

Stereo Review

OCTOBER 1984 \$1.75

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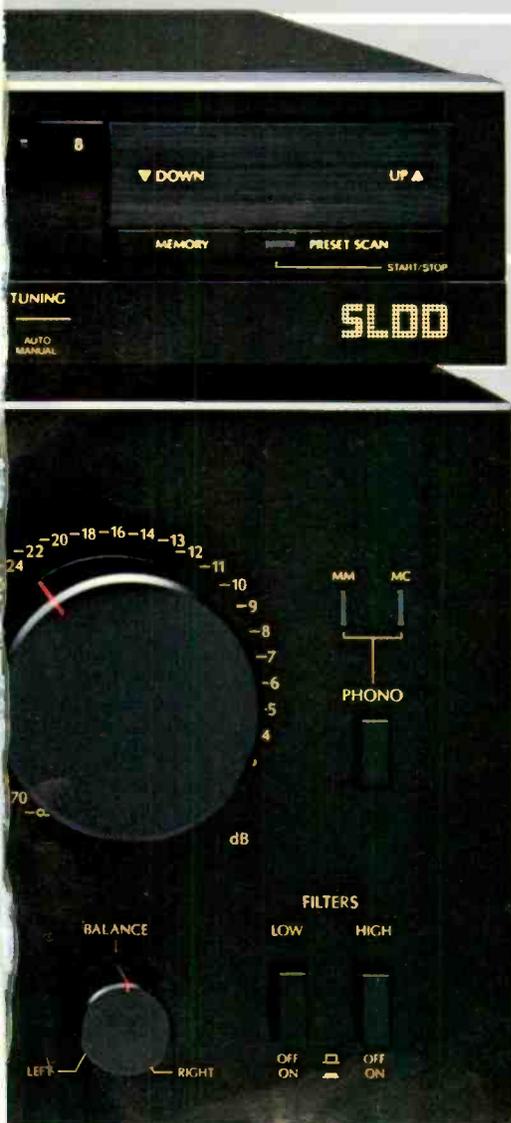
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COVER: DESIGN BY SUE LLEWELLYN, PHOTO JOOK LEUNG



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STONES REMASTERED

The latest in Mobile Fidelity's big-box sets of reissues by pop and rock giants is devoted to the Rolling Stones. The set includes ten records--from "The Rolling Stones" (1963) through "Let It Bleed" (1969)--plus a double-disc compilation of singles never released on LP. It has all been remastered from the original master tapes. Price: \$250.

BROADWAY BERNSTEIN

Composer/conductor Leonard Bernstein has finally recorded his musical West Side Story, which opened on Broadway twenty-seven years ago. The soloists on the recording include opera stars Kiri Te Kanawa and José Carreras as Maria and Tony with Tatiana Troyanos in the role of Anita. Deutsche Grammophon has not yet announced a release date.

BACK TO THE POPS

John Williams, whose resignation as conductor of the Boston Pops we noted last month, has "rescinded" his resignation, citing a resolution of differences with the orchestra. He will remain with the Pops through its centennial season, which begins in May 1985.

TECH NOTES

Tuner Broadcasting is considering starting a cable music-video channel to compete with MTV....The new fall NBC TV series Miami Vice will be produced for stereo TV broadcast and will include rock videos as a part of the story line....RCA will take over CBS's production of CED videodiscs....Nakamichi is adding a low-priced three-head cassette deck to its BX series....Kodak plans to start shipping 8-mm camcorders in early September and Polaroid by late fall. Sony will join TDK in producing 8-mm blank tape....In an effort to protect consumers from unscrupulous "gray

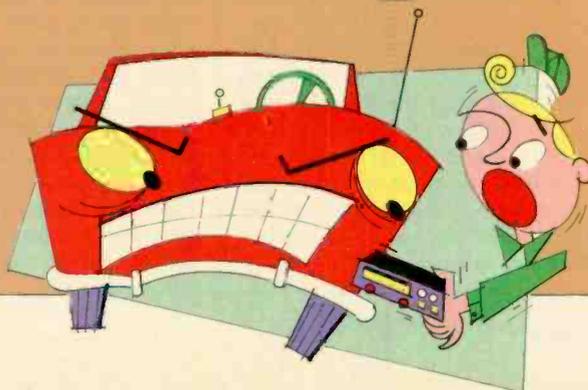
market" retailers, the New York State legislature is considering a bill that would require notice in stores and catalogs that the goods may not be accompanied by a valid warranty, instruction manuals may not be in English, and the goods may not be eligible for any rebate programs....Blaupunkt's ARI (Automatic Radio Information Service) is now in operation covering Los Angeles, San Clemente, and San Diego....According to a report in Billboard, a Dutch company called DocData claims to have developed a technique to reduce Compact Disc pressing time from between 15 and 30 seconds down to one second and potentially a tenth of a second.

TOP HONORS

The five artists receiving this year's Kennedy Center Honors will be comedian Danny Kaye, singer Lena Horne, playwright Arthur Miller, composer Gian Carlo Menotti, and violinist Isaac Stern. Chosen for their artistic achievements and contributions to American culture, they will be saluted at a gala at the Center on December 2.

DETROIT MUSCLES IN

Car stereo manufacturers and retailers have enjoyed a booming \$2-billion-a-year business thanks to the generally awful radios that have been sold with cars. Detroit has countered with higher-quality, higher-priced, factory-installed car stereo systems. According to current rumors, Detroit plans to make the car stereo business a lot tougher by designing future cars to be installer unfriendly.



by William Livingstone



GORDON SELL

CD and LP

THE writer Gertrude Stein was a voracious reader, and for much of her life she was afraid that she would exhaust the supply of good books and would have little or nothing left to read in her declining years. In *The Autobiography of Alice B. Toklas*, Stein wrote of the relief she experienced on realizing that there would always be plenty of books good enough to sustain her interest.

With a similar feeling of relief I have realized that there will always be more than enough good recordings to keep me happily feeding discs and tapes into my hi-fi equipment. At the moment I am listening to the first version of Wagner's *Ring of the Nibelung* to be made available in this country on Compact Discs. It is the Eurodisc set imported from East Germany, and hearing Wagner's monumental creation in the new digital medium is thrilling.

Before the development of the long-playing record, it was impractical to attempt a recording of even one of the four lengthy operas that make up Wagner's *Ring* cycle. The first recorded cycle was the one conducted by Georg Solti for London Records, and it was completed eighteen years after the introduction of the LP. Hailed as a milestone of the stereo era and one of the greatest achievements in phonographic history, Solti's *Ring* is still available on discs and cassettes, and time has not dimmed its luster.

In addition to whatever artistic merits the Eurodisc *Ring* may have, it is remarkable for being the first performance of the work to be recorded entirely by the digital process. Also noteworthy is the speed with which it has been released on Compact Discs. The CD system was introduced only last year!

The fact that so lengthy a work (appealing only to opera fans of proven stamina) is already out on CD tells us something about the speed with which the new technology is being accepted. The PolyGram plant in Hanover, West Germany, pressed its ten millionth CD (Pachelbel's *Kanon* conducted by Karajan) last June. According to Alison Ames of Deutsche Grammophon, within six months of the introduction of Compact Discs they accounted for 25 percent of DG sales in the United States.

By August 1, 1984, one thousand titles were available on CD in this country, and that number is expected to double by the end of the year. In 1983 sales of CD players reached 35,000 in the United States, and according to industry estimates 200,000 more will be sold here by the end of 1984. The article "Compact Discs on the Move" on page 50 lists twenty-seven CD players that cost \$600 or less.

Vast improvements in the quality of car stereo equipment gave a big boost to cassettes in the world of recorded music, and CD players for cars will no doubt do the same for the Compact Disc. The world's first road and lab tests of a CD player for cars (Sony's CDX-R7) begin on page 58.

Still, for the present the CD is an additional signal source, not a replacement for the cassette or the LP. Many record collectors, however, are getting as nervous as Gertrude Stein about great recorded performances that will never be transferred from LP to CD. It's making us much more attentive to record cleaning and stylus wear. I've just bought not one, but two new turntables. Much as I am intrigued by the Compact Disc, I want to be sure that my treasured LP's are there to sustain me in my declining years □

Stereo Review

PUBLISHER
WILLIAM T. DIPPE

EDITOR IN CHIEF
WILLIAM LIVINGSTONE
MANAGING EDITOR
LOUISE GOOCH BOUNDAS

ART DIRECTOR
SUE LLEWELLYN

TECHNICAL EDITORS
DAVID RANADA, GORDON SELL

MUSIC EDITOR
CHRISTIE BARTER

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LONDON EDITOR
HENRY PLEASANTS

CONTRIBUTING EDITORS

CHRIS ALBERTSON	LOUIS MEREDITH
RICHARD FRED	ALANINA NASH
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RALPH HODGES	ERIC SALZMAN
GEORGE JELLINEK	STEVE SIMELS
LARRY KLEIN	CRAIG STARK
STODDARD LINCOLN	JOEL VANCE

Editorial and Executive Offices: 212 503-3500
Ziff-Davis Publishing Company
One Park Avenue, New York, New York 10016
National Advertising Manager: Richard J. Halpern
Eastern Advertising Manager: Charles L. P. Watson

Midwestern Office, The Patis Group: 312 679-1100
4761 West Touhy Ave., Lincolnwood, Illinois 60466
Arnold S. Hoffman, Dirk E. Barenbrugge

Western Office: 213 387-2100
3460 Wilshire Boulevard
Los Angeles, California 90010
Western Advertising Manager:
Marge Doherty-Wilhite

Japan: Iwagi Trading Co., Ltd.
J. S. Yagi
603 Ginza Sky Heights Building
18-13, Ginza 7-Chome
Chuo-Ku, Tokyo, Japan 104
Telephone: (03) 545-3908

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Plus or minus noise

I just cannot imagine how your technical staff and the Delco-GM/Bose people reacted to Alanna Nash's article on "Cassettes for Cars" in August.

STEREO REVIEW has always encouraged readers to aim for the truest fidelity possible within their budgets, and Bose has presumably spared little effort in providing a car system with high fidelity in mind, yet the reviewer says she likes "to crank in the maximum amount of bass and treble" and "preferred to listen to even my high-bias tapes with the DNR and EQ buttons out."

My God, did the Bose people go through all that trouble with the effect that her "ears felt the way Buddy Rich's snare drum must feel at the end of a session"? Industrial noise will do the same thing and won't set you back \$895. It often seems that all the good work of people in the audio field to produce flat response and tonal accuracy is wasted on most of the public, represented here by Ms. Nash.

DAVID W. HARRIS
North Vancouver, B.C.

Ms. Nash replies: I just cannot imagine that a reader has nothing better to do than worry about whether I choose to exercise the option of using noise reduction or not. It is an option, after all. I happen to like bright sound. I plan to lose no sleep over whether Mr. Harris prefers it bright, flat, or dull.

Pros and cons of Peel

I was outraged by Mark Peel's August review of Roger Waters's "The Pros and Cons of Hitchhiking." Apparently your musical tastes reside out in left field with the Michael Jacksons of today's tired popular-music scene.

"Pros and Cons," in my opinion, is a work of genius and the most moving piece of music I've had the pleasure of putting ears to all year. It is the creativity of artists like Roger Waters that makes record buying a pleasure for me today.

JOHN SMITH
San Francisco, Calif.

I'm continually delighted with Mark Peel's impressions of the music world.

His critique of Roger Waters's "The Pros and Cons of Hitchhiking" makes me laugh out loud. I guess I'll have to continue to listen to "Dark Side of the Moon" to enjoy Waters's talent.

LESLIE WICKHAM, JR.
Chapel Hill, N.C.

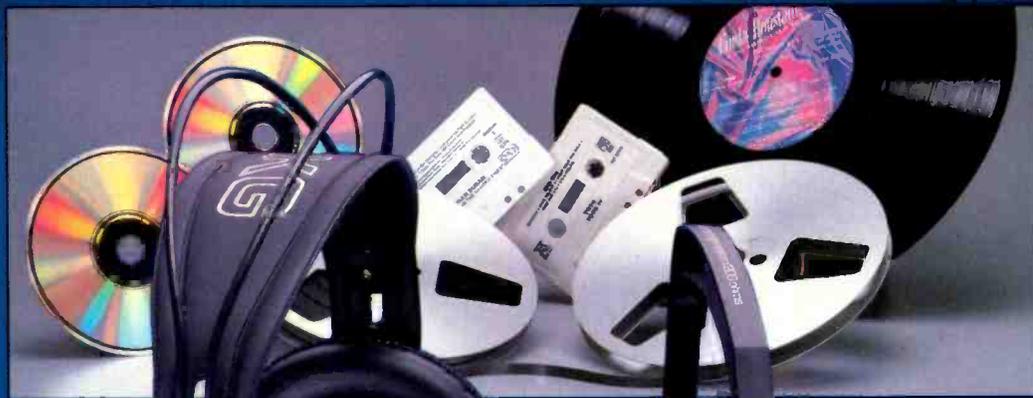
Will miracles never cease? I almost dropped my August STEREO REVIEW on my turntable when I saw Mark Peel's review of Dwight Twilley's album "Jungle." Just when I thought all pop music that receives airplay and critical review had to be formula rock, Peel writes the first print I've ever seen on Twilley. I've found his music an escape from the tripe on pop radio, and it's about time someone else noticed him.

MARK LINDEMER
Crown Point, Ind.

Stick it to Steve

Steve Simels obviously had a bad day when he reviewed Dire Straits' "Alchemy" in the August issue. He commented that "Mark Knopfler's singing and guitar playing suggest that he's

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grown thoroughly bored with his own material." I must have heard a different "Alchemy" because on my copy Knopfler never sounded better. I'll admit his singing may not win any awards, but his guitar is one of the best I've heard, ranging from the sublime (*Romeo and Juliet*) to the awesome (*Sultans of Swing*).

DARIN BORGEL
Halifax, Nova Scotia

I was shocked and outraged after reading Steve Simels's review of the

brilliant "Alchemy" live recording by Dire Straits. Is this really the state of musical journalism today?

I was fortunate enough to see Dire Straits twice last summer, and both occasions were sheer magic. What Simels describes as "perfunctory" singing is, in fact, Mark Knopfler's characteristic style of understated expression.

JEFF L. EASTBY
Tacoma, Wash.

Steady, Mr. Eastby, you don't have to defend Knopfler to us. Even here in the

benighted State of Musical Journalism Today we managed to give him a Record of the Year Award (for "Local Hero") only last February.

Your article "How to Buy Hi-Fi" contains some very bad advice. Steve Simels suggests putting a \$50 cartridge on a \$100 turntable, a \$75 cartridge on a \$100 turntable, a \$125 cartridge on a \$125 turntable, and a \$150 cartridge on a \$150 turntable.

Sure, it will work just fine, but Simels's idea is to get the most for your money. A \$100 turntable and its tone arm cannot fulfill the needs of an expensive cartridge. Would you put \$100 Firestone radials on your \$300 Chevy?

PHIL ROMANO
Lakewood, Ohio

Yes, that's not a bad analogy. No matter what the car was worth, we'd want the best tires we could afford. And please let us know where to get a car that will move for only \$300.

Steve Simels has been insulting our intelligence for years as a critic. Must he now insult our intelligence as a feature writer as well? People with the intelligence he writes for usually can't afford a \$600 stereo system.

JOHN ARFT
San Antonio, Texas

More power

We were delighted to see the Tandberg TPA 3006A mentioned in the article by Thomas R. Gillett, "The High End Horizon" in August. However, we must make a correction to the article, which stated:

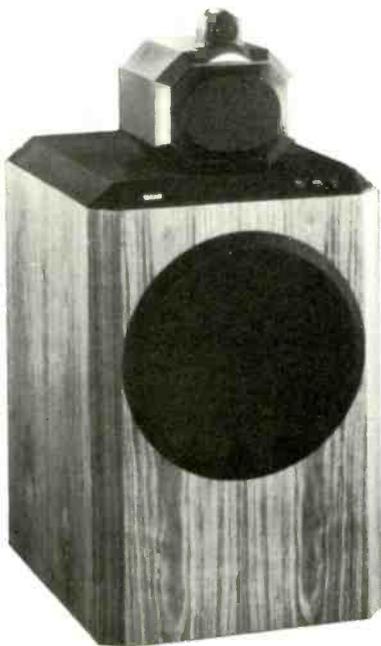
"Take Tandberg, for instance. Their TPA 3006A power amp (100 watts per channel, \$995) may not seem like the biggest bargain around—you can buy 100-watt-per-channel amps for half the price. What do you get for your money? Again, better parts and presumably a better built amp, which should mean longer life and greater reliability."

We agree with Mr. Gillett's statement on quality. However, the TPA 3006A power output is rated at 150 watts per channel into 8 ohms and 235 watts per channel into 4 ohms with less than 0.02 per cent THD and IM. Although watts per dollar is in no way a measure of an amplifier's quality, we do feel this will make the TPA 3006A a better value in the eyes of those to whom wattage is of great importance.

JOEL ROSENBLATT
Director of Sales & Marketing
Tandberg of America, Inc.
Armonk, N.Y.

Our apologies. The rating of the TPA 3006A was correctly given in the September issue, in which the amplifier was included among the most interesting new products introduced at the Summer Consumer Electronics Show.

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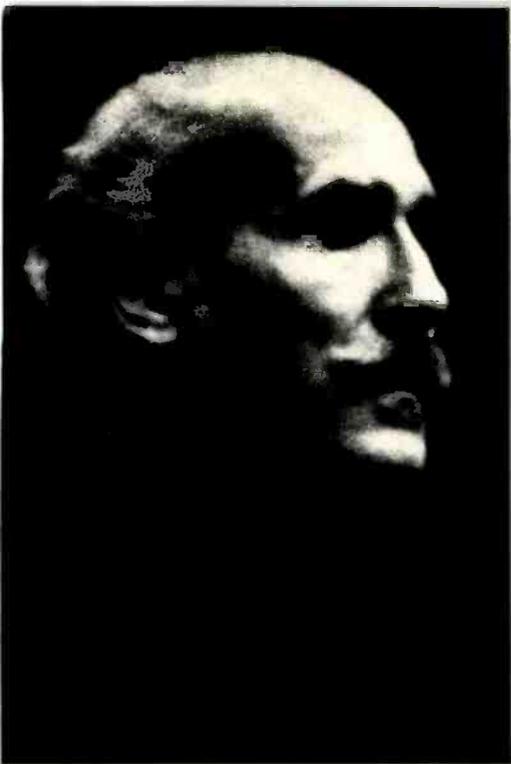


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SUBSCRIPTION APPLICATION

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1984 Grammy Award Winner. Category: "Historic Recordings" Presented by the National Academy of Recording Arts and Sciences.



Please mail by October 31, 1984.



