and-flutter:** none measurable

**Line input for indicated 0 dB:** 0.485 volt

**Line output at indicated 0 dB:** 2.2 volts

**Playback-only tests** (Sony TY-7551 test tape)

**Frequency response** (decibels, referred to 1,000 Hz):

	Left	Right
20 Hz	-0.1	-0.1
100 Hz	0.0	0.0
10 kHz	-0.45	-0.50
20 kHz	-1.1	-1.2

**Signal-to-noise ratios** (decibels):

	Unwtd.	A-wtd.	CCIR
Left	93.3	99.2	98.5
Right	91.2	98.6	98.2

**Crosstalk** (decibels):

	Left	Right
1 kHz	-90.8	-89.6
10 kHz	-74.1	-74.4

**Total harmonic distortion at 1,000 Hz:** left, 0.0065%; right, 0.0056%

**Record-playback tests**

**Frequency response** (decibels, referred to 1,000 Hz):

	Left	Right
20 Hz	0.0	0.0
100 Hz	0.0	0.0
10 kHz	-0.45	-0.50
20 kHz	-1.2	-1.3

**Signal-to-noise ratios** (decibels):

	Unwtd.	A-wtd.	CCIR
Left	86.2	89.0	85.4
Right	82.4	86.5	84.8

**Crosstalk** (decibels):

	Left	Right
1 kHz	-84.0	-81.5
10 kHz	-70.6	-70.8

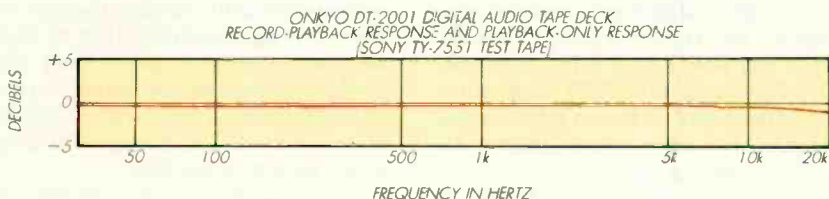
**Total harmonic distortion at 1,000 Hz:** left, 0.0054%; right, 0.0056%

excellent as well. As is inherent in the digital process, there was no measurable wow-and-flutter, and the total harmonic distortion was the residual of our Sound Technology meter, approximately 0.005 percent. A line input of 0.485 volt was required for maximum permissible input, at which point the line output was 2.2 volts. Fast-winding a 120-minute tape took 68 seconds.

## The Sound

Since the DAT format may give many audiophiles their first chance to hear for themselves what, if any, audible effect digital signal processing has (you don't get to hear the program on a CD *before* it's recorded), we spent considerable time listening for differences between pre-DAT and post-DAT sources. While the prerecorded digital tapes we obtained were more sonically spectacular than musically profound, we did manage to compare one selection (Dave Grusin, *The Heart Is a Lonely Hunter*) in its prerecorded DAT, CD, and dubbed-CD forms. We also compared several LP's and CD's (though we could not be sure that the same master tape had been used for both versions) with our digital dubs of each format.

With all levels matched within 0.1 dB, we *sometimes* convinced ourselves that the digital recording produced a slightly rougher tonal quality in the upper and lower midrange, but when we went back and listened again another day, as often as not the recollected "clearly audible" difference seemed to disappear. Suffice it to say that we feel that no one should assert that the digital process itself—whether in master tapes, CD's, or home DAT's—is *so* transparent as to be undetectable at all times on all sources by all persons. Still, in our view its sound quality is markedly superior to nearly any analog recording of nearly any source by nearly anybody. None of our source-to-tape comparisons using the DT-2001 changed this conclusion. We eagerly look forward to the time—and let's hope it is not far off—when DAT decks will at last give serious audiophile recordists a medium worthy of their devotion to the goal of making recordings that capture the full dynamic range of live music. □





# VIDEO'S NEW IMAGE

DIGITAL  
TECHNOLOGIES  
HEAT UP  
A COOL MEDIUM

BY

RICHARD JACCOMA

**T**HERE'S one fact about video that all the digital processing in the world won't change: Video is basically a low-fidelity medium. Audio reproduces three-dimensional reality in three dimensions, video in only two. Close your eyes in the presence of a truly superb audio system, and you may be unable to distinguish it from reality—that is, from a live performance. Open your eyes in the presence of the very finest digitally noninterlaced, digitally noise-reduced, digitally stored, digitally frozen, or in any way digitally processed video image. If you are unable to distinguish *that* from reality, consult your doctor.

Video is essentially a "cool" medium, and digital video just can't deliver the fire, the dramatic realism of digital audio. But within very definite limits, digital video processing can have interesting, amusing, and even quite dramatic effects on a video signal. In other words, even though we are dining at the corner beanery and not in an expensive French restaurant, there are some palatable items on the menu.

Most of the digital special effects available today can be inserted at various points in the video chain—that is, the necessary circuitry can be built into either a TV set, a VCR, or a stand-alone device. So it is not necessary to banish your nearly new monitor receiver or your top-of-last-year's-line VCR to the junk heap simply to add digital signal processing. It is also important to remember that digital effects vary widely from device to device: Some VCR's use digital circuitry primarily for signal processing, while some stand-alones provide little more than a picture in a picture (PIP).

### *Cleaning Up the Act*

Improving picture performance and reducing video noise (snow or grain) and color noise (streaking and overintensity) are probably the most no-nonsense uses possible for digital video processing. Toshiba and NEC were the first companies to offer VCR's with VLSI's (very large-scale integrated circuits) designed for this purpose, Toshiba with the DX-7 and NEC with the DX-1000 and DX-2000, and other manufacturers now also offer digital VCR's that offer vastly improved pictures during playback.

The key to the improvement is noninterlacing, which is only possi-

ble with digital circuitry. The broadcast transmission standard in the U.S., called NTSC, uses 525 scanning lines per video frame, but these are broadcast in two "fields" of alternate scan lines, one containing 213 lines and the other 212 lines. First one field is shown, and then the other, leaving it to the viewer's optical memory to combine them into a complete image. A digital noninterlace system stores the first field of each frame in its memory, then adds it to the second field so that both can be shown on the screen at once. Signal information at any moment is effectively doubled, although actual resolution remains the same since no *new* picture detail has been added. The image seems sharper and steadier, free of the barely perceptible yet troublesome flicker present in all analog video pictures.

In addition to noninterlacing, many digital VCR's apply a video noise-reduction system to the luminance (brightness) portion of the signal, improving the luminance signal-to-noise ratio (S/N). NEC's models, for example, use such a system to improve luminance S/N by more than 6 dB, from 43 dB to 49.3 dB. And its newer DX-5000 (\$1,199) reduces noise on the chrominance (color) portion of the signal as well, improving the color S/N by as much as 9 dB.

**D**IGITAL TV sets can also utilize noninterlace technology to provide a sharper, steadier picture. But, as with digital VCR's, no new information is presented, and the horizontal resolution (defined as the number of distinguishable points that can fit horizontally across the screen) stays the same. A nondigital device called a comb filter, however, can actually improve resolution. Once found only in studio-grade monitors, comb filters separate the chrominance and luminance portions of incoming video signals and thereby prevent crosstalk and signal degradation. More of the information contained in the broadcast or recorded signal entering the TV set or monitor actually reaches the screen. With the right combination of digital and nondigital processing circuitry and a superior signal source, TV sets such as the NEC DT-2680 are capable of delivering 500 lines of horizontal resolution.

Unfortunately, broadcast and cable signals still deliver only about





330 lines of resolution and most standard VCR's only about 240. The new combination players for CD's, CDV's, and laser videodiscs available from Yamaha, Pioneer, Magnavox, and others are better, with a horizontal resolution that may exceed 400 lines, but that still only approaches the capabilities of the best monitors.

The signal source that comes closest to pushing the limits of the best digital (and analog) monitors is a Super VHS VCR or camcorder. The Super VHS format has the capacity to record and play back pictures with 430 lines of horizontal resolution, and the machines can send separate chrominance and luminance signals to monitors that are equipped to handle them. While the medium is analog, S-VHS recorders can provide the best signals available in home video, better than any conventional digital VCR.

S-VHS plus digital processing for special effects can produce machines of remarkable power. Hitachi's new top-of-the-line VT 2700A, for example, is an S-VHS VCR with a full range of digital features, including PIP, "mosaic" and "paint" effects, and noiseless freeze-frame, slow motion, and search. Panasonic recently demonstrated an S-VHS camcorder with digital features to be available later this year. The camera section has an unequaled 1-lux low-light capability (a lux is a unit of light sensitivity; the lower a camera's rating, the better), and it uses digital field storage to memorize frames and create such special effects as wipes, dissolves, and superimpositions with a moving image. Similar camcorders will be sold by Quasar and JVC, and the upcoming second wave of S-VHS decks and camcorders is sure to make use of digital technology to an even greater degree.

### *Isn't That Special?*

There are a number of unique special effects that digital video circuitry can produce. The most popular of these, or at least the one most people associate with digital processing, is PIP, in which a video image is stored in memory and then displayed as a separate image in a smaller box on the television screen (the box itself is not digitally created).

Most often only a sampling of a single field is stored, so the resolution of the inset picture, whether



*Pioneer's CLD-1010 "combi-player" accepts standard compact discs, the new CD Videos, and both 8-inch and 12-inch videodiscs. Price: \$800.*



*Toshiba's DX-900 VHS Hi-Fi VCR has a full range of digital video special effects and a built-in PCM processor for digital audio recording. Price: \$1,300.*



*Performance features on Yamaha's CDV-1000 "combi-player" include a Direct FM Time Base Corrector and a tilt-servo laser mechanism. Price: about \$800.*

frozen or in full motion, is poor compared with the full-screen image. The quality of the PIP is enhanced, however, by the *apparent* increase in detail that size reduction affords any noncontinuous image (one made up of many discrete elements, such as scan lines in video).

ANY digital devices can store and release fields at the rate of thirty per second, thus producing full motion. Some allow a user to vary the PIP's position on the screen, change the image size, and produce multiple images, or images that change in sequence, for a "strobe" effect. The source of the PIP can vary, but even devices that allow multiple-source, simultaneous PIP's will only provide full motion for one at a time. The rest will be freeze-frames.

If a PIP is produced by a VCR or a stand-alone digital processor with a second tuner, it can show either the tape being played or any channel on the tuner. If it is produced by circuitry in the TV set, the PIP can show either the tuned channel or any source being fed through the set's video inputs. All of these PIP producers let you swap the main and inset images. Because audio information is not stored, the audio will almost always be from the main picture source. The Sony KV-2786R TV set, however, which has two built-in tuners, and two of MultiVision's outboard processors—including its new Model 1.1 (\$329)—allow audio switching from the main to the inset program.

Applications for PIP abound. TV sports addicts can watch two games at once. Home videotapers can use

it to edit out commercials on the show they are taping while viewing a second show on the large screen. Or a camera can be set up and the PIP used to monitor another part of the house—for security, to watch a sleeping infant, to keep an eye on a teenage daughter with her date on the porch . . . .

The PIP feature is available on many VCR's—Hitachi's VT-1370A and 1570A, and RCA's VMT-400, for example—and on TV sets such as the Panasonic CTG-2085R, the NEC DT-2680, and the Sony KV-2786R.

MultiVision makes a whole line of stand-alone digital accessories designed by Ken Kantor. The first of these, the Model 3.1 (\$549), is an elegant example of digital video design. It allows a user to choose among four inset picture sizes, to swap inset and main pictures, and to move the inset to any point on the TV screen. The MultiVision 3.1 also has twin 139-channel tuners, an MTS decoder for broadcast or cable stereo sound, and a full range of RF and audio/video inputs and outputs for complete integration into a home audio system. MultiVision's new models, the 1.1 and 2.1, have fewer features and lower prices.

Other special-effects applications of digital technology are interesting but far less flashy than PIP. Toshiba's DX-7, for example, uses digital-memory for freeze-frame and slow motion. Because the frozen image derives from a memory chip and not from a revolving tape head, the image is uncannily flicker-free, so rock-steady that it seems to be printed on your screen.

The use of a memory chip for freeze-frame effects has an intriguing spin-off benefit. Since tape isn't involved in the image storage, live, off-the-air pictures can be frozen instantly even when you aren't taping. Many digital VCR's, including JVC's HR-D570U and the NEC models, have this ability and, naturally, so do digital TV sets.

Video users who have work-related or other reasons for studying freeze-frames will especially appreciate digital special effects, as will those who regularly produce hard-copy prints from their TV screens. Polaroid, in fact, makes a machine that uses digital technology to produce a print of remarkably high quality, the FreezeFrame Video Recorder, which sells for about \$1,900. It prints from a digitally stored field

rather than a frame but offers a "fill" switch to double the number of scan lines and produce a smoother-appearing picture.

Technology similar to that used for clean, steady freeze-frames allows for visible high-speed search and slow-motion images that are blessedly free of streaks, color bars, and other annoying extraneous effects common on analog VCR's.

Several VCR's, such as Hitachi's VT-1370A and RCA's VMT-400, allow you to manipulate pictures to produce a solarized "paintbox" effect or a "mosaic" look in which the picture seems composed of small colored squares. Undoubtedly these abilities can be amusing, but since similar effects, and others such as wipes and dissolves, can be produced by stand-alone signal-processing units, they are probably not enough reason to buy a digital VCR.

With the exception of PIP, available only from digital devices, something similar might be said for the entire range of digitally produced special effects. The quality of digital freeze-frame, slow motion, visible search, and so on is superb. But better-quality standard VCR's can produce quite similar results through analog means—by adding special-effects tape heads.

A number of companies make stand-alone special-effects generators (SEG's). Sansui's XV-99 (\$600) is a highly rated recent arrival, but a wide range of SEG's is available from companies such as JVC, Sony, and Videonics. The Videonics DirectEd (\$499), with an NEC V40 microprocessor and 256K of memory, can catalog a videotape's scenes by name and location, then call up requested scenes and add titles, graphics, and a wide range of colorized special effects. Remember, however, that when you are editing from a VCR (as opposed to working with live video signals directly from cameras), SEG's often require the use of a separate time-base corrector (TBC) to synchronize the recorded signals.

### *Super Sonics*

Paradoxically, some of the most interesting applications of digital video technology are in the audio area. Toshiba's DX-900 has a built-in PCM processor for digital audio recording. And Sony's PCM-601ES (\$1,400) and PCM-501ES (\$1,000) are stand-alone devices that can

turn any VCR into a digital audio recorder capable of putting hours of superb digital audio programs on an ordinary videocassette. These digital-audio devices, unlike DAT recorders, are already available to American consumers. Audiophiles tired of the DAT debate might do well to consider them.

A consortium of equipment and video-recording manufacturers recently decided to rename videodiscs "CD Video" (CDV) and to market them as the 12-inch version of the CDV format. The new CDV's combine 5 minutes of analog video with 20 minutes of digital audio on 5-inch discs. Of course, many of the over 1,800 videodiscs previously released are recorded with analog audio, but some have digital audio, and now that the format has been renamed after the digital CD, more digital soundtracks are definitely on the way for 12-inch videodiscs.

Even the analog audio of CD Video "combi-players" is excellent, with a rated frequency response of 20 to 20,000 Hz, an S/N of 74 dB, and audio distortion less than 0.2 percent—similar in quality to VHS Hi-Fi. And, of course, the players' digital audio is superb: frequency response of 4 to 20,000 Hz, S/N of 98 dB, dynamic range of 95 dB, and total harmonic distortion around 0.005 percent.

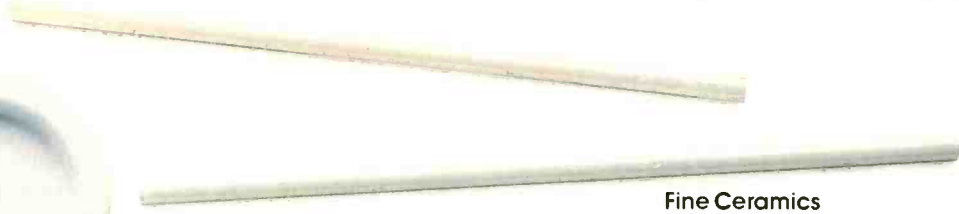
### *A Digital Future*

As things stand now, for enhanced taping quality Super VHS does far more than an otherwise standard digital VCR. And for highest-quality playback of prerecorded programs, CDV/videodisc is still the format of choice. Thousands of films are available now on videodiscs, none as yet on Super VHS cassettes.

**I**N a sense, the entire range of today's digital signal processing and digital special effects simply points to video's future, a future when VLSI technology will be used as it is in most industries, for its cost effectiveness. The real impact of digital video technology will be to provide high-quality pictures and special effects from low-cost video equipment. That future is approaching quickly, and while "digital" is still a buzz word used to sell step-up video gear, significant price reductions are occurring across the board. This year's digital VCR or TV set can be purchased for less than last year's. And next year... □



These anti-resonant chassis spacers are made with Kyocera's proprietary Fine Ceramics.

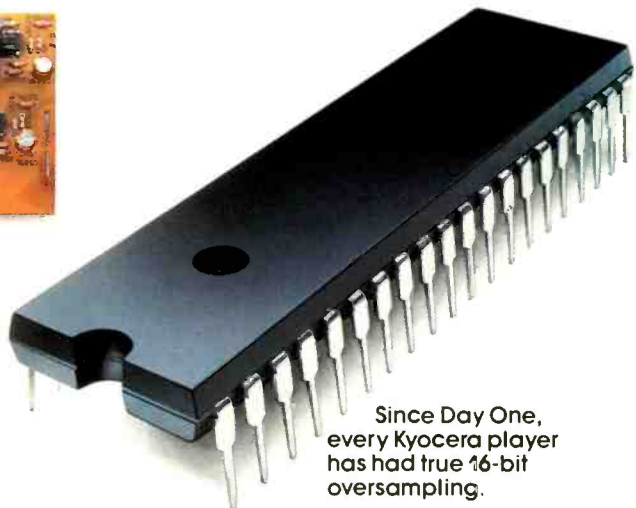


Fine Ceramics laser guide shafts hold their tolerances five times longer than other materials.

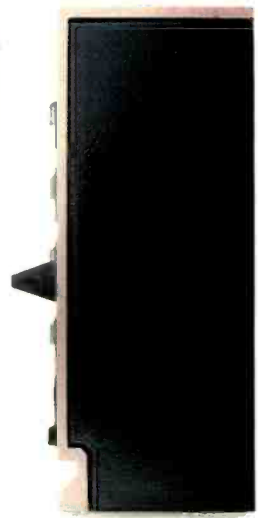
# These are the CD features they'll be copying next.



3rd-order analog filters cause less phase shift than the 7th- and 9th-order designs that others use.



Since Day One, every Kyocera player has had true 16-bit oversampling.



The front fascia of all our players is brushed aluminum, not plastic.



While our supplied remote controls are great, this optional full system remote control lets you operate a complete Kyocera system from anywhere in the house!



Our real wood side panels help damp resonance. They also look good.

In May of 1983, Kyocera introduced a CD player with true 16-bit digital filters. Today, the competition's calling this circuit "the latest thing." Years ago we had four-times oversampling. This year every high-end player worth mentioning has a similar design. In September, 1984 Kyocera raised some eyebrows with the world's first Fine Ceramics anti-resonant CD chassis. Now the stores are full of flimsy imitations.

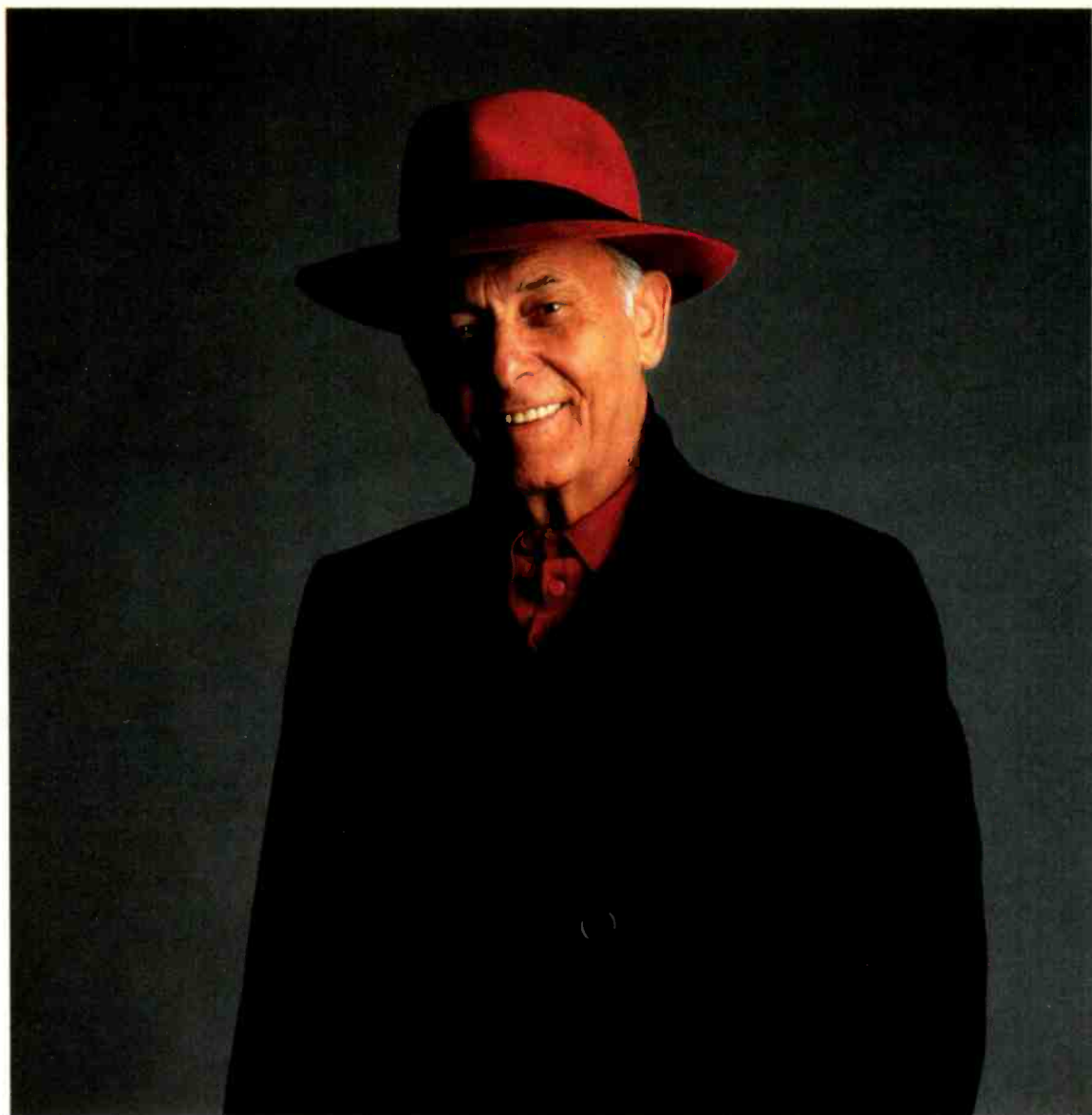
How did all these innovations happen to come from Kyocera, and not some household name? Perhaps because Kyocera's knowledge of digital circuitry comes from years of building computers for some of the best-known names in electronics. Perhaps because Kyocera is a world leader in Fine Ceramics, the technology used to house circuitry in aerospace and other advanced applications. Or perhaps because some top-rated CD players from other brands were actually made by Kyocera.

Now Kyocera has four world-beating Compact Disc Players, ranging in suggested retail price from \$350 to the \$800 model DA-710CX shown here. Each boasts technology so advanced, it's a preview of what the competition will be selling in 1989. After all, history does repeat itself.



Built right from the ground up.





# SOLO

A great conductor speaks his mind on music, maturity, and making records as he reaches the age of seventy-five.

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By  
William Livingstone



ALL over the world people seem to be retiring at increasingly early ages, and in many European countries and the United States it is not unusual for a professional person, a business man, or an office worker to take early retirement in his or her middle fifties. That trend does not apply to artists, however, and the eminent conductor Sir Georg Solti, who turns seventy-five in October, says that his plans for the future do not include retirement at all.

Conductors are a particularly long-lived breed, and Solti attributes their longevity to exercise. "Conducting requires both mental and physical exercise," he says. "You don't become senile if you exercise your brain, and you don't become crippled if you exercise your body—preferably without too much tension."

In his long life in music Solti has not spared himself either kind of exercise. Born in Budapest, Hungary, October 21, 1912, he started piano lessons at an early age. He graduated from the Franz Liszt Academy in his native city, having studied with Zoltán Kodály, Ernst von Dohnányi, and Béla Bartók. In 1938 he began conducting symphonic music and opera in Budapest, but, being Jewish, he sought refuge from the Nazis in 1939 and went into exile in Switzerland.

After World War II, he was appointed chief conductor of the Bavarian State Opera in Munich, beginning what was to become one of the most phenomenal conducting careers in the history of music. He later became director of the Frankfurt Opera and eventually artistic director of the Royal Opera House, Covent Garden, in London. He has also conducted with distinction at great opera houses in such cities as Vienna, Paris, New York, Chicago, and San Francisco and at the festivals in Salzburg and Bayreuth.

Simultaneously, his work as a symphonic conductor has flourished. In addition to performing as a guest with the world's major orchestras, he has held conducting posts with the London Philharmonic and the Orchestre de Paris, but he is most closely associated with the Chicago Symphony Orchestra, whose music director he has been since 1969.

An exclusive recording artist for Decca/London for forty years, Solti has had a dazzling career on records. His discography ranges from *Aida* to *Zauberflöte* and includes all the great symphonists—Berlioz, Brahms, Bruckner, Haydn, Mozart, and Schumann—as well as Bartók, Liszt, Strauss, Schoenberg, and Walton. Outstanding among his lofty achievements on disc are complete cycles of the symphonies of Beethoven and Mahler and the first complete recording of Wagner's monumental *Ring of the Nibelung*.

Among the honors heaped on Solti are doctorates from such universities as Harvard, Yale, and Oxford, decorations from the governments of Germany and France, and knighthood in England. His records have won more than one hundred awards including fourteen Grand Prix du Disque, and in the United States he has won more awards from the National Academy of Recording Arts and Sciences than any other artist, popular or classical. Often credited with twenty-six Grammys, he has actually won twenty-five Grammys plus the 1967 NARAS Trustees Award for the completion of the *Ring*. On top of all that, he is said to be the first classical artist to sell more than one million compact discs.

With so many accomplishments behind him an ordinary person would feel entitled to stop and rest, but Solti intends to continue at the same pace. "Most people look forward to a time at sixty or sixty-five when they can stop working and enjoy their leisure," he says, "but the musician must continue because of the tremendous urge to make music. It's as deep-seated as the urge for eating and loving."

A component of the artistic mentality, Solti says, this urge is what keeps the pianists Vladimir Horowitz (now in his eighties) and Mieczysław Horzowski (now in his nineties) still playing and recording. "Stokowski was still conducting at ninety-four, and during the last years of his life Toscanini wanted to rerecord everything. He wasn't satisfied with what he had done. For a musician it's a great blessing that he's never satisfied."

With his work in the concert hall, in the opera house, and on records Solti has touched the lives of millions of music lovers. Through him I discovered the power of the Mahler symphonies. At the San Francis-

co Opera he was the conductor of the first *Tristan* I ever saw, and at the Salzburg Festival he conducted my first *Magic Flute*. Like countless other Wagner fans, I learned the *Ring* through Solti's recording. And in the Seventies I was frequently a member of the ecstatic New York audience at his epoch-making concerts with the Chicago Symphony at Carnegie Hall.

Since he has played such an important part in my musical life for more than three decades, I was eager to talk with Solti when he was in New York this year, and I called on him at his hotel during his week of concerts at Carnegie Hall with the Chicago Symphony. These were his first performances in the hall since its 1986 renovation, and everyone in town was avid to know his opinion of its acoustics.