Ultrix

The R100 digital-synthesis AM/FM receiver from Ultrix includes special processing circuits to enhance the sound of tape decks and video sources. Built-in dbx circuitry encodes and decodes music for low-noise tape recordings, and the Matrix stereo synthesizer improves TV and VCR signals to near-high-fidelity quality. A wireless infrared remote control handles power, volume, scan, and selection of twenty radio stations. The preamplifier section accommodates both moving-coil and moving-magnet cartridges, and it includes an infrasonic filter and DNR. Instead of knobs for volume, bass, treble, and balance, the R100 uses stepped electronic attenuators and equalizers.

The power output of the R100 is 100 watts per channel with no more than 0.009 percent total harmonic distortion. A twenty-segment-per-channel fluorescent display shows output levels. Price: \$599.95. Ultrix, Dept. SR, 1200 West Artesia Blvd., Compton, Calif. 90220. **Circle 120 on reader service card**



Technics

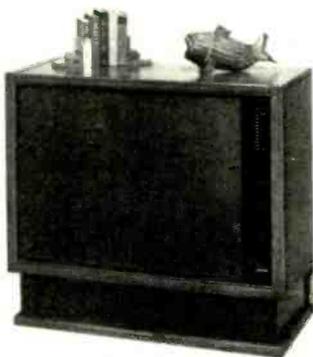
The Technics SA-350 AM/FM receiver has a built-in VHF TV sound tuner with Stereoplex circuitry that enhances mono broadcast signals by simulating stereo through phase adjustment of the middle frequencies. In addition, most video sources, such as cable and VCR's, can be connected to the receiver. It also has an MPX output jack for connection to a forthcoming stereo TV decoder.

AM/FM digital quartz tuning is featured with sixteen random station presets, auto-memory, and auto-scan. On/off switches for loudness and Stereoplex are on the front panel, as well as sliding controls for volume, bass, treble, and balance. An LED block-diagram display shows which receiver function is in operation. The receiver is rated at 40 watts per channel from 20 to 20,000 Hz with total harmonic distortion of 0.007 percent. Price: \$270. Technics, Dept. SR, One Panasonic Way, Secaucus, N.J. 07094.

Circle 121 on reader service card

RCA

All eighteen models in RCA's Full Spectrum line of video monitor/receivers have full stereo-TV and secondary-audio-program (RCA calls it "Audio B") capability. The units have connections for hookup to separate audio amplifiers, VCR's, and other video sources to act as the center of an extensive audio/video system. An LED lights up to indicate the reception of stereo TV broadcasts. The audio circuitry also



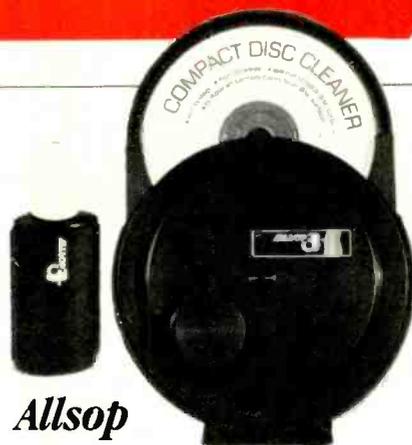
features Dynamic Noise Reduction (DNR) to reduce hiss on low-fidelity sound sources. The Full Spectrum video circuitry is said to process 100 percent of the NTSC signal for improved color quality, higher contrast, and lower graininess. Prices for the 25-inch sets range from \$1,099.95 to \$1,559.95. RCA, Dept. SR, 600 North Sherman Dr., Indianapolis, Ind. 46201.

Circle 122 on reader service card

JVC

JVC's DD-VR9 cassette deck includes the "U-Turn" quick autoreverse system with a "Flip Reverse" for correct alignment of the heads to the tape, ensuring uniform playback in both directions. The recording head is capped with ceramic material to prevent head magnetization and assure smooth tape flow. The direct-drive transport has a pulse servomotor. The three-head deck features Dolby B and Dolby C noise reduction, a digital counter, and fluorescent peak meters. Convenience functions include index scan, blank search, and block repeat. Price: \$800. Seven other new cassette decks are offered by JVC, from \$130 up. JVC, Dept. SR, 41 Slater Dr., Elmwood Park, N.J. 07407.

Circle 123 on reader service card



Allsop

Allsop's wet-system Compact Disc cleaner uses a soft replaceable pad that cleans discs across the spiral signal path to prevent scratches, which can cause mistracking. The radial cleaning system used is the method recommended by the manufacturers of Compact Discs. Price: \$29.95. Allsop, Dept. SR, P.O. Box 23, Bellingham, Wash. 98227.

Circle 124 on reader service card

Interaudio by Bose

Four new speakers in Interaudio's SA series feature a tweeter protection circuit that lights up during overload. The cone tweeter in this series of speakers has a wide-angle acoustic lens to disperse the high frequencies. Using tuned-port enclosures, the SA speakers feature a six-layer voice-coil woofer, push-type connectors, and a five-year transferable warranty. The first-order crossover networks roll off frequencies gradually, at 6 dB per octave.

The intermediate Model SA 500 (shown) has a frequency response given as 30 to 20,000 Hz. Its sensitivity is rated at a 91 dB sound-pressure level at 1 meter with a 1-watt input. Nominal impedance is 8 ohms. The cabinet has a vinyl veneer finish and a removable cloth grille. Price: \$538 per pair. Other SA speakers range from \$278 to \$858 per pair. Interaudio by Bose, Dept. SR, 100 The Mountain Road, Framingham, Mass. 01701.

Circle 125 on reader service card





Sansui

The new front-loading PC-V300 Compact Disc player from Sansui uses a three-beam laser, for improved tracking ability, and digital filtering. Its display panel shows the track and index number, minutes and seconds of playing time, and remaining time on the disc. The PC-V300 is capable of automatic play of up to twenty-three tracks programmed in random sequence. It can repeat all tracks, one track, or any segment on a disc. Music search/scan and timer play are included.

Frequency response is given as 5 to 20,000 Hz, signal-to-noise ratio as 95 dB, and total harmonic distortion as 0.005 percent. Channel separation is better than 90 dB, and wow-and-flutter is said to be unmeasurable.

The player, which measures 13 $\frac{3}{8}$ x 3 $\frac{3}{4}$ x 11 $\frac{3}{8}$ inches has a matte black finish. Price: \$500. Sansui, Dept. SR, 1250 Valley Brook Ave., Lyndhurst, N.J. 07071.

Circle 126 on reader service card



Nakamichi

The TD-700 car cassette/tuner from Nakamichi is said to have the first closed-loop dual-capstan tape drive in any automotive unit. Asymmetrical high-inertia flywheels and capstans are used in the tape-drive mechanism, and a magnetic clutch controls take-up and supply-reel torque to achieve a wow-and-flutter specification of less than 0.05 percent wrms. The unidirectional deck features automatic rewind/replay and a manual azimuth-adjustment control. A microprocessor permits motor-driven eject and loading and disengages the pinch-roller when the ignition is turned off. A Crystalloy playback head and switchable 70- and 120- μ s equalization are included, as well as Dolby B and Dolby C noise reduction.

The local oscillator in the TD-700's tuner section is phase-locked to a quartz reference for accurate reception. Tuning is done both manually and by autotune, and there are six AM and six FM presets. RF-amplifier gain is adjusted by a two-stage automatic gain control (for reduced cross-modulation and "picket-fencing"), and a noise-killer circuit cancels ignition noise and interference. The LCD panel shows station frequency, preset number, and band, and it also identifies a stereo broadcast. Independent left/right and front/rear faders control balance. The DIN chassis mounts in a sleeve, with a tool supplied to allow the TD-700 to be easily removed from the car for security. It measures 7 inches wide, 2 inches high, and 6 $\frac{1}{2}$ inches deep. Price: \$790.

The Nakamichi TD-500 is similar to the TD-700, but it has single-capstan drive and lacks program seek. Price: \$595. Nakamichi USA, Dept. SR, 19701 South Vermont Ave., Torrance, Calif. 90502.

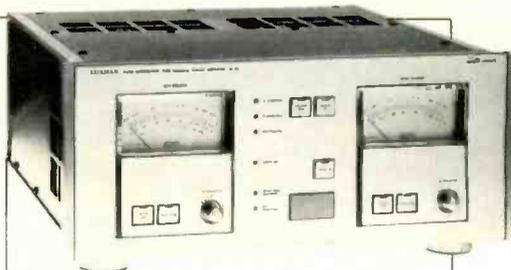
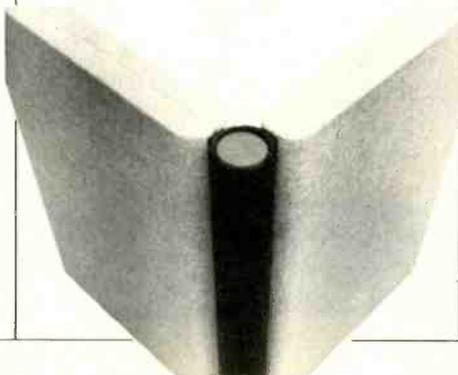
Circle 127 on reader service card

Monster Cable

Soundex acoustic control panels, by Monster Cable are intended to control room reverberations and absorb sound smoothly over the frequency spectrum without dips or peaks. They are constructed of a 1-inch high-density fiberglass mixture for a 0.90 noise-reduction coefficient. The panels may be installed on the wall behind the speakers for a "live-end, dead-end" system or to either side of the speakers to reduce ringing.

Soundex 1 panels attach to walls with Velcro strips. Price for 34 x 60 inch size: \$160. Soundex 2 free-standing panels are double-sided, with Velcro strips on both edges to attach to optional posts. Price for 32 x 60 inch size: \$260. Soundex 3 hanging panels use the same double-sided construction, but are to be suspended from ceilings. Color options include blue, rose, beige, gray, and "quartz." Price for 26 x 60 inch size: \$205. Monster Cable, Dept. SR, 101 Townsend St., San Francisco, Calif. 94107.

Circle 128 on reader service card



Luxman

Luxman's M-05 pure Class A power amplifier combines two monaural amplifiers to produce 105 watts of power per channel. Duo/Beta circuitry is combined with single-stage amplification, very large heat sinks, and quiet cooling fans. Input sensitivity is 750 mV. Frequency response is given as 10 to 100,000 Hz and the signal-to-noise ratio is 120 dB. The amp weighs 85 pounds. Price: \$2,799.95.

The Luxman C-05 preamplifier incorporates Duo/Beta circuitry and symmetrical-differential, cascode push-pull gain stages with SEPP (single-end push-pull) design at all stages. It has oxygen-free copper wiring and copper-clad isolation. The use of negative feedback is minimized. The preamp measures approximately 18 $\frac{1}{2}$ inches wide, 5 $\frac{1}{2}$ inches high, and 17 $\frac{1}{2}$ inches deep, and it weighs just over 24 pounds. Price: \$1,799.95. Alpine Electronics of America, Dept. SR, 19145 Gramercy Pl., Torrance, Calif. 90501.

Circle 129 on reader service card



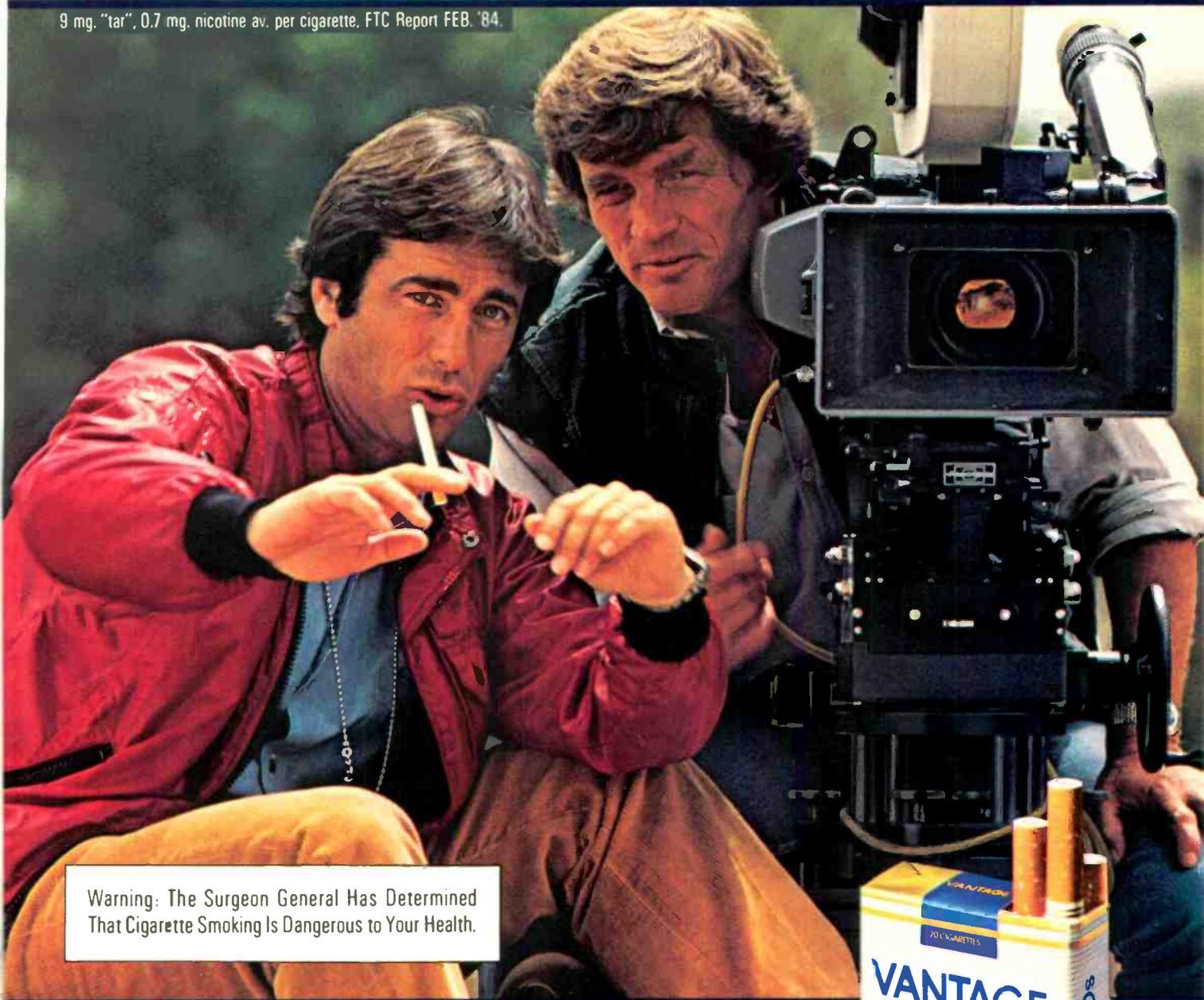
Adcom

Five of Adcom's new phono cartridges have the high-output Crosscoil moving-coil design. Improvements include uniformity in group delay characteristics, low armature inertia, a new damping compound, and a new suspension-wire system to lower intermodulation and phase distortion. The cantilever is shorter, with a tubular sapphire cantilever for the top-of-the-line SXC Van den Hul model and a tubular aluminum design for the others. Price of the SXC Van den Hul: \$450.

The XC-RM II (\$325) has a modified micro-ridge stylus, and the XC-LT II cartridge (\$260) has a line-trace stylus. The HC-VDH II (Van den Hul stylus) is \$220, and the HCE-II (elliptical stylus) is priced at \$140. Adcom, Dept. SR, 11 Elkins Rd., East Brunswick, N.J. 08816.

Circle 130 on reader service card

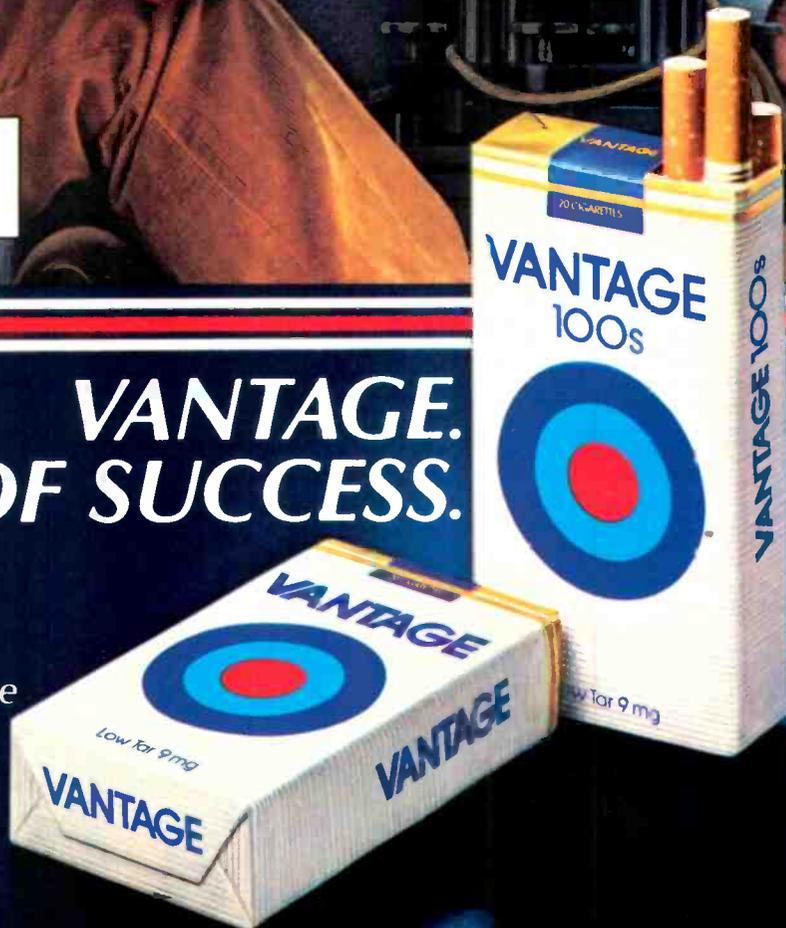
9 mg. "tar", 0.7 mg. nicotine av. per cigarette, FTC Report FEB. '84.



Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

VANTAGE. THE TASTE OF SUCCESS.

Great Taste
with Low Tar.
That's Success!



JBL

All five models in the TLX series loudspeakers from JBL contain a dome tweeter laminated with vapor-deposited titanium for a light but stiff assembly. An acoustic "contact lens" is said to eliminate phase shift and smooth the high-frequency response by "shadowing" the center of the tweeter dome. The woofers and midrange drivers are made of a plasticized layer laminated over a pulp base for best stiffness, mass, and internal damping. The "floating" grilles



of the speakers are mounted on struts to minimize interference with the sound.

The TLX series ranges from the two-way J216A design at \$199.90 a pair to the three-way Model J350A (shown) at \$639.90 a pair. All models require only 10 watts of power and have nominal impedances of 8 ohms. Sensitivity ratings range from 89 to 91 dB sound-pressure level with an input of 1 watt measured at 1 meter. JBL, Dept. SR, 8500 Balboa Blvd., P.O. Box 2200, Northridge, Calif. 91329.

Circle 131 on reader service card

Fultron

A power amplifier and an equalizer are combined in two new car stereo units from Fultron. Each model is rated to deliver 120 watts of peak output power and can boost or attenuate response in seven frequency bands—centered at 60, 150, 400, 1,000, 2,400, 6,000 and 12,000 Hz—by as much as 12 dB. Both feature dual grounding and built-in circuit protection, and they can be

connected to either two or four speakers. In addition, the Model 15-0736 (shown) includes DNR (Dynamic Noise Reduction) and a variable echo control for a "concert hall effect." Its price is \$179.95; the Model 15-0734 is \$139.95. Arthur Fulmer, Inc., Electronics Division, Dept. SR, P.O. Box 177, Memphis, Tenn. 38101.

Circle 132 on reader service card



Rich Acoustic Labs

Rich Acoustic Labs' Model 5 is a ported, two-way bookshelf speaker system. Part of the company's four-model Monitor line, the Model 5's driver and port are vertically aligned for accurate imaging. It has an 8-inch polypropylene woofer in the center of the enclosure; a 1-inch soft-dome tweeter is mounted above it, and the bass port is below it. The crossover frequency is 3,000 Hz. Frequency response is given as 32 to 20,000 Hz, nominal impedance as 8 ohms. Sensitivity is rated as a 91-dB sound-pressure level at 1 meter with a 1-watt input. Recommended amplifier power is 5 to 250 watts.

The Model 5's cabinet is finished in walnut and measures 22½ x 13 x 11 inches. It carries a five-year warranty. Price: \$550 per pair. Rich Acoustic Labs, Inc., Dept. SR, 2401 Ross Clark Circle, Dothan, Ala. 36301.

Circle 133 on reader service card



Boston Acoustics

The Omnimount/CFT tweeter used in the Boston Model 741 speaker system is an automotive version of the CFT tweeter from Boston Acoustics' top-of-the-line home speakers. The ferrofluid-cooled tweeter measures 1 13/16 inches deep and can be surface-mounted. It is paired with a 4-inch copolymer-cone woofer with a high-energy strontium magnet and a 1-inch voice coil.

The Boston Model 751 (shown) combines the same tweeter with a larger 5¼-inch woofer. Crossover network, appropriate cables, and mounting hardware are included in both systems. Prices (per pair): Model 741, \$169.95; Model 751, \$219.95. Boston Acoustics, Dept. SR, 247 Lynnfield St., Peabody, Mass. 01960.

Circle 134 on reader service card

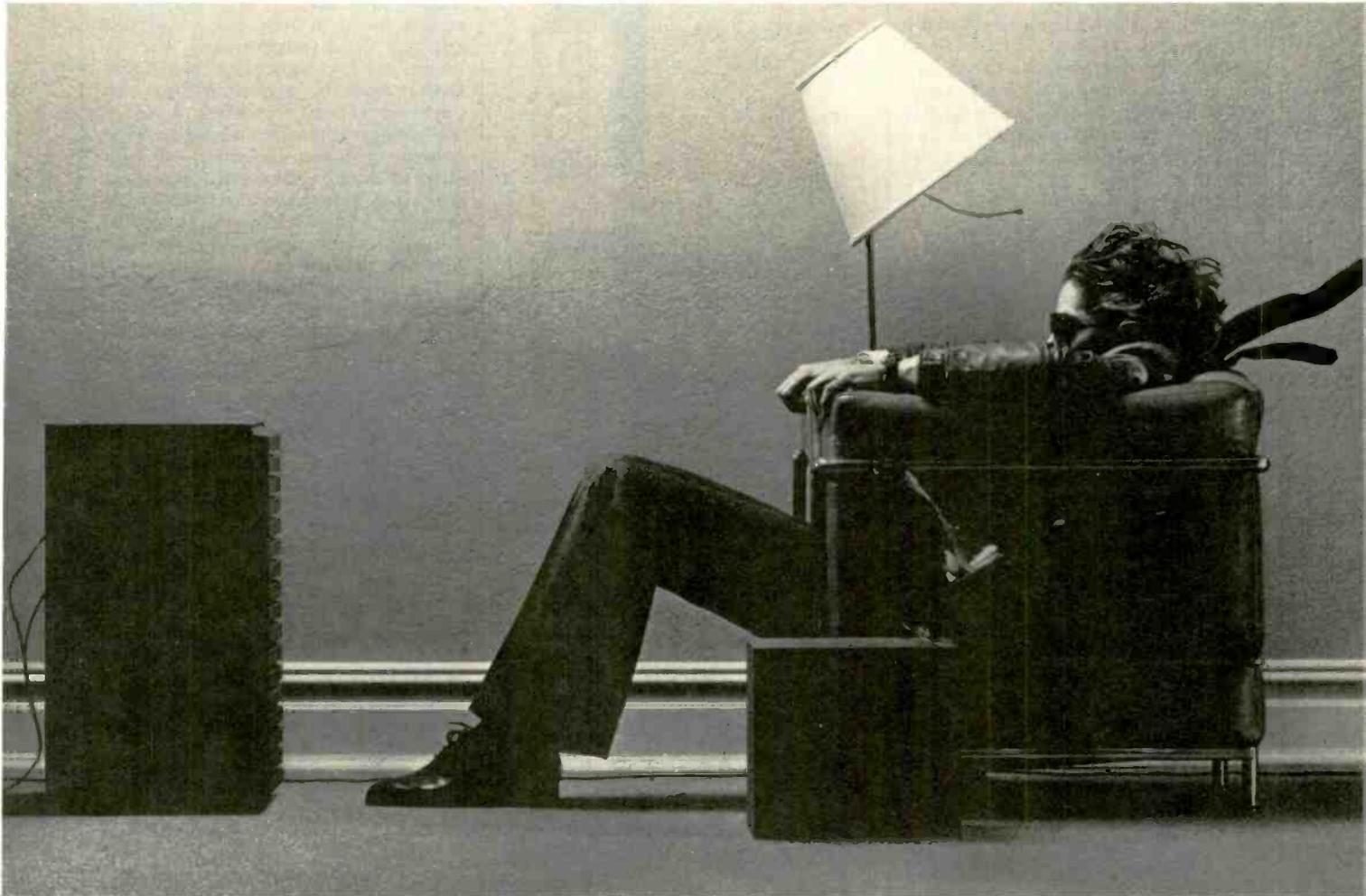


Onkyo

The Onkyo Integra T-9090 quartz digital frequency-synthesis tuner analyzes the incoming FM signal and adjusts the following features for optimum performance: local/DX RF amplifier, wide/narrow/super-narrow selectivity, FM feedback on/off, auto stereo/mono, and auto high blend on/off. The preset scan previews up to twenty stations in the memory for 5 seconds each. Price: \$600. Onkyo U.S.A. Corp., Dept. SR, 200 Williams Drive, Ramsey, N.J. 07466.

Circle 135 on reader service card

AFTER 500 PLAYS OUR HIGH FIDELITY TAPE STILL DELIVERS HIGH FIDELITY.



If your old favorites don't sound as good as they used to, the problem could be your recording tape.

Some tapes show their age more than others. And when a tape ages prematurely, the music on it does too.

What can happen is, the oxide particles that are bound onto tape loosen and fall off, taking some of your music with them.

At Maxell, we've developed a binding process that helps to prevent this. When oxide particles are bound onto our tape, they stay put. And so does your music.

So even after a Maxell recording is 500 plays old, you'll swear it's not a play over five.



IT'S WORTH IT.

Speaker volume

Q I have a set of speakers on my porch that I use together with those in my living room. I would like separate control of the volume of my porch speakers and have been told that an L-pad or a T-pad is the ideal way of doing that. Can you give me more information on the subject?

STEVE GORDON
Glen Oaks, N.Y.

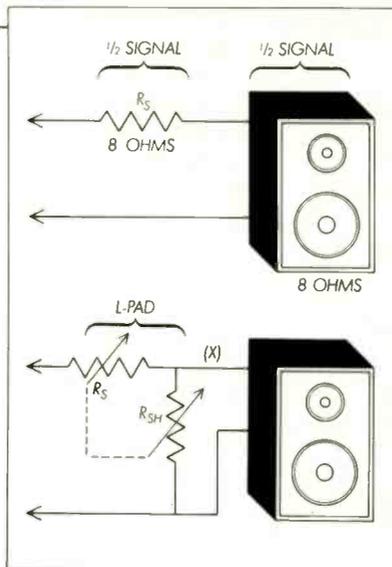
A Unfortunately, there is no simple "ideal" way to control volume at a remote speaker. The problem is this: Any speaker volume control essentially acts as a series resistance, which is varied to produce the desired drop in the signal voltage reaching the speaker. If you were to add, say, an 8-ohm resistor (R_S in the accompanying diagram) in series with a nominal 8-ohm speaker, half the signal coming out of the amplifier would reach the speaker and the other half would be absorbed by the resistor and dissipated as heat. The audible signal level would be down by half power (3 dB), which is a barely perceptible reduction.

Speaker volume controlling causes exactly the same sort of difficulty as small-gauge speaker wire: The series resistance causes dips and peaks in the speaker's frequency response that coincide with its (the speaker's) impedance variations.

But what about "L-pad" and "T-pad" attenuators? Aren't they intended to prevent such effects? Not really. L-pads have two variable elements that are ganged (mechanically linked) so that as the pad is turned down, a resistance element (R_S) in series with the speaker increases, and a separate resistance element (R_{SH}) connected across (in parallel with) the speaker simultaneously decreases (see the diagram). The purpose of this arrangement is to present the source of the signal with a reasonably constant resistive load as the attenuation is varied. This is of no practical concern when dealing with a transistor amplifier connected to two sets of speakers, but it can be important when you want to control the level of a tweeter or midrange without upsetting the crossover network.

T-pads have three ganged elements arranged to vary in such a way as to present a fairly constant resistance to both the source and the speaker voice coil. (The third element would be found at X in the L-pad diagram.) But T-pads are expensive and seldom warranted for speaker use, so we can ignore them in favor of the L-pad.

Since the problem with any pad or volume control is its potential effect on frequency response, can an L-pad be



Remote control of speaker volume

recommended over, say, a standard heavy-duty potentiometer? Yes, but not for the reasons generally given: For a wirewound potentiometer to operate smoothly as a speaker volume control it should have a resistance of about five times the speaker impedance. (An 8-ohm speaker would require a 50-ohm control.) This means that the speaker will see a comparatively large series resistance at most settings of the control. Since the potential series resistance in an L-pad is much lower to start, and will stay lower at equivalent attenuation settings, an L-pad is the way to go. Radio Shack has an appropriate \$9.95, 75-watt two-channel L-pad listed in its 1984 catalog.

Keep in mind that the greater the attenuation used, the larger the series resistance and the more energy the L-pad must dissipate. It's good practice to use the L-pads set as close to fully on as possible. In short, the best way to use L-pads is as little as possible.

Six-volt car stereo

Q My father recently bought a 1954 Chevrolet sedan and I'll probably be driving it a lot when he lets me. There is only one problem: The car's electrical system operates on a 6-volt battery. I would like to put in a car stereo setup, but I can't find a high-quality system that runs on 6 volts. Are there any, and if not, do you have any suggestions?

SCOTT GOODWIN
Oak Ridge, Tenn.

A You came to the right place! In the very early primitive days of car stereo, when there were no cassette or even eight-track players, and even stereo FM radios were rare, I of course had to have a stereo tape player (with built-

in stereo amplifier) installed in my car. The machine used the same type of cartridges found in broadcast stations of the day, and subsequently became known as a four-track player to differentiate it from the eight-track units that appeared shortly thereafter. I had a Volkswagen at the time whose electrical system was—you guessed it—6 volts short of the 12 volts needed to operate the player. Since I was also interested in installing a 12-volt Motorola stereo FM radio, I was truly motivated to solve the low-voltage problem.

The solution turned out to be fairly simple. I wired in a small 6-volt motorcycle battery through a heavy-duty double-pole, double-throw switch that put it in parallel with the regular car battery for overnight charging, and in series (thus yielding 12 volts) with the car battery for playing. I had plans to put in a relay to do the switching automatically, but the VW was totaled in a rear-ender before I got around to it. My next car, a Volvo 122, had 12 volts and ten speakers—but that's another story.

I'm aware that today there are 6-to-12-volt converters available, but I suspect they are both too expensive and too low in power for your purposes.

Solenoid story

Q I keep seeing the phrase "solenoid activated controls" in the descriptions of the more expensive cassette decks. Exactly what is a solenoid?

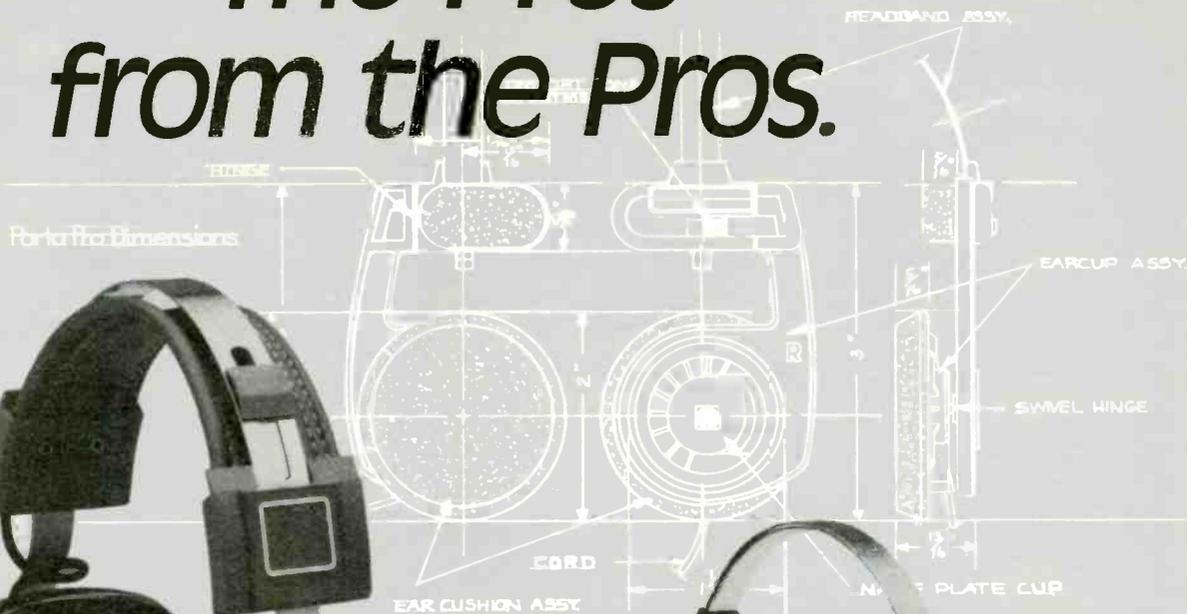
ARTHUR KREBS
Yonkers, N.Y.

A A solenoid is an electromagnet with a movable iron core. When current is applied to the solenoid's coil, the core is electromagnetically drawn into position with considerable force. In tape decks, solenoids are used to move the tape-head assembly into contact with the tape and to position the transport elements for play, wind, or rewind.

Solenoid-operated transports have several advantages over those that are operated manually by pressing piano-key controls or moving levers. Since solenoids are electronically controlled, it's easy to build in electronic-logic interlocks and delayed actions that prevent tape tangles, improper operation, and drive-system damage. And because solenoid operation does away with complex mechanical linkages, it simplifies the transport mechanism.

Some recent decks have replaced solenoids with special motors that move the drive and head elements into position far more gently than a solenoid can. This is said to be easier on the machine and to help preserve critical mechanical alignments.

The Pros from the Pros.



Koss Pro/4x
Suggested retail \$85.00



Koss Porta Pro
Suggested retail \$59.95

Never have two stereophones offered the personal and private listening experience that these Koss professional stereophones do. But then, only Koss, the worldwide leader in quality stereophones, could create the ultimate in transducer design and psycho-acoustic sound technology. Once you've heard them, you'll know why they're in a class by themselves, and why Koss proudly calls them the "Pros."

By combining a solid state piezoelectric tweeter with a samarium cobalt, rare earth, moving coil transducer, the Pro/4x produces the deepest, richest bass, the cleanest mid-range and the highest highs you've ever heard. In fact, the Pro/4x's remarkable solid-state piezoelectric tweeter reproduces frequencies from 2,500 Hz to an incredible 40,000 Hz. And the Pro/4x's exclusive Koss Pneumalite® earcushions not only offer the ideal listening comfort but also a perfect seal for the ultimate in low bass

performance to below audibility. The Koss Porta Pro, on the other hand, is designed to offer the ultimate listening experience in a portable stereophone. Weighing just 2.5 ounces, the Porta Pro features an ultra-thin state-of-the-art acoustical diaphragm that offers a frequency response range of 15-25,000 Hz and a Sound of Koss you won't want to leave home without. There's even an exclusive Koss Comfort Zone™ 3-position switch to adjust each earcup for your personal listening comfort. And a mute button that lets you turn off the sound without turning off the source. But best of all, the Porta Pro is designed to stay on whether you're jogging, doing your aerobic exercises or even flash dancing.

Ask your Koss Dealer to show you the Pros. Once you've heard the famous Sound of Koss, you'll never settle for less.



Porta Pro folds to fit in the palm of your hand.