"I came with such a palpitation," he said. "I had heard so many reports that the hall was ruined, but I quickly realized that this is not so. A slight adjustment is necessary for the brass instruments in the last row—you have to turn the level down one notch—but they can still play a noble fortissimo. Otherwise, it's the same as before. The sound of the strings and the woodwinds is equally as beautiful as before, and we enjoyed every minute of playing here. I am greatly relieved because the Concertgebouw in Amsterdam and Carnegie Hall are my two favorite halls in the world."

Willing to single out his favorite concert halls, Solti was not willing to name favorites among his recordings. "When I make a record, for the moment that is my favorite piece of music, and I do the best I can with it. Afterwards, I love all my children equally."

NEW Solti recordings released by London in September are Haydn's Symphonies Nos. 93 and 99 and a new performance of Beethoven's Ninth. Due in October is Wagner's *Lohengrin* with Plácido Domingo and Jessye Norman. This will complete his traversal of the major Wagner operas, and he expresses no interest in such early works as *Die Feen*.

"But I have a great deal of new things to do," he says. "Two major operatic plans I hope to fulfill are Strauss's *Die Frau ohne Schatten* and a new *Tristan* with Plácido

Domingo and Jessye Norman. We have talked seriously about doing it in three or four years' time. My first *Tristan* is no longer *me*. It is a young man's *Tristan*—it goes back nearly thirty years—and I would like to leave behind a grown-up musician's *Tristan*."

He does not contemplate rerecording the *Ring*. "First, there is not a new Birgit Nilsson to sing Brünnhilde. There is not even a Windgassen [for Siegfried] or a Hans Hotter [for Wotan]. Second, I'm not sure I have the stamina for so many studio sessions. For a time we discussed recording live performances—which has some advantages as well as disadvantages—but then I heard the transfers of the old *Ring* to compact disc, and the sound was so wonderful that I decided it would be a mistake to try to improve on that."

His symphonic plans include some new things and some rerecording of existing repertoire. "I don't know if we will end up with a complete new cycle of Beethoven symphonies, but I have finished Numbers Nine and Five. In the next twelve to sixteen months I want to record Six, Four, and Seven. After that we can decide whether to stay just with these or to make new recordings of the others as well.

"The point in rerecording the Beethoven symphonies is the same as with *Tristan*. Maturity. Three or four years ago when the compact disc came along, the question of rerecording was raised because there was no digital Beethoven of mine. I didn't want to do it. I didn't think I was yet ready for another cycle, but last year I felt ready for something new. I am very happy with Nine and Five. They represent a new aspect of my life and a new point of

view on Beethoven which I *hope* one can hear."

Solti is an exciting conductor, probably at his best whipping up great climaxes in the tone poems and operas of Richard Strauss, the Wagner operas, and the Mahler symphonies or with showpieces like Holst's *The Planets* or Walton's *Beshazzar's Feast*. Making this kind of music with large orchestras requires a strong will and a dictatorial urge to control. Although Solti maintains that the autocratic behavior of a Toscanini would not be tolerated today, he has about him the aura of great power.

A tender side of Solti was revealed in a television documentary that showed his first master classes for young conductors in which he treated his sensitive students with the utmost gentleness. It was touching to see tradition passed on from a mature artist to neophytes, and I asked him if he still teaches.

"Yes, whenever I can," he replied, "at such places as Juilliard in New York and the Eastman School in Rochester. The young American generation of musicians is truly amazing. There are many promising young conductors. I don't want to name any to avoid insulting the ones I might leave out, but there is no shortage. There are not hundreds—there never have been—but there will always be a dozen really talented ones."

Delayed by the seven years he spent in Switzerland when he was not conducting, Solti got a late start in his career. He feels, however, that he made up that time, and he looks back on his life with benign satisfaction. "I have no regrets," he said. "Despite the bad years, I have been extremely fortunate. I had a guardian angel who guided me through the most difficult times a musician could have in the twentieth century, and I am most grateful."

His second marriage has brought him a happy family life, and high among his blessings he counts the privilege of seeing his two teenage daughters grow up. There are no vastly different projects in his future. After decades of not playing the piano, he has accepted a few engagements as a pianist with his young colleague Murray Perahia, who is like a member of Solti's musical family.

Perahia is scheduled to join the singers Kiri Te Kanawa and Plácido Domingo, who are also close friends

and colleagues of Solti's, at a birthday celebration for him and a gala concert with the Chicago Symphony on October 9. Domingo will conduct as well as sing, and Solti will conduct and play the piano.

When I talked with Solti about the value of music to the public, he agreed that it might be useful during the current crisis of ethics in politics, business, and religion if more people in high places were acquainted with, say, Wagner's *Ring*. It sends a clear message about the bitterness of the fruits born of greed and duplicity. Nevertheless, he does not ascribe to music the power to make us better human beings.

"We live in disturbing times," he said, "and there are many things about modern society that are depressing, but something wonderful about our period is the renaissance of the arts. Never in the history of mankind have so many people been interested in the visual arts and music. Although I got a late start with the visual arts, I have developed an eye for pictures.

"Recordings have done an enormous amount toward popularizing music by making it available to people of relatively modest incomes. By listening they become addicted and become better educated to enjoy good music—not just classical music, but jazz or whatever—and there are now millions of people all over the world whose lives are enriched by music."

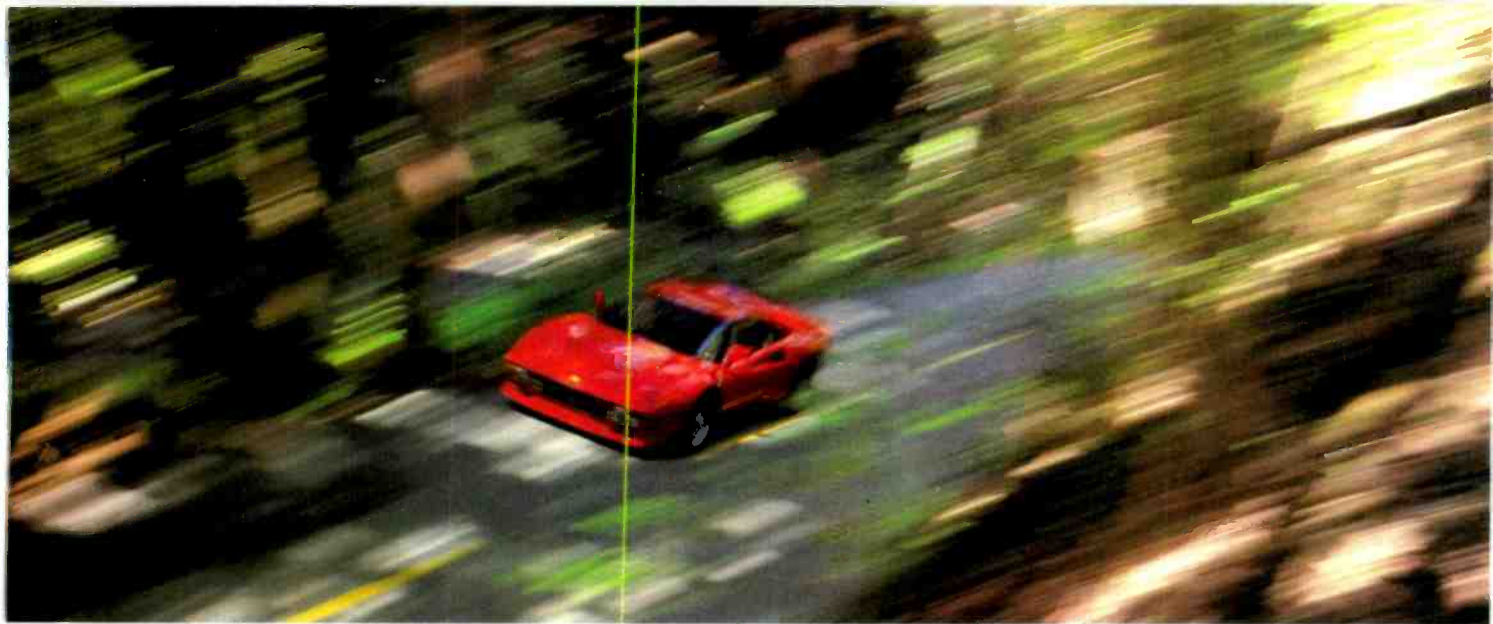
I pointed out to Solti that just as the need to make music is a potent motive force in a musician's life, the need to consume music is also a tremendous urge for the audience. For us the appetite for music, like the appetite for food and love, can be satisfied only temporarily. But if music doesn't make us better people, I asked, what good is it?

He replied that he sees it as a kind of spiritual medicine. "And it is the most wonderful medicine because, unlike drugs, it doesn't ruin you. Music can take you out of yourself and transport you to something different. This accounts for the upsurge in Romantic music because life in our time is so unromantic.

"What I think music can add to the existence of everybody is a certain amount of relief from the hardship of daily life." The satisfaction of providing that relief through music is probably a part of the artistic compulsion that will keep Solti from ever thinking about retiring. □







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# GETTING THE MOST FROM YOUR CASSETTE DECK



CASSETTE recorders have become such a large part of audio that it is easy to take them for granted, to forget that they are triumphs of modern engineering. The cassette was never intended to be a hi-fi medium. Norelco's original Carry-Corder was designed to be a portable, economical *voice* recorder.

The system was so attractive, however, that audio engineers soon began to apply themselves to turning the humble cassette into a medium suitable for music. New tape formulations extended the high end,

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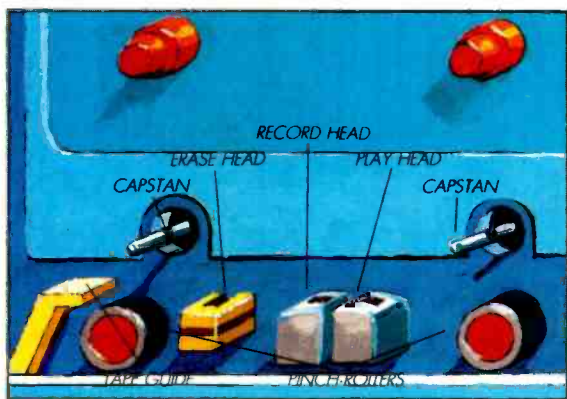
Dolby B tamed the inherent noise problems, and sophisticated manufacturing techniques brought wow-and-flutter to acceptable levels.

The effort was so successful that—except for the most critical applications—the cassette has become even more popular than the vinyl record as a program source, and today's cassette decks are marvels of quality and reliability. But because the decks have been so carefully fine-tuned to achieve this level of performance, some steps

must be taken to insure that they live up to their potential. It's a relatively simple matter to keep your cassettes sounding as good as possible, but you do have to work at it.

### *In the Beginning*

Even before you take a new cassette deck out of its box, there are some elementary steps you can take to make sure it will perform optimally. The tape-recording process is a *system* that includes both the cassette deck and the tape used in it, and they have to be perfectly matched if either is to realize its



**C**lose-up view of a dual-capstan cassette deck's well (nearly actual size) shows the parts that should be cleaned and demagnetized. During use, the tape is squeezed between the pinch-rollers and the capstans, holding it against the heads.

potential. It's not enough simply to purchase a good machine and high-quality cassettes—they have to be the *right* cassettes.

In developing their sophisticated oxides, tape manufacturers have come up with slightly different formulations to squeeze that last decibel of quality from their products. The resulting tapes may be equal on an absolute scale, but they are subtly different in their bias requirements, their output level, or both. Even very small differences in the bias requirement can affect high-frequency performance, while variations in the output level can cause level-sensitive noise-reduction systems such as Dolby B and Dolby C to mistrack.

The trick is to discover which tape best matches your machine's characteristics. Check the owner's manual first, as it may indicate exactly which formulation to use. Usually, however, the manual will list a number of tapes to choose from—useful in narrowing the field, but not very helpful in the quest for the single optimal tape. (If, however, one of the tapes on the list bears the same brand name as your deck, there's a good chance it's the one.)

Failing such clues, you may simply have to buy a number of different tapes and try them out. If you have a three-head deck, it will be an easy matter to make an A/B comparison between your recording and the source signal—the tape that sounds most like the source is the best match. Listen not only for treble performance but also for overall level. If your deck is a two-head machine, you can still perform a reasonable approximation of the same test by recording a piece of music, recuing the source, and switching between the original and

the copy. The closer you can synchronize the two, the easier the comparison will be, so you may have to try several times with each tape.

If none of this gives you a clear indication of your ideal tape, you may just have to choose one arbitrarily and have a technician match your deck to it. While this may seem to be a lot of trouble, technically it's the ideal solution.

Some of the more elaborate decks make fine-bias adjustment easier by incorporating bias-matching circuitry that you can adjust yourself. In this case, you can get superior performance from virtually any tape as long as you remember to readjust the deck every time you change brands or formulations.

### *Getting It on the Tape*

Finding the best tape, and sticking to it, merely makes good performance from your cassette system *possible*. It doesn't guarantee that the signal on the tape will be a high-quality one. If your recordings are less than perfect to begin with, no amount of care later on will improve them.

Every cassette deck has its own personality, so it is important that you discover from the first how your deck is meant to be operated. Level-indicating systems vary, for instance—not only are some peak-reading and others average-reading (which require very different level-setting techniques), but some manufacturers suggest that your recordings should peak at 0 dB no matter what type of tape you are using, while others indicate by symbols on the indicator the peak levels permissible with various tape formulations. A new machine's level indicators might be set up very differently from others you have used, but even

seemingly small differences can affect your recordings dramatically.

I have known people who find the level-setting process confusing, so they always make their recordings with the input control at one position, but that is a surefire way to make terrible recordings much of the time. The output level of source material varies considerably, so using a fixed setting increases the risk of low-level, noisy recordings or high-level, distorted ones. A cassette deck can only do its best if enough—but not too much—signal reaches the recording head, and the only way you can insure this is by carefully setting the recording levels using the deck's meters or level indicators as a guide.

When making a recording, also avoid the temptation to compensate for your deck's playback level. Relatively few of today's cassette decks provide output-level controls, and many of them send signals to the amplifier or receiver that vary significantly from those of other sources. It is unpleasant to have to adjust the volume control every time you play a tape, and some users solve the problem by recording their tapes unusually loud or soft so that their outputs will match other signals on playback. This technique undoubtedly works, but at a sacrifice of recording quality.

You *should* try to anticipate playback conditions in the use of noise reduction. As a rule, you should use the most sophisticated system you have, whether that is Dolby C or dbx, particularly if the tape will mainly be played back on the same machine. But tapes are often recorded for playback on another deck—in your car, for example, or by your cousin in Des Moines—and you may not be able to count on the availability of the best noise reduction, or any at all. While it is desirable to get the best possible signal onto the tape, there is little point in using a noise-reduction system that makes it incompatible with the primary playback equipment. The result will be poorer sound than you began with, so you would be better off to choose a more modest type of noise reduction, or none. Whatever you do, indicate on the label what type of noise reduction was used. Differences between noise-reduction systems can sometimes be subtle, but you will be able to obtain the



A "prod-type" demagnetizer like the one shown produces a strong magnetic field that removes built-up magnetic charges from the metal parts of a tape deck. It must be used carefully, as it can easily erase your tapes too.

best results only by decoding properly during playback.

### Preserving the Sound

Having taken pains to get the best possible signal on the tape, there are certain precautions you should take to insure that it stays there. Tapes are pretty rugged, by and large, but audio signals can suffer if you are not careful.

Some of the pitfalls are physical ones, but these are fairly easy to avoid. Dust particles, for example, can get into the cassette itself and gum up the works, and large clumps can even cause dropouts or be transferred to the mechanism of your deck. Dust problems are prevented effectively by keeping cassettes in their boxes when not in use and by making sure that the tape is always fully wound to one end between playings, so that dirt cannot lodge between the tape layers.

Another reason for keeping tapes completely wound is that the tape is normally rather loose inside the cassette shell and often protrudes slightly, forming a small loop. This loop can occasionally snag even with careful handling, causing tape creases that will be audible on subsequent playings. By making sure that only the leader tape is exposed to this risk, you can protect your valuable recordings. Also, if you expect to store a cassette for a relatively long time, winding it to the end at playing speed—*not* fast forward or rewind—will insure that there are no uneven tensions to deform the tape and no protruding edges that may become damaged. The recorded track on a cassette is very narrow, and it doesn't take much damage to cause problems.

Other physical damage can usual-

ly be prevented by storing tapes away from the extremes of temperature and humidity. If you keep a library of music in your car, you may prolong its life by bringing it into your home each night.

The biggest enemy of the sounds you have recorded is magnetism. Just as a tape is recorded by varying magnetic fields, the recorded patterns on the tape can be disturbed after the fact by other magnetic fields. Our homes are full of magnets, so it's important to keep tapes away from them. In an audio system, speakers and amplifiers are prime radiators of magnetic energy—so tapes should be stored at least 2 feet away from either. And if you keep your cassettes in a closet, make sure its doors are not held shut magnetically.

The worst risk of after-the-fact magnetic disturbance comes from the cassette deck itself, oddly enough. Decks are full of metal parts that constantly come into contact with magnets—even a tape can be considered a magnet. Over time, these parts pick up a permanent magnetic field of their own, and as tapes move past them, they are gradually erased. This effect is very subtle (the fields are very weak), but eventually you will notice that your tapes exhibit a loss of high frequencies and an increase in noise, particularly those that are played often. The effect is irreversible. Once a cassette has been affected, it can't be restored.

The solution is to demagnetize the recorder periodically—once a month should be enough unless your deck gets unusually heavy use. There are no shortcuts in demagnetizing a tape deck, and you will have to purchase a device made for the

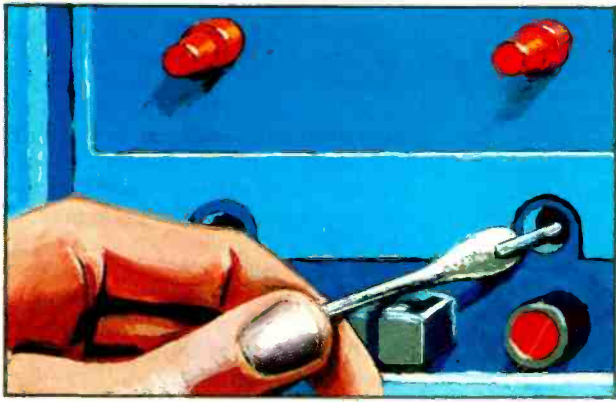
purpose. The easiest kind to use is battery-operated and mounted in a cassette shell. You simply pop it into the deck and let it "play" for a few moments. Make sure that your amplifier's or receiver's volume control is all the way down—otherwise, it will treat the demagnetizing field as a very loud audio signal, which can easily cause damage elsewhere in the system.

Such demagnetizers tend to be fairly expensive, though, and their internal batteries may not produce sufficient power to remove extreme amounts of residual magnetism. Still, they may be the only option if your deck's heads and tape guides are inaccessible to the more traditional, prod-type demagnetizers—as is often the case with portable or automotive decks. Be sure to choose one that demagnetizes everything that comes in contact with the tape and has a pilot light to indicate that the batteries are still functioning.

The more traditional demagnetizer has a pair of prods that you poke into the cassette well to remove magnetism from the tape-contacting parts individually. This type of demagnetizer operates from the AC line and produces a field that's more than strong enough to do the job. To use it, you must reach all of the relevant parts in the deck, and you have to know how to handle it.

Before you do anything, make sure your tapes are a safe distance away—this device can erase *them* as well. Then, keeping the demagnetizer at least a foot away from your deck, plug it in—or turn it on, if it has a power switch—and move it very slowly toward the head block. Making no sudden moves, gradually bring the tip close to each head in turn, then to the tape guides, the capstan, and the pinch-roller. In each case, hold the tip stationary for a few seconds before moving on to the next. When you have demagnetized all of the parts, move the device *slowly* away from the deck, and do not unplug it—or shut off the power—until it is again at least 1 foot away. Sudden changes of magnetic flux will magnetize—rather than demagnetize—the deck, so the prod should be at a safe distance before you allow its field to collapse by killing the power.

There is no more important safeguard to good sound than this



**T**o clean capstans and other parts, use a cotton swab dipped in a special cleaning solution, isopropyl alcohol, or denatured alcohol. Holding the swab against a capstan or pinch-roller while the deck is running is a good way to remove oxides or other dirt. Be sure to clean all the tape heads too.

sometimes irksome process. It is frustrating that you will probably hear no difference after you have completed the demagnetizing, but when you *can* hear a difference, it's too late.

### *Recovering the Signal*

The most critical part of the whole tape-recording process may be the recovery of a well-recorded and well-preserved signal. The prime factor in this is good *tape-to-head* contact.

Because cassette tape moves so slowly, and because the recorded tracks are so narrow, it is critically important that all of the recorded portion of the tape come into intimate contact with the playback head gap, that part of the head that reads those signals. Otherwise, high-frequency response will suffer.

One potential cause of such degradation is physical wear of the heads themselves. Wear will inevitably occur over time, however careful you might be, because of the constant friction between the tape and the heads. It can be aggravated by dust particles that find their way into the cassette shell or into the mechanism itself, though this can be minimized by keeping the dust cover or cassette-well door closed. Frequent use of features that cause the tape to rub against the heads at high speed, such as some forms of audible search, can also cause excessive head wear. This sort of wear not only disturbs tape-to-head contact but may eventually require the replacement of the heads themselves. On the positive side, the head materials used in most decks are now hard enough that significant wear will probably not occur for years.

Of more immediate concern is the buildup of oxide particles on the

tape heads, the capstan, the tape guides, and the pinch-roller—on anything, in fact, that touches the tape as it passes by. Even the best tapes shed some oxide, and it accumulates on everything, eventually disrupting smooth tape motion and physically pushing the tape away from the playback-head gap. This problem can be exacerbated by the use of older or inexpensive tapes, which tend to drop their oxide particles more readily.

However the buildup happens, the particles must be removed. This should be done at least every 10 playing hours, or whenever you begin to hear the effects of the buildup: degraded treble, wandering images, or—in the worst cases—squeals from the mechanism itself.

As with demagnetizers, some head-cleaning devices take the form of cassettes, and these do have the virtue of simplicity. If the areas you have to clean are buried in the works, you may have to choose this sort of cleaner. Unfortunately, few cassette-type cleaners really do a thorough job. Most just clean the heads and even do *that* minimally. To be effective, they must be used very often—once an evening would probably not be overdoing it.

The best tools for cleaning oxide particles from a deck are a simple cotton swab and a cleaning agent. As for the swabs, any commercial version will do—although the ones with wooden sticks are more satisfactory than the flexible-plastic variety, as you can apply some pressure to the task.

The swabs should be moistened with a tape-head cleaning liquid—there are many brands available—or with alcohol. Get isopropyl or denatured alcohol, as the other kinds have additives that may do

more harm than good. Whatever cleaner you use, apply it sparingly and only to the surfaces you wish to clean. Cassette decks contain many plastic parts that can be damaged by chemicals, and it is hard to recognize the vulnerable parts until it is too late.

Rub a dampened swab across each head, vertically and horizontally. Use a new swab for each head, and repeat the process until no further dirt is visible on the swab. Do the same for the other surfaces that need to be cleaned, and then check your work with a clean swab—it should be able to go over each surface and still remain white.

The simplest way to clean the capstan and the pinch-roller is to put the deck into the play mode and hold a moistened swab against each part as it rotates. Turn the swab slowly, bringing its clean surfaces into contact with the rotating elements. By the end, the swab should not be picking up any more oxide.

How often you should clean your cassette deck depends very much on your usage, but you are on the right track if each cleaning yields only a slight amount of oxide buildup.

### *Occasionally. . .*

Just as the heads and the other parts of your deck can pick up tape-borne oxide particles, the electrical contacts inside your deck can become contaminated with air-borne materials such as cigarette smoke, salt, or pollution. It's not a bad idea, therefore, to spray a bit of contact cleaner into the switches and level controls about every six months to make sure that good electrical contact is made. Do the same with the input and output jacks as well, although simply unplugging and replugging them a few times will usually accomplish the same end.

Tape recording, particularly with cassettes, is a complex and delicate process. Done properly, it can yield extraordinarily high-quality reproduction, but for that to happen, three elements must be attended to: the tapes themselves, the machines on which they are recorded and played, and the recording techniques. It's remarkable that the cassette works as well as it does. Treating your equipment and tapes with respect and care should keep them at this high level of performance almost indefinitely. □

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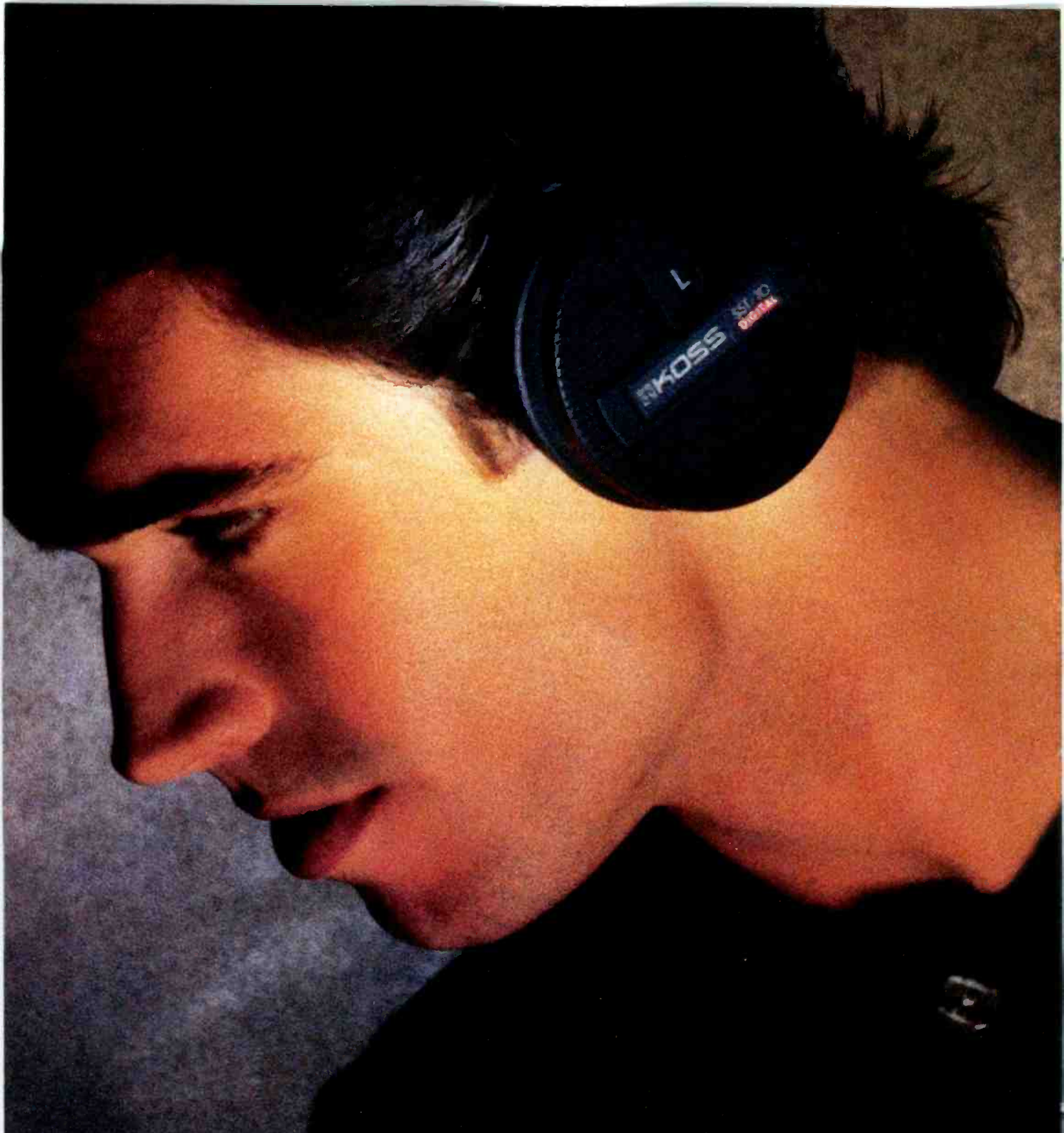
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## BEST RECORDINGS OF THE MONTH

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

### THE dB'S: REAL POP IS BACK

**T**HE dB's are what we used to call a pop band before the term was corrupted by the overdressed and emotionally stillborn sellouts who currently dominate the airwaves. The band's aesthetic is simple: brash guitars, sinewy and memorable melodies, soaring harmonies, and (fittingly, for a group that once described its work as "smart music for stupid people") lyrics that betray a more than nodding acquaintance with irony. In "The Sound of Music," the band's first effort for I.R.S. Records, that aesthetic is embodied in one of the most brilliant collections of modern pop songs since, oh, the first Marshall Crenshaw album. Not to mince words, this is great stuff.