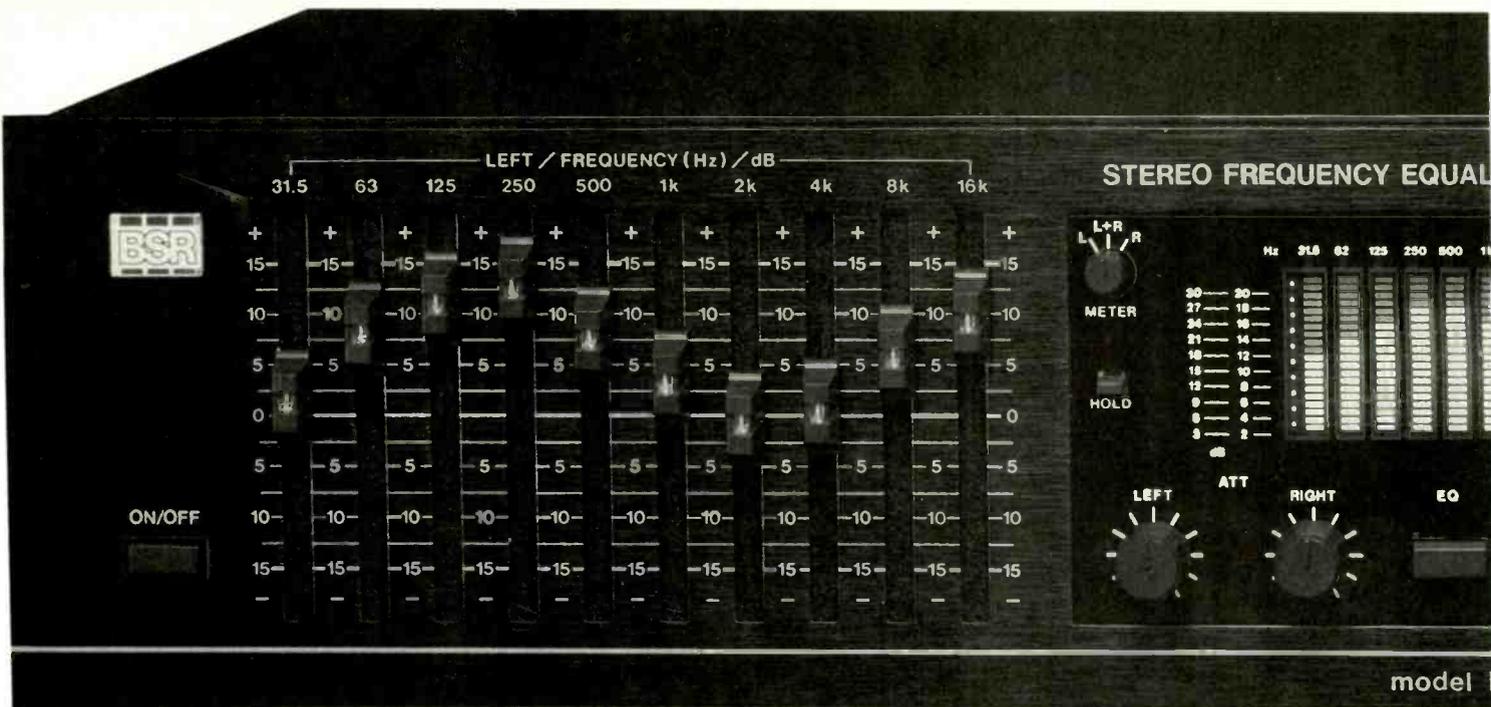
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CIRCLE NO. 23 ON READER SERVICE CARD



Smart Sound Detonator

Obliterate the wall between you and the individual instruments in your music. Infuse your own stereo system's sound with a breathtakingly vibrant 30 to 50% improvement in sound quality that you can measure with this superb BSR Equalizer/Spectrum Analyzer limited \$149 close-out.

By Drew Kaplan

Close your eyes. Touch a button. And you'll hear your stereo system literally explode with life.

You'll hear the gentle brushes on a snare drum, the startling bone-jarring realism of a thunder clap, or the excitement of a full cymbal crash.

You'll hear string basses and other deep low instruments emerge from bass (that will sound murky by comparison), with such clarity and such definition that you'll feel you can almost touch each instrument.

This astoundingly distinct yet powerful bass adds such a full bodied warm feeling to your music, you'll feel as if you've been lovingly wrapped in a warm soft blanket on a cold winter's night.

But don't take my word for the sound quality improvement. With the Pink Noise Generator, Calibrated Electret Condenser Mike and the 220 Element Spectrum Analyzer, you can instantly measure each and every improvement you make.

Plus, there's more. A subsonic filter effectively adds the equivalent of many watts onto the power of your amplifier.

Plus, with its provision for two separate tape decks including two way dubbing, you'll have much more than just greatly improved sound.

You can count on great sound from this top of the line Equalizer/Analyzer. It has a frequency response from 5hz to 100,000hz ± 1 db. And, it has an incredible 100db signal to noise ratio.

BSR, the ADC equalizer people, make this super Equalizer/Analyzer and back it with a 2 year standard limited warranty. Our \$149 close-out price is just a fraction of its true \$379 retail value.

FIRST THE EQUALIZER

YOUR STEREO'S HIDDEN SOUNDS

Your stereo can sound incredibly bet-

ter. Just a 5db roll-off at the high end, up around 14,000hz to 16,000hz, can just decimate the harmonics that give you the open feeling you'd experience at a live concert. A similar roll-off at 60hz, causes the fundamental bass notes to just fade away into the 'murk'.

An equalizer isn't some magical device that manufactures sounds that don't exist. Most of the frequencies that will make your music really vibrant, are actually already recorded in your music.

You'll be able to prove this with a few simple tests we'll try when we discuss the Spectrum Analyzer.

You see, certain frequencies are simply not reproduced with as much volume as are the mid-range frequencies which stretch from about 800hz to 2,000hz.

An equalizer simply lets you establish accurate control of all frequencies to fit your equipment, your recordings, your taste, and your listening environment.

TOTAL MUSICAL CONTROL

And, what a job it can do. It's totally unlike bass and treble controls which simply boost everything from the mid-range down for bass, or everything up for treble. You can boost the low-bass at 31.5hz, 63hz and/or 125hz to animate specific areas or instruments.

And, when you boost the part of the bass you like, you don't disturb the mid-range frequencies and make your favorite singer sound like he has a sore throat.

The high frequencies really determine the clarity and brilliance of your music. The problem is that highs are very directional. Wherever you move in your listening room, you'll find a big difference in high end response, as you'll see when we test the Analyzer.

No recording engineer or equipment manufacturer can even begin to control your listening environment.

You can control the highs at 4,000hz, 8,000hz and/or 16,000hz, to bring crashing cymbals to life at 16,000hz while at the same time you can cut tape hiss or annoying record scratches at 8,000hz.

But there's more. Don't leave out the mid-range. You can boost trumpets at 300 to 500hz or a clarinet at 1000hz. You can boost or cut any part of the frequency spectrum a full ± 15 db.

TAPE DECK HEAVEN

You can push a button and transfer all the equalization power to the inputs of two tape decks. Now you can pre-equalize your cassettes as you record them and get all the dramatically enhanced sound recorded right on your cassettes.

This is an especially great feature when you play your cassettes on bass-starved portables or high-end starved car stereos.



SIMPLY PLUG IT IN

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks.

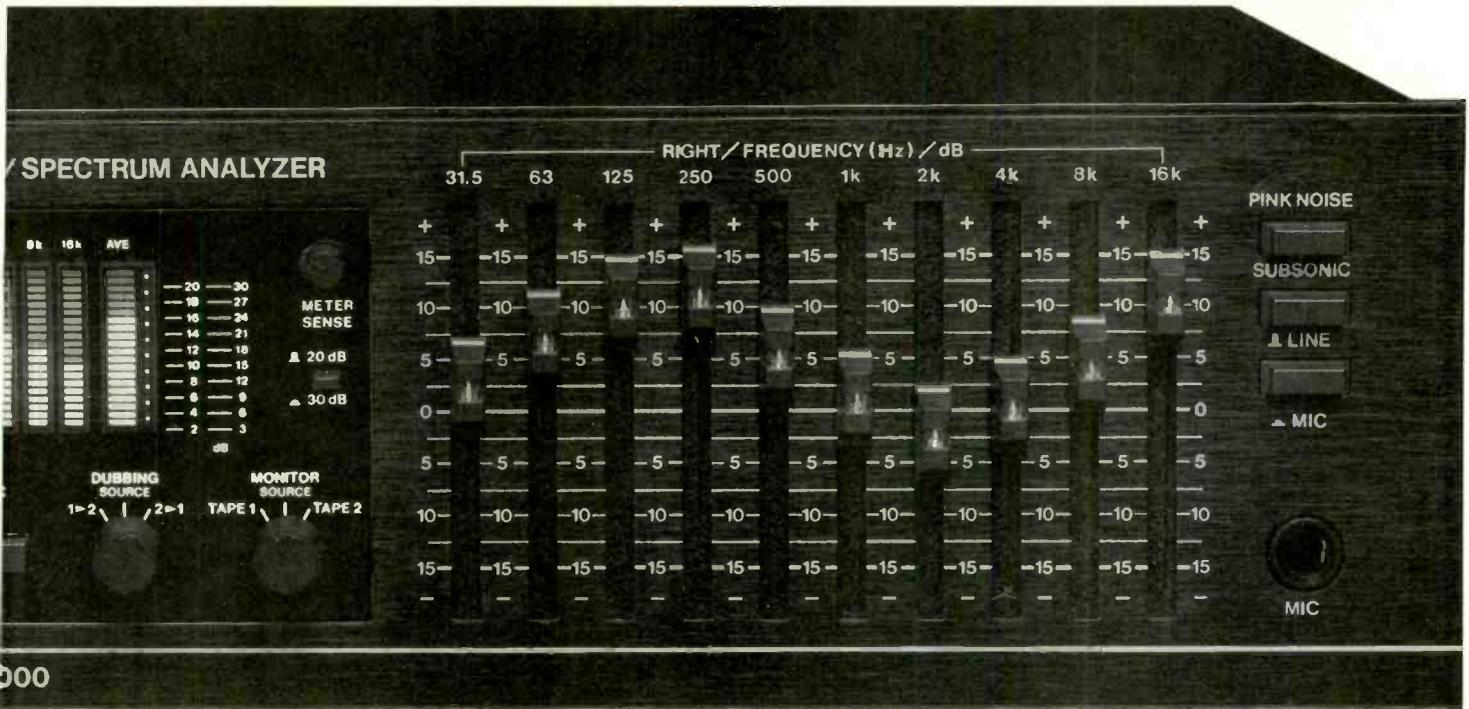
Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver or preamp. We even supply the cables.

As you listen to your records, FM or any 'Aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

The output from your receiver is always fed directly to your tape deck(s) for recording, and with the touch of a button, you can choose to send equalized or non-equalized signal to your deck(s).

When you want to listen to a tape deck, just select which tape deck you want, turn the switch on the equalizer,

model



and your tape deck will work exactly as it did before. Except, now you can listen with or without equalization.

Look at this. You can dub tapes from deck 1 to deck 2, or from deck 2 to deck 1 with or without equalization.

THE SUBSONIC FILTER

Much of the power drawn from your amplifier is used to drive your woofers. When you drive the amplifier too hard, it clips and you end up with distortion.

A subsonic filter removes a lot of non-musical material you can't hear that exists below 20hz. So, it relieves your amplifier of a lot of work. It doesn't actually create more watts (Please, no letters from my 'technical' friends) for your amplifier.

But, it's like turning off the air conditioning in your car. It saves you using about 7hp of what you have. And therefore, you'll have more watts for clean powerful sounding music.

THE SPECTRUM ANALYZER

Now you can scientifically analyze your stereo listening room and test your equipment by using BSR's Real Time Frequency Spectrum Analyzer.

Plus, you'll see your music not as a single level on a VU meter, but as a kaleidoscopic parade of 10 individual 20 element VU meters.

Each is tuned to a specific octave of the sound spectrum. An eleventh 20 element meter averages all levels.

The effect is awesome. You can visually isolate a string bass or cymbal, and actually see each individual instrument almost as a wave moving across the 220 individual fluorescent elements.

THE MOUTH AND EARS

It talks. The Analyzer speaks with a voice of pure calibrated Pink Noise. Pink Noise is the standard composite 'sound' of all frequencies used for testing in labs around the world. All frequencies from 20hz to 20,000hz are generated at the exact same level at the exact same time.

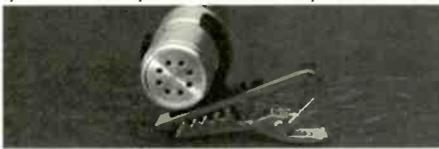
It listens too. If you are testing a cassette or a component in your system, use the 'Line Button'. If you're testing your whole system with speakers, use the matched calibrated electret condenser

microphone (included). Either way, you'll have a quick, easy and accurate way to evaluate the total sound of your system.

HOW TO TEST

SPEAKERS, EQUIPMENT AND TAPE

Testing your speakers in your listening room is the really crucial test. Simply place the calibrated microphone where you normally sit to listen to your stereo.



At the end of an 18 foot cord is the ear of the system. Just clip the mike wherever you sit and test your room.

Turn on the Pink Noise. You can switch to Left Channel, Right Channel or both. There's a meter range button, a sensitivity control, and even a switch that lets you freeze the meter.

Just sit down at the equalizer. Start with one channel. You'll see all 10 octave bands on the meter. Just slide the corresponding controls to increase or decrease any area that needs help.

You have now set up your system to its maximum capability. But as you'll see, location is very important. Move the microphone 5 feet to the left or right.

Then turn on the Pink Noise and check the Spectrum Analyzer. Now you can see why the specifications that come with your system are only a starting point.

Here's a way to test your tape deck and tape. First record Pink Noise for 3 minutes at -20VU. Then play it back and note the readings on the meters.

Now, record the Pink Noise again at 0VU or +3. Wait till you see how much the high end falls off. Now you'll see why all specifications are listed at -20VU.

With the Equalizer/Analyzer you can enjoy the finest stereo sound from your system and be a test lab too.

WHY SO CHEAP

BSR now only sells equalizers under their ADC name. Well, as Detroit comes out with new cars each year, ADC comes out with new equalizers. We got them to supply us with just 30,000 of last year's

ADC model before they shut it down.

They had already paid for all the tooling, all the research and design, so we were able to buy these for less than half the normal price, for cold hard cash.

THE FINAL FACTS

There are 20 slide controls, each with a bright LED to clearly show its position. Each control will add or subtract up to 15db. (That's a 30db range!)

There are separate sound detonation slide controls for each channel at 31.5hz, 63hz, 125hz, 250hz, 500hz, 1,000hz, 2000hz, 4000hz, 8000hz, and 16,000hz.

BSR backs this top of the line Graphic Equalizer/Spectrum Analyzer with a 2 year standard limited warranty. It is 1 7/8" wide, 3 1/2" tall and 8 3/4" deep.

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AUDIOMOBILE SYSTEM 1600



by Julian Hirsch and Christopher Greenleaf

A combination of amplifiers and speakers makes it easy to add hi-fi sound to any car stereo system.

AT the introduction, about a year ago, of the System 1600 (originally called the K-40 Signature), Audiomobile claimed that its new brainchild would deliver hi-fi sound with a smooth, flat frequency response and balanced stereo image for both front-seat passengers. What's more, the company claimed it had researched the acoustics of all but the most esoteric of automobiles and that the system could easily be made to do this for any car. To anyone who knows about car stereo acoustics, that is quite a claim. We were, to say the least, skeptical.

The Audiomobile System 1600 consists of a single four-channel amplifier plus a built-in front-rear fader that allows it to drive four satellite speakers and two subwoofers. There is a crossover network inside

the unit that divides the signal between the satellite amplifiers and the subwoofer amplifiers. An intentional notch in the frequency response at the crossover frequency attenuates the standing-wave resonances common to most cars at this frequency. The output of the subwoofers is adjustable relative to the satellite outputs.

The amplifier power rating is given as 160 watts total rms into 2 ohms from 30 to 20,000 Hz with no more than 0.05 percent total harmonic distortion (THD). That would be 80 watts per channel with 40 watts going to the two satellites on each side and 40 watts to each subwoofer. But note that the rating is into 2 ohms—most car stereo systems are rated for 4 ohms, which would cut these power ratings by half.

Since car stereo systems are so installation-critical, the Audiomobile people designed the System 1600 to minimize the acoustic effects of the car's interior. The satellite speakers are intended to be installed where they can radiate directly at the listeners rather than trying to bounce the sound around the car. Audiomobile gives its dealers fairly explicit instructions as to where to install the speakers in all kinds and models of cars.

The satellite speakers are sealed enclosures with 1/2-inch wide-disper-

sion dome tweeters. There are 3-inch midrange drivers in the front satellites and 4 1/2-inch "midwoofers" in the rear satellites. The subwoofers fit neatly into the standard 6 × 9 inch mounting holes on the rear decks of most cars. Audiomobile dealers are supplied with kits for adapting them to nonstandard holes, and they also have enclosures available to fit in some hatchbacks and wagons.

The system can operate with any in-dash unit either through the amplifier outputs to the original speakers or through line-level preamp output jacks. A remote front/rear fader control is supplied for under-dash mounting. The input sensitivity and bass level control are on the amplifier itself.

The System 1600 amplifier is solidly constructed and measures about 15 × 5 1/2 × 2 inches. The suggested retail price of the entire system is \$1,089. Audiomobile, Dept. SR, 1500 Executive Drive, Elgin, Ill. 60120.

Lab Tests

Since the Audiomobile System 1600 contains two pairs of amplifiers operating in widely separated frequency ranges, we first measured the frequency-response characteristics of both amplifiers, adjusting their levels to give equal gains in their passbands. The subwoofer amplifier response was flat from 20 to 40 Hz, rolling off and intersecting the satellite amplifier response at 155 Hz, -10 dB.

Because of the automatic power-on circuit, the amplifier tended to shut off at the lower input levels, making it impossible to measure its noise level in the few seconds that elapsed between the time the signal was removed and the unit turned itself off. We found that the 1600 is one of those rare amplifiers that acts like an almost perfect constant-voltage source, with virtually no change in output voltage when the load was switched between 2 and 4 ohms. Thus, the power output for a given input level was inversely proportional to the load impedance, although the clipping power was slightly more than twice as great into 2 ohms as into 4 ohms.

We were able to measure the per-

formance of the fully enclosed satellite speakers as we would with any home speaker system, but that was not possible with the subwoofers, since no enclosure we might devise would be likely to simulate their normal automotive environment. Thus, we were limited to an un baffled impedance measurement on these drivers. The subwoofers resonated at 45 Hz (which would be increased slightly when loaded by the volume of a typical automobile trunk). Their minimum impedance of about 2 ohms occurred in the 200- to 300-Hz range.

Both satellite speakers delivered a sound pressure level of 90 dB at a 1-meter distance with 2.83 volts of midrange input. The averaged room response of the rear satellites was surprisingly uniform, within ± 5 dB from 160 to 20,000 Hz. The smaller front satellites had a somewhat less regular response, with a peak at 600 Hz that could be heard as a buzz with a sine-wave input. Their overall response variation was ± 10 dB from 170 to 20,000 Hz. The satellite speakers had fairly similar impedance curves, measuring about 3.8 ohms over much of the bass and midrange. The bass resonance was at 250 Hz for the rear satellites and at 340 Hz for the front satellites.

The 1600 is one of those rare amps that acts like an almost perfect constant-voltage source.

Our IQS FFT signal-analysis system yielded frequency-response curves much like those of the room-response measurements except that they typically showed interference effects between the woofer and the tweeter. These effects showed up in the form of a hole in the response at a frequency of a few thousand hertz that appeared only at a few specific distances and angles from the speaker. The hole did not appear in the room curves.

As we learned from working with the System 1600, it is especially

important that this amplifier be installed by someone who is not only familiar with the techniques of car audio installation but is specifically experienced with the Audiomobile units. As an example of the kind of pitfalls we encountered, when we accidentally got one side of a speaker output grounded, the amplifier went dead immediately. Surmising that an internal fuse had blown, we discovered that none of our fairly complete set of Allen-head wrenches would fit the capscrews holding the end plates in place. Unable to open up the amplifier, we could not replace the fuses.

These comments aside, the System 1600 amplifier proved to be excellent, delivering typically 20 or more watts per channel to 4-ohm loads or 40 watts to 2-ohm loads over the full audio range with very low distortion. Our experience with numerous car radio/cassette players leaves no doubt that the total distortion in the system will always be that of the radio that drives it.

The measured response of the System 1600 speakers should not be compared with that of a home hi-fi speaker, for the final result will be strongly affected by the characteristics of the car and how the speakers are installed. Since the satellites are "cross-fired" (the driver's-side speaker aims at the passenger, and vice versa), and since the frequency range is divided between front and rear speakers, the usual criteria for stereo imaging do not apply.

Our tests show that the speakers have the potential to propagate the entire audible spectrum within the car. The system's amplifier meets home hi-fi standards in respect to frequency response and distortion, and is able to develop a considerable power output into the low impedance of these speakers. It seems probable that a competently ex-

cuted installation of the Audiomobile System 1600 system should produce a highly satisfactory mobile listening experience. *J.H.*

Road Tests

The Audiomobile System 1600 had been in my car for 6,800 miles by the time this report was finished. It has been a welcome, utterly musical partner in travel. It has had at least six front-ends driving it and has enjoyed (as have I) a diet of very good cassettes and a sampling of the country's best FM stations.

The System 1600's sound is essentially too neutral and accurate to impart its personality to the music it plays.

The few quibbles with the system over all these miles arose from frequent drives down bumpy lanes in the Berkshire hills, not from any element of its musical performance. The right front satellite became detached from its place on the side of the passenger's kick-well, but as far as I could tell, that was because the installer used too large a drill to bore its one screw hole. The left-hand rear satellite's wire mesh grille loosened and slipped out of its pressure-fit recess in the front panel of that speaker, a matter I rectified by using my fingers to increase the tension between grille and lip slightly before refitting it. And the wire clips on the woofers were so easily disturbed by loading bulky or easily snared objects into the trunk that I turned the woofers 180 degrees and

HIRSCH-HOUCK LAB MEASUREMENTS

■ Satellite amplifier

Power output at clipping (1,000 Hz): 4 ohms, 23 watts; 2 ohms, 40 watts
Frequency Response: $-1, +0.5$ from 600 to 20,000 Hz; -3 dB at 350 Hz
THD at 1,000 Hz, 4 ohms: 1 watt, 0.078%; 20 watts, 0.03%
THD at 1,000 Hz, 2 ohms: 1 watt, 0.105%; 20 watts, 0.25%
Sensitivity for 1-watt output (4 ohms): 30 to 300 millivolts

■ Subwoofer amplifier

Power output at clipping (20 Hz): 4 ohms, 20 watts; 2 ohms, 40 watts
Frequency response: $+0, -3$ dB from 20 to 72 Hz
THD at 20 Hz, 4 ohms: 1 watt, 0.045%; 20 watts, 0.48%
THD at 20 Hz, 2 ohms: 1 watt, 0.07%; 40 watts, 0.055%
Sensitivity for 1-watt output (4 ohms): 30 to 100 millivolts

clamped on a metal bar to protect them. That was the total extent of my difficulties with the system, and I wish every *car* I've owned could have been as trouble-free!

The design of the speakers theoretically covers the full musical range, but the interworkings of amplifier and crossovers have a significant frequency-response dip in them from a point in the upper bass to the middle of the midrange, centered at 180 Hz. This drop in

response corresponds to what Audiophile feels is the average boomy peak in cars and neatly flattens it out. As it happened, the dip very nearly coincided with my Volvo's acoustic properties. A slight mismatch was audible as a leanness around 250 to 350 Hz, but I easily compensated for it with tone controls and the woofer-level control.

If you have a really flat system, which I believe this one to be, tonal adjustments can be both subtle and

effective. There is no need to make an equalizer's levers into an analog of the curve of a high-tension cable between pylons. Instead, a gentle nudge upward of the bottom one or two increments will lend additional authority to the already awesome low end. The treble is crisp and clear, never gritty or shrill. I warn you, though, that treble response this good will reveal the blemishes of old tapes, of poorly maintained records dubbed onto tape, and of broadcasters with mediocre sound! It might even jolt you, if you are forgetful about such things, into using your tape-head cleaners to restore your cassette player's high-frequency performance.

Perfect bass...Perfect treble... Perfect sound...forever

ROTEL introduces a refreshing new range of audio equipment designed exclusively to appeal to hi fi enthusiasts. Its acceptance in the UK, where Rotel was designed and conceived, is overwhelming.

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CIRCLE NO. 55 ON READER SERVICE CARD

Even very low levels are graced with the impact and clarity befitting true musical reproduction.

I can't really describe the sound of the Audiophile System 1600, which is essentially too neutral and accurate to impart its personality to the music it plays. If it is properly installed—and that may involve repositioning of the satellites, so you may want to postpone boring holes until you've road-tested it a short while—this somewhat expensive array of components becomes virtually unnoticed in the car as the months spin by. And it is physically durable too.

I tried equalizers with the system and found them staying in the flat position once I had gotten tired of playing with the things. The cross-firing satellite pairs make for a firm and convincingly stable stereo image across the front-seat spaces. And, once bass level and tonal adjustments have been decided on, performance from low organ notes up to the shriek of a piccolo is seamless and full. Ear-battering levels are possible, of course, given all that wattage at your fingertips, but even very low listening levels (switch in the *loudness* control) are graced with impact and clarity befitting true musical reproduction. This design from Audiophile lives up to its claims, and it is certainly one of the very best it has been my privilege to hear.

C.G.

Circle 145 on reader service card



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Electrical and Electronics Division

How Audible Is Distortion?



EVERYBODY knows that audio distortion is bad. Liking it would be tantamount to denouncing the flag, motherhood, and apple pie. While distortion cannot be eliminated entirely, it can be reduced to tolerable levels. In hi-fi "tolerable levels" means below audibility. And just what is "below audibility" constitutes the \$64,000 question.

In this examination of an answer, keep in mind that I am referring only to *nonlinear* distortions, the family containing harmonic and intermodulation distortions, among others. (Deviations from flat frequency or phase response are examples of *linear* distortion.) A nonlinear distortion occurs when the output of a component is not proportional to its input, so that the input and output waveforms are not identical in shape. If when the input to a component is doubled, the output goes up by a factor of 1.99 or 2.01, the system is nonlinear. We could express this nonlinearity as a distortion of one part in 200, or 0.5 percent.

The most interesting aspect of nonlinear distortion is that minute quantities of some kinds of distortion

may be unpleasantly audible, while others, measuring hundreds of times greater, may be quite imperceptible to the listener. It is misleading and incorrect to conclude that, say, 0.1 percent distortion is less audible than 1 percent distortion or that an amplifier with 0.002 percent distortion is, per se, "better" than one that has 1 percent distortion at the same power output. Either of those assumptions *might* be correct, but it is much more likely that there would be no significant correlation between the distortion figures and the sound of the system.

Harmonics

Harmonic distortion is usually measured with a sine-wave input signal, the simplest of all, as it is composed of only a single frequency. Any departure from an ideal sine-wave shape in the output waveform is equivalent to adding additional frequencies at multiples of the original frequency, or the *fundamental*. These multiples, or *harmonics*, can be measured in any of several ways, and their amplitude is expressed as a percentage of the fundamental's amplitude.

The lower-order even harmonics (particularly the second harmonic, at twice the fundamental frequency) can affect the timbre of the sound, but they are rarely harsh or unpleasant even when present at a considerable level. Low-order odd harmonics are generally less acceptable, but reasonable amounts of third-harmonic distortion (three times the fundamental) are not likely to offend most listeners. However, certain types of distortion mechanisms create high-order harmonics (such as the ninth, eleventh, etc.), which have been shown to be both unpleasant and audible in low amounts under *some* conditions.

Tested This Month

ADC TRX-3 cartridge
EPI T/E 320 speaker system
Luxman L-430 integrated amplifier
Audiosource RTA-One spectrum analyzer
Akai CX-R99 cassette deck

The audibility of any form of distortion depends greatly on the nature of the test signal. A small amount (sometimes as little as 0.01 percent) of almost any distortion added to the usual 1,000-Hz sine-wave test signal is plainly audible as a separate and higher-pitched component of the sound. However, if the test signal itself consists of two or more different signal frequencies—as occurs in certain intermodulation-distortion measurements—the distortion may have to be many times greater before it can be detected by ear. And if the program is very complex (music or speech), it is often impossible to hear surprisingly high amounts of distortion, equivalent to several percent, because the harmonic components are swamped or *masked* by the main body of the program.

I am not trying to suggest that nonlinear distortions can be ignored in judging or enjoying a music system. Certain types are intolerable to almost anyone. For example, a sharp discontinuity in the waveform (caused by amplifier clipping, excessive crossover distortion in the output stages, or—worst of all, for me—a mistracking phono cartridge) produces large amounts of very high-order harmonics. They are usually the odd ones, which are the worst. Even a rather small amount of ninth- or eleventh-harmonic content can be expected to produce a negative reaction from any listener who really appreciates good sound.

The Unmeasurable

In view of all this, it is hard to justify the emphasis placed by some amplifier manufacturers on reducing distortions to nearly unmeasurable levels (under 0.001 percent at normal listening levels in many current amplifiers and receivers). An amplifier, which is but one part of a music system, is by far the most nearly perfect in its characteristics and is thus least likely to contribute audible distortion under normal conditions. Only a true clipping overload is likely to produce a significant amount of harsh, high-order distortion, and even that is not necessarily audible unless its duration is excessive. Brief mo-

ments of clipping can easily pass unnoticed, being masked by the program that produces them.

Transducers

Still, since our reproduced music does not always sound as "clean" as we would wish it to be, *something* must be distorting it audibly. And so it is. The playback of a phonograph record contains enormous amounts of distortion, almost never less than ten times the distortion created by even a modest amplifier or digital Compact Disc player. The distortion in record playback is more likely to be *hundreds or thousands* of times greater. This is the case even when playing the finest direct-to-disc or digitally mastered LP with the most highly regarded pickups on the market. We are dealing here with distortion percentages of tenths of a percent at low recorded levels, and several percent at high levels, in contrast with the amplifier's probable maximum reading of 0.05 percent at any level.

The loudspeaker is also not an ideal transducer. The nonlinear distortion of a well-designed speaker can be quite low under most conditions, but it is inevitably many times greater than any distortion contributed by the amplifier.

I guess the conclusion I am approaching is that simple nonlinear distortions (harmonic and intermodulation) in an electronic component are by no means as serious a detriment to ideal sound reproduction in the home as many advertisements would have us believe. Most of the common ratings for nonlinear distortion in an electrical system component have little or nothing to do with how that product might sound in your system. They usually describe effects whose audible contribution is minuscule or even inaudible compared with those of the analog record-player/record combination and the speaker system. And in my opinion even those sources are almost trivial compared with the distortions (linear, nonlinear, and musical) added by the stages that precede and follow them. These include the original recording environment, miking, and mixdown, and the effect of your own listening room on the sound you hear. □



ON ELECTION DAY in Jack Daniel's Country it doesn't take long to find out who won.

There are only five precincts to be heard from. So the results get tallied pretty quick. And our County Judge has them posted right on the courthouse square. This November, there's no predicting how our citizens will be voting. But, no matter where in America you live, we hope you'll be joining us at the polls.



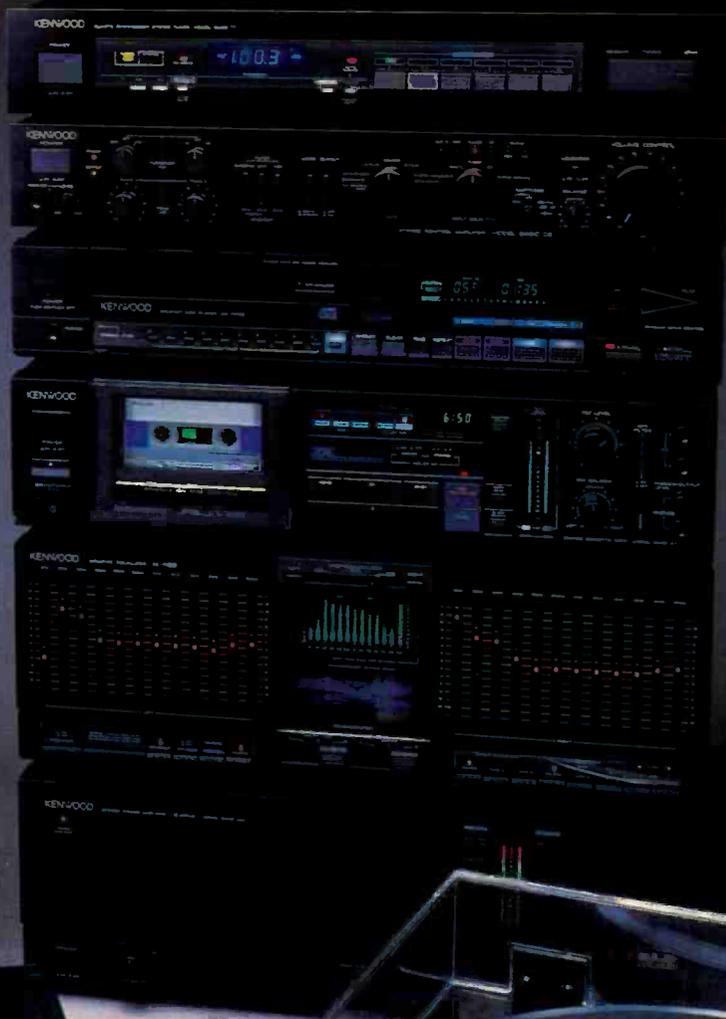
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Or, Dynamic Linear Drive (DLD): super-efficient, dual-output amplifier technology that produces power, purity and a dynamic range wide enough for Kenwood's amazing full and jacket-size CD players.

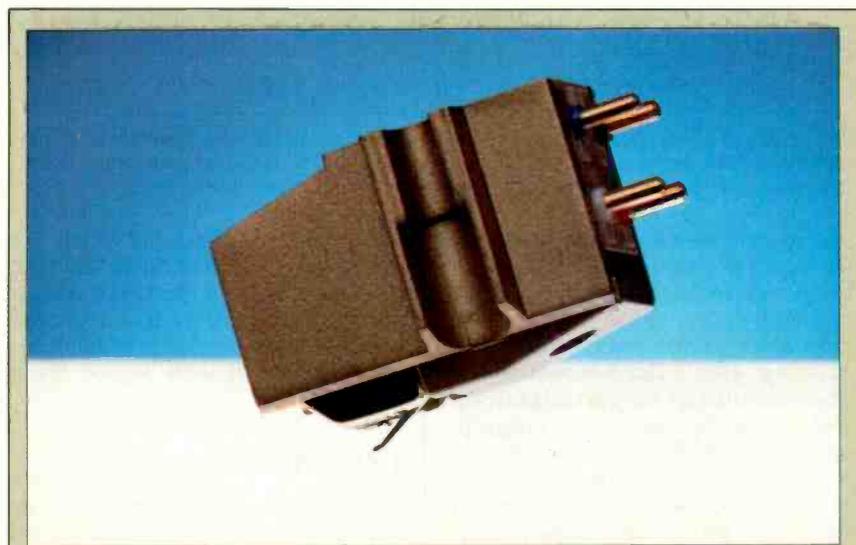
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ADC TRX-3 PHONO CARTRIDGE

A top-of-the-line cartridge with a smooth, uncolored sound quality



PHOTOS BY ROY SCHNEIDER

FEATURES

- "Zero Resonance" design
- Induced-magnet construction using a samarium-cobalt magnet and a tri-pole mu-metal armature
- Tapered beryllium tubular cantilever
- with nude, line-contact diamond stylus
- User-replaceable stylus assembly
- Recommended tracking force of 1.2 ± 0.2 grams
- Standard 1/2-inch mounting centers

LIKE previous ADC cartridges, ADC's new TRX "Zero Resonance" phono cartridges, of which the TRX-3 is the top model, all employ the induced-magnet principle of operation. While usually classified as moving-magnet designs, induced-magnet cartridges do not have moving magnets. Instead, a magnetically permeable armature is attached to the stylus cantilever and located close to a fixed magnet. This arrangement induces magnetic flux into the armature and effectively turns it into a

moving magnet. The armature's magnetic field moves in response to the stylus motion and in turn induces signal voltages in the cartridge's fixed coils.

In the TRX-3 a high-energy samarium-cobalt magnet energizes a three-pole mu-metal armature, which is located near the pivot point of the tapered tubular beryl-

lium cantilever. The cantilever pivot point is accurately maintained by a fine tension wire. To reduce the mass of the moving system, the stylus is fashioned on a rectangular shank, which has less residual mass after the stylus has been cut than the usual square shank. In the interests of high positioning accuracy, low mass, and ruggedness, the stylus is nude-mounted perpendicular to the cantilever. The stylus itself is a line-contact configuration with contact radii of 0.06 and 0.12 mils.

The "Zero Resonance" in the cartridge's name refers to the reduction of undesirable resonances by such techniques as the use of a rigid one-piece die-cast aluminum-alloy body and by the anchoring of the replaceable stylus assembly by means of a screw. The lowered mass of the stylus/cantilever assembly also helps reduce the effects of high-frequency resonances. Price: \$300. ADC, Dept. SR, Route 303, Blauvelt, N.Y. 10913.

Lab Tests

We installed the ADC TRX-3 in the moderately high-mass tone arm of a typical high-quality turntable. Initial tracking tests with high-velocity test records showed that the cartridge tracked well at its nominal 1.2-gram vertical force rating, but an increase to the maximum rating of 1.4 grams made a substantial improvement in its tracking ability. We used 1.4 grams for the balance of our tests.

Similarly, frequency-response measurements using several values of load capacitance confirmed that the recommended load of around 275 picofarads (pF) gave the flattest overall response, although the audible differences between the extremes of 170 and 400 pF were not significant (about 2 dB maximum output change in the 10,000-Hz range and virtually none at 15,000 Hz). We used a 300-pF termination for our testing of the cartridge.