What does it sound like? Well, that sort of varies from song to song, but the glue that holds it all together is lead singer/songwriter Peter Holsapple. In the great tradition of Alex Chilton and Michael Stipe, Holsapple has a voice that isn't traditionally pretty, but his phrasing is superb, and his rough-hewn nasal twang is both bracing and affecting. It is also an apt vehicle for his dry, off-kilter lyrics.

Stylistically, the songs draw on a lot of models, some of which you might expect and some a little more from left field. The gorgeous lost-love ballad *I Lie*, for example, is in a Beatles/Byrds/Hollies mode, which makes sense given the band's pop sensibility. But *Bonneville* is a deadpan demented hoedown, the sensationally hyperkinetic *Any Old Thing* could be Led Zeppelin gone rockabilly, and *Working for Somebody Else* tips its hat to Lee Dorsey's daffy New Orleans r-&-b. Even more surprising, the album's best track, *Never Before and Never Again*, plumbs a genre most reasonable people might consider hopelessly

played out, mid-Seventies West Coast country-rock. Yet this undeniably moving song, featuring underground fave Syd Straw contributing harmonies that suggest a punked-out Sandy Denny, works like gangbusters. It has hit written all over it.

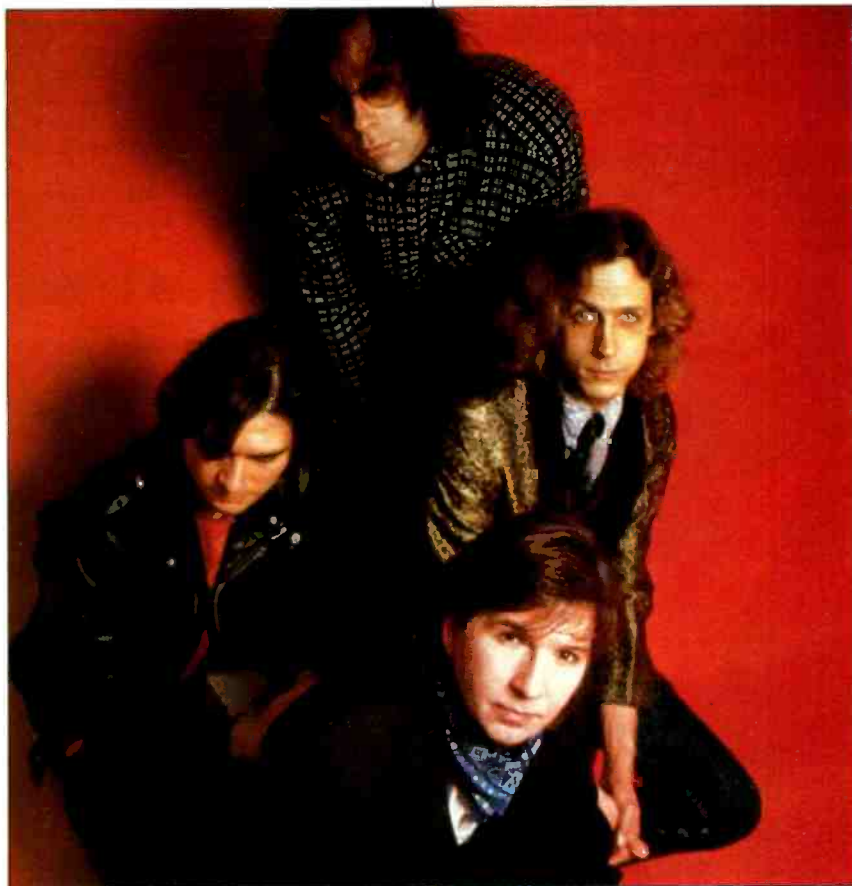
Add to the virtues of "The Sound of Music" some nicely discreet keyboard touches from Benmont Tench (of Tom Petty fame) and an absolutely ideal production job by Greg Edwards (reminiscent of his work with John Cougar Mellencamp), and you have what is clearly one of the most accomplished and intelligent pop records of the year. Most of the empty-headed superstar records you hear these days are more like the sound of money. "The Sound of Music," refreshingly, has its priorities straight. *Steve Simels*

**THE dB'S:** *The Sound of Music.* The dB's (vocals and instrumentals); Benmont Tench (organ); Van Dyke Parks

(keyboards); Syd Straw (vocals). *Never Say When; Change with the Changing Times; I Lie; Molly Says; Bonneville; Any Old Thing; Think Too Hard; Working for Somebody Else; Never Before and Never Again; A Better Place; Looked at the Sun Too Long; Today Could Be the Day.* I.R.S. IRS-42055 \$8.98, © IRSC-42055 \$8.98, © IRSD-42055 no list price.

### TENNSTEDT'S POETIC MAHLER

**K**LAUS TENNSTEDT has concluded his imposing Mahler cycle for Angel with the Eighth Symphony, subtitled *Symphony of a Thousand*. That subtitle, tacked on by an impresario for the world premiere in 1910, leads people to expect a supercolossal blockbuster, and the work is huge in that it calls for eight vocal



*Peter Holsapple (top), Gene Holder, Jeff Beninato, and Will Rigby of the dB's*

STEPHANIE CIERNIKOVSKI/I.R.S. RECORDS

## BEST RECORDINGS OF THE MONTH

soloists, a boys' choir, a mixed chorus, an enormous orchestra, and a pipe organ. But all these forces are used selectively to contribute variety of color and texture. They are used together only sparingly, and with the most telling impact.

I have not by any means heard all the current recordings of the Mahler Eighth, but among those I have heard, the new Tennstedt recording is one of the most outstanding, the other being Georg Solti's very different 1971 recording with the Chicago Symphony.

The distinctive features of Tennstedt's recording stem from his conception of the Mahler Eighth as an inner-directed, poetic work. He emphasizes its symphonic-linear essence, and he has kept the choruses small enough for the musical texture to remain clear. The soloists seem to emerge from within the musical texture rather than standing out against it. The tenor is a bit on the white and reedy side for my taste, and the other male solo roles are not as sharply characterized as in the Solti recording, but the distant placement of soprano Felicity Lott for her brief *Mater Gloriosa*

solo toward the end is a real tour de force.

Tennstedt and his British forces worked in Walthamstow Town Hall outside of London, which is not quite as grateful an acoustic venue as Vienna's Sofiensaal, where Solti recorded, but is more than sufficient for the purpose. The organ of London's Westminster Cathedral was very effectively tracked in later. The recording has an excellent sense of ambience, and its softer focus and slightly lower overall level compared with Solti's seem to fit Tennstedt's more intimate approach to the work.

As far as I am concerned, it all works superbly. There is a lot to be said for experiencing this music on a less insistent level, so that one can concentrate on its poetic essence rather than its mere effect.

David Hall

**MAHLER: *Symphony No. 8, in E-flat Major*.** Elizabeth Connell, Edith Wiens, Felicity Lott (soprano); Trudeliene Schmidt, Nadine Denize (contralto); Richard Versalle (tenor); Jorma Hynninen (baritone); Hans Sotin (bass); David Hill (organ); Tiffin School Boys' Choir; London Philharmonic Choir and Orchestra, Klaus Tennstedt cond. ANGEL ◉ DSB-47625 two LP's \$23.96, © 4D2S-47625 two cassettes \$23.96, © CDCB-47625 two CD's no list price.

### MICHAEL WEISS: REAL BOP IS BACK

**T**O state that jazz has not taken a meaningful new turn since the advent of bebop is pretty much to state a fact. Granted, significant new voices have been raised since the impromptu workshop at Minton's Playhouse bid farewell to swing, but many of us continue to return to bebop whenever we think of "modern" jazz. Bop also stands still, perhaps, but it is a fertile style that demands skill and creativity from its exponents, and a new breed of articulate players has rekindled its flame. I am very much encouraged by a new album featuring a quintet under the leadership of pianist Mi-

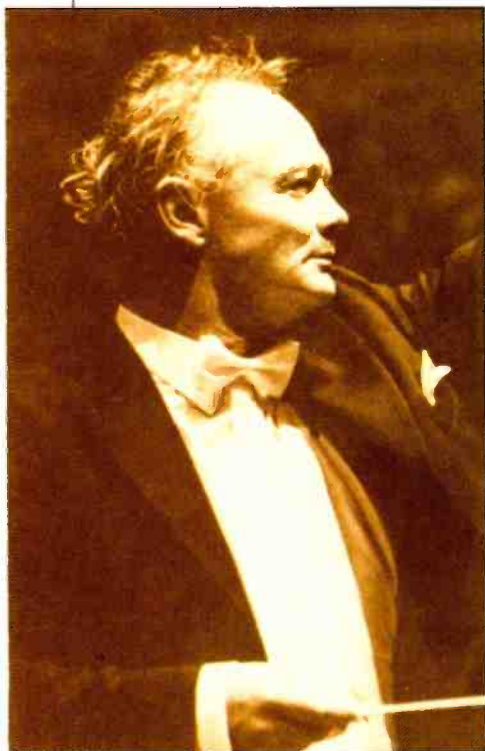


Michael Weiss: honest, eloquent jazz

chael Weiss. It does not point us in a new direction, but "Presenting Michael Weiss" underscores in a most eloquent manner that musicians who weren't even born when Bird took flight can meet the challenge of bop and come up with fresh, exciting music.

Weiss has not recorded before, but he has spent five rewarding years on the New York scene, and his debut release—made here by a Dutch company—can only enhance his growing reputation. It is a loving tribute to the bop tradition, a spirited, sensitive reflection of the past performed with a kind of insight that is rare among such young musicians. Trumpeter Tom Kirkpatrick, still in his early thirties, evokes memories of the late Kenny Dorham and that time in the Fifties when jazz seemed to be on an evolutionary roll. He contributes a particularly effective solo on *Après vous*, a piece by Weiss based on the chord changes in *After You've Gone*. Tenor saxophonist Ralph Lalama is another asset; his warm, crisp tone and authoritative articulation is refreshingly pre-Coltrane. Bassist Ray Drummond and drummer Kenny Washington are a superb team, providing the perfect cushion for Weiss's sprightly style.

This is an honest, beautifully performed bop session, rife with intriguing twists and turns, and superbly recorded by Rudy Van Gelder. If jazz is not particularly moving



Klaus Tennstedt: distinctive Mahler

TIM GEANEY

KLAUS HENNCH/ANGEL RECORDS

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## BEST RECORDINGS OF THE MONTH

ahead today, it is at least standing still in a most graceful pose. As long as there are new voices with as much to say as Michael Weiss, it matters little if their language draws upon the past. *Chris Albertson*

**MICHAEL WEISS:** *Presenting Michael Weiss.* Michael Weiss (piano); Tom Kirkpatrick (trumpet); Ralph Lalama (tenor saxophone); Ray Drummond (bass); Kenny Washington (drums). *My Melancholy Baby; Après vous; Enigma; B.G.O.; Riverbed; Gallop's Gallop.* CRISS CROSS/ROUNDER 1022 \$10.98.

### A DELIGHTFUL NEW "COSÌ" FROM HAITINK

As a boy I was led to Mozart's *Così fan tutte* through the Fritz Busch Glyndebourne Festival recording of 1935. No performance I have heard since, live or recorded, has surpassed the sense of pacing, the verve, the airiness, the winning nonsense, or the stylishness of Busch's reading. The new Angel Glyndebourne recording conducted by Bernard Haitink, however, equals it.

All those qualities that have endeared Mozart's comedy-farce to opera lovers for years are present in the new recording. You listen, and listen again, with increasing pleasure and a sense of fun. The chief credit for its success belongs to Haitink, certainly one of the most eminent among today's opera conductors. He has caught the spirit of the opera and elicits a delightful performance from the London Philharmonic and the Glyndebourne Festival Chorus.

The strong cast, too, conveys infectious high spirits. They sing beautifully and at the same time give dramatically convincing performances so that the listener is very much a first-hand observer of the masquerade. Carol Vaness is a bit explosive and strident in her first inhumanly difficult aria, but a few weak notes do not dim an otherwise fine reading, one of the most effective I have heard from her. Dolores Ziegler is a properly daffy Dorabel-



*Carol Vaness: high spirits*

la, and she sings most gracefully. As the two suitors, Dale Duesing and John Aler sing with polish, conviction, and a fine sense of humor. Lillian Watson, a pert and witty Despina, avoids the pitfall of exaggeration in her two scenes in disguise. Claudio Desderi offers a worldly, avuncular, and smoothly sung Alfonso.

The recording quality is outstanding. Balances are carefully observed, and, while the voices are given emphasis, the delicate tracery of Mozart's orchestration is always present. The Italian text is finely articulated. The performance is uncut, by the way, offering the gratifying opportunity of hearing Dorabella's and Ferrando's second arias, usually omitted in live performance.

In short, a great opera in a shining performance that I am privileged to recommend. *Robert Ackart*

**MOZART:** *Così fan tutte.* Carol Vaness (soprano), Fiordiligi; Dolores Ziegler (soprano), Dorabella; Dale Duesing (baritone), Guglielmo; John Aler (tenor), Ferrando; Lillian Watson (soprano), Despina; Claudio Desderi (bass), Alfonso. Glyndebourne Festival Chorus; London Philharmonic Orchestra, Bernard Haitink cond. ANGEL ● DSC-47727 three LP's \$39.94, © 4D3S-47727 three cassettes \$39.94, © CDCC-47727 three CD's no list price.

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- **PETER TOSH: *Legalize It.*** COLUMBIA CK 34253. "Warm, ingratiating" (November 1976).
- **NEIL YOUNG WITH CRAZY HORSE: *Everybody Knows This Is Nowhere.*** REPRISE 2282-2. In which Young invents cowpunk about twelve years before its time (1969).

#### CLASSICAL

- **BEETHOVEN: *Piano Sonatas Nos. 8, 14, and 23 ("Pathétique," "Moonlight," and "Appassionata").*** Barenboim. DG 419 602-2. "Extraordinarily moving" (October 1985).
- **BERLIOZ: *Symphonie fantastique.*** Beecham. ANGEL CDC-47863. "A fresh experience of a very familiar piece" (December 1971).
- **BIZET: *Symphony in C; L'Arlésienne Suites Nos. 1 and 2.*** Beecham. ANGEL CDC-47794. "A prize" (August 1972).
- **CHOPIN: *Piano Sonatas Nos. 2 and 3; Ten Mazurkas.*** Kapell. RCA 5998-2-RC. Last recordings, from the 1950's, by a fondly remembered American pianist.
- **MENDELSSOHN: *Piano Concertos Nos. 1 and 2.*** Perahia, Marriner. CBS MK 42401. "Wonderfully fluent and beautifully nuanced" (September 1975).
- **PURCELL: *King Arthur.*** Gardiner. ERATO ECD 880562 (two CD's). "A joy" (April 1985).



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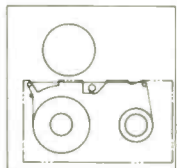
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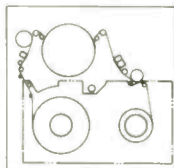


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*Discs and tapes reviewed by  
Chris Albertson, Phyl Garland,  
Alanna Nash, Mark Peel,  
Steve Simels*

**ASLEEP AT THE WHEEL: 10.** Asleep at the Wheel (vocals and instrumentals); instrumental accompaniment. *Way Down Texas Way; Tulsa Straight Ahead; Blowin' Like a Bandit; I Want a New Drug; Big Foot Stomp*; and five others. EPIC BFE 40681, © BFT 40681, © EK 40681, no list price.

Performance: *A-ha!*  
Recording: *Crisp and clear*

Asleep at the Wheel has had something of an iffy career—the band seems to be here one minute and gone the next, only to pop up again when you least expect it—but if the seven current members keep up the level of excellence apparent in this release, the group should be around for quite some time.

The Wheel owes its existence to Western swing, primarily Bob Wills—although leader Ray Benson sounds remarkably like Ernest Tubb at times—and its musicians are the real thing. Dominated by fiddles and pedal-steel guitar, the band also employs a saxophonist and an accordion player, and they can get flat-out inspirational. Part of their charm is that they mix old standards with whatever strikes their fancy—in this case, a rousing version of Guy Clark's *Blowin' Like a Bandit* and Huey Lewis's *I Want a New Drug*, which Lewis co-produced using Dwight Yoakam's former guitarist, Pete Anderson. You do get a certain time-warp feeling listening to this stuff, but, all in all, it's a heck of a journey. *A.N.*

**MARSHALL CHAPMAN: Dirty Linen.** Marshall Chapman (vocals, guitar); Mary Ann Kennedy, Pam Rose (background vocals); other musicians. *Great Big Crush; Daddy Long Legs; Betty's Bein' Bad; Hollywood Here I Come; Go On 'Bout Your Bidness*; and five others. TALL GIRL cassette (\$10 from Tall Girl Records, Suite 803, 900 19th Ave. S., Nashville, TN 37212).

Performance: *Welcome back*  
Recording: *Properly gritty*

In her first album in five years, Marshall Chapman—once described as “Bacall in Bogart's clothes”—makes it clear that the wait was worth it. Chap-

## EXPLANATION OF SYMBOLS:

- = DIGITAL-MASTER LP
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Laurence Tolhurst, Boris Williams, Robert Smith, Simon Galley, Porl Thompson

## THE CURE'S CRUEL PASSIONS

**L**AST year's singles compilation “Standing on the Beach” created a bigger audience for the Cure than the band's six previous albums combined. In exceeding just about everybody's commercial expectations, it also gave the Cure's Sven-gali, Robert Smith, a lot of freedom when he went into the studio to record the new “Kiss Me, Kiss Me, Kiss Me.” The result is bold, self-indulgent, outrageous, and unsettling—sure signs of a rock visionary at work.

“Kiss Me” is a punk-rock *Last Tango in Paris*, a primal scream of passion and selfishness, and a rebuke to love experienced within the timid confines of convention and morality. The title is fitting in its self-centeredness, ironic in suggesting a tenderness nowhere evident in the music. Smith's vision of love and sex is a sensuous but ultimately repellent and depressing one. But he articulates it with such chilling conviction, in music so jagged-edged and driving, that you find yourself replaying it even as you shake your head.

“Kiss Me” derives its unusual power from two sources: the brutal war of words waged in the song lyrics and the riveting anarchy of Smith's guitar and vocals. Each song seems to be at war with itself, a confused tangle of violent contradictions and vicious urges. In *Catch*, for example, Smith seduces a woman with the unlikely approach, “. . . you remind me of a girl I think I used to know/. . . she used to fall down a lot.” In *Torture*, he describes lovemaking as “like a vampire bat/. . . hanging on your back.” The album's first single, *Why Can't I Be You?*, distills the essence of self-absorption and self-loathing. Even a song called

*How Beautiful You Are* begins with the question, “You want to know why I hate you?”

The Cure's cruel passions are played out with harsh, jangling guitar chords, bare-fisted drums, mocking saxophone, and the naked, arrogant energy of Smith's vocals. His guitar work is not particularly accomplished technically, but it is invigorating in the sheer brutality of its groaning distortion and jarring chordal attacks. The music is a confluence of punk and psychedelia, thrash rock and funk, folk ballads and Middle Eastern trance music, with expansive introductions and long, narcotic guitar breaks, ornamented with evocative cheap theatrics—sitar, low-tech reverb, cheesy violin.

If self-indulgence is one of the chief themes of the album (even the recording site—a studio nestled in a vineyard in Provence, France—suggests a half-dozen cardinal sins), it is also one of its virtues. After all, ideas are what Smith is indulging in here. They may be disturbing, even distasteful ideas, but their savage eloquence makes “Kiss Me, Kiss Me, Kiss Me” an intense and unforgettable listening experience. *Mark Peel*

**THE CURE: Kiss Me, Kiss Me, Kiss Me.** The Cure (vocals and instrumentals). *The Kiss; Catch; Torture; If Only Tonight We Could Sleep; Why Can't I Be You?; How Beautiful You Are; The Snake Pit; Hey You!!!; Just Like Heaven; All I Want; Hot Hot Hot; One More Time; Like Cockatoos; Icing Sugar; The Perfect Girl; A Thousand Hours; Shiver and Shake; Fight.* ELEKTRA 60737-1 two LP's \$13.98, © 60737-4 one cassette \$13.98, © 60737-2 one CD no list price.

man's 1977 debut LP, "Me, I'm Feelin' Free," amounted to a country "outlaw" album, and the next, "Jaded Virgin," was essentially half country, half rock. With "Marshall," in 1979, she moved increasingly into the rock domain, honing a fine blues-pop-rock fusion with her last album, "Take It On Home." The six-foot singer/guitarist/songwriter—whose voice sounds like tobacco leaves rubbing up against each other—continues to mine that vein in "Dirty Linen," with the addition of a handful of standout rockabilly tunes.

Above all, "Dirty Linen" is that increasing rarity—a fun album. Sporting a stripped-down sound and showcasing Eddie Angel's zingy, Scotty Moore-like guitar, it goes for the meat-and-potatoes of rock-and-roll/blues. At least half of the songs are favorites from Chapman's live show, including *Betty's Bein' Bad*, a Chapman original that Sawyer Brown made famous, and *Rockabilly Sweethearts*, a veritable trip to Memphis, where the syncopated lovers ("They got every single record in the Sun catalog") check into the Peabody Hotel with their sole piece of luggage—a Stratocaster guitar. Make no mistake—Chapman has got it *down*, even to Roy Orbison's ooby-doo background.

All in all, Chapman's in fine form here—loose, ripe, and irreverent. *A.N.*

**CLUB NOUVEAU: *Life, Love & Pain.*** Club Nouveau (vocals and instrumentals). *Jealousy; Lean on Me; Situation #9; Let Me Go;* and four others. WARNER BROS. 25531-1 \$8.98, © 25531-4 \$8.98, © 25531-2 no list price.

Performance: *Mechanical*  
Recording: *Crash-boom*

You'll have heard at least one song on this Club Nouveau album because it went, as young John Lennon once said, to "the toppermost of the poppermost" early this year. That song is Bill Withers's *Lean On Me* from 1972. It is also the only real song on the album, and it gets the only real performance this group delivers. The opening cut, *Jealousy*, was socko-boffo in 1986, but, like the rest of the (ahem) selections, it's no more than something loud and monotonous to dance to the next time you roll back the rugs, put wax on the floor, and have the guys and gals over.

Two other cuts, *Promises, Promises*

and the reprise of *Lean on Me* at the end of side two, are such shabby throwaways that you'd be within your rights to complain to your local consumer advocate. If the three principal members of Club Nouveau want label credit as the ones who produced, arranged, and mixed the album, then they're also going to have to take the blame.

*Joel Vance*

**BARBARA COOK: *It's Better with a Band.*** Barbara Cook (vocals); instrumental accompaniment. *It's Better with a Band; Remember; I Love a Piano; The Ingenue; If Love Were All; Sweet Georgia Brown;* and four others (eight others on CD). MMG D-MMG 104 \$10.98, © D-CMG 104 \$10.98, © MCD 10010 no list price.

Performance: *On target*  
Recording: *Fair remote*

Barbara Cook's extensive experience on the Broadway musical stage comes across in every perfectly placed phrase in "It's Better with a Band," recorded at Carnegie Hall seven years ago and now rereleased on CD with four extra tracks. On some tracks the recording suffers from poor balances, which may be the result of an imperfect mix, but generally Cook's performances are strong enough to overcome such technical sloppiness. On the CD, her program lasts almost an hour. Highlights in all three formats, however, would include *Them There Eyes*, to which tuba player Sam Pilafian contributes memorable whimsy; *The Ingenue*, a patter song in the style of Gilbert and Sullivan; and the wonderful *It's Better with a Band*. The latter two were written by Cook's musical director, Wally Harper. *C.A.*

**MARSHALL CRENSHAW: *Mary Jean & 9 Others.*** Marshall Crenshaw (vocals, guitar); Graham Maby (bass); Robert Crenshaw (drums); other musicians. *This Is Easy; A Hundred Dollars; Calling Out for Love (At Crying Time); Wild Abandon; This Street;* and five others. WARNER BROS. 25583-1 \$8.98, © 25583-4 \$8.98, © 25583-2 no list price.

Performance: *Surprisingly dull*  
Recording: *Very good*

On paper, this release seems promising: production by Don Dixon, who did

such wonderful work with the Smithereens and Marti Jones, and bass guitar by Graham Maby, formerly of the Joe Jackson band and one of the most interesting instrumentalists to emerge from the whole post-punk whatsis. And, sure enough, the production is the most flattering Marshall Crenshaw has ever received, and the band, with its newly improved bottom end, sounds better than ever. Unfortunately, though, the script is weak. In fact, despite Crenshaw's customarily ingratiating vocals and sharp guitar, the songs seem utterly generic, the most in-one-ear-and-out-the-other set in the guy's career. Only an odd cover, Peter Case's *Steel Strings*, makes any impression at all. Crenshaw's first album was one of the strongest debuts of recent years, but it's beginning to look more and more like a brilliant fluke. *S.S.*

**THE dB'S: *The Sound of Music*** (see *Best of the Month*, page 89)

**THE DEL FUEGOS: *Stand Up.*** The Del Fuegos (vocals and instrumentals); vocal and instrumental accompaniment. *Wear It Like a Cape; New Old World; Name Names; Long Slide (For an Out); He Had a Lot to Drink Today; I'll Sleep with You (Cha Cha d'Amour);* and four others. SLASH/WARNER BROS. 25540-1 \$8.98, © 25540-4 \$8.98, © 25540-2 no list price.

Performance: *Brutal*  
Recording: *Good*

The Del Fuegos are to other rock bands what the bull dog is to domestic pets: low-down, grotesque, a bit rank, they nonetheless confer upon their adherents a certain perverse pride of ownership, a brutish but self-effacing swagger. "Stand Up," the third album from the band that bills itself as "rock's ugliest," is stripped-down, punked-out, primal rock—invigorating and blood curdling in the same breath.

Lead vocalist Dan Zanes sings with gritty determination in a scarifying growl. When he sneers the words "bad attitude," you know from the irony in his intonation that he's heard it directed at himself once or twice. The rest of the Fuegos back Zanes with a lean but hugely muscled sound—not the frenetic machine-gun chording of the neo-nihilist school but a more measured pace, much

*Club Nouveau: "the toppermost of the poppermost"*



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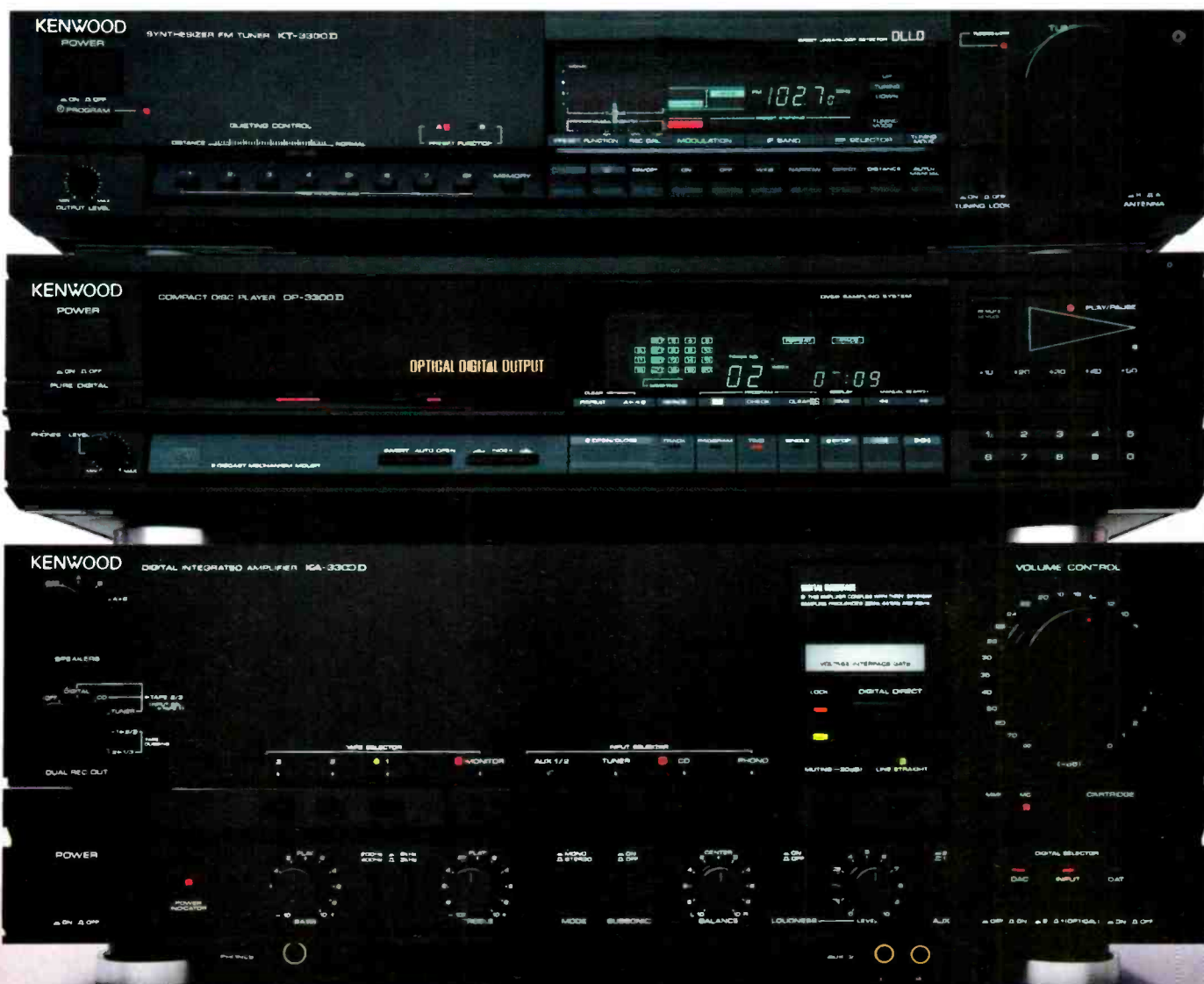
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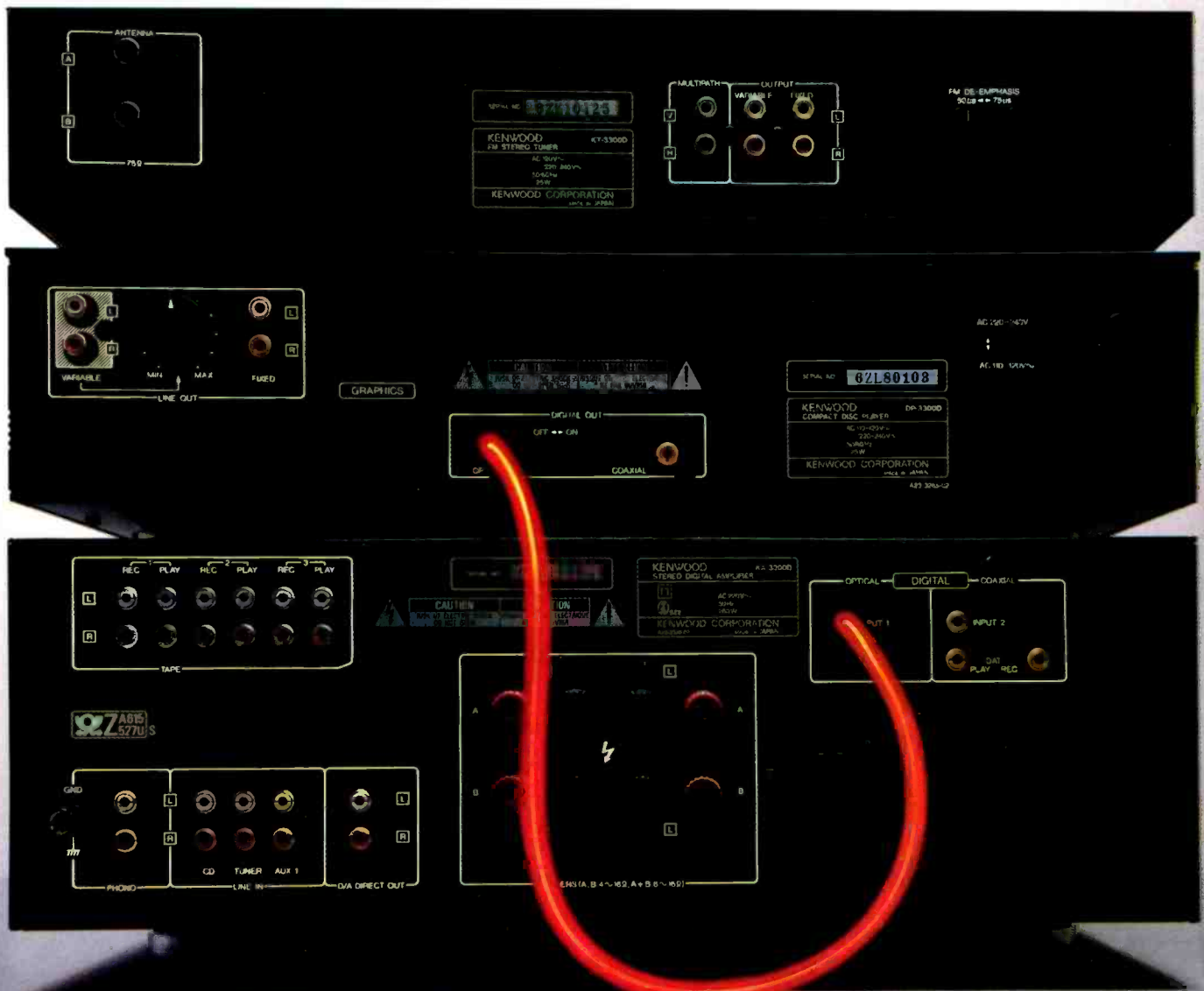
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This is the second Del Fuegos album produced by Mitchell Froom, and once again he's wrought a minor miracle, adding sophisticated instrumental details without compromising the band's raw, beer-soaked blues and country-vaudeville sound. On *Wear It Like a Cape*, a J. Geils Meets Jack the Ripper trash rocker, Froom tags a neat four-part bass harmony and gospel chorus on at the end. After Zanes has sung, "In between the sheets, we keep it going," the coda sounds as though the Del Fuegos had been rescued from the clutches of sin by the Staple Singers. On *He Had a Lot to Drink Today*, Zanes's Tom Waits-at-death's-door vocal is backed by rubbery, nightmarish piano, clarinet, and cello sounds that seem to be rising up from the bottom of a vat of Jack Daniel's. Froom also keeps guest guitarists James Ralston (Tina Turner's band) and James Burton (half the records done in Nashville in the last decade) around for the odd wah-wah guitar or sliding dobro riff. The Del Fuegos will be the first to tell you it's not pretty. But, like three fingers of Jack-in-the-Black, a night of "Stand Up" builds character. *M.P.*

**MICHAEL FEINSTEIN:** *Remember—Michael Feinstein Sings Irving Berlin.* Michael Feinstein (vocals, piano); David Ross, Stan Freeman (piano); John Hughart (bass); Dennis Budimir (guitar, banjo). *Let Me Sing and I'm Happy; Better Luck Next Time; Say It Isn't So; Always; Puttin' on the Ritz; Slumming on Park Avenue; Change Partners;* and twelve others. ELEKTRA 60744-1 \$8.98, © 60744-4 \$8.98, © 60744-2 no list price.

Performance: *Joyfully immediate*  
Recording: *Generally good*

Michael Feinstein is on a roll, and it's easy to see, and hear, why he's become the hottest young singer-pianist on the supper-club circuit, concentrating on the great treasury of American show tunes and pre-1950's pop songs. First there was his excellent Gershwin album and then a wonderful potpourri drawn from his Algonquin shows. His first major-label album, "Remember," is a knockout tribute to Irving Berlin, who recently celebrated his ninety-ninth birthday and is arguably the most successful songwriter of all time. Certainly, as this album shows, he has been one of the most versatile.

Feinstein generously offers no fewer than nineteen songs, some familiar, some neglected gems. The arrangements are neatly and subtly varied, from one or two pianos on most of the tracks to a small combo backing on the rest. But it's Feinstein's ingratiating vocal stylings that hold center stage, and they hold it in the best sense of that word, whether he's crooning a romantic ballad or jauntily cutting loose on a



*The Del Fuegos: raw, beer-soaked blues and country raunch*

more rhythmic number. And (bless him) he almost always includes the verse too.

Feinstein is at his best when he sings quietly and intimately, breathing fresh, meaningful insights into lyrics that so many others gloss over as if by rote, but he can also belt out with intensity and impact, if sometimes at the expense of some unwelcome shrillness. Happily, when his friend and booster (and frequent belter) Liza Minnelli joins him for a medley of *Remember, Always, and What'll I Do?*, they both opt for more caressing tones, with enormous effectiveness. If you like Irving Berlin—and is there really anybody who doesn't?—get this album. *Roy Hemming*

**THE FIXX:** *React.* The Fixx (vocals and instrumentals). *Red Skies; Big Wall; Don't Be Scared; Rules and Schemes; Deeper and Deeper;* and five others. MCA MCA-42008 \$8.98, © MCAC-42008 \$8.98, © MCAD-42008 no list price.

Performance: *Irreparable*  
Recording: *Good*

The Fixx remains, to these ears, one of the greatest mysteries in rock today. For all the energy, drive, and talent in guitarist Jamie West-Oram's fingers, all the stylish intensity of Cy Curnin's vocals, this band is incapable of striking any kind of musical chord. Their songs twist and turn without ever eliciting surprise, plead and provoke without generating any emotional or intellectual response. "React," mostly live performances of earlier "hits," finds the Fixx trying to redefine themselves with three new studio tracks, which are less convoluted

than their previous material but busy and purposeless nonetheless. Producer Hugh Padgham has tried to make the band less clinical and less academic, but he's succeeded only in making it less complicated. Making music still—and at this point, perversely—eludes the Fixx. *M.P.*

**DAN FOGELBERG:** *Exiles.* Dan Fogelberg (vocals, guitar); Russ Kunkel (drums); Mike Porcaro (bass); Mike Hanna (keyboards); Michael Brecker (tenor saxophone); vocal and instrumental accompaniment. *Exiles; What You're Doing; Lonely in Love; Seeing You Again;* and five others. FULL MOON/EPIC OE 40271, © OET 40271, © EK 40271 no list price.

Performance: *Attention, K-Mart shoppers...*  
Recording: *Very good*

Back in the 1970's, rock was overrun by the singer-songwriters—James Taylor, Jackson Browne, Paul Simon without Art Garfunkel, Joni Mitchell, Carole King. There ensued five years of extraordinary songwriting alternating with depressingly sensitive navel-gazing, after which popular music did the only thing it could do to keep its sanity: it surrendered its gray matter altogether and invented disco. Dan Fogelberg was a heart-throb of the second rank back then, not as rugged or chiseled as Kris Kristofferson, but not as wimpy as Michael Murphey, either. Listening to Fogelberg now, it's amazing how little he's changed, even as popular music has grown more eclectic and technologically sophisticated.

There are a few surprises in "Exiles,"



Emmylou Harris: gorgeous gospel moments

a few concessions to the digital era. The vocal on *What You're Doing*, for instance, will shock long-time Fogelberg fans. Its grainy, whiskey-soaked quality, backed by a funk chorus, sounds more like Robert Palmer. And Fogelberg's characteristic multitracked vocals have a trebly, made-for-CD sheen. But for the most part it's business as usual, from the slick L.A. production of Russ Kunkel to the trail of broken hearts that runs through the song lyrics. Even the jazz and funk stylings—Michael Brecker's Clarence Clemmons imitation on *Exiles*, for instance, an obvious nod to the Clemmons–Jackson Browne collaboration—sound perfunctory and somewhat dated.

Fogelberg is an incurable romantic, and after one or two songs you're ready for someone to find a cure. It wouldn't be so bad if he had something new or interesting to say about love, but all he does is recycle the tired excuses and rationalizations couples use on one another when they're too lazy to *think*—lines like, "You said you had changes you need to work through." Someone's going to hear this on the radio driving home and use it on her husband to justify a lunch-hour indiscretion—and the poor guy will have Dan Fogelberg to blame.

He reaches some kind of nadir on *Seeing You Again*, a song about a chance meeting between ex-lovers in which Fogelberg actually sings, "Seeing you again was the sweetest torture I may ever know." With its sappy hearts-

and-flowers melody, *Seeing You Again* doesn't even need to be rearranged for Muzak—it's ready for the underwear department at K-Mart just the way it is. Not all of "Exiles" is that bad, but none of it is ever very good. *M.P.*

**EMMYLOU HARRIS:** *Angel Band*. Emmylou Harris (vocals, guitar); Vince Gill (vocals, guitar, mandolin); other musicians. *Where Could I Go but to the Lord*; *Precious Memories*; *Bright Morning Stars*; *We Shall Rise*; *Drifting Too Far*; *Who Will Sing for Me*; and six others. WARNER BROS. 25585-1 \$8.98, © 25585-4 \$8.98, © 25585-2 no list price.

Performance: *Keening*  
Recording: *Varies*

No matter how striking the material on Emmylou Harris's most visionary albums, you either love her earnest, piercing soprano, or you don't care for it *at all*. Me, I love it, even when it reverberates on the back of my brain stem. For me, the voice by itself is worth sitting through some of Harris's less compelling albums.

"Angel Band," in case you haven't already guessed, is one of those. A twelve-cut set of traditional country-gospel songs (or "public domain/inspirational" tunes, as Warner Bros. calls them, terrified of what the word "gospel" might do to sales), the record was conceived when a few of Emmy's musician buddies sat around the living room trading favorite sacred songs. Impressed with what he heard, Paul Ken-

nerley, Harris's writing partner at the time and now her husband, dragged out his sixteen-track recording console, and, with occasional overdubs, the instrumentals and vocals were recorded simultaneously—the old-fashioned way, the way the old gospel quartets used to do it.

It was only later that anyone realized they had an album. The thing is, though, for the most part it *sounds* like a living-room recording. Emory Gordy, Jr., who co-produced it with Harris, is credited with the bass vocals, but except in the three songs rerecorded later in a Nashville studio, it's difficult to hear his voice. For that matter, all of the vocals except Harris's sound somehow restrained, as if they were meant to be merely back-up instead of blended parts—something essential in this kind of music.

Still, the musicianship—including Harris's intonation—is almost impossible to fault, and there are some gorgeous moments, especially in her delivery in *Other Side of Life* and *When They Ring Those Golden Bells*, the album's last two cuts. *A.N.*

**JOHN HIATT:** *Bring the Family*. John Hiatt (vocals, guitar); Ry Cooder (guitar); Nick Lowe (bass); Jim Keltner (drums). *Memphis in the Meantime*; *Alone in the Dark*; *Thing Called Love*; *Lipstick Sunset*; *Have a Little Faith in Me*; and five others. A&M SP-5158 \$8.98, © CS-5158 \$8.98, © CD-5158 no list price.

Performance: *Smart*  
Recording: *Live-like*

John Hiatt is one of those singer-songwriters, in the Elvis Costello or Randy Newman mold, who often seem, as night-club comics put it, too smart for the room. Witty, literate to a fault, and versatile enough to have gotten typed as a New Waver and a roots-rocker before his time, he's made a lot of impressive but commercially unsuccessful albums (1985's "Riding with the King," on Geffen, is worth combing your local cut-out bins for).

Hiatt's new one, "Bring the Family," was recorded more or less live in the studio with a superb band starring Ry Cooder, apparently on the theory that a relatively unadorned Hiatt will fare better in the marketplace. Whether that holds true or not, it's certainly hard to see how the songs could have been improved by more production. They're truly aces, a series of sharply observed character studies, domestic vignettes, and unsentimental love songs rendered in a style that might be called blues moderne. Pick to click: *Your Dad Did*, a hilarious fathers-and-sons number (Hiatt's daughter prays that "her brother's pet hamster will burn in hell") that rocks like mad. *S.S.*

**WHITNEY HOUSTON:** *Whitney*. Whitney Houston (vocals); vocal and



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instrumental accompaniment. *I Wanna Dance with Somebody (Who Loves Me)*; *Love Will Save the Day*; *So Emotional*; *Where You Are*; *For the Love of You*; *Where Do Broken Hearts Go?*; and five others. ARISTA AL 8405 \$8.98, © AC 8405 \$8.98, © ARCD 8405 no list price.

Performance: *Disappointing*  
Recording: *Mostly loud*

If "Whitney" had been the first album by Whitney Houston, she would have

been dismissed as a promising singer whose innately appealing voice was buried beneath extraneous clutter. The qualitative differences between her debut album and this one are not that easy to pinpoint, for many of the basic ingredients of the earlier record are present here. Most of "Whitney" was produced by Narada Michael Walden, with notable input by Michael Masser, who co-wrote and produced *Greatest Love of All* and *Saving All My Love for You*, the best selections in Houston's first set.

That there are fundamental problems here is apparent from the first cut, an atrocious dance tune called *I Wanna Dance with Somebody* that enjoyed strong chart action but is totally unworthy of Houston's talents. The other songs range from the unforgivably raucous *Love Will Save the Day* to the pleasantly ingratiating *Just the Lonely Talking Again* and *You're Still My Man*. There are a few treasurable moments in *Didn't We Almost Have It All* and *I Know Him So Well* (a duet with Whitney's mother, Cissy Houston), but there's just too much formula-ridden junk in this album, and too often Houston is forced to scream above the roar. Seldom has so auspicious a debut had so disappointing a sequel. P.G.

**LUTHER INGRAM.** Luther Ingram (vocals); vocal and instrumental accompaniment. *Baby Don't Go Too Far*; *Don't Turn Around*; *Rain, Rain, Rain (Stormy Weather)*; *Right Away*; *Golden Girl*; *All in the Name of Love*; and four others. PROFILE PRO 1226, © PCT 1226, © PCD 1226, no list price.

Performance: *A welcome return*  
Recording: *Quite good*

Although it has been ten years since Luther Ingram recorded an album, he sounds here as if he had spent most of that time perfecting his already considerable ability to interpret r-&-b ballads with soul-tugging conviction. Everything has been carefully produced so as not to detract from Ingram's emotional renditions, with economical arrangements and comfortably unobtrusive vocal accompaniment. Although there is some drum and keyboard programming, the objective was apparently to resurrect the old Memphis blues-based sound of the Seventies, back when sweet singing was in vogue. The guitars and organ on *How Sweet It Would Be* are also perfect in achieving this effect. Among other choice items are such proven favorites as *Right Away*, *Golden Girl*, and *You Don't Know Me*, and there's a startlingly inventive reshaping of *Stormy Weather* called *Rain, Rain, Rain*. P.G.

**ELTON JOHN:** *Live in Australia*. Elton John (vocals, piano); Davey Johnstone (guitar); Fred Mandel (keyboards, synthesizer); David Paton (bass); Charlie Morgan (drums); Melbourne Symphony Orchestra, James Newton Howard cond. *Sixty Years On*; *I Need You to Turn To*; *The Greatest Discovery*; *Tonight*; *Sorry Seems to Be the Hardest Word*; *The King Must Die*; *Take Me to the Pilot*; and seven others. MCA MCA2-8022 two LP's \$10.98, © MCAC-8022 one cassette \$10.98, © MCAD-8022 one CD no list price.

Performance: *Overblown*  
Recording: *Excellent*

Elton John has worn so many hats during his career, literally and figuratively,

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## ORCHESTRAL JACKSON

**W**HILE a number of jazz and rock musicians have recorded orchestral albums—Duke Ellington, John Lewis, John Coltrane, and Frank Zappa spring to mind—most of them simply contain orchestral arrangements of their own popular music or music written for orchestra in the jazz or pop idiom. Joe Jackson's new "Will Power" is a more ambitious project. Jackson assembled a fifty-piece orchestra, kept his rock band but threw out the rock music, and started virtually from scratch to create a kind of 1980's street-life impressionism that owes more to nineteenth- and twentieth-century classical composers than it does to rock, pop, or jazz.

Jackson's command of the orchestral vocabulary in "Will Power" is far broader and more assured than any of his previous albums, soundtracks included, would lead you to expect. You can tick off the composers from whom he borrows—the impressionistic woodwinds of Debussy and piano of Ravel, the galloping string writing of Copland, and the fluid, romantic strings of Vaughan Williams, even the eerie percussive violins and synthesizer of Zappa. Running through all of it, though, is the familiar sound of Joe Jackson—the arching melodies, straining with emotion, the barely contained urge to swing. These signatures come as subtle reminders, not sweeping statements, but they mark the instrumentation and structure of "Will Power" as Jackson's, not simply Mod. Comp. 101.

The five compositions prove Jackson an entertaining, inventive, and emotional writer. *No Pasaran* opens the album in breathtaking fashion. A slow-stepping acoustic bass stalks silently forth, joined by the high-pitched murmur of a plucked violin. Bit by bit, Jackson adds slowly circling layers of percussion—piano, xylophone, guitar—in an increasingly busy, fidgeting whirl. The slowly accelerating rhythm is shattered suddenly by a full fortissimo blast.

I've listened to this piece twenty or thirty times, and I still jump every time I hear it.

The long flute and bass-clarinete introduction to *Solitude* hovers like a glowing flame; dispelled by a bell-like soprano-sax voice, it yields to an extended jazz-impressionist meditation—shimmering strings alternating with ringing guitar harmonics and dream-like saxophone. The counterpoint of synth and massed woodwinds in *Will Power* conjures up a street scene of quickly shifting tempos, relaxed one moment, relentless the next. *Symphony in One Movement* is probably the jazziest Jackson gets. Its main theme begins as an orchestra tune-up that's turned on its head and played faster and faster, then passed back and forth from one section to another, the strings handing off to the flutes, which in turn pass it along to the trumpets and trombones. The orchestration is dizzying.

Jackson's rock ensemble is used on "Will Power" as both a solo instrument and, more often, to add percussive detail. He achieves a neat balancing act in miking and mixing the guitar, sax, synth, and drums (typically miked individually) with the orchestra (usually recorded with one or two microphones). And the overall recording quality is excellent.

Until you've heard it, the temptation is to view "Will Power" as another of Joe Jackson's "statements." After all, Jackson has always been as much a crusading musicologist as a musician. "Will Power" is a much greater achievement than that, though. It may not put Joe Jackson on next year's Mostly Mozart program, but it sets one of pop music's most innovative talents on a promising course. *Mark Peel*

**JOE JACKSON:** *Will Power*. Orchestra, Joe Jackson cond. *No Pasaran; Solitude; Will Power; Nocturne; Symphony in One Movement*. A&M SP-3908 \$8.98, © CS-3908 \$8.98, © CD-3908 no list price.

that it's difficult to guess at the intent of a release like this. John has played the sensitive, romantic interpreter of Bernie Taupin's lyrics; the keyboard-pounding rocker, Britain's answer to Jerry Lee Lewis; and, finally, rock's Liberace, a megastar of unrivaled flamboyance and self-indulgence. "Live in Australia" pairs Elton the sensitive balladeer with Elton the bombastic superstar—the most contradictory permutation possible. Fans of the rock-and-roller will find little of interest.

"Live" reprises Elton's classic early ballads, those precariously balanced works of insight and sentimentality—*Your Song, Sixty Years On, I Need You to Turn To, The Greatest Discovery, Tiny Dancer*, and others—some bathetic, some genuinely moving. But, of course, Elton John couldn't simply walk out on stage, sit down at the piano, and sing these songs. Instead, he hired the Melbourne Symphony to lend gravity to the proceedings. *Tiny Dancer* becomes *Pomp and Circumstance*.

I wish I hadn't looked at the jacket of this record before listening to it. But I did. Elton is dressed in a powdered wig and satin breeches, perched at the keyboard, a beauty mark radiating from his pancaked face. But there's more Mantovani than Mozart in this recording, and the silly Viennese trappings make these otherwise attractive songs seem bloated and farcical. *M.P.*

**PATTY LOVELESS.** Patty Loveless (vocals); vocal and instrumental accompaniment. *Lonely Days, Lonely Nights; I Did; After All; Wicked Ways*; and six others. © MCA MCA-5915 \$7.98, © MCAC-5915 \$7.98.

Performance: *Expressive*  
Recording: *Excellent*

Although comparisons are often dangerous, or at the very least inaccurate, Patty Loveless's debut album is in some ways much like Emmylou Harris's first Warner Bros. album, "Pieces of the Sky." Vocally, the two singers are really nothing alike, but both albums stand out as examples of tasteful and masterly integration of traditional and progressive styles. Furthermore, both records appeal, on a surface level, to a straightforward country audience, while they also flirt unabashedly with country-rock fans through the song lyrics, stance, and instrumentation.

Understandably, then, there's a lot going on here, all supported by a buoyant energy that is evident even when Loveless is playing the suffering romantic, hurting to the point of frenzy. In those songs, particularly *After All, Slow Healing Heart*, and *Wicked Ways*, Loveless's strong soprano is tempered with an irresistible vulnerability that is underscored by Ray Flacke's no-nonsense guitar and Glen Duncan's plangent fiddle. Producers Emory Gordy, Jr., and Tony Brown take her to the limit on *After All*, where she strains against

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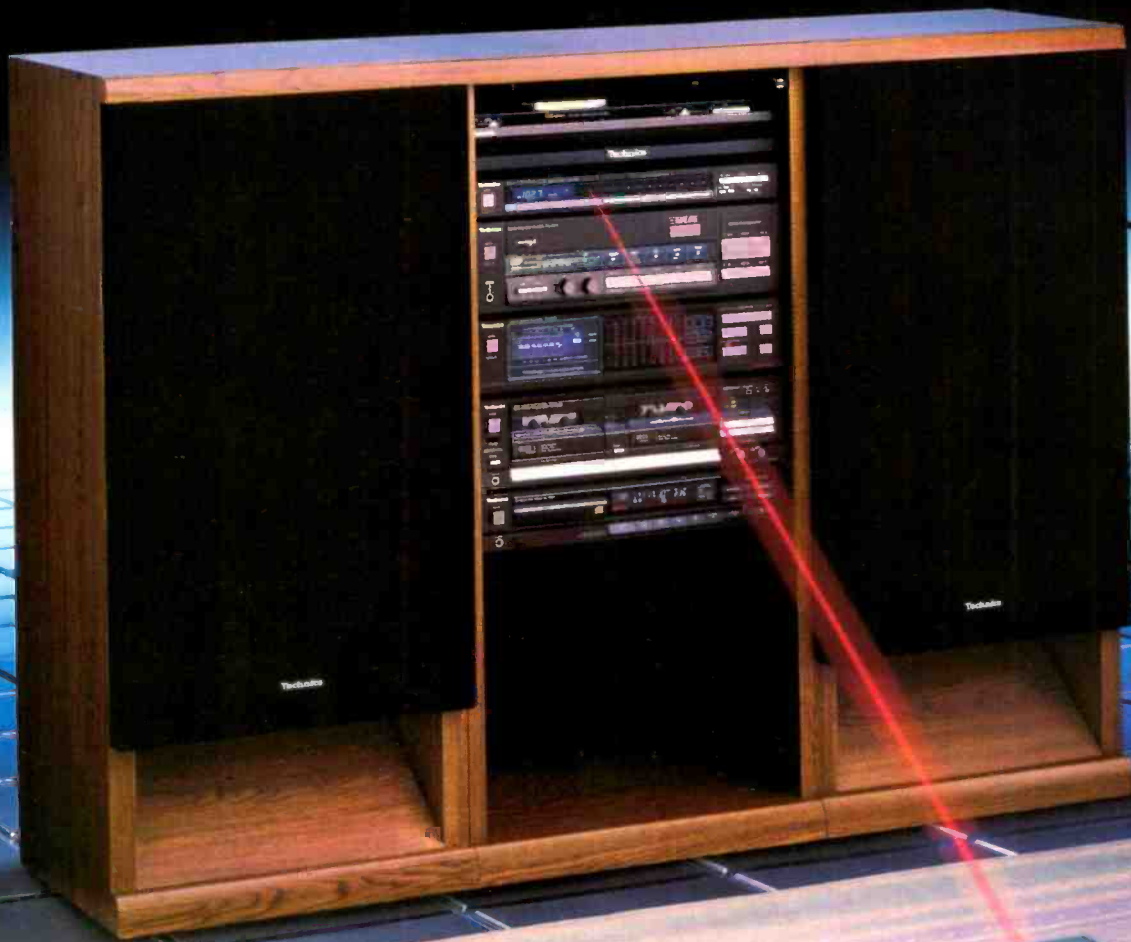
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her upper register, but on the whole, with her hard-country diction often giving her the air of an innocent—or a repentant—turned loose in a cruel world, she delivers a sterling set of expressive and affecting performances.