The ADC TRX-3 impressed us by the unusual symmetry of its measured performance. Although some cartridges have well-

HIRSCH-HOUCK LAB MEASUREMENTS

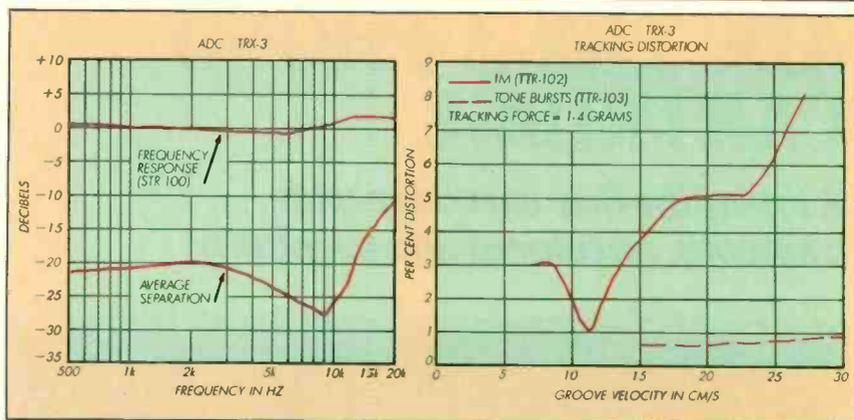
Frequency response (with CBS STR 100 test record): 40 to 20,000 Hz ± 1.25 dB referred to 1,000-Hz level
Channel separation: 22 dB at 1,000 Hz, 26 dB at 10,000 Hz
Output voltage (at 3.54 cm/s groove velocity, 1,000 Hz): 3.32 millivolts

Channel balance: 0.13 dB
Vertical stylus angle: 24 degrees
Optimum load: 47,000 ohms in parallel with 275 picofarads capacitance
Tracking ability (at 300 Hz with German HiFi-2 test disc): 70 microns at 1.2 grams, 80 microns at 1.4 grams

matched output levels at 1,000 Hz, it is most unusual that both the frequency-response curves and the crosstalk curves for left and right channels are essentially alike over the full audio frequency range. In this respect the TRX-3 was clearly the most outstanding cartridge we have tested so far.

The intermodulation distortion of the TRX-3 was fairly low, and there was no evidence of severe mistracking at the 27-cm/s maximum recorded level on the Shure TTR-102 test record. High-frequency tone-burst distortion, from the Shure TTR-103 test record, was low and varied little over the 15- to 30-cm/s range of the record. Other high-level tests, including the German HiFi:2, were tracked easily.

The ADC TRX-3 has a very high stylus compliance, rated at 40 micrometers/dyne, and therefore it should deliver its best performance when installed in a relatively low-mass arm. The effective mass of our arm and headshell (not including the 6.5 grams of the cartridge) was about 24 grams. The whole assembly resonated with the stylus compliance at 6 Hz. Although this is well below the optimum range of 8 to 12 Hz, we had no difficulty in playing any reasonably flat record with this tone-arm/cartridge combination (even if it were in-



In the graph at the left, the upper curve represents the frequency response of the cartridge. The distance between it and the lower curve is the average separation. The right graph shows the tracking distortion with various test signals.

stalled in a very low-mass tone arm we would not expect the TRX-3 cartridge to resonate above a frequency of 8 or 9 Hz).

In spite of our reservations concerning the "Zero-Resonance" nomenclature of the cartridge (resonances can be reduced to insignificant amounts, but they usually cannot be entirely eliminated), it does indeed have very well-suppressed resonance properties. In particular, the square-wave response to the CBS STR 112 test record was about as good as we have ever seen. The top and bottom of the 1,000-Hz square wave were flat and free from

identifiable ringing, and there was only a single cycle of fairly low-level ringing at each of the transitions of the square wave. The unavoidable high-frequency stylus resonance appeared to be at least 30,000 Hz, if not higher, in frequency.

Comments

Given the excellent specifications and measured performance of the ADC TRX-3, one would not expect to find anything wrong with its sound. In this respect, our listening tests produced no surprises.

When discussing a cartridge of this quality, however, it is rather difficult to make meaningful distinctions between its sound and that of other fine cartridges. This is closely analogous to the situation existing with amplifiers, and for the same reason. Once the quality of performance of a system component has reached a sufficiently high level, any clearly audible differences are likely to be the result of a flaw rather than an improvement in its performance.

After that lengthy aside, I can simply say with some assurance that the TRX-3 is about as smooth-sounding and free of coloration as any cartridge I can think of. Certainly its frequency-response and crosstalk characteristics are superb, and its trackability and low distortion easily meet our own standards for a true top-quality cartridge. The TRX-3 is a worthy flagship for the ADC cartridge line.

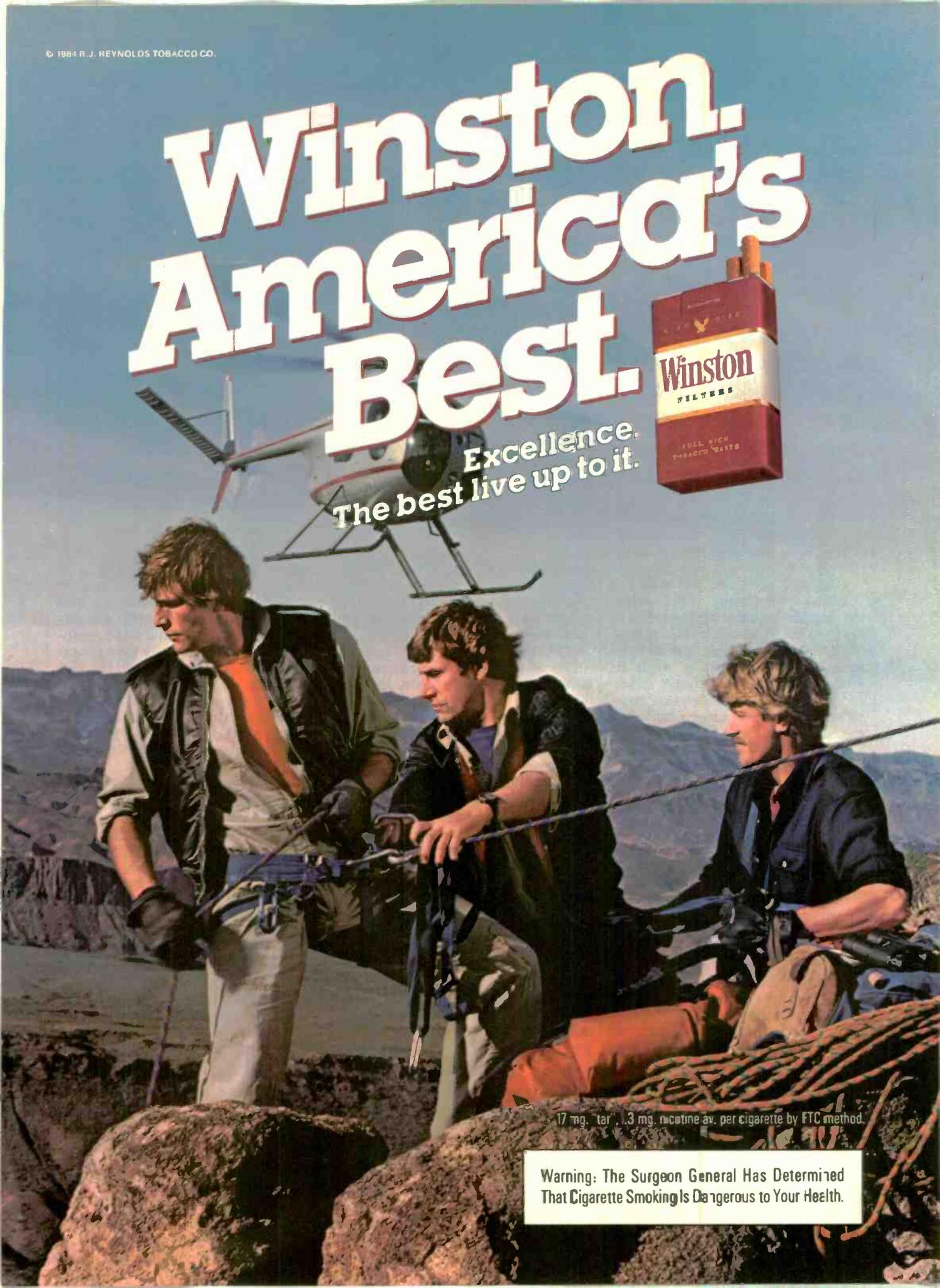
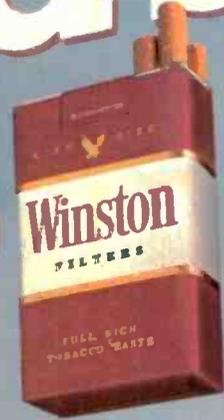
Circle 140 on reader service card



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17 mg. tar, 1.3 mg. nicotine av. per cigarette by FTC method.

Warning: The Surgeon General Has Determined
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EPI T/E 320 SPEAKERS

New construction techniques for diaphragms result in sweet sound at a moderate price

THE design of conventional loudspeaker diaphragms (cones or domes) has always been a series of compromises. The ideal diaphragm must strike the proper balance between lightness, stiffness, and internal damping (the property that prevents a material from resonating while it vibrates). EPI's Time/Energy series of loudspeakers addresses this classic standoff with several newly designed drivers.

All of the new drivers are meant to have good time/energy response. EPI describes this property as the ability to reproduce short pulses accurately by virtue of using stiff yet well-damped diaphragms that respond rapidly to transients, that do not store mechanical energy and release it as sound after the signal has ended.

Finding that no single material commonly used in speaker diaphragms had all the necessary properties for good time/energy response, the EPI engineers decided to use layered materials. The foam-plastic midrange and woofer cones are formed integrally with their edge suspensions in a single structure, each diaphragm having a contour and profile optimized for its function. The foam material provides the necessary self-damping qualities.



For stiffness, a clear, light, and rather rigid plastic cone is bonded to the outside of the foam cone to form a single rigid structure with the desired mechanical properties.

The tweeter diaphragm and its integral surround suspension are also made of plastic foam, but the outer-surface coating is applied by a spraying process instead of bonding. The two-layer construction was found to adversely affect the high-frequency response of the concave dome tweeter shape that has been used in EPI speakers for many years. A new, more conventional-looking *convex* dome shape was developed to exploit the advantages of the new materials while retaining or surpassing the high-frequency performance of the older driver.

The T/E series presently consists of six models; the T/E 320 tested in this report is the next-to-largest model in the line. It is a three-way floor-standing system with a 10-inch woofer crossing over at 700 Hz to a 4-inch midrange driver, which in turn crosses over to a 1-inch

dome tweeter at 3,000 Hz. The enclosure measures 29 x 17 x 10½ inches and weighs 52 pounds. The cabinet is covered with walnut-grain vinyl veneer and has a snap-on grille of acoustically transparent brown cloth. Recessed into the rear of the cabinet are insulated connectors accepting stripped speaker cable. There are no external controls. Price: \$250 each. Epicure Products Inc., Dept. SR, 25 Hale St., Newburyport, Mass. 01950.

Lab Tests

The quasi-anechoic frequency response of the EPI T/E 320, measured at a 1-meter distance with our IQS FFT-analysis system, showed some midrange fluctuations that appeared to be caused by refraction at the cabinet edges or other interference effects (the overall range of output variation was about 6 dB at several points between 1,000 and 6,000 Hz). From 8,000 to 18,000 Hz, the response was very smooth and varied about 4 dB overall. A

close-miked measurement of midrange-driver output showed a definite notch at the 3,000-Hz crossover to the tweeter, but this was not visible in our other measurements.

HIRSCH-HOUCK LAB MEASUREMENTS

Frequency response: 28 to 20,000 Hz, ± 4 dB

Impedance: 6 to 10 ohms average; 3.3 ohms minimum from 4,000 to 8,000 Hz; 40 ohms maximum at system resonance (44 Hz)

Sensitivity: 91 dB SPL at 1 meter with 2.83 volts input

Bass distortion (at 90-dB SPL

equivalent): 100 Hz, 0.21%; 60 Hz, 0.72%; 30 Hz, 5.3%

Group delay variation: ± 0.2 milliseconds from 2,500 to 20,000 Hz

Maximum power input (4-ohm impedance): 100 Hz, 190 watts; 1,000 Hz, more than 700 watts; 10,000 Hz, more than 300 watts.

The key is Kyocera ceramics technology—a superior new way to virtually eliminate mechanical and electrical vibrations that impede dynamic performance.

It starts with a handsome ceramic-compound resin base (actually the chassis) that supports all components. Because ceramics are rigid and inert, they provide vibration-free stability immune from volume and frequency irregularities. Because ceramics are non-ferrous, there are no eddy currents—so there's no electrical hum. Result: a chassis with practically no mechanical and electrical impurities.

**The new Kyocera A-910
Integrated Amplifier.**

Pure power without vibes.

In addition, fine ceramics encapsulate critical components throughout the circuitry to further isolate vibration. Kyocera also uses a heavy duty cutlass core power transformer to reduce eddy currents, minimize flux leakage and improve voltage regulation.

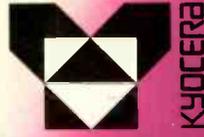
There are many other features that

- distinguish this extraordinary integrated amp: Rated a full 150 watts per channel into 8 OHMS at 0.02% THD from 20-20,000 HZ.
- New MM/MC equalizer with ultra low noise and input impedance transistors.
- Heavy duty high speed 80 MHz power amplifier design incorporating parallel triple push pull final stages with MOS FET drivers.
- Single stage push pull amplifier circuitry for improved signal to noise ratio and wide band frequency response.

Kyocera's matching PLL Quartz synthesized AM/FM Stereo T-910 Tuner.

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The room response of the EPI T/E 320 (measured at the far end of the room and using a swept sine-wave driving signal and averaging the outputs of both speakers) was quite smooth over most of its range,

They had a fine balance and a sweet, smooth, and airy overall character

with an overall variation of about 5 dB from 370 to 20,000 Hz. At lower frequencies, the speaker's characteristics were obscured by room resonances, so we measured the woofer response separately, with close microphone spacing, and "spliced" the two curves together. The woofer output varied only 3 dB overall from 40 to 400 Hz, with a broad maximum in the range of 60 to 100 Hz. The resulting composite response curve had a slight mid-bass emphasis, but its ± 4 -dB variation from 28 to 20,000 Hz represents excellent speaker performance by any standards.

The tweeter dispersion was very good up to 10,000 Hz or higher (about 4 dB maximum difference between the response curves measured on axis and 45 degrees off axis), but the curves diverged sharply at higher frequencies, with about 17 dB difference at 16,000 Hz. Some of the benefits of the Time/Energy design concept were demonstrated by the speaker's good group-delay characteristic. The T/E 320 impedance is rated at 4 ohms, and our tests validate this figure.

The T/E 320 is a relatively efficient speaker, especially for one using a non-vented enclosure. When we drove the speaker with 2.55 volts (equivalent to 90-dB SPL in the midrange) the woofer distortion was very low. At some frequencies, the low-frequency tone produced audible panel buzzing from the speaker, but the speaker's total output was very loud under these unusual conditions (and notably free of the usual bass harmonic distortions). We never heard it on music even when there was substantial deep-bass content.

The short-term power-handling ability of the EPI T/E 320 was tested with single-cycle tone bursts at frequencies of 100, 1,000, and 10,000 Hz. By displaying the driving pulse and the speaker's acoustic output (from our laboratory microphone) simultaneously on a dual-channel oscilloscope, we could determine its maximum output capability from the appearance of waveform distortion on the acoustic output (or on the amplifier output if it occurred there first). Sometimes the acoustic output of a speaker simply stops increasing with higher drive levels or rounds off gradually instead of "clipping," and this point is considered to be its maximum power capability for that frequency. Based on the T/E 320's rated 4-ohm impedance, the 100-Hz output rounded off at 190 watts input. Measurements at 1,000 and 10,000 Hz (midrange and tweeter operating frequencies) were limited by amplifier clipping.

Comments

The sound we heard from the EPI T/E 320 speakers was completely consistent with their measured characteristics (which is not necessarily true of all speakers we have tested). In our listening room they had a fine octave-to-octave balance and a sweet, smooth, and airy overall character, which included the modest amount of bass emphasis

that we have experienced from most speakers used in that room. In our listening tests we placed them several feet from the side walls and about 18 inches from the wall behind them.

What impressed us the most about the T/E 320 speakers was not one of their features or specifications, or even one of our measurements. We have tested and used a number of speakers that sound about as good as the T/E 320 (but very few that we would describe as unequivocally *better*). But most of these cost far more, usually from two to six times as much, as a matter of fact. There is nothing surprising about hearing excellent sound from a speaker costing from several hundred to a few thousand dollars, but we do not often enjoy this experience from a \$250 speaker.

Nothing we heard from the EPI T/E 320 would have been inconsistent with the performance of some of the finest (and much more expensive) speakers. The several A/B comparisons we made were sufficient to make that point. This does not mean, of course, that the T/E 320 sounds "as good" as any or all of those speakers (how could one possibly quantify "goodness" in that way?), but simply that it is very much in their class, sonically speaking. That, we would say, represents quite an achievement for any \$250 speaker.

Circle 141 on reader service card



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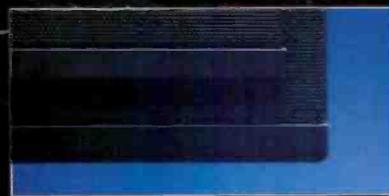
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America's best kept secret.

LUXMAN L-430 INTEGRATED AMP

*A good-looking, functional amplifier
with some unusual features and controls*



FEATURES

- Frequency-shift tone controls
- Tone-control defeat switch
- Phono input switchable between moving-magnet and moving-coil operation
- Selectable moving-coil cartridge termination (100 or 300 ohms)
- Connections and switching for two tape decks and two pairs of loudspeakers
- Switchable "subsonic" filter (-6 dB per octave below 30 Hz) and high-cut filter (-6 dB per octave above 7 kHz)
- Phono Straight control permits bypassing of the filter circuits (for phono input only)
- Low boost (loudness) control
- Headphone output
- Gold-plated phono input jacks
- Pre-out, main-in jacks
- Rear-panel switch inserts on external processor accessory between the pre-out and main-in jacks

LUXMAN'S top-of-the-line integrated amplifier, the L-430, is rated to deliver 100 watts per channel into 8-ohm loads with no more than 0.018 percent total harmonic distortion from 20 to 20,000 Hz. In addition to the usual amenities provided with top-line integrated amplifiers (moving-coil and moving-magnet cartridge inputs, etc.), the L-430 has some common controls that work in an unusual way.

For example, the tone controls are eleven-position detented knobs. That doesn't seem too unusual until you notice that those detents are calibrated in terms of nominal "turnover frequency" (1,000 to 10,000 Hz for the treble control, 20 to 400 Hz for the bass). Turning the treble control to a *lower* Hz setting increases the boost or cut effect as does turning the bass control to a *higher* Hz setting. As Luxman's informative instruction manual points out, these controls simulta-

neously shift the frequency at which the control takes effect and the amount of boost or cut.

In addition to a tone-control-defeat switch, there is a PHONO STRAIGHT control which, when pressed, bypasses the balance control, tape monitor and selector switches, and the stereo/mono switch. The phono-preamp output thus feeds directly into the volume control, minimizing the number of circuits and switch contacts that the signal must pass through.

The L-430's rear panel contains, together with the standard input and output jacks (gold-plated for the phono input), large heavy-duty insulated binding posts for speaker connections and separate preamp-out main-amp-in jacks. These are normally connected via a slide switch but can be separated by that switch for connection of a signal-processing accessory (such as a speaker equalizer) between the preamp and power amp. There are also two switched a.c. outlets and one unswitched one on the rear.