Patty Loveless is neither as aggressive and boisterous as Reba McEntire nor as self-consciously sly as the Judds. But there is a strength to both her songs and her character that bores deeper than the work of most current female country singers. *A.N.*

**STEPHANIE MILLS: *If I Were Your Woman*.** Stephanie Mills (vocals); vocal and instrumental accompaniment. *I Feel Good All Over; Jesse; Secret Lady; Touch Me Now*; and four others. MCA MCA-5996 \$8.98, © MCAC-5996 \$8.98, © MCAD-5996 no list price.

Performance: *Still looking up*  
Recording: *Good*

After several false starts, Stephanie Mills hit her stride on her last two albums, especially with *I Have Learned to Respect the Power of Love*, and she's sustained that peak level of performance in "If I Were Your Woman." The album is carefully tailored to highlight her gospel-derived style, and fortunately the many producers involved (I

counted at least seven, with Mills serving as co-executive producer) have all focused their efforts on showcasing Mills's extraordinary vocal talent. Nothing seems contrived or hastily dashed off, and there's a prevailing intimacy throughout. Altogether, the record offers the kind of fine, soulful singing that Stephanie Mills does best. *P.G.*

**OAK RIDGE BOYS: *Where the Fast Lane Ends*.** Oak Ridge Boys (vocals); vocal and instrumental accompaniment. *This Crazy Love; Whatever It Takes; Where the Fast Lane Ends*; and seven others. MCA ◊ MCA-5945 \$7.98, © MCAC-5945 \$7.98, © MCAD-5945 no list price.

Performance: *Polished, but . . .*  
Recording: *Gorgeous*

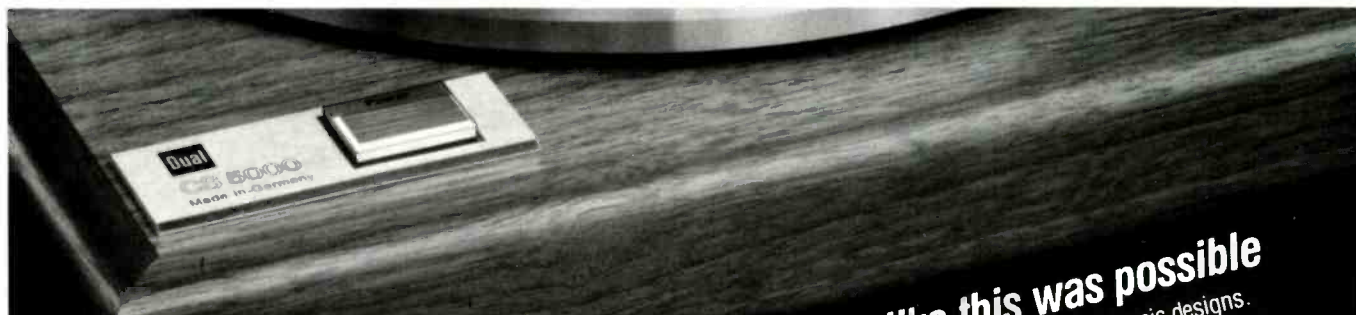
Things haven't exactly been swell for the Oak Ridge Boys lately. William Lee Golden, the senior citizen of the group, was recently forced out of the quartet—this recording is one of his last appearances with the Oaks. Aside from that, there's the small matter of declining record sales. Golden is being replaced, of course, just as the group has switched producers—to hitmaker Jimmy Bowen—in an effort to win back its audience.

Based on "Where the Fast Lane Ends," whether they'll succeed is still an open question. The production is stunning—the digital recording is especially effective in separating the four voices—and there's a dressed-up, best-foot-forward feeling that emphasizes a basic, group-harmony sound. But with the exception of *Rainbow at Midnight*, where guests Patti LaBelle and Joe Walsh come on board for some searing vocals and slide-guitar work, the songs are fairly sedate, never rising above mid-tempo, and hardly the stuff to make you sit up and take notice. Unless you're just enthralled with the blend of the Oaks' voices—which, admittedly, accounts for whatever spark there is here—you might want to wait 'til they get their energy back. *A.N.*

**K. T. OSLIN: *80's Ladies*.** K. T. Oslin (vocals, keyboards); vocal and instrumental accompaniment. *Wall of Tears; Younger Men; 80's Ladies; Do Ya'; Old Pictures*; and five others. RCA ◊ 5924-1-R \$8.98, © 5924-4-R \$8.98, © 5924-2-R no list price.

Performance: *The real stuff*  
Recording: *Sparkling*

The "K.T." is for Kay Toinette; she's forty-five years old, and she hails from




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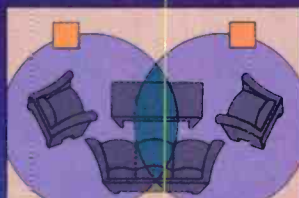
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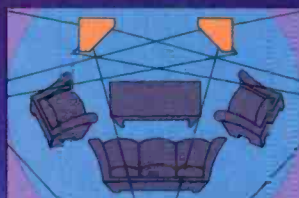
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Crossitt, Arkansas, and Mobile, Alabama. She's also one of country music's most formidable singer-songwriter combinations, having turned out *Old Pictures* for the Judds, *Round the Clock Lovin'* for Gail Davies, and *Lonely but Only for You* for Sissy Spacek. And now, after the Top 10 status of her debut album's title tune, a meaty song chronicling the lives of three girl friends—a pretty one, a smart one, and a self-styled “borderline fool”—she is about to become one of Nashville's Most Valuable Players although she has lived in New York for years.

Like Gus Hardin, who also recorded *Wall of Tears*, the only nonoriginal song on this release, Oslin is really more Southern rock-and-blues than country, influenced more by Chuck Berry than Ernest Tubb. But she is Dixie—and earthy—to the core, something readily apparent in her pronunciation and the way she seduces a song, sliding her sometimes slight but always affecting voice under a lyric before it's had a chance to notice.

There is also an abundance of humor and sagacity at work here, often in tandem, such as in *Younger Men*, where Oslin sings, “Women peak at forty, men at nineteen/I remember laughing my head off when I read that in a magazine/ (I was twenty at the time).” And that, coupled with Shedd's topnotch production and a smorgasbord of rhythmic and melodic hooks, makes “80's Ladies” irresistible. Strong women, strong men, and anyone wanting to be either will find it impossible to ignore. *A.N.*

**THE OUTFIELD:** *Bangin'*. The Outfield (vocals and instrumentals). *Some-where in America; Bangin' on My Heart; No Surrender; Moving Target; Long Way Home;* and five others. COLUMBIA OC 40619, © OCT 40619, © CK 40619, no list price.

Performance: *Good average*  
Recording: *Very good*

The story of the Outfield's rise from East London poverty to chart-making success is considerably more interesting than its music. In fact, it seems odd that these street-toughened cockney working lads would end up sounding like Boston—making well-groomed, chrome-plated guitar rock—but that's exactly what happened. In “Bangin’,” their second album, the Outfield churns out formulaic AOR with accomplished ease. It's hard not to appreciate the professionalism of the grandiose vocal harmonies and windmill guitar arpeggios, but it's far too familiar to give much pleasure. *M.P.*

**PSYCHEDELIC FURS:** *Midnight to Midnight*. Psychedelic Furs (vocals and instrumentals); vocal and instrumental accompaniment. *Heartbreak Beat; Shock; Shadow in My Heart; Angels Don't Cry; Midnight to Midnight; One More Word;* and three others. COLUM-



*Psychedelic Furs' Richard Butler*

BIA FC 40466, © FCT 40466, © CK 40466, no list price.

Performance: *Hair-raising*  
Recording: *Excellent*

The Psychedelic Furs are ear-ringed, leather-clad thugs in the prime of their pallid, excessive youth, and “Midnight to Midnight” is a virtual May Day parade of assault-force rock. Vocalist Richard Butler, a kind of reform-school David Bowie, renders each anthem with good, solid, working-class-kid-gone-to-punk-hell conviction. And the band is loud 'n' proud—thundering drums, megawatt guitar, sax to shame Clarence Clemmons, the usual weapons of destruction.

An academician might point out, with justification, that the Psychedelic Furs only seem to have written one song for “Midnight to Midnight,” which they play at different tempos and with different lyrics. Who cares? It's a great song. If your girl friend, wife, or mother has a Psychedelic Fur problem, I've found it's best to get it out in the open. But be understanding. It can happen in the best families. *M.P.*

**JUDY RODMAN:** *A Place Called Love*. Judy Rodman (vocals); instrumental accompaniment. *A Place Called Love; I Want a Love Like That; Girls Ride Horses Too; That Was Then, This Is Now; Early Fall; What's a Broken Heart;* and four others. MTM/CAPITOL

ST-71060 \$8.98, ©4XT-71060 \$8.98, © CDP-71060 no list price.

Performance: *Nutrasweet*  
Recording: *Very good*

If you were picking a name for your second album, would you choose “A Place Called Love”? No, nor would I, but Judy Rodman has, which makes her the Harlequin Romance queen of country music. Certainly most of her other material supports this dubious honor. In her two albums, Rodman has applied her bouncy but well-trained voice to any manner of melodramatic, sentimental situations, all of them central to the quest for the Handsome Young (and by all means True-Hearted) Stranger. I've listened to “A Place Called Love” three times so far. Now I'm looking for a place called quiet. *A.N.*

**MASON RUFFNER:** *Gypsy Blood*. Mason Ruffner (guitar, vocals); John David (bass); Dave Charles (drums); other musicians. *Gypsy Blood; Fightin' Back; Dancin' on Top of the World; Distant Thunder;* and six others. CBS ASSOCIATED BFZ 40601 © BZT 40601, © ZK 40601, no list price.

Performance: *Good, but . . .*  
Recording: *Very good*

Mason Ruffner is a handsome young guitar-slinging Texan who has been highly touted in certain roots-conscious circles. As Eric Clapton said about Robert Cray, Ruffner “sings great, plays great, and looks great. Nice package, isn't it?” Ruffner's latest album, produced impeccably as usual by Dave Edmunds, is indeed a nice package, but there aren't any particularly memorable songs on it. Though Ruffner can work up a bluesy storm on an instrumental like *Courage*, he mostly comes off as a journeyman, long on skill but short on personality. *S.S.*

**SCRUFFY THE CAT:** *Tiny Days*. Scruffy the Cat (vocals and instrumentals). *My Baby She's All Right; Shadow Boy; Upside Down; Time Never Forgets; Thomas Doubter; Never, Never; My Fate Was Sealed with a Kiss;* and four others. RELATIVITY 8158-1 \$8.98, © 8158-4 \$8.98, © 8158-2 no list price.

Performance: *Charming*  
Recording: *Very nice*

The great hope of Boston's now largely played-out roots-rock movement, Scruffy the Cat is something like an updated version of the Flamin' Groovies. These Cats have enormous energy and a brash if-it-sounds-cool-we'll-use-it attitude (how many other current bands do you suppose would have the nerve to use a—gasp!—banjo?). Most important, if it has three chords they're in favor of it.

Speaking as a three-chord fan from way back, I enjoyed this record immensely. True, the songs are not terribly innovative, and they're still a little rag-



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ged around the edges, but they have a naive charm that's undeniably winning. Best of the lot here is probably the opener, My Baby She's All Right, which could be R.E.M. after getting good news. But there are a number of other moments, like the skewed guitar solo that decorates When Your Ship Comes In, that should remind you of what rock-and-roll sounded like before it got taken over by technocrats and accountants. Recommended. S.S.

DAN SEALS: On the Front Line. Dan Seals (vocals, guitar); vocal and instrumental accompaniment. Out on the Front Line; Three Time Loser; It's Gonna Be Easy Now; I Will Be There; You Still Move Me; Lullabye; and four others. EMI AMERICA PW-17231 \$8.98, @ 4XT-17231 \$8.98.

Performance: Solid
Recording: Extremely good

If you're like me, you've stayed away from Dan Seals on principle. Back in the Seventies this Texan had the audacity to call himself "England Dan"—as half of the soft-rock duo England Dan and John Ford Coley—and when the gig was up, there he was working in country music because nobody else would have him. Or so it seemed. Seals, the younger brother of Jim Seals of Seals and Crofts, may have fabricated the "England" stuff, but it turns out the country pedigree is real.

Possessing a sweet, strong, and fluid tenor, Seals also writes most of his material. Like his work with John Ford Coley, Seals's current songs cut across the lines of country, folk, and pop, and they manage to be affecting without boring too deep. But they are exceptionally well crafted—sometimes reminiscent of James Taylor, in fact—and they never dip into cliché for lyrics or melodies. To top it off, Seals and producer Kyle Lehning have dressed the songs with dignified and sprightly arrangements (his duet with Emmylou Harris in Lullabye positively shimmers), steering clear of deadly Nashville formula. There is something compelling about this record, an honesty enhanced, perhaps, by the excitement of watching a man find his true musical path. Give him a try. A.N.

SHEILA E. Sheila E. (vocals); vocal and instrumental accompaniment. One Day (I'm Gonna Make You Mine); Wednesday Like a River; Hold Me; Faded Photographs; Koo Koo; Pride and the Passion; Love on a Blue Train; and three others. PAISLEY PARK/WARNER BROS. 25498-1 \$8.98, @ 25498-4 \$8.98, @ 25498-2 \$15.98.

Performance: Thunderous
Recording: Fine

It's ironic that singer-percussionist Sheila Escovedo, who inherited considerable musical gifts from her hugely talented family, emerged as a star only

when she began singing stuff several cuts below her capabilities. Fortunately she is so talented that the quality does occasionally shine through in her recordings.

There's so much percussive, synthesized overkill in "Sheila E." that the eardrums quickly numb, but when the thunder subsides enough for us to hear her, she shows that she can deliver a song with hypnotic effectiveness. Hold Me, the album's best track, is a case in point, and it's already a hit. What is depressing is that this artist, with her mastery of Latin music, could avoid being overly reliant on a static, overstated, and unvarying beat. She could, but she doesn't here. P.G.

THE SMITHS: Louder Than Bombs. The Smiths (vocals and instrumentals); vocal and instrumental accompaniment. Is It Really So Strange?; Sheila Take a Bow; Shoplifters of the World Unite; Sweet and Tender Hooligan; Half a Person; London; Panic; Girl Afraid; Shakespeare's Sister; Golden Lights; and fourteen others. SIRE 25569-1 two LP's, @ 25569-4 two cassettes, @ 25569-2 one CD, no list price.

Performance: Old wine, new jugs
Recording: Mostly very good

Among other things, the Smiths are the foremost contemporary practitioners of what some wags have referred to as Mope Rock. In song after song, Morrissey, the band's lead singer, wears depression, rejection, and dissatisfaction with the human condition (his, specifically) like a Red Badge of Courage. When he sings Heaven Knows I'm Miserable Now, you know Morrissey isn't kidding.

Taken in small doses, this can be affecting stuff, but over the long haul it verges on the unintentionally funny, especially since the Smiths' musical palette is a fairly circumscribed goulash of Bo Diddley and the prolonged sigh of the third Velvet Underground album. What keeps it all bearable, even interesting, is the uniformly splendid instrumental work of Johnny Marr, who gets more out of a twelve-string guitar than anybody since Roger McGuinn.

Nothing in this set of odds and ends, heretofore unreleased in America, approaches the kinetic excitement of the band's previous albums, but if you're in the mood for a good cry, it's probably a worthwhile investment. Recommended to fans of that immortal B. B. King song, Nobody Loves Me But My Mama, and She May Be Jiving Me Too. S.S.

SPANDAU BALLET: Through the Barricades. Tony Hadley (vocals, synthesizers); Gary Kemp (guitars, synthesizers); Martin Kemp (bass); Steve Norman (saxophones, percussion); John Keeble (drums); vocal and instrumental accompaniment. Barricades—Introduction; Cross the Line; Man in Chains; How Many Lies?; Virgin; Fight for Our

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Thompson Twins Alannah Currie and Tom Bailey

*selves*; and three others. EPIC FE 40642, © FET 40642, no list price.

Performance: *For sale*  
Recording: *Okay*

**Epic A&R Man:** Tony, Gary, baby—we absolutely love that New Romantic sound you used to do with your old label. But it doesn't travel well, you know what I mean? Too subtle for American radio. Can you get rid of the disco beat and get a little heavier? You know, like Bon Jovi?

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**A&R:** And put in some big AOR guitar power chords, like Bon Jovi?

**Spandau:** We couldn't do that.

**A&R:** And Tony, could you be just a little less campy and a little more sincere—like Jon Bon Jovi?

**Spandau:** We couldn't do that.

**A&R:** Tony, Gary, I'd like to show you something. This is Bon Jovi's royalty statement for last month.

**Spandau:** . . . AOR? . . . Sure, we could do that. *M.P.*

**THOMPSON TWINS:** *Close to the Bone*. Thompson Twins (vocals and instrumentals); vocal and instrumental accompaniment. *Follow Your Heart; Bush Baby; Get That Love; Twentieth Century; Long Goodbye*; and five others. ARISTA AL-8449 \$8.98, © AC-8449 \$8.98, © ARCD-8449 no list price.

Performance: *Look, don't listen*  
Recording: *Good*

The Thompson Twins have benefited from video as much as any group in the

MTV era. Alannah Currie's blonde tresses, two-foot eyelashes, and enormous hats, Joe Leeway's shaking dreadlocks, and Tom Bailey's London fashions were always more fun to watch than their music was to listen to. You never got the sense that these people were doing anything with their instruments; it was lip-syncing taken so far beyond the limits of credibility, you didn't even notice. Who cares where the music is coming from? It's there, and we look great!

Repeated listening to "Close to the Bone" fails to disclose a single well-constructed song. Instead, the Thompson Twins' latest album is a haphazard collage of unfocused, unaligned percussion, scraps of guitar phrases, and Bailey's rambling vocals, which always seem in search of a song rather than in command of one. Bailey sounds like Donovan on this record, and the songs are just as remote and out of touch with reality. Jamie West-Oram's fluid guitar fills are the only interesting things happening instrumentally, and Currie's lyrics are straight from the Famous Songwriter's School final exam: you could scramble the choruses and verses from any song, and they'd make just about as much sense. Wait for the video. *M.P.*

**RICKY VAN SHELTON:** *Wild-Eyed Dream*. Ricky Van Shelton (vocals); vocal and instrumental accompaniment. *Ultimately Fine; Crime of Passion; Life Turned Her That Way; I Don't Care; Wild-Eyed Dream; Don't We All Have the Right*; and four others. COLUMBIA

B6C 40602, © B6T 40602, © CK 40602, no list price.

Performance: *Covering the bases*  
Recording: *Nice*

Ricky Van Shelton, the pride of Grit, Virginia, gave up his appliance-store manager's job two years ago to move to Nashville. Judging from the cover of his debut album, Van Shelton is the Marlon Brando of country music, stripped to his undershirt and headed for a "stella" career.

Van Shelton has a good, well-controlled baritone and the confidence to put it over. But there's a patina covering this record, a shallowness in producer Steve Buckingham's approach (particularly in the Buck Owens and Merle Haggard classics), and a "just kidding" feel to the whole thing. Part of that comes from the campiness of some of the material: two songs that sound like Elvis; another, the engaging *Crime of Passion*, that mentions somebody's "future ex-husband"; and a perfect—though probably unintentional—parody of country-music lyrics in Harlan Howard's *Life Turned Her That Way*, the sad tale of a woman who's "been walked on, and stepped on, so many times/And I hate to admit it, but the last footprint's mine." Obviously, it's hard to dislike a man who would sing that, but it's also hard to take him seriously. *A.N.*

**TOWNES VAN ZANDT:** *At My Window*. Townes Van Zandt (vocals, acoustic guitar); instrumental accompaniment. *Snowin' on Raton; For the Sake of the Song; Ain't Leavin' Your Love; Buckskin Stallion Blues; The Catfish Song*; and five others. SUGAR HILL ♠ SH-1020 \$8.98, © SH-C-1020 \$8.98.

Performance: *Dignified*  
Recording: *Nice*

Best known as the writer of *Pancho and Lefty* and *If I Needed You*, Townes Van Zandt is the dean of the Texas school of country-folk songwriting. Although he would be the first to admit he is no great shakes as a vocalist—he sounds like a cross between Bob Dylan and fellow Texan Kris Kristofferson—he has taken on cult status through the years for his eight hard-to-find records, all of which present him as a poet of pain and dignity and as a consummate storyteller of engrossing narratives.

In "At My Window," his first album in nine years, Van Zandt displays his customary facility with language and delivers melodies that flow so easily they might have circulated for ages. But while all ten songs gleam with intelligence, character, and calming fortitude, they explore basically two subjects—getting and losing love, and truth and order in nature. There is not one story song among them. This could be a conscious choice on Van Zandt's part, of course, an effort to capture the quixotic torrents of life and love as simply as

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## HUGH MASEKELA

IT may have taken Paul Simon's highly acclaimed "Graceland" album to focus world attention on the rich music of black South Africans, but a handful of these artists have been making records for some time. Foremost among them is trumpeter Hugh Masekela, whose superb new Warner Bros. album, "Tomorrow," represents his return to a major U.S. label.

Masekela came to the U.S. in the Sixties to study at the Manhattan School of Music. Later he appeared with Harry Belafonte and released several solo albums that helped him establish an international reputation. His high-spirited, pepperish horn style and whimsical vocals, however, remained rooted in the music of his homeland. In fact, his biggest hit, *Grazing in the Grass*, was adapted from a Zambian tune.

Masekela returned to Africa in the Seventies, and he continued to produce imaginative, robustly invigorating albums. In "Tomorrow," he has at last fully achieved his artistic mission, creating a masterly fusion of lyrics freighted with political messages and music that pulsates with vitality. The songs have such an affirmative spirit that it is difficult to believe they were inspired by his people's oppression.

The album's tone is quickly established in the opener, *Bring Him Back Home*, which calls for the release of the imprisoned black leader Nelson Mandela. The singers and instrumentalists in Masekela's group Kalahari burst forth with such a glorious surge of strutting music that you want to sing and dance along, at least, or march right out

of the house to a public demonstration. There is a kind of power here that is seldom realized in popular music. Nor does the spirit flag in what follows, as English lyrics are alternated with Zulu in irresistible waves of sound. Perhaps even more powerful than that first track is *Ke Bale*, where the protest motif is more subtly couched in lyrics about boys tending goat herds.

Throughout the album, Masekela's political messages are accompanied by his best trumpet work to date, ranging from the blistering intensity of the upbeat selections to the lyrical passages of *Bird on the Wing*. The back-up performers, all African except for keyboardist Don Freeman, blend vocal harmonies and instrumental statements into an altogether seamless whole.

During his years in the States, Masekela not only mastered Western pop styles but came to appreciate the importance of technical quality in producing a successful recording. In "Tomorrow," recorded in London, he has combined elements of American popular jazz with music of his African heritage to create an inspiring celebration of the freedom yet to be attained by his people.

Phyl Garland

**HUGH MASEKELA:** *Tomorrow*. Hugh Masekela (vocals, trumpet, flugelhorn, percussion); Kalahari (vocals and instrumentals); other musicians. *Bring Him Back Home*; *Mayibuye*; *Ke Bale*; *London Fog*; *Everybody's Standing Up*; *Bird on the Wing*; *Something for Nothing*; *Serengeti*. WARNER BROS. 25566-1 \$8.98, © 25566-4 \$8.98.

possible, or an exercise in exploring the the musical, as opposed to the lyrical, aspect of his work. But after nine years in the making, this record, for all its quiet charm and clarity of thought, adds up to less than expected. A.N.

**ROGER WATERS:** *Radio KAOS*. Roger Waters (vocals, guitar, bass, keyboards); vocal and instrumental accompaniment. *Radio Waves*; *Who Needs Information*; *Me or Him*; *The Powers That Be*; *Sunset Strip*; *Home*; *Four Minutes*; *The Tide Is Turning (After Live Aid)*. COLUMBIA FC 40795, © FCT 40795, © CK 40795, no list price.

Performance: *Impassioned*  
Recording: *Very good*

Roger Waters's "Radio KAOS" is a digital-age parable about the capitulation of radio—and the rest of Western society with it—to the rule of "market forces." Waters's point is that radio has become the slave of demographics and market research, so that programming decisions are no longer based on music values, and that this slavish pursuit of profit is symbolic of society's headlong plunge into money madness. "Radio KAOS" depicts the conditions created by this tyranny of economics, an electronic world of alienation and uncomprehending brutality. The protagonist is Billy, sort of a 1980's version of the Who's Tommy—confined to a wheelchair and, to all appearances, incapable of speech or understanding. But Billy can receive and transmit radio waves, and he carries on a running dialogue with a DJ at KAOS (played by Jim Ladd, who in real life left KMET in Los Angeles when that station changed from rock to New Age).

Like most rock dramas, the plot is half-baked. But, surprisingly, the music is pretty good. The sweeping electronic counterpoint, churning rhythms, and spacy guitars and horns will be instantly familiar to fans of Pink Floyd. Intricate melodies sung in Waters's droopy Midlands accent are backed by intergalactic gospel choruses. Surging sax lines and wiry guitar tendrils veer forth from the big dance beats and rolling synthesizer charts. Fortunately, Waters is just wacky enough to keep from being preachy or heavyhanded. In addition to Billy and the DJ, for instance, there are a number of "California Weirdos" who go on at some length about their strong dislike for fish. Waters peppers his narrative with clever observations and odd asides. And you can't quarrel with his politics: Market forces may make for sound economics, but there's a tremendous human cost involved in achieving an "efficient" market—and demographics-driven programming makes for sterile, least-common-denominator radio. M.P.

**PATRICK WILLIAMS:** *10th Avenue*. Patrick Williams' New York Band (instrumentals). *The Chant*; *Her Song*; *Jive*

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Performance: *Easy listening*  
Recording: *Very good*

When Rolling Stones drummer Charlie Watts brought his big band to the U.S. last year, he had to know that if we weren't impressed with its sound, we would at least have to marvel at its size. As it turned out, many were impressed on both counts. Now comes another bigger-than-life band, this time a local one. The man behind it—and, for that matter, in front of it as well—is Patrick Williams, who also owns the Soundwings label. Williams's orchestra is five men short of matching the Watts band, but except for Michael Brecker, who contributes two tenor solos, there are no reed players; that section, the traditional backbone of big bands, has been replaced by four synthesizers. Of course, we all know that four synthesizers can be made to sound like two or three symphony orchestras—in terms of volume, at least—but here their role is tastefully underplayed.

The program is a good blend of Wil-

liams originals (*10th Avenue, Her Song*), Sixties jazz tunes (*The Chant, Jive Samba*), and more recent pop material (*Still Crazy After All These Years, New York State of Mind*), but the treatment of these songs is neither exciting nor innovative. The band plays with admirable precision, and its smooth Fifties sound is pleasing to the ear, but Williams's polite arrangements leave little room for solos. With Bill Watrous, the Brecker brothers, Marvin Stamm, and Richard Tee on hand, that seems rather wasteful.

C.A.

**TAMMY WYNETTE: *Higher Ground.*** Tammy Wynette (vocals); Ricky Skaggs, Gene Watson, Emmylou Harris, Vince Gill, the Gatlin Brothers, the O'Kanes, Rodney Crowell (background vocals); other musicians. *Your Love; Tempted; Some Things Will Never Change; Beneath a Painted Sky; Talkin' to Myself Again; There's No Heart So Strong*; and four others. EPIC FE 40832, © FET 40832, no list price.

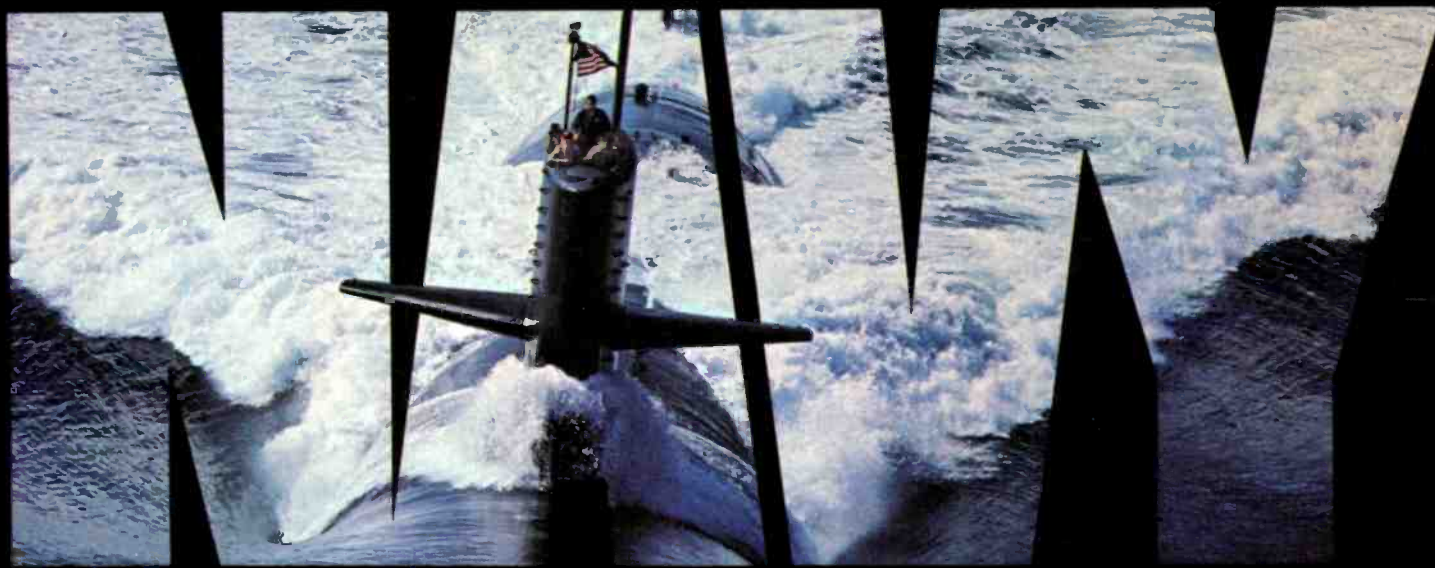
Performance: *Bolstered*  
Recording: *Nice*

Despite her mesmerizing voice and her impeccable gift for phrasing, it's been a long time since Tammy Wynette weighed in with an album worth its

vinyl. It's even longer since she tried to keep it country. With "Higher Ground," however, Wynette delivers a couple of surprises. First, instead of the avalanche of strings we've come to expect from her, Wynette and producer Steve Buckingham have gone the traditional route here, serving up a mostly acoustic, dobro-mandolin-and-fiddle-flavored set. Second, there are cameo appearances by the likes of Emmylou Harris, Vern Gosdin, Ricky Skaggs, Vince Gill, and the O'Kanes. With the exception of Gosdin, who gets to do a proper duet, the other singers stay dutifully in the background, so much so that sometimes they are mixed so far beneath Wynette that they could be anybody—you wouldn't know who they were without reading the jacket.

All told, though, this is a welcome little album, full of charming instrumental touches—particularly from Mark O'Connor on fiddle and mandolin—and a handful of remarkable vocal performances from Wynette, especially in *I Wasn't Meant to Live My Life Alone* and *All Through Throwing Good Love After Bad*. These are the songs, after all, on which Wynette gets to suffer, sob, and pine. And in the Suffer and Sob department, Wynette still has no equal.

A.N.



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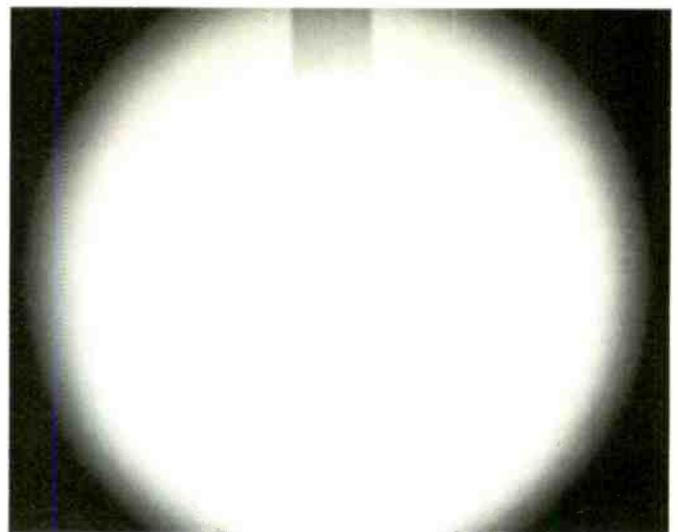
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# JAZZ

**CANADIAN BRASS: *Basin Street.*** Canadian Brass (instrumentals); George Segal (banjo, vocals). *Sweet Georgia Brown; Amazing Grace; St. Louis Blues; Royal Garden Blues; Beale Street Blues; High Society March;* and nine others. FM/CBS FM 42367, © FMT 42367, © MK 42367, no list price.

Performance: *Excellent*  
Recording: *Echoy*

Producer James Mallinson should be sentenced to spend major time in an echo chamber for the dreadful sound he has given the Canadian Brass in "Basin Street." This is a wonderful group, and its slick, carefully arranged program of Dixieland standards would have been enjoyable if only it had been better recorded. So much echo has been added to these tracks that it sounds as if the Canadian Brass were playing from the far side of a very long pipeline. Both the group and arranger Luther Henderson deserve better. C.A.

**CHICK COREA: *Light Years.*** Chick Corea Electric Band (instrumentals). *The Dragon; Your Eyes; Flamingo; Prism; Starlight; Time Track;* and three others (six others on CD). GRP ● GR-1036 \$8.98, © GRC-1036 \$8.98, © GRD-9546 no list price.

Performance: *Drudgery*  
Recording: *Good*

Seventeen years have passed since pianist Chick Corea jumped fingers first into a burgeoning fusion trend by forming his group Return to Forever. He has since returned to more demanding music, most notably in some wonderful acoustic teamwork with vibist Gary Burton. Some of Corea's early fusion music was quite exciting, but I can't say that about "Light Years," a very long hour of mechanical music. C.A.

**RONNIE CUBER: *Passion Fruit.*** Ronnie Cuber (baritone saxophone); George Benson (guitar); Richard Tee (electric piano); other musicians. *What It Is; Love Notes; Come Dance with Me;* and three others. PROJAZZ © PCJ 616, © CDJ 616, no list price.

Performance: *Thrashing it out*  
Recording: *Quite good*

**RONNIE CUBER: *Two Brothers.*** Ronnie Cuber (baritone saxophone); David Sanborn (alto saxophone); Steve Gadd (drums); other musicians. *Move It; On Green Dolphin Street; Pin Point; Heavy Hang;* and three others. PROJAZZ © CDJ 623, © PCJ 623, no list price.

Performance: *Somewhat boring*  
Recording: *Quite good*

**RONNIE CUBER: *Live at the Blue Note.*** Ronnie Cuber (baritone saxo-



Duke Ellington: rich legacy

phone); Randy Brecker (trumpet); Lonnie Smith (organ); Ronnie Burrage (drums); others. *Nica's Dream; Night and Day; Maiden Voyage; Tune Up;* and four others. PROJAZZ © CDJ 629 no list price.

Performance: *Instant relief*  
Recording: *Good remote*

When Ronnie Cuber auditioned for the Newport Youth Band in the late Fifties, he was told that there were too many tenors already, so he became a baritone sax player. Since then, he has played with a number of name bands and groups, including some led by Maynard Ferguson, Woody Herman, George Benson, King Curtis, and Lionel Hampton. He has also been heavily involved in session work, often accompanying rock and rhythm-and-blues acts. That, I suppose, accounts for the honking quality of his playing these days, but it does not explain why one record company would release three Cuber CD's simultaneously as ProJazz has done.

The first, "Passion Fruit," sounds like a gathering of studio musicians. Its pedestrian sound, belying the talent of producer/arranger David Matthews, is reminiscent of Stuff, a group of New York session men that enjoyed some success ten years ago. Indeed, Stuff pianist Richard Tee plays on the set. Another Stuff alumnus, drummer Steve Gadd, is heard on "Two Brothers," which Matthews is also responsible for. Featuring alto saxophonist David San-

born, it is more musical, but it still adheres too strictly to a tried and not-so-true fusion formula. Cuber is heard to best advantage in *On Green Dolphin Street*, where he takes his somewhat cumbersome instrument aloft with commendable results. The rhythm section is also more flexible on this set.

There is one quite worthwhile set among the three, however, and that's Cuber's "Live at the Blue Note." The program includes familiar material by Miles Davis, Horace Silver, Cole Porter, Herbie Hancock, and Dizzy Gillespie—all played in a straightforward bop style, unlike the artificial stuff Matthews cooked up for the other two albums. You get the feeling that there is actual communication among the group's members. The difference in Cuber's playing is startling, Randy Brecker is clearly inspired, and the Lonnie Smith/Ronnie Burrage team is right on target. C.A.

**DUKE ELLINGTON: *In the Uncommon Market.*** Duke Ellington and His Orchestra (instrumentals). *Bula; Asphalt Jungle; Kinda Dukish; Guitar Amour; Star-Crossed Lovers;* and five others. PABLO/FANTASY 2308-247 \$8.98, © 52308-247 \$8.98, © 2308-247-2 no list price.

Performance: *Exquisite*  
Recording: *Excellent remotes*

When Duke Ellington died in 1974, he left a rich legacy of recordings spanning more than half a century. Just a small fraction of this enormous output would qualify Ellington for his lofty niche in the jazz pantheon, yet new material keeps appearing.

"Duke Ellington in the Uncommon Market" is a set of Ellington recordings made by Norman Granz at various European locations in the Sixties. It opens with *Afro-Bossa*, which Ellington often introduced as *Bula* and sometimes described, with typical wit, as "the gutbucket bolero." In this selection and one other, *I Want to Love You* (here listed as *Asphalt Jungle*), the band itself comes front and center. Otherwise the program continues with a succession of compositions featuring some of the great Ellington stars: *Silk Lace*, a 1963 composition also known as *Caliné*, is designed to show off the talent of clarinetist Jimmy Hamilton and succeeds admirably. *Star-Crossed Lovers*, from Ellington's *Shakespearean Suite* of 1957, belongs to the mellow, articulate alto voice of Johnny Hodges. *E.S.P.* and the 1935 Ellington standard *In a Sentimental Mood* generate disparate atmospheres, but both are vehicles for the surging, full-throated tenor saxophone of Paul Gonsalves. Set against an exotic, hypnotically swelling background of



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rhythm, Ray Nance's violin dominates *Guitar Amour*, which is from the 1960 film *Paris Blues* and has little to do with a guitar.

The album's last sixteen minutes are given over to the leader's piano in trio recordings made for a film short that featured Ellington and Spanish painter Juan Miró. There are two bouncy takes of *The Shepherd* and a joyous stride through the 1955 *Kinda Dukish*. It is all wonderfully Dukish. C.A.

**MANHATTAN JAZZ QUINTET:** *Autumn Leaves*. Manhattan Jazz Quintet (instrumentals). *Jordu*; *Confirmation*; *Mood Piece*; *Autumn Leaves*; *Recado Bossa Nova*. PROJAZZ © CDJ 625 no list price.

Performance: *Blunt bop*  
Recording: *Very good*

**MANHATTAN JAZZ QUINTET:** *Live!* Manhattan Jazz Quintet (instrumentals). *Angel Eyes*; *'Round Midnight*; *Autumn Leaves*; *So This*; *Misticized*; *S.U. Blues*. PROJAZZ © CDJ 637 no list price.

Performance: *Live and lively*  
Recording: *Good remote*

The Manhattan Jazz Quintet, led by pianist/arranger David Matthews, is made up of articulate musicians who are much in demand for studio work in the New York area. Having all too often had to play in restricted musical environments, they obviously enjoy the freedom of being able to improvise within a freewheeling bop group. "Live!" was recorded digitally during a Tokyo appearance early last year. Running over seventy minutes, the CD is certainly generous in terms of time, and it offers spirited jazz from a group that obviously enjoys mutual rapport and has fun demonstrating it. There's not a bad track here. You especially won't want to miss Lew Soloff's unorthodox trumpet work in Monk's *'Round Midnight*.

"Autumn Leaves," twenty-four minutes shorter, features the quintet in a 1985 New York studio recording that includes two bop classics, *Jordu* and *Confirmation*. The personnel is the same except that Charnett Moffett, a fine and as yet fairly unknown bassist, replaces Eddie Gomez. Again, the music is worthy of the discriminating ear, although this is not the kind of session that will go into the history books—relatively few studio sessions actually do. Here, too, are animated solos from the horns of Lew Soloff and tenor saxophonist George Young, and all is captured with digital clarity and a wide frequency range. C.A.

**MODERN JAZZ QUARTET:** *Three Windows*. Modern Jazz Quartet (instrumentals); New York Chamber Symphony, John Lewis cond. *Three Windows*; *Kansas City Breaks*; *Encounter in Cagnes*; *Django*; *A Day in Dubrovnik*.

ATLANTIC 81761-1 \$8.98, © 81761-4 \$8.98, © 81761-2 no list price.

Performance: *Superb*  
Recording: *Excellent*

The Modern Jazz Quartet has been with us for so many years that it has long since become a jazz staple. Even during the seven years that its members pursued individual careers after the MJQ's breakup in 1974, they remained identified with the group, and even as we welcomed their reunion in 1981, to many of us it seemed as if the MJQ had never really been gone. The fresh performances in the new "Three Windows" serve to remind us that the MJQ is indeed active once again.

The album's title track is an update of some of the music Lewis wrote for the film *No Sun in Venice* and includes one of the quartet's most celebrated themes, *The Golden Striker*, featuring vibraphonist Milt Jackson. *Django*, another of their enduring pieces, dates back thirty-three years and is enhanced here by a rewrite calling for string backing by the New York Chamber Symphony. *A Day in Dubrovnik*, an extended work originally recorded by the quartet in 1976 with I Solisti di Zagreb, has also been updated and rearranged as a suite in three movements.

If you think mood music and substance don't mix, listening to the MJQ's "Three Windows" will give you a clearer view. C.A.

**SOUNDSTROKE:** *Laser Woodcuts*. SoundStroke (instrumentals). *Back Talk*; *Fluffy Ruffles*; *Diabolic Variations*; *Send In the Clowns*; *Memory*; *Portico*; and five others, SECOND HEARING © GS 9008 no list price.

Performance: *Striking*  
Recording: *Very good*

SoundStroke, a ten-piece percussion ensemble from the University of Oklahoma, made "Laser Woodcuts" to take advantage of digital recording and the compact disc medium. And it is indeed a medium ideally suited for capturing the dynamics and subtle nuances of this unusual group. Its hodgepodge repertoire is delightful, ranging from obscure rags to Chopin (seriously reworked), Prokofiev, and Sondheim, with a mesmerizing mallet mixture interspersed. I am hard put to place this music in a category; it is certainly not jazz, nor would I call it pop, and neither is it classical. There is a novelty aspect to SoundStroke's sounds, but that term implies gimmickry. Sure, there is hokum afoot here, but it is executed with a virtuosity that renders it quite legitimate. There are beautiful, somber pieces in this bouquet, but if there is a dominating mood here it is one of joy and fun. C.A.

**MICHAEL WEISS:** *Presenting Michael Weiss* (see Best of the Month, page 90)

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## THE DIGITAL REVOLUTION (Continued from page 62)

sampling rate of 48 kHz, deliberately making the DAT format incompatible with compact discs and necessitating an analog stage if recordings of CD's were to be made. While some of the early prototypes could record at both the DAT and CD sampling rates, none of the machines that have been brought to market in Japan have that capability. And if the Copycode controversy in the U.S. is decided in favor of the record companies, dubbing of encoded recordings will be impossible even if the digital signal is converted to analog and back again.

One novel application of tape technology for digital sound is a series of experimental broadcasts by Boston's WGBH television. During off-hours, the station has broadcast digital music on its video channel; anyone tuning in saw only a series of vertical lines on the screen, but if the broadcast were recorded on a VCR and played back through a PCM adaptor, true digital sound could be heard. Digital broadcasting

on a regular basis would seem to be a long way off in this country, however, although it is already a reality in Europe.

### *A Digital Future*

Virtually all the development effort in digital audio has been focused on record/playback methods, whether disc- or tape-based, but there is every reason to suppose that digital technology will eventually affect all areas of audio. Some digital techniques have already been employed by amplifier manufacturers, for instance, in the so-called Class D switching amplifier. Infinity and Sony, both of which marketed Class D amplifiers for some time, never really perfected the component, but the problems were undoubtedly solvable. In time, not only digital amplifiers but other components will appear as well.

According to one prominent audio researcher and commentator, Dr. Floyd E. Toole of Canada's National Research Council, the opportunities for signal processing in an all-digital system are very great.

Toole points out that the basic control functions could be supplemented by a whole range of special processes to tame the more troublesome acoustic characteristics of listening rooms, either automatically or by means of a simple series of computer programs. Speaker manufacturers could design their products to optimize efficiency and dispersion, say, and then supply a card for insertion into an appropriate receptacle in an amplifier, which would then automatically correct for phase or balance anomalies.

Even purely digital speakers are theoretically possible, says Toole, and prototypes have been shown to the scientific community. However, he notes, these are fairly primitive so far and will probably find their initial use in the telephone market. Hi-fi versions are a long way off. But we thought digital audio was a long way off back in 1972. Perhaps fifteen years from now we will take all-digital audio systems for granted and be bowled over by some new audio technology that most of us today have never heard of. □

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

**BACH:** *The Goldberg Variations (BWV 988)*. Kenneth Gilbert (harpsichord). HARMONIA MUNDI ● 1240 \$11.98, © 401240 \$11.98, © 901240 no list price.

Performance: *Cerebral*  
Recording: *Splendid*

Aside from technical virtuosity, Bach's monumental Goldberg Variations require a harpsichordist who is equally at home in several musical forms and styles. Kenneth Gilbert comes very close. His playing of the canons is a study in clarity, and the lyricism is tenderly wrought. But the brilliance in the virtuoso variations is too subdued.

In the performer's note accompanying this recording, Gilbert writes that he conceives the work as essentially a cycle of canonic and contrapuntal work-outs, so that the virtuosic elements are deliberately tossed off. This view governs his apparently arbitrary observance of repeats. He takes them all for the canons and most of the lyrical variations, but he sails through the technically flashy variations without repeats. The result is a performance that emphasizes the cerebral aspect of the work above all else, and that, I believe, is contrary to Bach's careful placement of the three different types of variations. Nonetheless, the playing is fine, and the album is another positive contribution to Gilbert's discography. *S.L.*

**BEETHOVEN:** *Symphony No. 6, in F Major, Op. 68 ("Pastorale"); Leonore Overture No. 3, Op. 72b*. Cleveland Orchestra, Christoph von Dohnányi cond. TELARC © CD-80145 no list price.

Performance: *Elegant symphony*  
Recording: *Very good*

These Beethoven performances conducted by Christoph von Dohnányi range from the perfunctory in the *Leonore* No. 3 to the elegantly refined in the first four movements of the *Pastorale*. There is a beautifully transparent realization of the arrival in the countryside, paced briskly but not uncomfortably so, a serenely flowing but not somnolent brook, with the concluding bird song exquisitely articulated (notably the flute echo effect), a snappy peasant dance, and a sternly controlled storm. The

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*Pianist Janis Vakarelis: brilliance to burn*

## LISZT AND PROKOFIEV

**T**HE new recording of the Liszt Second Piano Concerto and the Prokofiev Third by Janis Vakarelis, with the Royal Philharmonic Orchestra under Witold Rowicki, is the first concerto recording to be issued on the orchestra's own label, RPO Records (distributed here by MCA Classics). You may not have heard of this thirty-seven-year-old Greek pianist, but you won't forget him after you've heard this recording. These are quite exceptional performances of both works: charged with vitality, as responsive to the music's varying moods as to its coloring, and with the solo and orchestral elements remarkably well meshed.

If Vakarelis has brilliance to burn, he displays it with a fine sense of subtlety, wit, and all-round elegance, and the choice of Rowicki as his collaborator was surely an inspired one. This Polish conductor has turned in some outstanding recordings of symphonies by Dvořák and Shostakovich in the not-too-distant past, but he's been even more impressive, perhaps, as concerto companion to such pianists as Sviatoslav Richter and Ingrid Haebler. He has the RFO at the top of its form here, and between him and Vakarelis not a detail is missed in either the Liszt or the Pro-

kofiev. The clarity of the performances is never achieved at the expense of momentum: the sense of heady spontaneity is as remarkable as the other virtues already cited.

We have become accustomed to having the two Liszt concertos packaged together—a sensible and convenient arrangement, to be sure—but if the combination of the Liszt Second and the Prokofiev Third appeals to you (I can't recall its ever having been offered before), this stunning release should leave absolutely nothing to be desired. If it is not what you had in mind, you're going to find it irresistible anyway once you've heard it, and you won't be at all concerned about duplication. The recording itself offers not only outstanding clarity but a quality that is rich and live without being overinsistent. It could serve as a model of how a piano and an orchestra ought to be recorded together. *Richard Freed*

**LISZT:** *Piano Concerto No. 2, in A Major*. **PROKOFIEV:** *Piano Concerto No. 3, in C Major, Op. 26*. Janis Vakarelis (piano); Royal Philharmonic Orchestra, Witold Rowicki cond. RPO/MCA CLASSICS ● MCA-6204 \$9.98, © MCAC-6204 \$9.98, © MCAD-6204 no list price.

symphony concludes with a thanksgiving hymn that is more raucous than usual, however, and despite some of the best recorded sound I've heard from Severance Hall, I don't feel impelled to replace any Sixth Symphony already in my library with this one—nor any *Leonore* No. 3, either. *D.H.*

**BEETHOVEN:** *Symphony No. 8, in F Major, Op. 93; Symphony No. 9, in D Minor, Op. 125.* Suzanne Murphy (soprano); Carolyn Watkinson (mezzo-

soprano); Dennis O'Neill (tenor); Gwynne Howell (bass); Tallis Chamber Choir; English Chamber Orchestra, Michael Tilson Thomas cond. CBS ◉ M2 39711 two LP's, © M2T 39711 two cassettes, © M2K 39711 two CD's, no list price.

Performance: *Good, but...*  
Recording: *A little rough*

A few years ago Michael Tilson Thomas and the English Chamber Orchestra launched their Beethoven symphony

cycle with an especially ingratiating account of the *Pastorale*, which remains competitive among LP versions. Subsequent installments in the series have been less notable, and CBS has doomed this one, ensuring that it will *not* be competitive, by gratuitously splitting the performance of the Ninth, which runs sixty-six and a half minutes and could, of course, have fit comfortably on a single CD. Instead, the first movement of the Ninth is on a disc with the Eighth, which might more sensibly and more economically have been coupled with another whole symphony. While both performances are well paced, beautifully detailed, and perfectly satisfactory in every respect, neither is special enough to justify investing in a package whose layout seems downright contemptuous of the consumer. The sound quality, too, is rather fierce, particularly in No. 8. *R.F.*

**BERLIOZ:** *Les Nuits d'été, Op. 7* (see WAGNER)

**CHAUSSON:** *Le Roi Arthur.* Teresa Zylis-Gara (soprano), Guenievre; Gino Quilico (baritone), Arthur; Gösta Winbergh (tenor), Lancelot; René Massis (baritone), Mordred; Gilles Cachemaille (bass), Merlin; others. Chorus of Radio France; Nouvel Orchestre Philharmonique, Armin Jordan cond. ERATO/RCA ◉ NUM 75271 three LP's \$32.94, © MCE 75271 three cassettes \$32.94, © ECD 88213 three CD's no list price.

Performance: *Impassioned*  
Recording: *Full, lush*

Of Ernest Chausson's three operas, *Le Roi Arthur* is the only one that was ever performed. Staged some four years after the composer's death, it met with considerable success. A passionate Wagnerite, Chausson was influenced by the Bayreuth master, particularly in the work's rich, thick orchestration, yet the music overall has a distinctly Gallic flavor. The libretto, which Chausson wrote, is almost a parallel to *Tristan*, but Chausson follows one of the most celebrated Arthurian legends.

*Le Roi Arthur* tells the story of the adulterous love between the monarch's young wife, Guenievre, and his favorite knight and kinsman, Lancelot, and of Arthur's self-immolation in the cause of forgiveness. The highly romantic story unfolds in a pleasing vocal line, though I find the writing for the male voices more rewarding than that for Guenievre, which lies uncomfortably high for Teresa Zylis-Gara in this new recording. The men's performances, however, are of a high order throughout.

Indeed, the principal dramatic problem with *Le Roi Arthur* is the character of Guenievre. We see her first as deceitful, then as abandoned to sensuality, third as a coward and liar, and last as a demanding shrew. That she strangles herself with her own hair (rather difficult, I would imagine) after Lancelot's


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# Stereo Review

high-minded desertion of her does not make amends for her generally unattractive behavior up to that point.

It is the orchestra, however, that makes this opera glow. Rich, full-bodied, swelling with melody, the orchestral passages are, for me, the principal focus of interest. The interludes separating the six scenes are particularly compelling. Chausson fancied himself primarily a composer for the voice, but in *Le Roi Arthur* it is his mastery of orchestral color that captures the imagination, and the admirable performance by the Parisian orchestra under the engaged direction of Armin Jordan does him full justice. I can recommend this recording to admirers of Chausson's music, currently enjoying something of a resurgence, to opera collectors eager to expand their horizons, and to listeners who, like me, enjoy being swept away by glorious orchestral sound. *R.A.*

**DEBUSSY: *Images, Sets I and II; Images (1894); Estampes; Pour le piano.*** Jacques Rouvier (piano). DENON © 33CO-1411 no list price.

Performance: *Excellent*  
Recording: *First-rate*

Jacques Rouvier's coverage of Debussy's piano music for Denon becomes more appealing with each successive installment, and this sixty-five-minute collection is especially satisfying. The late Paul Jacobs made the premiere recording of the long-lost (or, at least, long-forgotten) 1894 *Images*, which preceded the two better-known sets by more than a decade and which includes material used in the still later orchestral *Images*, and at least one other pianist, Zoltán Kocsis, has since made a handsome recording of it, on Philips, in a collection similar to this new one. In terms of programming alone, Rouvier is to be preferred for offering all three sets of *Images*, as Jacobs did; in terms of performance, he quite comfortably holds his own against the most distinguished interpreters of this repertoire. He is perhaps somewhat understated in comparison with Kocsis in the last of the 1894 *Images*—the one that shares a folk-song base—"Nous n'irons plus au bois"—with the last of the orchestral *Images*, but throughout the recorded program Rouvier's unfailing sensitivity and taste keep the artistic level very high. His playing is always civilized but never, to my ear, cold; it seems effortlessly idiomatic.

The recorded sound is not as dazzlingly vivid as some of Denon's other productions, but it is first-rate by any standard, and the quality of the annotation shows a welcome improvement over what this label has provided in the past. Highest recommendation. *R.F.*

**DVOŘÁK: *Symphony No. 8, in G Major, Op. 88.*** Vienna Philharmonic Orchestra, Herbert von Karajan cond. DEUTSCHE GRAMMOPHON © 415 971-1,



Carlo Maria Giulini: warmly humanistic Franck

© 415 971-4, © 415 971-2, no list price.