The Luxman L-430 is supplied in a black metal cabinet, and its front panel is attractively finished in pale satin gold with matching knobs and buttons. The control layout is well thought-out, with the many push-buttons grouped according to function. The unit is about 7¾ inches wide, 16¾ inches deep, and 5¼ inches high. It weighs about 30 pounds. Price: \$529.95. Luxman, Dept. SR, 19145 Gramercy Pl., Torrance, Calif. 90501.

Lab Tests

Preconditioning the amplifier for one hour at one-third rated power resulted in a rather warm exterior, and some parts of the top plate were too hot to touch comfortably. However, it did not become significantly warmer during our testing, and in use it became only moderately warm.

The L-430 is specifically rated for driving 8-ohm loads, and markings near its speaker terminals make it plain that the total load impedance should not be less than 4 ohms. Our clipping-power tests confirmed that the amplifier has the limited current-output capability that these restrictions imply. The maximum continuous power output into

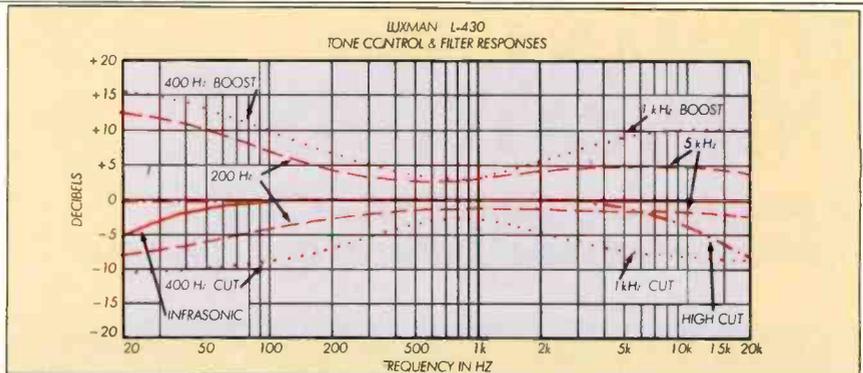
8-ohm loads was 112.5 watts per channel, for a clipping headroom of 0.5 dB. Although we were able to develop about 120 watts into 4-ohm loads, the output waveform was rounded (rather than sharply clipped). When driving 2 ohms, this effect was even more pronounced, a slight rounding appearing at power outputs as low as 25 watts and gradually becoming more obvious as the power was increased. Eventually the amplifier's current-limiting protection circuits created a large notch in the waveform (this also happened when we drove 4-ohm loads). We

Our tests indicate that the L-430 amp has excellent reserve power capability

decided that 50 watts was the maximum reasonably undistorted output that the L-430 could deliver into 2 ohms. The amplifier's protection system shuts it off with a relay in the event of a major overload or output short circuit and resets automatically a couple of seconds after the overload is removed.

Dynamic-power output (tone-burst) measurements indicated that the L-430 has an excellent reserve power capability, developing 156 watts into 8-ohm loads (for a dynamic headroom of 1.93 dB). With 4- and 2-ohm loads, the dynamic power appeared to be slightly less than the continuous clipping-power output (this could be due to differences in the measurement criteria during tone-burst testing).

Although the bass tone control had a fairly conventional characteristic, with a moderate range and a sliding turnover frequency, the treble control seemed to do little more than vary the gain slightly over a frequency range of several octaves; only near its maximum boost or cut settings was there a significant effect on



the frequency response (see graph). The loudness compensation (which Luxman calls "LOW BOOST") boosts only the lower frequencies.

The RIAA phono equalization was extremely accurate. However, the phono-input termination for moving-magnet cartridges had a relatively high capacitance. Even when using the L-430 with low-capacitance turntable cables, it would be advisable to use a cartridge designed to operate into a load of 400 pF or so. The amplifier was stable with reactive simulated speaker loads, and its slew factor exceeded our measurement limit of 25.

Comments

Comparing the measured performance of the Luxman L-430 to its printed specifications, it is clear that the amplifier is honestly rated and easily meets or surpasses all significant specifications. Furthermore, those specifications define a very good amplifier, with ample power for most needs, extremely low distortion and noise levels, and considerable operating flexibility.

Indeed, in most respects it would be hard to criticize the electrical performance or features of the L-430.

Also, as might be expected, the amplifier sounded fine with either MM or MC phono cartridges or a tuner input. We should point out however, that the speakers available to us at the time had what might be called "easy" impedance characteristics, with a minimum impedance of at least 5 ohms, and thus did not activate the amplifier's current-limiting circuits. We would not recommend using the L-430 with speakers whose impedance drops to 3 ohms or less at some frequencies.

The L-430's virtues are undeniable, but we were puzzled by a few of its features. We could find little value in the tone controls, for example, but quite possibly someone else would react differently to their performance. The filters, both low- and high-cut, were more gradual in their effects than we would like (although this amplifier is by no means unique in that respect).

We would have expected the moving-coil cartridge-impedance button to be on the rear apron rather than the front panel, since it is not exactly an everyday operating control. We would have preferred to have the more useful signal processor switch on the front instead.

We hasten to add, however, that the location of a button or two does not alter an amplifier's electrical performance. And the performance of the L-430 was first-rate.

Circle 142 on reader service card

HIRSCH-HOUCK LAB MEASUREMENTS

1,000-Hz output power at clipping:
112.5 watts into 8 ohms, 121 watts into 4 ohms, 50 watts into 2 ohms

Clipping headroom (relative to rated output): 0.5 dB (8 ohms)

Dynamic power output: 156 watts into 8 ohms, 108 watts into 4 ohms, 46 watts into 2 ohms (see text)

Dynamic headroom: 1.93 dB (8 ohms)

Maximum distortion from 20 to 20,000 Hz: 100 watts output, 0.017% (8 ohms) and 0.47% (4 ohms); 30 watts output, 0.3% (2 ohms)

Sensitivity (1-watt output): Aux, 30 mV; Phono (MM), 0.29 mV;

Phono (MC), 15 μ V

Output noise referred to 1-watt output: Aux, -84 dB; Phono (MM), -81 dB; Phono (MC), -75 dB

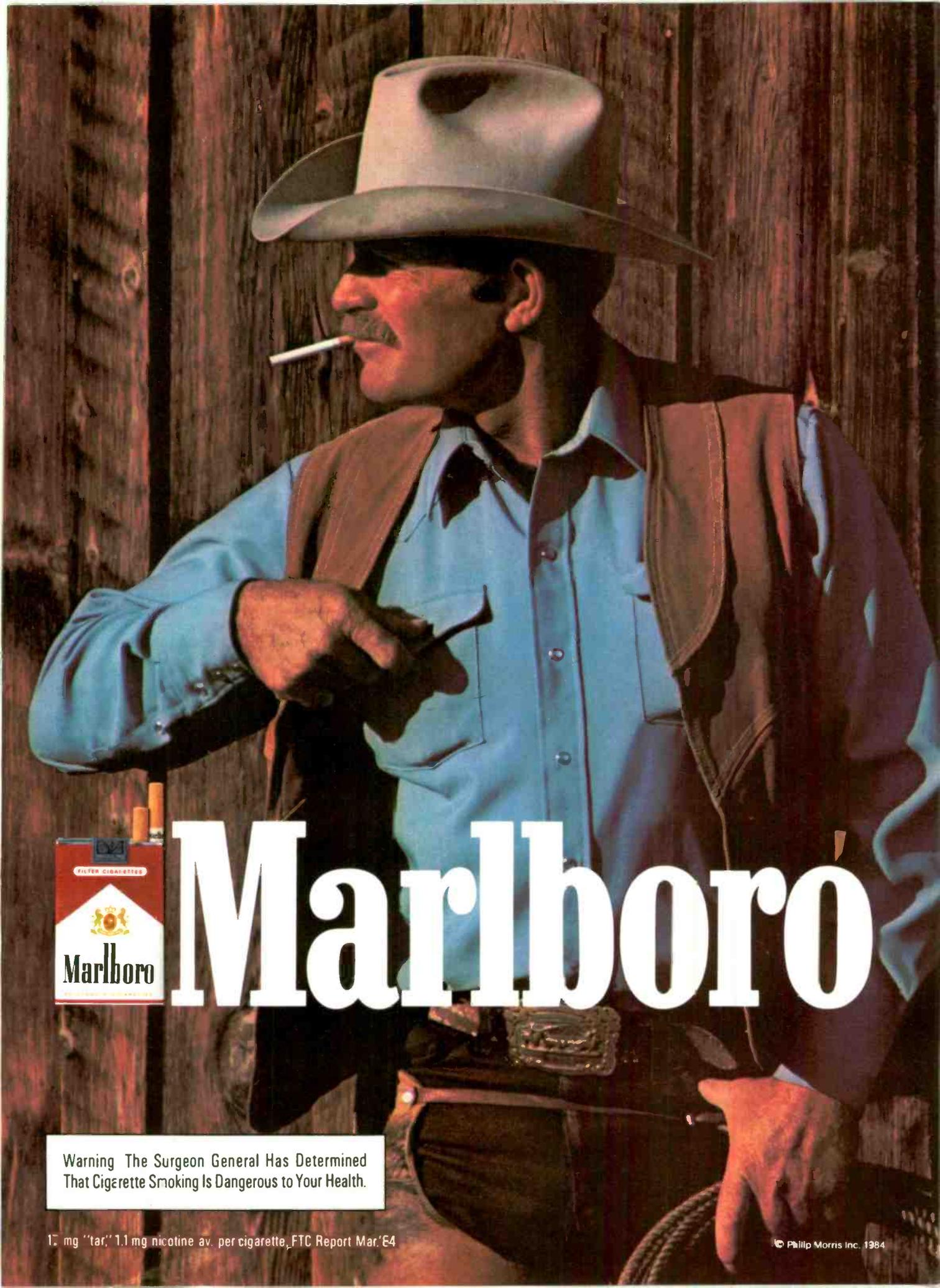
Phono (MM) input overload level: 60 to 115 mV depending on frequency

Phono (MM) input impedance: 47,000 ohms in parallel with 330 pF capacitance

Slew factor: greater than 25

Tone control range: +10.5, -8.5 dB at 100 Hz; +10, -8 dB at 10,000 Hz

RIAA equalization accuracy: better than ± 0.25 dB from 20 to 20,000 Hz



Marlboro

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17 mg "tar," 1.1 mg nicotine av. per cigarette, FTC Report Mar. '84

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AUDIOSOURCE RTA-ONE SPECTRUM ANALYZER

A laboratory-type instrument that can help you optimize your system's sound quality



FEATURES

- Ten-band spectrum analyzer/sound-level meter
- Built-in electret microphone for sound-level measurements and analysis
- Choice of decay speed on LED display
- Line-level input jacks for connection to audio components
- Power, low-battery, and overload indicators

- Attenuator with 40-dB range
- Battery-powered (four AA cells)
- External microphone input
- Camera-tripod socket for stable positioning
- Display range: -50 to +20 dB, line-level inputs; 50 to 120 dB SPL with microphone input
- Optional a.c. adaptor, battery-powered pink-noise generator, and carrying case for all three pieces

ONE of the most useful instruments for checking or adjusting the frequency response of an audio system—especially of loudspeakers, tape decks, and car stereo installations—is a *real-time spectrum analyzer*, or RTA. An RTA measures the energy or sound level in each of a number of contiguous frequency bands comprising the audible frequency range and simultaneously displays the levels in all those bands. Spectrum

analyzers used to be expensive laboratory-only instruments until integrated-circuit technology made consumer versions practical. You can even find RTA's built into some equalizers and tape decks.

AudioSource's RTA-One is an inexpensive, stand-alone RTA/sound-level meter meant for consumer use. Like most simple RTA's, the RTA-One divides the audio range into ten bands, each one octave wide. Its multi-LED display has an amplitude range of 20 dB in 2.5-dB steps. Green LED's are used

for the 0-dB reference-level indicators, red LED's for the balance of the display. Attenuation of the incoming signal can be dialed in 10-dB steps, allowing the RTA-One to measure and display levels over a 70-dB range.

The input signal can come from two sources. The unit has a built-in electret microphone, which makes the RTA-One useful for acoustical signal analysis (as in the equalization of a loudspeaker system). The RTA-One also has a pair of line-level phono input jacks that can be connected to any line-level point in a system's signal path (for instance, to a tape deck for adjusting bias and equalization). The two line inputs are electrically summed before being analyzed.

There are two modes of operation of the RTA-One: as a sound or signal-level meter, and as a real-time spectrum analyzer. In the former mode a horizontal row of LED's lights and moves up and down in accordance with the input level, much the way a LED record-level meter works on a cassette deck. In RTA mode, each column of LED's operates independently of the others since each column monitors only one band of frequencies. Since the center frequencies of those bands range from 31.5 to 16,000 Hz, the entire audio range is displayed continuously.

The display in both sound-level and RTA modes has two speeds. In both cases the "attack" is fast, so that the display will respond to rapid signal increases. The "decay" time can be set fast or slow, as desired. The fast decay setting can give a more informative display of a rapidly varying frequency spectrum when monitoring music, but, since the array of moving lights can be confusing when you're making adjustments or measurements, the slow decay produces a more stable indication.

A desirable accessory for any real-time analyzer is a reference signal source, which is usually based on "pink noise." This is random noise, which sounds similar to the interstation hiss of an FM tuner but has a different frequency distribution. It is sound that has a "flat" frequency content when displayed on an analyzer like the RTA-One. There are



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THE SOLID GOLD SOUND

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several test records available that contain pink-noise signals meant for checking the response of a home stereo system.

A better method is to use a pink-noise generator circuit, which supplies a full-range pink-noise signal to a line-level input of the system and eliminates any possible response alterations stemming from the phono-cartridge characteristics. For this purpose AudioSource offers the PNG-One, a small battery-powered adjunct to the RTA-One. Its two output jacks carry identical full-band pink-noise signals and can be connected to any line-level input. The PNG-One's output level can be continuously adjusted with a knob that doubles as the power switch.

We found that this simple system worked about as well as some far more elaborate devices we have used for the same purpose.

The AudioSource RTA-One is about 6 $\frac{3}{4}$ inches long, 3 $\frac{7}{8}$ inches wide and 2 inches thick. As it weighs about 1 pound (without batteries), it is easily held in the hand. The unit's four AA cells (not included) give about ten hours of continuous operation. The PNG-One measures 4 x 2 $\frac{3}{4}$ x 1 $\frac{1}{4}$ inches and weighs about 10 ounces. It is powered by two 9-volt transistor radio batteries. An optional carrying case holds the RTA-One, the PNG-One, and an a.c. adaptor for the analyzer. Prices: RTA-One, \$199.95; PNG-One, \$44.95; a.c. adaptor, \$12.95; remote microphone, \$24.95; carrying case, \$34.95. AudioSource, Dept. SR, 1185 Chess Dr., Foster City, Calif. 94404.

Measurements

Since few performance specifications are provided for the AudioSource RTA-One and PNG-One, our tests were directed toward determining what they actually did

rather than trying to verify any of the manufacturer's claims. Initially, we measured the frequency spectrum of the PNG-One output on our Hewlett-Packard spectrum analyzer and confirmed that it met the spectral characteristics of pink noise over the range of 200 to 20,000 Hz. The maximum output of the PNG-One was 0.3 volt on an average-responding meter.

On the RTA-One display, the PNG-One output appeared as a flat spectrum from 125 to 16,000 Hz. At lower frequencies, it fell off slightly, to -2.5 dB at 31.5 Hz and to an intermediate level (which we estimate at -1 to -1.5 dB) at 63 Hz. The 2.5-dB resolution of the analyzer makes it impracticable to measure levels more precisely than that, although one can interpolate readings when two adjacent lights are on simultaneously or alternately.

To measure the frequency calibration and response flatness of the RTA-One, we drove its line input with a constant-amplitude sine-wave signal, adjusting the frequency for a maximum indication in each band. Because each LED lit over a range of amplitudes covering about 2.5 dB, we measured the limits for each one and averaged them to determine its center value. All the frequency ranges were quite accurate, with the centers typically being well within 5 percent of the nominal frequencies. The level calibrations were typically within 0.3 dB of the marked values (although, as we mentioned, they cannot ordinarily be read closer than every 2.5 dB), and all the bands had the same sensitivity.

Curious about the use of the RTA-One as a sound-level meter, we set it up adjacent to our regular laboratory sound-level meter (which meets industry standards for a hand-held portable instrument) and an inexpensive sound meter sold by Radio Shack. With a nearby speaker reproducing the output of the PNG-One, we compared the readings of the three meters, using the slow decay mode of each one for ease of reading (the two sound-level meters were also set to give a C-weighted frequency response, which is the flattest over the audio range). The two sound-level meters read within 1 dB of each other, but the

RTA-One consistently read about 6 dB higher. The flat response of the RTA-One up to 16,000 Hz or higher probably accounts for much, if not all, of its higher reading with wide-band pink noise, since the frequency response of a laboratory-standard sound-level meter is defined only up to 8,000 Hz and rolls off at higher frequencies.

Comments

Our use of the Audio-Source RTA-One/PNG-One combination satisfied us that it is a useful and valid accessory for an audiophile who wants to verify the actual performance of his system (particularly the speakers). We used it, with our amplifier tone controls, to adjust system response for flattest acoustic output at the usual listening position, and we found that this simple system worked about as well as some more elaborate devices we have used for the same purpose. Also, we felt that the end results were as valid as any we have obtained by similar equalization techniques, in that a truly flat response at the listening position is usually too bright-sounding to be really enjoyable—but that is another story!

All the frequency ranges were quite accurate, with the centers typically being well within 5 percent of the nominal frequency.

The AudioSource system is an excellent value, and most audiophiles will doubtless find it to be educational as well as practical. While the limited resolution and uncertain absolute accuracy of this analyzer do not make it a serious competitor for existing professional analyzers, how many audiophiles could justify spending from \$1,000 to \$3,000 to achieve what can be done quite well at a small fraction of that price? **Circle 143 on reader service card**



WHO WOULD HAVE THOUGHT IT COULD TRIGGER A REVOLUTION IN SOUND.

Remember when laser technology was the stuff that made for good science fiction?

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reproduces music so realistically you'll think you were at the original recording session.

Since a sophisticated optical laser never makes contact with the disc, all surface noise from dust and scratches is eliminated.

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\$129 PRICE EXPLOSION



The Complete Computer

Here's a 50 character per second, plain paper, dot matrix printer that you can use with virtually any home or office personal computer. It's built really tough to withstand heavy use. And, it's really easy to use. Price Slashed to \$129.

By Drew Kaplan

Let's clear the air. This printer isn't the fanciest. It doesn't have the most features. And, it's not the fastest.

But, it uses plain paper and it's super reliable. It prints both upper and lower case characters. And, if you aren't using a printer with your computer, read on.