Performance: *Brilliant*  
Recording: *Splendid*

Chalk up yet another fine recording of this lovely Dvořák symphony. Herbert von Karajan takes a fiercer view of the Eighth than most conductors do, especially in the third movement, which is usually taken at an easygoing lilt. Such is far from the case here, and, indeed, Karajan's reading is more imbued with nationalistic fervor than most Czech performances I've heard. The sound of the Vienna strings and woodwinds is gloriously warm, in a more pleasant acoustic ambience than most of Karajan's Berlin recordings get. On the minus side is the short playing time (just under thirty-seven minutes). Christoph von Dohnányi and the Cleveland Orchestra offer a comparably fine reading of the symphony on a London CD that has Dvořák's superb *Scherzo capriccioso* as a bonus. *D.H.*

**FRANCK: *Symphony in D Minor; Psyché et Eros.*** Berlin Philharmonic Orchestra, Carlo Maria Giulini cond. DEUTSCHE GRAMMOPHON © 419 605-1, © 419 605-4, © 419 605-2, no list price.

Performance: *Intensely lyrical*  
Recording: *Mellifluous*

Carlo Maria Giulini's view of the Franck symphony results in a performance quite different from the almost Verdian drama of Riccardo Muti's or the hot, impassioned one by Leonard Bernstein. Giulini's might be described as warmly humanistic, with emphasis on an unbroken lyrical flow. The opening movement is paced deliberately and comes close to the playing time of Tos-

canini's 1940 NBC Symphony broadcast recording. One small questionable point in my mind is the extra weight Giulini gives to the "big tune," or secondary subject. The slow movement is notable for both its steadiness and lack of exaggeration. The opening pages of the finale seem overdeliberate in tempo, but I am beguiled by the delicacy with which Giulini handles the development section leading up to the climactic recall of the second movement's main theme.

*Psyché et Eros* is the instrumental fourth movement of Franck's choral-orchestral tone poem *Psyché*, and its sensuous lyricism is right up Giulini's alley. Recorded at the Philharmonie in Berlin, both works sound decidedly warmer in tone than Herbert von Karajan's recent recordings in the same hall, falling most gratefully on the ear. *D.H.*

**GADE: *Symphonies Nos. 1-8.*** Stockholm Sinfonietta, Neeme Järvi cond. Bis © CD-338 (Nos. 3 and 4), CD-399 (Nos. 1 and 8), CD-355 (Nos. 2 and 7), CD-356 (Nos. 5 and 6), no list price.

Performance: *Splendid*  
Recording: *Mostly excellent*

Together with his father-in-law, J. P. E. Hartmann, Niels Wilhelm Gade (1817-1890) epitomized the high-Romantic era in Danish symphonic and choral music. Although his First Symphony, *On Sjolund's Fair Plains*, has been considered, in Denmark at least, to be the first work of its kind in a national-Romantic idiom, his most famous work remains his Op. 1 overture, *Echoes of Ossian*, which he composed in 1840 at the age of twenty-three.

Felix Mendelssohn took a fancy to the First Symphony and conducted its premiere in 1842 at the Gewandhaus in

## MUSIC FOR THREE PIANOS

ALEXANDER TORADZE, who settled in the United States four years ago, was not preceded here by recordings as other pianists from the Soviet Union have been. He had toured widely, however,



Alexander Toradze

and since his arrival here he has been standing audiences and fellow musicians on their collective ear by his stunning performances with our major orchestras. It is only now, at forty, that he has begun recording in the West, and his first release here, on Angel, may be the most impressive piano recording of the year. It is surely destined to become a classic, containing simply indispensable performances of Prokofiev's Seventh Sonata, Stravinsky's Three Movements from *Petrushka*, and Ravel's *Miroirs*.

In the Prokofiev and Stravinsky, of course, Toradze comes into direct competition with what already is a classic, Maurizio Pollini's 1971 recording of those two works, which Deutsche Grammophon recently transferred to CD. While in a sense comparison at this level is rather beside the point, Toradze's performances are notable for sheer power and brilliance, and he brings to them something more: a lusty, earthier spirit, warmer splashes of color, and a somewhat bolder range of dynamics than Pollini does with his steely and occasionally icy approach. That approach is dazzling, but Toradze's is dazzling and embracing at the same time.

Moreover, in addition to the difference fifteen years can make in terms of sound quality (DG's sound for Pollini is still very good, but EMI's for Toradze is sensationally realistic), most listeners are likely to find the Ravel *Miroirs* on Toradze's disc more fetching than the Boulez Second Sonata and Webern Variations that fill out Pollini's. The Ravel is very effectively placed between

the two Russian works, and each of its five component pieces is realized with an unerring flair for its poetry and fantasy—and a downright awesome relish of its pianistic challenge. And Toradze no doubt relishes the challenge he has set himself with this extraordinary debut recording.

The framing of Ravel between Prokofiev and Stravinsky on Toradze's disc not only happens to provide an alphabetical order for the program but may remind us of the cross-pollination between French and Russian music that was so especially fertile at the time these composers were starting out. The symbolic summing-up of that productive exchange is Ravel's famous orchestral setting of Mussorgsky's *Pictures at an Exhibition*. The original piano version of that work dominates the first solo recording by young Barry Douglas, whose career was launched by his winning the Tchaikovsky Competition last year in Toradze's native country.

*Pictures* was Douglas's big solo piece in the competition, and his recorded performance on RCA is more impressive and more enjoyable than his showy but shallow recording of the Tchaikovsky Concerto No. 1 (also RCA). In fact, Douglas's *Pictures* bears comparison with the best around—which, on CD, comes down to Vladimir Ashkenazy on London. Douglas uses the same edition of the score Ashkenazy used, and he shows a similar feeling for the work. I like his moving-along tempo for the final piece and his deliberate one for "Bydlo." I did not much care for the way he hams up "The Old Castle," which would have benefited from the sense of easy dignity he brings to the finale, but in general all the sections of the work are well characterized.

With *Pictures* are two works by Liszt,



Richard Shirk

the so-called *Dante Sonata* and the transcription of the *Liebestod* from Wagner's *Tristan und Isolde*. The former is given a loving, unhurried presentation, not without elegance but without the sort of concentrated intensity Alfred Brendel and Jorge Bolet, among others, have brought to the more overtly dramatic sections.

Richard Shirk does not play any Russian music on his all-Mozart debut disc, and he hasn't come from a triumph in Moscow. In fact, the label itself, Classic Masters, is making its debut on CD, and it's an auspicious one. Shirk did win the Leschetizky Competition in 1978, and he has won a good deal of favorable attention as a Mozart player both here and abroad, notably in Salzburg. His performances of the magnificent C Minor Sonata (K. 457), the elegant B-flat Sonata (K. 333), the Dupont Variations (K. 573), and the Adagio in B Minor (K. 540, not on the LP version) are exceptional for the sense of authority, freshness, and all-round persuasiveness they convey. Shirk is clearly "inside" this music and draws the listener in with him without any mystic fuss, playing a big modern piano and making no attempt at disguising it. He is especially successful in the Dupont Variations, finding precisely the right character for each episode, yet with a natural pulse and momentum that make the set more than a mere sequence of episodes. But similar virtues illumine and enliven all the music in this collection, and the program itself is as appealing for its variety as for its substance. The analog recording, vintage 1983, is first-rate too, and not only is it available on LP and CD but it is also slated for release on prerecorded digital audio tape, or DAT.

Richard Freed

**PROKOFIEV:** *Piano Sonata No. 7, in B-flat Major, Op. 83.* **RAVEL:** *Miroirs.* **STRAVINSKY:** *Three Movements from "Petrushka."* Alexander Toradze (piano). ANGEL ● DS-37360 \$11.98, © 4DS-37360 \$11.98, © CDC-47607 no list price.

**MUSSORGSKY/RAVEL:** *Pictures at an Exhibition.* **LISZT:** *Après une lecture du Dante.* **WAGNER/LISZT:** *Tristan und Isolde, Liebestod.* Barry Douglas (piano). RCA ● 5931-1-RC \$8.98, © 5931-4-RC \$8.98, © 5931-2-RC no list price.

**MOZART:** *Piano Sonata No. 14, in C Minor (K. 457); Variations on a Minuet by Dupont (K. 573); Piano Sonata No. 13, in B-flat Major (K. 333); Adagio in B Minor (K. 540).* Richard Shirk (piano). CLASSIC MASTERS/HARMONIA MUNDI CMS-1005 \$10.98, © CMCD-1005 \$15.98, DAT CMDT-1005 no list price.



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Leipzig. Within a year, Gade himself was in Leipzig under a Danish state grant and was soon deputizing as conductor for his renowned mentor. Only Mendelssohn's untoward death in 1847 and the war between Denmark and Prussia in 1848 forced Gade back to Denmark, where he eventually became the power on the Danish musical scene for the remainder of his life. His eight symphonies encompass a period of some thirty years. The first three take him from Copenhagen through his years in Leipzig, and the other five were composed back in Denmark. The musical language of Mendelssohn and Schumann pervades all eight of them, but each is endowed with an element of poetic and exuberant lyricism of Gade's own.

His Symphony No. 1 is wholly beguiling for its youthful energy and flavor of the Danish ballad-song. Although No. 2 is more beholden to Mendelssohn, it offers a splendidly energetic finale with a memorable refrain-style tune. The Third Symphony also recalls Mendelssohn but culminates in a finale of almost ferocious impetuosity that is more like Schumann. I find No. 4 at its best in the sun-drenched, lyrical opening pages of the slow movement. The Fifth is distinctly unusual in its use of a

concertante solo piano throughout, but it is still heavy on Mendelssohn.

The Symphony No. 6 was composed while Gade was recovering from the death of his young wife shortly after she gave birth to twins. The work seems to have served as effective creative therapy, and it is for me the most vital of Gade's symphonies after No. 1. The consolatory slow movement and a distinctly original scherzo highlight the score. The Seventh Symphony offers a fine elegiac slow movement. The two abrupt chords that introduce the Eighth suggest Brahms's *Tragic Overture*, and the shadowy scherzo also suggests something of Brahms.

I can only admire the enterprising Swedish Bis label for producing this fine set of the Gade symphonies in addition to its ambitious ongoing projects of recording all of the orchestral works of Carl Nielsen and Sibelius. Though only Gade's First and Sixth Symphonies belong in the same company as the symphonies of those composers in terms of musical substance, the craftsmanship is expert throughout, and conductor Neeme Järvi and the Stockholm Sinfonietta acquit themselves splendidly. Except for over-resonant timpani in the first two symphonies, the recorded sound is first-rate.

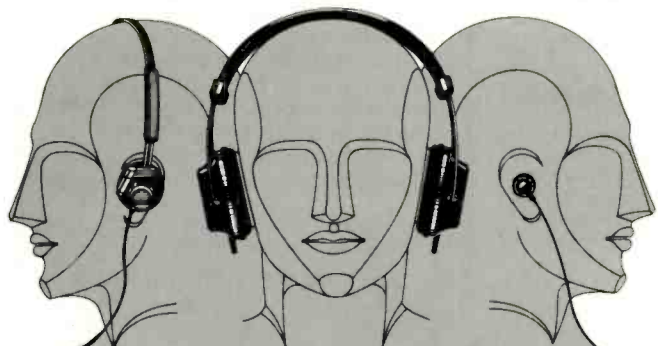
D.H.

**GOUNOD: *Faust*.** Francisco Araiza (tenor), Faust; Kiri Te Kanawa (soprano), Marguérite; Evgeny Nesterenko (bass), Méphistophélès; Andreas Schmidt (baritone), Valentin; Pamela Coburn (mezzo-soprano), Siebel; Marjana Lipovšek (mezzo-soprano), Marthe; Gilles Cachemaille (baritone), Wagner. Bavarian Radio Chorus and Orchestra, Colin Davis cond. PHILIPS 420 164-1 three LP's, © 420 164-4 three cassettes, © 420 164-2 three CD's, no list price.

Performance: *Excellent*  
Recording: *Clear, full-toned*

With its very "set" set-pieces, sometimes inappropriately elegant scoring, and rather trying length of over three hours, Gounod's *Faust* seems oddly old-fashioned today. Yet it remains one of the most popular operas ever written. It has been performed countless times in many languages and owes nothing to any "school" or influence, even though it grew out of a purely French musical and theatrical climate.

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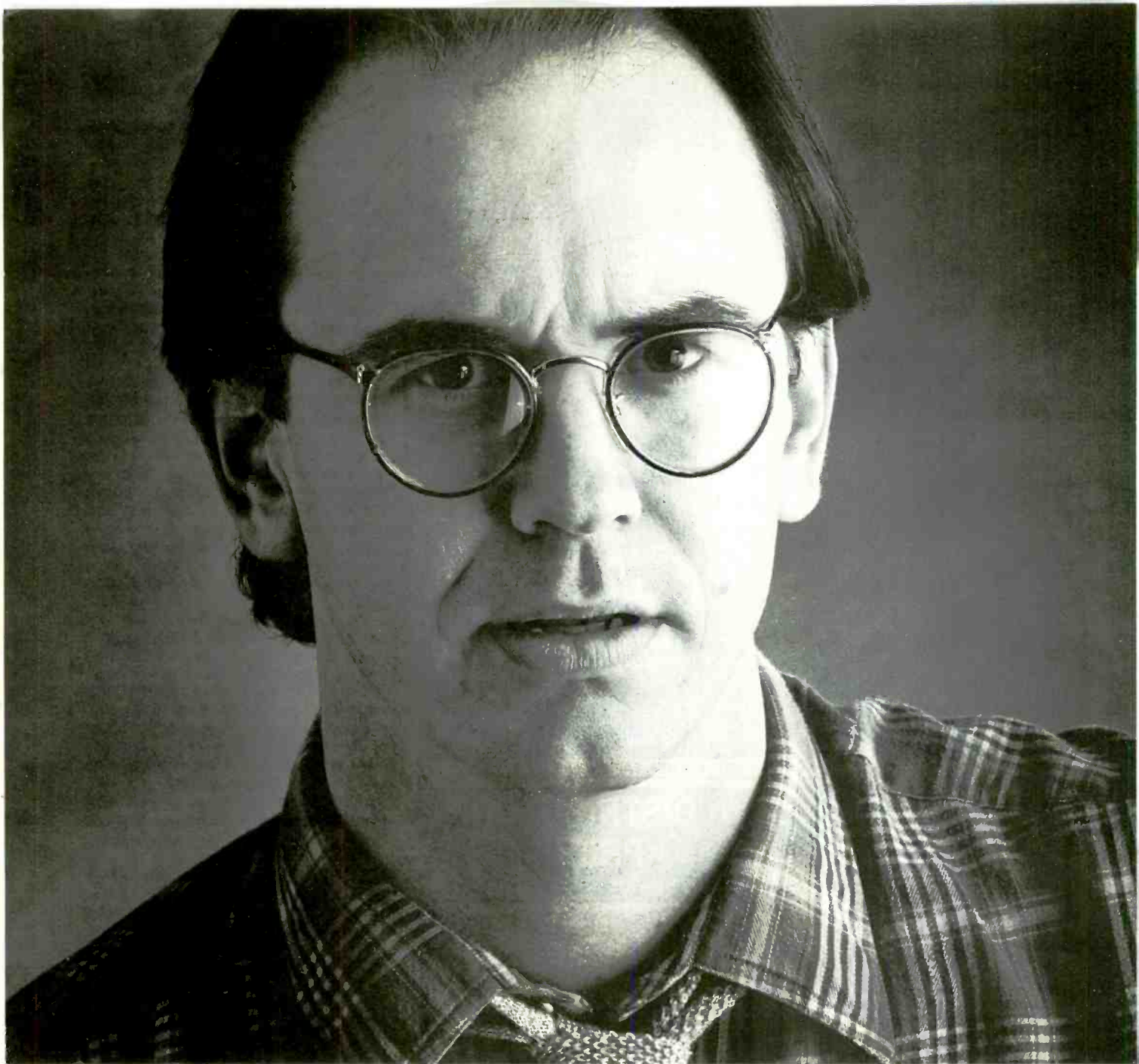
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that unfold from Goethe's celebrated story are always infused with the elegance of Gounod's music. The opulence can become soupy, but Sir Colin, happily, escapes that pitfall.

Francisco Araiza sings the title role convincingly, without attempting to push his *tenore leggero* in heavier passages. Margu rite is a role made to order for Kiri Te Kanawa, whose silvery, limpid voice touchingly evokes the childlike innocence of the heroine. Margu rite is essentially a passive character, and Dame Kiri's rather cool temperament seems to be naturally suited to the part.

Evgeny Nesterenko is a rich-voiced, vigorous M phistoph les, and for the most part his performance is gripping and convincing. His tone is sometimes rather rough and burly, which in some passages well suits the role, and his French is carefully studied but frequently thick; his laughter can be stogy and overdrawn. If his M phistoph les lacks some of the insidious suavity that Gounod provided for in the music, he is nonetheless energetic, vital, and compelling.

The remaining members of the cast are commendable. Andreas Schmidt and Pamela Coburn, as Valentin and Siebel, respectively, make much more positive statements in their roles than is frequently the case. The Bavarian chorus and orchestra, thoroughly attuned to Sir Colin, with whom they have worked for several years, sing and play expressively. Altogether, this is a well-recorded, musically satisfying, and theatrically effective performance of one of the grandest of grand operas. *R.A.*

**HANDEL: *Music for the Royal Fireworks; Water Music, Suite.* HANDEL/BEECHAM: *Amaryllis Suite.*** Royal Philharmonic Orchestra, Yehudi Menuhin cond. RPO/MCA CLASSICS   MCA-6186 \$9.98,   MCAC-6186 \$9.98,   MCAD-6186 no list price.

Performance: *Extravagant*  
Recording: *Adequate*

RPO Records, established to present performances by the Royal Philharmonic, was launched in 1986, but this Handel collection conducted by Yehudi Menuhin is so out of touch with what is going on today in performances of Baroque music that it can almost be looked on as a document of the past.

The *Royal Fireworks Music*—performed from an edition by Anthony Baines and Charles Mackerras that uses strings and adds flutes, piccolos, clarinets, and trombones—comes off splendidly, however, especially the monumental overture. The suite from the *Water Music*, as arranged and edited by Baines, is less successful because Menuhin's conducting lacks rhythmic propulsion, an essential ingredient for music of this sort. As for the *Amaryllis Suite*, a concoction of dances from various Handel operas that was put together

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James Galway: an eminently agreeable Nielsen collection

by Sir Thomas Beecham (the RPO's founder), it may have had value in its day for introducing unknown Handel to the masses, but it is so coyly orchestrated and played with so many ritards and echoes that it soon palls on contemporary ears. I'd recommend a pass on this one. *S.L.*

**HAYDN: *Mass No. 9, in D Minor ("Lord Nelson Mass")***. Sharon Baker (soprano); Pamela Dellal (mezzo-soprano); Jeffrey Thomas (tenor); James Maddalena (baritone); Orchestra, Chorus, and Soloists of Banchetto Musicale, Martin Pearlman cond. ARABESQUE ◉ ABQ-6560 \$8.98, © ABQC-6560 \$8.98, © Z-6560 no list price.

Performance: *Austere*  
Recording: *Excellent*

As played here on original instruments, Haydn's *Lord Nelson Mass* takes on a rather unexpected quality. Compared with performances on modern instruments, the focus shifts from the strings to the winds, lending the music an austerity and aggressiveness that are at first rather disquieting. When you get used to the differences, however, the work takes on a new meaning—Haydn no longer pleads for peace, he demands it in no uncertain terms.

The performance under Martin Pearlman's direction is excellent in all respects. The soloists are strongly individual but well balanced in their ensemble passages, the orchestral forces of Banchetto Musicale are convincing in their handling of the old instruments, and the chorus sings superbly. *S.L.*

**MAHLER: *Symphony No. 8, in E-flat Major*** (see Best of the Month, page 89)

**MOZART: *Così fan tutte*** (see Best of the Month, page 92)

**MOZART: *Divertimento in D Major (K. 334); Divertimento in F Major (K. 138)***. Salzburg Camerata, Sándor Végh cond. CAPRICCIO ◉ C-27157 \$8.98, © CC-27157 \$8.98, © 10 153 no list price.

Performance: *Breezy*  
Recording: *Bright*

The Salzburg Camerata has a polished style with a light, airy sound and a springy bounce, just right in this music written for diversion. I wonder if Mozart could have heard such sparkling performances in his native city in his own day. *S.L.*

**NIELSEN: *Flute Concerto***. James Galway (flute); Danish Radio Symphony Orchestra, James Galway cond. *Wind Quintet, Op. 43; Three Pieces from "The Mother," Op. 41; Two Fantasy Pieces, Op. 2*. James Galway (flute); other musicians. RCA © 6359-2-RC \$9.98, © 6359-2-RC no list price.

Performance: *Eminently agreeable*  
Recording: *Crisp and clear*

Carl Nielsen composed his masterly *Wind Quintet* for the Copenhagen *Wind Quintet* in 1922, delineating the character of each of its five members. He then decided to provide each of them with a concerto of his own, but he got only as far as the concertos for flute and for clarinet. The capacity of a compact disc would have made it possible to put the quintet and both concertos in a single package, but since James Galway is the star of this production it is filled out with brief pieces for flute instead of the *Clarinet Concerto*.

All the performances are eminently agreeable, however. Galway conducts a more than adequate accompaniment in the *Flute Concerto*, he blends well with his Danish colleagues in the quintet, and he is quite endearing in the three

pieces from the music for Helge Rode's play *The Mother* and in the early *Fantasy Pieces* (actually composed for oboe and piano). The sound throughout is as crisp and clear as the performances. I can't help thinking how singularly appropriate it would have been to have both of the wind concertos flanking the quintet, but if the combination of titles looks appealing this recording is a very safe bet. *R.F.*

**ROUSSEL: *Symphony No. 1, in D Minor, Op. 7 ("Le Poème de la forêt"); Symphony No. 3, in G Minor, Op. 42***. Orchestre National de France, Charles Dutoit cond. ERATO ◉ NUM 75283 \$10.98, © MCE 75283 \$10.98, © ECD 88225 no list price.

Performance: *Lustrous*  
Recording: *Very fine*

Albert Roussel was viewed in the decade before his death in 1937 as the great hope of French symphonism in the grand classic manner, but as fine as his last two symphonies (Nos. 3 and 4) are, his real gift was for a kind of musical structure both more compact and more flexible, as in his ballet scores and the *Orchestral Suite in F*.

Even so, it is a pleasure to have on one disc Roussel's youthful *First Symphony*, a four-movement evocation of nature in the style of his teacher Vincent d'Indy, with a tinge of Debussy as well, together with the *Symphony No. 3, in G Minor*, commissioned for the fiftieth anniversary of the Boston Symphony in 1921. The latter combines a lean athleticism with (in the adagio) a passionately lyric strain. While the early symphony has had comparatively few recorded performances, the *G Minor* has had a number of distinguished ones, including the still-available CBS LP with Pierre Boulez and the New York Philharmonic.

Charles Dutoit is an ideal interpreter of Roussel. He draws gorgeous sounds from the Orchestre National in the *D Minor Symphony*, and in the *G Minor* he catches perfectly the drive of the opening movement and the festive Chabrier-like brilliance of the scherzo and finale. In most hands, the slow movement sounds a bit cool and distant, but Dutoit makes of it a truly passionate utterance. The sonics on CD are just fine all the way. A most attractive release. *D.H.*

**SCHUMANN: *Carnaval, Op. 9; Fantasia in C Major, Op. 17***. Jorge Bolet (piano). LONDON ◉ 417 401-1, © 417 401-4, © 417 401-2, no list price.

Performance: *Mellow*  
Recording: *A bit overbright*

If you have Claudio Arrau's deleted Philips LP of these two works, you may not be interested in replacing it with a CD, but this one is certainly worth hearing. The murmuring counter-melody under the impetuous flight in the mid-

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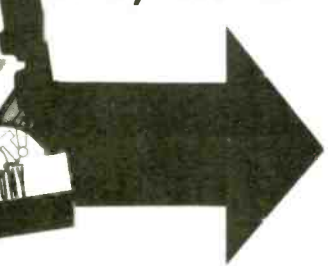
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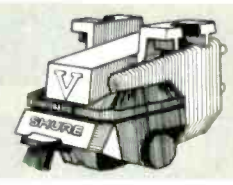


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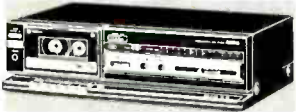
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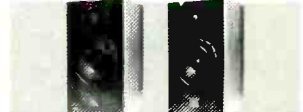
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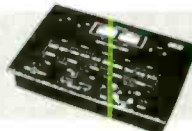
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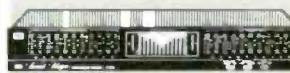


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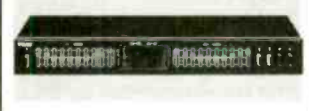


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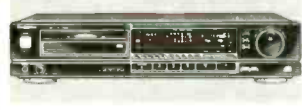
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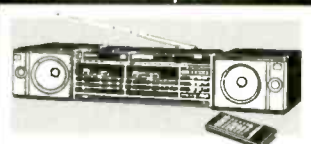
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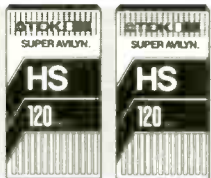
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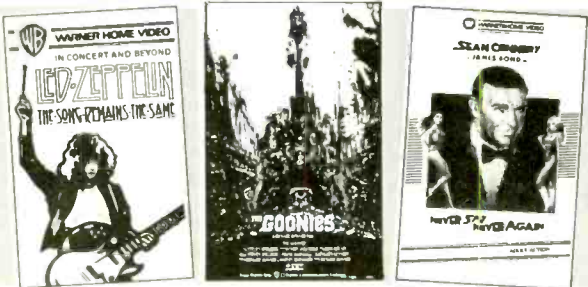
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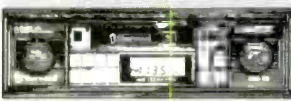
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dle of *Florestan* is as good a gauge as any of the sort of performance Jorge Bolet gives of *Carnaval*: noble, good-humored, affectionate, mellow. Bolet suggests a long and intimate relationship with the music—too comfortable, perhaps, for any impetuosity now, but how it responds to the familiar touch! The consecutive sections *Estrella*, *Reconnaissance*, and *Pantalon et Colombine* seem a little prosaic, and the last section is a little hard-boiled, but in general this is a lovely performance, anything but faceless, that invites a happy return.

In the C Major Fantasy Bolet is consistently more ruminative than declamatory. You feel that he may have consciously resisted the possibility of driving the music too hard and determined to keep Schumann's grand gestures from becoming larger than life. This approach produces a glowing, rather "philosophical" realization of the big final movement that suits it especially well. The frequently overbright sound, unfortunately, tends to distort the mood of the opening of the middle movement and other loud passages. The smoothness of the sound on Alfred Brendel's Philips CD, which couples the Fantasy with the Op. 12 *Fantasiestücke*, is a factor in persuading me to prefer it to Bolet's new one, but Bolet's *Carnaval* is so very attractive (and less affected by the sonic shortcoming that mars the Fantasy) that you may decide you need both.

R.F.

**SIBELIUS: *Symphony No. 2, in D Major, Op. 43.*** Dallas Symphony Orchestra, Eduardo Mata cond. PRO ARTE © CDD 320 no list price.

Performance: *Routine*  
Recording: *Unexceptional*

The idea of a Mexican conductor as interpreter of Finland's foremost composer may seem incongruous at first, but anyone with a long memory may recall that Carlos Chávez conducted the Sibelius Fourth in New York back in the late 1930's. At all events, Eduardo Mata and the Dallas Symphony do a decent, workmanlike job on the popular Second Symphony, but it offers no serious competition to the CD's by Neeme Järvi and Alexander Gibson or the LP's by Herbert von Karajan and Colin Davis. The sonics are perfectly okay but no better than those of any of the current CD rivals.

D.H.

**TCHAIKOVSKY: *1812 Overture, Op. 49; Romeo and Juliet, Fantasy Overture; The Nutcracker Suite, Op. 71a.*** Chicago Symphony Orchestra, Georg Solti cond. LONDON © 417 400-1, © 417 400-4, © 417 400-2, no list price.

Performance: *Very good*  
Recording: *Could use more space*

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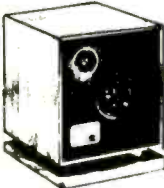


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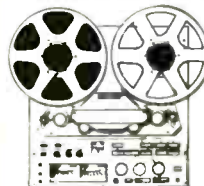
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the 1812 Overture ranks with Riccardo Muti's on Angel as one of the most musical versions, with great care lavished on details of phrasing and dynamics, particularly in the opening pages and the two lyrical folk-tune episodes. As for sound, however, I would give Muti's more spacious recording a decided edge. The microphone pickup in Chicago's Orchestra Hall seems to have been quite close, which makes for a clean sound but also deprives works such as the 1812 and *Romeo and Juliet*

of the sonic bloom and expansiveness they really need for maximum effect.

Sonics aside, the performance of *Romeo and Juliet* here is a sharply articulated but sternly controlled one. The orchestral attacks, where conflict takes center stage, are imbued with the typical Solti brilliance, however. The finest performance is of the ever-popular *Nutcracker* Suite. Very seldom will you hear the *Overture miniature* and the *Marche*, for example, carried off with such verve and crispness, and the same

holds for all the other numbers except the final waltz, which is just a shade foursquare for my taste.

A word of warning: stay away from the LP version. Cramping thirty-five minutes' worth of the 1812 and *Romeo and Juliet* onto the first side makes for audible sonic dilution. D.H.

**TCHAIKOVSKY: *Symphony No. 6, in B Minor, Op. 74 ("Pathétique")***. New York Philharmonic, Leonard Bernstein cond. DEUTSCHE GRAMMOPHON 419 604-1, 419 604-4, 419 604-2, no list price.

Performance: *Unconventional*  
Recording: *Conductor's perspective*

Performance times tell much of the interpretive story here. Normal playing time for the *Pathétique's* first movement runs around nineteen minutes and for the concluding *Adagio lamentoso* around ten minutes. Leonard Bernstein, on the basis of what he claims to be a restudy of the score, takes more than twenty-two minutes for the first movement and more than seventeen for the last, thus giving us nearly an hour's performance time for the entire work instead of the more conventional forty-six minutes or so.

Despite the slower-than-usual pacing for the lyrical sections of the opening movement, the reading of that movement as a whole carries passionate conviction. The "waltz" movement in 5/4 time goes well enough, and the march is performed more in the Teutonic Furtwängler manner than as the Russian quickstep favored by Slavic interpreters. There is no attempt to "wow" the audience in this sober treatment.

Bernstein's finale is unconvincing, however. His approach to the movement requires the most intense concentration and control on the part of the orchestral string players, and the New York Philharmonic is with him all the way. Yet I remained unmoved by his performance of this infinitely moving music.

Bernstein's recording was made in Lincoln Center's Avery Fisher Hall, and the sound is clean and fairly close-up. Still, it hardly has the glowing ambience of Vladimir Ashkenazy's fine London recording, which I consider the best digital one so far. All told, I am inclined to describe Bernstein's *Pathétique* as a noble curiosity. D.H.

**VAUGHAN WILLIAMS: *Norfolk Rhapsody; In the Fen Country; Fantasia on a Theme by Thomas Tallis; Five Variants of "Dives and Lazarus."*** London Philharmonic Orchestra, Bryden Thomson cond. CHANDOS 419 1212 \$11.98, 419 1212 \$11.98, 419 1212 \$11.98, no list price.

Performance: *Sensuous*  
Recording: *Very good*

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Vaughan Williams exemplify the composer's imaginative treatment of his English heritage and his deep-rooted love of modality. Bryden Thomson emphasizes the lushness of the orchestration and keeps the flow of sound uninterrupted as he slowly builds his climaxes. This recording is an adventure in pastoral lyricism reflecting the gentle undulations and subtle hues of the English landscape. S.L.

**VIVALDI: Chamber Music with Wind Instruments. Quartet in C Major; Trio in G Minor (RV 103); Trio in A Minor (RV 86); Sonata in C Minor (RV 53); Trio in G Major (RV 80); Sonata in G Minor (RV 58); Trio in G Minor (RV 81).** Camerata Köln. DEUTSCHE HARMONIA MUNDI/ANGEL © CDC-47574 no list price.

Performance: *Spicy*  
Recording: *Good*

This charming collection of sonatas for one, two, and three wind instruments with basso continuo reveals Vivaldi's skill at handling various combinations of instruments with and without harpsichord. You'll recognize the sharp profiles and rhythmic verve of Vivaldi's concerto style, and you'll also be treated to the sensitive contrapuntal writing and delicate textures possible with a small ensemble. In highly articulate performances, the members of Camerata Köln demonstrate their mastery of early instruments as both soloists and ensemble players. The lines are sharply etched, the balances superb, the pacing supple. In sum, here is an excellent CD of fine Baroque chamber music played in the authentic style. S.L.

**WAGNER: Wesendonck-Lieder. BERLIOZ: Les Nuits d'été, Op. 7.** Agnes Baltsa (mezzo-soprano); London Symphony Orchestra, Jeffrey Tate cond. PHILIPS ④ 416 807-1, © 416 807-4, © 416 807-2, no list price.

Performance: *Too intense*  
Recording: *Good*

Agnes Baltsa has shown herself to be a singer of strong personality who is especially effective in dramatic material. Both of these song cycles certainly qualify as dramatic, but whether the distinctive character of either is actually realized here is open to question. There is no denying the intensity—indeed, you might say *urgency*—that Baltsa brings to the material, but the roughness of the actual singing, as if she were somehow determined that it should not be merely “pretty,” will surely not be everyone's cup of tea. If you expect the familiar warmth and voluptuousness associated with these songs, you may be disappointed. I sensed more in the way of a challenge to the music than a rising to the challenges presented by it.

The Wagner is more successful than the Berlioz, I think, in part because the material lends itself to this sort of

approach more gratefully than the Berlioz, but also because the tempos are more sensibly chosen and evenly maintained and because the orchestra's playing is more persuasive. Jeffrey Tate does not bring out the undercurrents of impetuosity or the fizzy voluptuousness that are so indispensably part of the character of Berlioz's music. The opening number of *Les Nuits d'été*, the *Villanelle*, is almost always sure-fire, and it comes off well here, but some of the longer and more serious songs are taken so slowly—no doubt in the name of intensity—that momentum flags. The effect is not so much “moving” as simply uncomfortable, a reaction intensified by the vocal character Baltsa has chosen (and also, to a lesser degree, by her less than fully idiomatic articulation of either language). The sound is good without being exceptional. R.F.

**WALTON: Symphony No. 1, in B-flat Minor; Crown Imperial March; Orb and Sceptre March.** Royal Philharmonic Orchestra, André Previn cond. TELARC © CD-80125 no list price.

Performance: *Lyrical*  
Recording: *Bass-heavy in spots*

William Walton's First Symphony was composed at about the same time in the Thirties as Ralph Vaughan Williams's great Fourth Symphony, but while the senior composer's work is terse and charged with emotional dynamite, Walton's is expansive almost to a fault. It combines the passionate lyricism of his masterly Viola Concerto of 1929 and, in its scherzo, the rhythmic verve of his earlier *Portsmouth Point* Overture. Although the shadow of Sibelius looms large over some pages of the opening movement, that scherzo and the intensely expressive slow movement that follows it are among the finest things Walton wrote.

In his early years with the London Symphony, André Previn recorded a memorably dynamic reading of this symphony for RCA that's well worth reissue. His performance of it with the Royal Philharmonic on this new, state-of-the-art Telarc recording is less taut and dynamic, with decidedly more emphasis on the lyrical elements in the score. The sprawling finale, with its somewhat academic fugal episode, holds together less well here than in the RCA recording.

The two coronation marches from 1937 and 1953 make fine encore pieces, but the recorded sound seems overweighted in the bass, particularly in *Crown Imperial*. The marches were recorded in Fairfield Hall, Croydon; the symphony, recorded in Watford Town Hall, fares somewhat better sonically, though I still wish there were a little more bite in the middle and upper frequencies. But these are minor complaints, and this recording of the Walton First ranks well ahead of the currently available alternatives. D.H.

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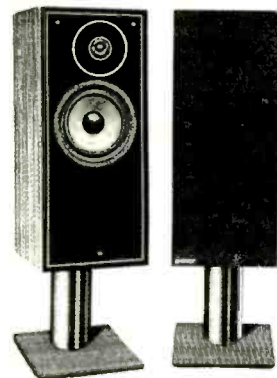
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by *Christie Barter & Steve Simels*

**D**ON'T look now, but that long-threatened surf-music revival is finally upon us. First there was the utterly unlikely collaboration between big rappers and surf kings when the **Fat Boys** and the **Beach Boys** remade the

neering team and American conductor **Lawrence Leighton Smith**, music director of the Louisville Orchestra, over to record the Moscow Philharmonic. The idea was that Smith would conduct the works by Russian composers, and **Dmitri Kitayenko**, chief conductor of the Philharmonic, would conduct American works. Well, it worked.

music by Gershwin, Barber, Copland, Glinka, Glazunov, and a half-dozen others. □

**W**E thought that RCA's Caruso recordings were probably the earliest ever transferred to compact disc until we spotted one titled "*Stars et monstres sacrés*" on the French Adès label. It includes some of the same Caruso tracks as a recent RCA release but also contains recordings made by sopranos **Adelina Patti** and **Nellie Melba** and the legendary actress **Sarah Bernhardt** that go back to 1903.

And we thought that they must be the earliest recordings on CD until Arabesque sent us Gilbert and Sullivan's *Trial by Jury* and *H.M.S. Pinafore* as recorded by the D'Oyly Carte Opera Company in 1927 and 1930, respectively. Prefacing the whole thing is the only extant recording of the voice of **Sir Arthur Sullivan**, made on October 5, 1888! □



SCOTT WEINER/RETNA

*Herman: Back to the Beach*

Now the Nashville Entertainment Association has made some of what's happening there available on "What You Haven't Heard: Nashville Rocks," a CD anthology of fifteen new bands. Fittingly, the bands are a thoroughly varied lot, ranging from the slick commercial heavy-metal of **Hocus Pocus** to **Necie Alexander's** revivalist r-&-b to the unclassifiable whatsis of **These Are Houseplants**. The only common denominator we can discern is that they're all interesting to listen to. Pick of the litter: the **Drmls**, whose *Into the Dreamlight* is an absolutely gorgeous synth-pop ballad that suggests a grittier Southern verion of David Bowie in his *Heroes* period.

You can write or call the Nashville Entertainment Association (P.O. Box 121948, Nashville, TN 37212; 615-321-5662) for more information. Reliable sources tell us, however, that a major label will issue the disc sometime this fall. □

**G**OOD news for **Joe Ely** fans. The maverick Texas country rocker hasn't been heard from since "Hi Res," his 1985 flirtation with something resembling synth-pop, but he's back. Appropriately, Ely's new label is **Hightone Records**, the feisty independent that made a star out of blues singer **Robert Cray**. Meanwhile, Joe's been performing around. We caught him recently at Manhattan's

J. B. KELLER



EBET ROBERTS

*Fat Boys and Beach Boys: a knock-out in Wipe Out?*

venerable (1963) Surfari's hit *Wipe Out*. Barely having recovered from that, we now have—in the soundtrack of the new **Frankie Avalon** and **Annette Funicello** film *Back to the Beach*—none other than **Pee Wee Herman** in a revival of the Trashmen's 1964 *Surfin' Bird*, which may be the most demented and meaningless song in rock history. Other surf items of note on the *Beach* soundtrack (Columbia): a version of *Pipeline* by bluesman **Stevie Ray Vaughan** and the song's original guitarist, **Dick Dale**, and an even unlikelier update of *Wipe Out* by techno-jazzman **Herbie Hancock**. We haven't the slightest idea what all this activity signifies, but we find it, like, totally gnarly. □

**I**T'S not as if the Russians haven't been making records in Moscow for years, but the American audiophile label **Sheffield Lab** can take pride in "The Moscow Sessions," which were the first in twenty-five years to be undertaken by an American record company in the Soviet Union. Sheffield sent its engi-

neering team and American conductor **Lawrence Leighton Smith**, music director of the Louisville Orchestra, over to record the Moscow Philharmonic. The idea was that Smith would conduct the works by Russian composers, and **Dmitri Kitayenko**, chief conductor of the Philharmonic, would conduct American works. Well, it worked.



*Smith (left) and Kitayenko: cultural exchange*

# Reality Realized.

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The most experienced and knowledgeable experts in the audio industry have concurred. Julian Hirsch wrote in *Stereo Review*, "The effect strains credibility - had I not experienced it, I probably would not believe it."

*High Fidelity* magazine noted that "...it seems to open a curtain and reveal a deployment of musical forces extending behind, between and beyond the speakers." According to another reviewer, "It brings the listener substantially closer to that elusive sonic illusion of being in the presence of a live performance."

All this with your existing speakers and music collection.

**HOW SONIC HOLOGRAPHY WORKS.** Unfortunately, conventional stereo cannot isolate the output of left and right speakers and send their output only to your left and right ears. Left and right versions of a sound occurrence also cross in the middle of your listening room, confusing your ears with additional extra sound arrivals a split second apart. Stereo imaging and separation suffer because both speakers are heard by both ears, confusing your spatial perception.

The Sonic Hologram Generator in the Carver 4000t Preamplifier, C-1 Preamplifier and Carver Receiver 2000 solve this muddling of sound arrivals

by creating a third set of sound arrivals. These special impulses cancel the objectionable second sound arrival, leaving only the original sound from each loudspeaker.

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

**IMAGINE THE POSSIBILITIES.** Thanks to VHS and Beta Hi-Fi stereo soundtracks (found even on rental tapes), and the increasing number of stereo TV broadcasts, Sonic Holography can put you inside the video experience, too.

It's a breathtaking experience. Without the need for additional rear speakers, extra amplifiers or decoders, the visual experience is psychoacoustically expanded by lifelike sound that envelops you, transforming stereo from monochromatic flatness into vibrant three-dimensional reality. Instead of being at arm's length from the action, you are immersed in it.

Then there are the familiar audio sources which Carver innovation has further improved upon, each of which gains character and heightened impact through Sonic Holography.

Compact discs, whose potential is still trapped in the two-dimensionality of conventional stereo, are even more lifelike with Sonic Holography.

Thanks to the Carver Asymmetrical Charge-Coupled FM Detector, FM stereo broadcasts can be received hiss- and interference-free, ready to take on an astonishing presence and dimension through Sonic Holography.

Even AM stereo can actually become a three-dimensional phenomenon with Sonic Holography and the new Carver TX-11a AM/FM tuner which delivers AM stereo broadcasts with the same dynamics and fidelity as FM.

**ENHANCE YOUR SPATIAL AWARENESS WITH CARVER COMPONENTS.** When considering the purchase of a new preamplifier or receiver, remember how much more you get from the Carver 4000t, C-1 and Receiver 2000. Or add Sonic Holography to your existing system with the C-9 add-on unit.

Each can transcend the limits of your listening (and viewing) experiences by adding the breathtaking, spine-tingling excitement that comes from being transported directly into the midst of audio-video reality.

Visit your nearest Carver dealer soon and expand your range of experiences with Sonic Holography.



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# Bass vs. Space

**It's an old dilemma: To tolerate those large, room-dominating loudspeakers for the sake of true bass? Or sacrifice bass for the sake of more living space?**

The classic solution to this problem—a solution that allows even efficiency-dwellers ample bass *and* space—is the satellite/subwoofer speaker system. Simply put, the mid-range and high frequencies are delegated to a pair of small satellite loudspeakers, placed for optimum stereo imaging. The bass is handled by a single large subwoofer unit, which can be hidden virtually anywhere in a room. (How? Frequencies under 100 hz are nondirectional;

the ears can't tell where they're coming from. So one subwoofer suffices.)

The most common kind of satellite/subwoofer system is "passive" (externally powered), such as the Canton Plus C.

## Active Advantages

The Canton Plus Beta subwoofer looks much like the Plus C, but does the job quite differently. That's because it's "active" (internally powered).

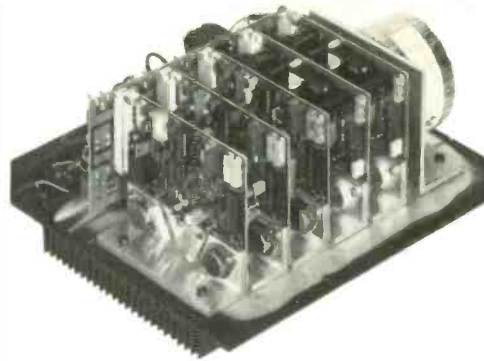


Canton's Plus Beta active subwoofer.

Don't have a preamp? No problem, your receiver can drive the Plus Beta too. The amplified power from your receiver is dropped down to preamp line level and the Plus Beta amplifies this signal through its own three amplifiers.

Canton has a variety of satellites to choose from: minis, indoor/outdoor, ultra-thin speakers or bookshelf units.

Featured at right are the Plus S mini speakers. Like most Canton products, they are available in black, white or walnut.



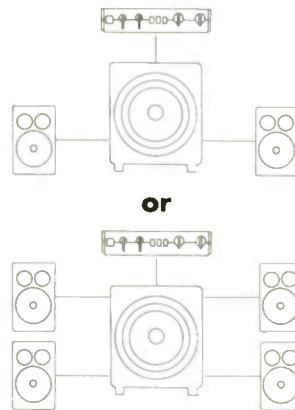
The Plus Beta contains three discrete power amps with digitally controlled active filters. They are frequency-driven and provide dynamic soft clipping for overload protection. The bass amplifier is rated at 100 watts RMS power; the satellite amps at 80 watts RMS per channel. THD is less than 0.01%.

Three advanced power amplifiers are built in, one custom-designed for the subwoofer and one each for the satellites. The active crossover network has three selectable crossover frequencies, allowing unparalleled flexibility in matching the Plus Beta with satellites. There is also an input sensitivity control and a bass level control.

Consequently, the Plus Beta can be used with a wide



The Plus Beta's control panel allows adjustment of: crossover point, for perfect matching with any satellite loudspeakers; input sensitivity, to optimize preamp compatibility; and bass level control to adapt for room characteristics.

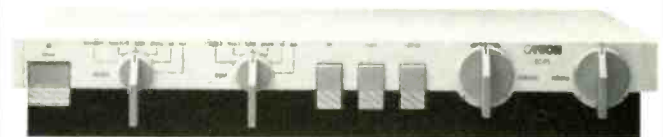


The Plus Beta can accommodate an extra pair of satellites, either

in the same room or as extension speakers in another room.

variety of satellites. For example, Canton's affordable and very compact Plus S or the high-performance Karat 100. If desired, the Plus Beta can accommodate two pairs of satellites. By way of driving the Plus Beta, virtually any preamp or receiver will do, whether a high-end unit such as the Canton EC-P1 or a more modest design.

Where space is at a premium, but the awesome dynamic range of digital program sources can't be missed, there's no better option than an active subwoofer such as the Canton Plus Beta.



A Plus Beta subwoofer/satellite system can be driven by any preamp, such as Canton's EC-P1.

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

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EBET ROBERTS



Richards (left), Keys, and Ely: rootsy

Lone Star Cafe in a show that attracted such devotees as Rolling Stone Keith Richards (just signed to a big solo deal with Virgin) and sax player Bobby Keys. Ely's new album, we understand, will be significantly rootsier than "Hi Res," which sounds like a good thing to us. □

MEDIA HOME ENTERTAINMENT



Heavy metal on Elm Street

**M**ONSTER MASH! Attention, all you fans of the *Nightmare on Elm Street* series! The third installment, *Dream Warriors*, is heading to home video from Media Home Entertainment with a little something extra tacked onto the end—a five-minute music video featuring heavy-metal favorites Dokken. The surprisingly witty clip finds the band rescuing heroine Patricia Arquette from fiendish villain Freddy Krueger (actor Robert Englund underneath the latex). In a nifty switch on the premise of the film series, the video concludes with Freddy waking up from his own Dokken-inspired nightmare and asking, "Who were those guys?" □

**T**HE American soprano Barbara Hendricks, the Spanish tenor José Carreras, and the Canadian baritone Gino Quilico spent the early summer in Paris recording Puccini's *La Bohème* for Erato under the direction of James Conlon (his first opera recording). The cast, with a non-singing actor replacing Carreras, who had been taken ill, later re-assembled in Paris to film the opera, which will receive its first screening at the Cannes International Film Festival in May 1988. Both the film and the soundtrack are slated for general release next fall.

Meanwhile, over in Rome, Leonard Bernstein was recording another *La Bohème*, for Deutsche Grammophon, with an all-American cast headed by Angelina Réaux and Jerry Hadley. This one will be released next year in time for Bernstein's seventieth birthday in August. □

**O**PERATIC tenors have been on the endangered-species list for decades, and the *Heldentenor*, or heroic tenor, needed for Richard Wagner's operas is rarer than the Whooping Crane. Opera fans are, therefore, all a-twitter over the emergence of a new young *Heldentenor* from Texas, Gary Lakes.

Standing six feet, four inches in his socks and boasting a fifty-four-inch chest, Lakes is a very large Great White Hope. He made a triumphant European debut as Siegmund in a concert performance of Wagner's *Die Walküre* in Paris in 1985, and

last year he joined the Metropolitan Opera in New York.

This spring Deutsche Grammophon recorded *Die Walküre* in New York with the Met orchestra conducted by James Levine, the first installment of a complete Met *Ring* cycle on records. Lakes is Siegmund, and the other soloists are Hildegard Behrens, Christa Ludwig, Kurt Moll, James Morris, and Jessye Norman.

That album is due for release in 1988. Anyone impatient to sample the sound of Lakes's voice can hear him now in Strauss's *Ariadne auf Naxos*, a DG release for September. Anna Tomowa-Sintow sings the title role, and Levine conducts the Vienna Philharmonic. □

**G**RACENOTES. Further proof that vinyl is dead—CBS has actually released a Kay Kyser compact disc ("Sentimental Favorites"). . . . Susanna Hoffs of the *Bangles* is making her way to home video in a bikini. *The Allnighter*, Hoffs's feature film debut (with music by Ronnie Spector, Aretha Franklin, and Mike and the Mechanics) died at the box office, but in the great tradition of *Howard the Duck*,

MCA Home Video is betting a tape version will fare better. We won't hold our breath. . . . Recently divorced video vixen Joan Collins is the unlikely hostess of Sony Video's



Hendricks: Paris in summer

*An Orchestral Tribute to the Beatles*, a fifty-two-minute program featuring the Royal Philharmonic performing at London's Royal Albert Hall. . . . Where Are They Now Dept.: In case you're wondering who programs all the great old rock songs on the soundtrack of NBC's Sixties cop show *Crime Story*, it's none other than Al Kooper, ex-head honcho of the legendary *Blues Project*. Coincidentally, PolyGram has scheduled a CD reissue of the Project's great "Reunion in Central Park" album. □

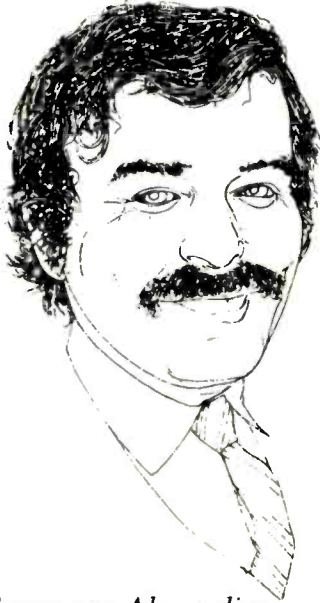
Lakes: opera's Great White Hope



JACQUES SARRAT/ERATO DISQUES

SCHLAFLEK, SALZBURG/DEUTSCHE GRAMMOPHON

by Ralph Hodges



## Crossovers Abounding

**I**F you are among those who believe that loudspeaker drivers and enclosures have been gaining significantly on the laws of physics in recent years, you'll have to conclude, with many speaker designers, that much of what you don't want to hear from a speaker system these days is the fault of the crossover network. And, yes, you may legitimately consider voice coils and internal speaker wiring as parts of the crossover.

Ignoring the crossover is one of the most pleasant of audiophile activities, for any sophisticated understanding of it begins with math not usually taught in high schools and advances rapidly after that. Some enthusiasts have turned to exotic loudspeaker types (electrostatics, planar magnetics) because of a misconception that these don't involve crossovers. Alas, most of them do, if not always conventionally. In fact, many of the sexiest new speakers of the last few decades could have benefited from fewer exotic trappings and more solid, grind-it-out work on the crossover.

Crossovers, as every basic speaker article explains, have a fundamental function of keeping the tweeter from woofing and the woofer from tweeting. But that barely scratches

the surface. Crossover characteristics also have the most profound implications for a loudspeaker's frequency response both on-axis and at various angles off-axis, its overall lateral and vertical directivity, its power response (total radiated power versus frequency), and its phase/time integrity.

Anyway, let's say you have a woofer, a tweeter, a box, and an obvious need for a crossover network. How to begin? Simple solutions are best, so we look first to the first-order family of filter networks, which provide gentle rolloffs (6 dB per octave), generally good electrical characteristics, and the least complex phase behavior available. But we note immediately that these same gentle slopes may cause the tweeter to be playing with considerable output at frequencies lower than it can handle easily and the woofer at frequencies higher than it should. First-order networks do not suit all drivers, particularly some of the better ones.

But let's say you use drivers that are appropriate for a first-order crossover. You'll then find an even stickier problem with the system's midrange response, which will be extremely ragged—on-axis, off-axis, and everywhere else. Yet the drivers seemed to have been ideally matched, electrically and acoustically, within the crossover area. What went wrong?

The problem is classic acoustical interference *between* drivers when both are handling the same frequencies. Such interference cannot happen at the frequency extremes, where either the woofer or the tweeter is radiating alone. But the generous region of operational overlap provided by 6-dB-per-octave slopes means that at some points in the listening room the tweeter's 800 Hz, say, reinforces the woofer's 800 Hz, and at other points it cancels it. Change the crossover frequency or the listening position a bit, and the reinforcement/cancellation pattern may change dramatically, but the *overall* response smoothness will not improve.

The exercise has a lesson in it: A first-order crossover network is advisable only when the distances from the drivers to any point in the

listening area differ by appreciably less than any wavelength they are likely to reproduce jointly. In practice, this means that the drivers must be mounted extremely close together—often impossibly so. Failing this, using a more complex network is the only option.

There is no shortage of higher-order crossover designs; slopes of 12 and 18 dB per octave are encountered regularly. One manufacturer even claims *infinite* slopes, but I'll reserve comment on that until I've seen and heard much more. The steeper-slope configurations make speaker systems with nonoptimal driver spacings possible and even listenable, but it's doubtful they can ever make them ideal.

Every higher-order configuration entails tradeoffs. Some have less than flat frequency response (which may be amenable to equalization, but still . . .), others have problematic phase and group-delay behavior (sometimes actually exploitable for better system behavior by the cunning designer, but still . . .), and all are more costly, more complex, more distortion-prone, and more lossy than anyone wants to put up with.

As an example of how it is, take the case of the Linkwitz-Riley network, one of the newest and trendiest crossover designs. It was developed because many popular network configurations cause a speaker system's polar response pattern to wobble around the system's axis in the crossover region—the effect of the network's asynchronous phase behavior on the driver outputs. The Linkwitz-Riley network managed to take the wobble away and achieve a flat axial response through the crossover range, which was very gratifying. Soon, however, someone pointed out that the flat on-axis response had been achieved only with the sacrifice of a flat power response. An unacceptable sacrifice? Well, how long have we been hearing debates over the relative importance of flat axial response versus flat power response? And how long do you think it will take to resolve the issue?

So much for why we should hate crossovers—but we still have to take an interest in them. □

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