LISTING/INDEXES/LETTERS AND MORE

Experience the thrill of actually writing your letters and reports on your computer. Now you'll be able to use all of your computer's word processing and correcting capabilities to really explore your creative talents.

It's easy. Some of the new word processing programs are so 'user friendly' that you can learn to use them in just about 10 minutes. Change a line, change a word, move a line. It's all just a push of a button away.

Are data bases a four letter word? Not on your life. Now you can use your computer to organize all your telephone numbers, your stocks, stamps, and recipes.

If you're using your computer for business, you can have a complete, instantly accessible file for each customer by name, what they bought, when, etc.

A data base will let you find or organize and print out any information you want, however you want, whenever you want.

There's no more complicated programming. Here's how you'd build a telephone/address data base.

A menu will come up and say, Field 1? You put in 'Name'. Field 2? You put in 'Phone Number'. Field 3? You put in 'Address' and so on.

Now that you've entered your headings, the computer will ask you for the information that goes with the headings. It will say, Name? You put in 'DAK'. It will say, Phone Number? You put in '1-800-325-0800'. And so on.

Then the fun begins. Just type search. The Computer will say, For What? You say 'DAK', or '800' or '325' etc. Your computer can search every letter and every number almost instantly to find just what you are searching for.

You can print out a phone directory in alphabetical order, numerical order, by area code, or even by zip code.

PERMANENT RECORD

If you have a modem, you're in for a treat. You can access encyclopedias, stock market reports, and much more. When you sign on a service like CompuServe or The Source, the world is quite literally at your finger tips.

With a printer, you can get a 'hard copy' of all the incoming information. You can get everything from SAT test simulations and IQ tests to loan amor-

tization schedules.

With this printer, we will send you all the information you'll need about how to access, and use modems for fun, information and profit.

And in addition to the large dial-in companies, there are over 400 Electronic Bulletin Boards that let you access information about everything, from buying computers, to diamonds, to finding the ideal date.

AFRAID OF PROGRAMMING?

You don't need to know the first thing about programming to use this or any printer. But, if you've never typed in and run a program, here's the easiest one I know. Turn on your computer.

Commodore Owners, and Atari Owners, your computer, and most others will say 'Ready'. Just push Control and Reset on an Apple. Then type the following:
10 PRINT "DAK IS WONDERFUL"
20 GOTO 10
RUN

You should type a carriage return at the end of each line. Why not try this program now? Next time, I'll tell you how to get out of the program, and maybe even discuss peeks and pokes.

If the program isn't running, type LPRINT instead of PRINT in line 10.

To you sophisticated programmers, think how easy your life will be when you

can print out program lists that you can study at length.

And, you won't have to load a bunch of disks to find a program when you print out a menu for each disk.

WHY BUY A CHEAP PRINTER? OR, THE SALES PITCH

An ad in several August computer magazines listed a \$149 thermal printer as the lowest priced printer in the U.S. Obviously they haven't seen this printer.

Imagine a 50 character per second, plain paper, full 80 column dot, matrix printer with a built-in standard Centronics Parallel Interface, slashed to just \$129. Then add the extras.

This printer handles plain old cheap standard fanfold pin feed computer paper from 4.5" to 9.5" wide, with its built-in adjustable tractor pin feed drive.

It's so powerful you can even use two-part forms for a carbon copy. Plus, there's an impact control for print darkness.

It understands and prints 116 upper and lower case characters, numerals and symbols. And that's not all.

You can even print Double Width characters. And, look at this. This printer has full graphic capabilities with 480 dot horizontal resolution and 63 dot per inch vertical resolution. So, you can print out your pictures, pie charts or graphs.

It prints 10 characters to the inch, six lines to the inch. In short, it's going to make typewriters into dinosaurs. When hooked to your computer, you'll never have to retype anything again. If you find an error, just make the correction and let the computer retype your work for you.

The printer is made by C. ITOH/Leading Edge in Japan. It's built to really take heavy use. But in the unlikely event that it should need service, there are approximately 400 service centers nation wide.

It takes standard long life inked ribbon cassettes that are readily available nation-wide. This is a printer that will give you many years of continuous reliable service.

AND NOW THE BAD NEWS

If you're the president of a large company sending important business letters, you may want a \$1000 daisy wheel printer. But for most uses, dot matrix printers are incredibly faster, less expensive and there isn't any way to print out a graph or picture on a daisy wheel printer.

But, there are two things you need to know about this printer. First, it has about the dumbest name I've ever seen.

Its built tough and rugged without a lot of fancy features. So, they named it The Gorilla Banana Printer.

The second thing is more important. Like many dot matrix printers, there are no descenders on lower case letters.

The letters g, j, p, q, and y are all raised up. They are perfectly formed, but the whole letter sits level with the rest of the alphabet. Upper case letters are unaffected and so are symbols. So, if you want super fancy business letters, this printer probably isn't for you.

But for social letters, term papers or reports, programming and all the data bases and information you'll get through a modem, this printer is perfect.

COMPATIBLE COMPUTERS

Any Computer with a standard Centronics parallel port, such as: Apple, Franklin, IBM PC, TRS80, Osborn, Atari, Com-

modore VIC 20, Commodore 64, Kaypro, and virtually any other personal computer. Plus, most briefcase portables. **FEAR OF INTERFACES?**

Your computer is smart. But, it doesn't know how to 'talk' to other devices. That's why you need an interface.

An interface isn't just a simple cable. It's actually an intelligent translator that lets your computer talk to another piece of equipment.

Usually the computer manufacturers don't include the various interfaces when you buy your computer, because they don't know if you'll ever add peripherals such as disk drives, printers or modems.

So, rather than sell you something you don't need, you don't buy an interface until you add onto your computer.

There are two types of printer interfaces. The first allows you to do text word processing. For 99% of computer use, this is all that is needed. It translates all the possible letters and punctuation known as ASCII. This printer understands 116 characters and symbols.

A second type of interface also allows you to dump pictures or graphics from your screen or memory. This is more complicated because every dot must be told where to go. This interface, or 'driver program' as it is called, is available in two forms. Built into an interface card, or as a program on a disk which you use in conjunction with any standard interface.

Either way, you'll have the printer operating in just a few minutes. And if you already have a printer, the same Centronics parallel interface and cable (about 85% of all printers are compatible) should work with this printer.

WHY SO CHEAP

A new model will emerge soon with a different name. Leading Edge had just 21,000 of these remarkable printers which have been selling at discount for as little as \$199, left in stock.

DAK bought them all for cold hard cash. And now we're offering them to you for less than the original price we were quoted as wholesale. The only difference is our price. Each comes packed with a ribbon, ready to plug in.

The printer is approximately 16½" wide, 9" deep and 7" tall. It's backed by Leading Edge's standard limited warranty. Of course, parts and service are guaranteed to be available for at least 3 years. So you can buy with confidence.

ADD PRINTING POWER TO YOUR COMPUTER RISK FREE

Now you can really make use of your computer. 50 characters per second printing on plain paper for just \$129. Wow!

Now you can print out your programs, your notes or your letters. If you're not 100% satisfied, simply return the printer and any accessories in their original boxes to DAK within 30 days for a refund.

To order your 50 Character Per Second Dot Matrix, Plain Paper Printer with a built-in Centronics Parallel Interface, risk free with your credit card, call toll free, or send your check for the breakthrough close-out price of just \$129 plus \$8 for postage and handling to DAK. Order No. 4101. CA res add 6% sales tax.

Special Note: If you need a serial printer for a computer, such as the TRS80 Color Computer, order the identical printer with a built-in Serial Interface for the

same price. Use Order No. 4102.

The Printer comes packaged with a long life ribbon. Extra ribbons are available at computer stores. DAK has them for \$4 each (\$1 P&H) Order No. 4103.

Standard Centronics Interfaces for your computer are available at any computer store. This Printer has its receiving interface built in. You simply need one, complete with its cable, to plug into your computer 'to send' information. Below are our favorites for 5 of the most popular computers.

For your Apple. We have Practical Peripherals' text interface for just \$49 (\$2 P&H) Order No. 9877. We have their graphics capable interface for just \$79 (\$2 P&H) Order No. 4104. If you already have a Centronics Parallel Interface, we have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4105.

For your IBM PC, you don't need an interface. It's already built-in. But, you do need a cable. We have a cable, ready to connect this printer to your computer, for just \$19 (\$2 P&H) Order No. 9879. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4106.

For your Atari 800, 800XL, 400, or 600XL, we have a text interface for just \$69 (\$2 P&H) Order No. 9881. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4107.

For your Commodore VIC 20 or 64, we have a text interface for just \$39 (\$2 P&H) Order No. 9883. We have a Graphics interface for just \$54 (\$2 P&H) Order No. 4108.

Special Bonus for Commodore 64 owners. We have a powerful word processing program with editing, including changing a line, a word or moving a line.

Plus, we have a super data base program that lets you use 8 fields of information on up to 200 subjects at a time. Then you can search for any part, sort alphabetically or numerically and print out an address book, a list of your stocks or anything you can imagine. It's yours for just \$5 (\$1 P&H) with purchase of the printer. Use Order No. 4122 for Disk, or Order No. 4123 for Cassette.

For TRS80 Computers, you don't need an interface, just a cable. For the Black and White Computers, we have a Parallel Cable for just \$18 (\$2 P&H) Order No. 9885. For the Color Computers we have a Serial Cable (You need the Serial Printer as well) for just \$18 (\$2 P&H) Order No. 4109.

For briefcase-type portables, the Centronics Interface is usually built in. Just stop by any computer store. All Centronics Printers use the same cable at the printer end, but you'll need a cable that fits your particular computer's plug.

Get hard copy print-outs of your programs or your graphics. Turn your computer into a powerful word processor. Forget retyping ever again.

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AKAI GX-R99 CASSETTE DECK

An extraordinary display of the power of microprocessor control

THE Akai GX-R99 cassette deck boasts as many attractive and truly useful features as any tape unit to come our way in some time. Capable of bidirectional autoreverse recording and playback, the deck has three heads, a closed-loop dual-capstan drive system, and a fully automatic tape-optimization system that can even set the record level controls. It also has Dolby B and C noise-reduction systems as well as an unusually versatile and informative fluorescent display panel.

The separate record and playback heads of the GX-R99 are made of glass-fused ferrite (said to offer greater wear resistance than ordinary ferrites) and are mounted on a plate that rotates 180 degrees when the tape direction is reversed. This shifts the two heads' track positions from side one to side two, and it



FEATURES

- Autoreverse recording and playback with quick-reverse head-flipping mechanism.
- Dolby B and Dolby C noise reduction
- Separate record and playback heads
- Playback head with 1-micron gap for extended response to 20,000 Hz
- Dual-capstan drive with separate d.c. servomotors
- Capstans with different shaft diameters and flywheel masses to minimize mechanical resonances
- Additional d.c. motors turn the reel hubs, rotate the head assembly, and extend the record-control panel
- Automatic source/tape monitoring
- switchover during recording with manual override
- Control for automatic fade-in or fade-out
- Blank-search and program-scan automatic cueing features
- Several memory play options
- Front-panel headphone jack with level control
- Switchable over/standard/under bias fine-trim control
- Two-setting memory for storing record levels
- Cassette length selector calibrates elapsed-time and remaining-time digital display
- Timer-activated recording and playback possible
- Switchable FM multiplex filter
- Optional remote control

keeps the record head "upstream," so that just-recorded material can be instantly played back in audible comparison regardless of the direction of tape motion. There are two separate fixed erase heads, one for each tape direction.

It is not necessary to use the motorized slide-out control panel

(below the display area) simply to play or fast-wind a cassette in either direction. Tapes are dropped, tape openings downward, into slides on the back of the cassette-well door, and the usual transport-control pushbuttons to the right of the display are used. The illuminated cassette well shows how much tape

remains on each reel but affords little label visibility. Cassette loading on the GX-R99 is unusual only in that you do not have to close the door manually: pressing any of the transport buttons closes the door and causes any tape slack to be taken up. Sensors inside the well switch between ferric and chrome/

HIRSCH-HOUCK LAB MEASUREMENTS

Fast-forward time: 110 seconds (C-60)

Rewind time: 112 seconds (C-60)

Speed error: -0.7%

Dolby tracking error: +0.5, -1.0

dB with Dolby B; +1.0, -0.5 dB with Dolby C

Wow-and-flutter: 0.21% wrms, 0.48% DIN peak-weighted (forward); 0.27% wrms, 0.58 per cent DIN peak-weighted (reverse)

Line input for indicated 0-dB: 67 mV

Line output at indicated 0-dB: 0.37 volt

Meter indication at IEC-standard

0-dB: +3 dB

■ Tape used: TDK AD-X (ferric)

IEC 0-dB distortion: 0.25%

Meter indication at 3% third-

harmonic distortion: +9.3 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	49.8	56.2	54.3
Dolby B	59.4	65.8	64.3
Dolby C	62.2	70.4	71.6

■ Tape used: TDK SA-X (chrome-type)

IEC 0-dB distortion: 1.0%

Meter indication at 3% third-

harmonic distortion: +7.9 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	49.8	57.6	57.1
Dolby B	58.8	66.5	66.3
Dolby C	61.3	70.5	71.5

■ Tape used: TDK MA (metal)

IEC 0-dB distortion: 0.6%

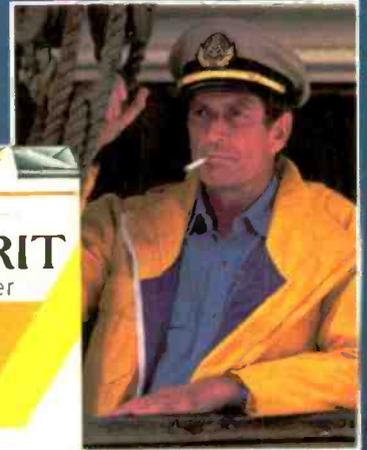
Meter indication at 3% third-

harmonic distortion: +9.2 dB

Signal-to-noise ratios (in decibels):

	Unwtd.	A-wtd.	CCIR
NR off	48.5	56.5	57.9
Dolby B	58.5	66.8	67.0
Dolby C	60.5	71.2	72.0

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Kings: 9 mg "tar," 0.6 mg nicotine—100's Reg 11 mg "tar," 0.7 mg nicotine—
100's Men, 10 mg "tar," 0.7 mg nicotine av. per cigarette, FTC Report Mar '84

metal playback equalizations, as appropriate, and can't be overridden.

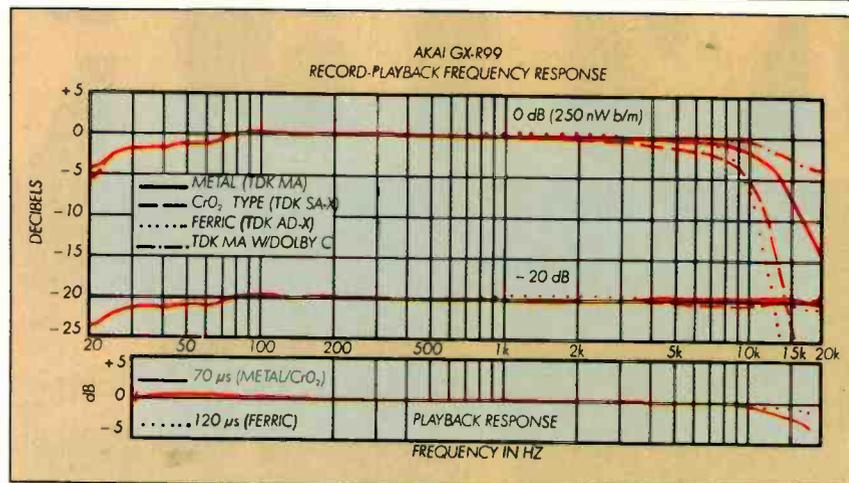
To record, however, you must press the OPEN/CLOSE button to reveal the entire panoply of previously invisible recording controls on the slide-out control panel. Touching the RECORD PAUSE button starts an internal microprocessor program that adjusts record bias, equalization, and tape sensitivity for the tape in use. It also adjusts the MOL (maximum output level) indicators. The program takes about four seconds, after which the tape is rewound to the point at which the test signals were recorded, so they will be erased when normal recording is begun.

The record level can be set manually using a rocker switch to control level and channel balance. It can also be set by pressing a CRLP (computer recording level processing) button, which checks the high- and mid-frequency content of the music being fed in for ten seconds

Copies of compact discs were almost indistinguishable from the originals when we used the GX-99R's source/tape comparison switch.

and sets the record-level control accordingly. Should this setting later prove too high, the deck will (if operating in its CRLP rather than in its manual mode) gradually reduce the level automatically. The circuit is not a compressor or limiter, and it does not continuously "ride gain" on the music, for this would restrict the natural dynamic range. For convenience in taping FM sources, two programmable record levels can be preset and selected by pushbuttons, obviating the ten-second CRLP sampling delay, but this does not bypass the four-second tape-optimization program.

Either average (VU) or peak (dB) record and playback levels can be switched for display on the GX-99R's high-resolution fluorescent



The upper curves indicate overall record-playback response at the manufacturer's indicated 0-dB recording level using the tapes designated on the graph. In the center are the same measurements recorded at -20 dB relative to the upper curves, a level used for frequency-response measurements. Bottom curves show playback response with calibrated test tapes and indicate performance with prerecorded tapes.

indicators (twenty-four segments per channel). The VU markings are calibrated from -30 to +8 VU; peak-reading levels are shown from -17 to +15 dB. The Dolby-level marking is at +3 on either scale, and 1-dB (1-VU) resolution is maintained over all but the lowest levels. A third switchable level-display mode (and an unusual feature) shows the energy in the mid-frequency (400-Hz) and high-frequency (8-kHz) ranges, together with two MOL markers that indicate the tape's undistorted storage capacity in the two frequency bands. Recording levels can be set using this spectrum/MOL display in addition to the more conventional peak/VU metering. Settings of the record-level and balance controls (which are incremental rather than continuously variable) are shown on another part of the display. The digital tape counter can be switched to indicate conventional reel rotations, elapsed time, or remaining time.

The Akai GX-R99 measures 17³/₈ inches wide, 4¹/₈ inches high, and 14³/₈ inches deep, and it weighs a little over 19 pounds. Price: \$800. Akai America, Ltd., Dept. SR, P.O. Box 6010, 800 W. Artesia Blvd., Compton, Calif. 90224.

Lab Tests

The playback frequency-response curves for the GX-R99 shown in the

graph represent an averaging of the forward and reverse directions, as these did not materially differ. The ferric (120-μs) response was exceptionally flat, being within ±0.5 dB throughout the 31.5- to 18,000-Hz range of the test tape.

Akai did not supply any of the blank tapes used in its factory checkout, but the manual indicated that these were Maxell UD (ferric), TDK SA (chrome-equivalent), and TDK MA (metal). Since the optimizing circuitry is used each time the deck is put into record mode, however, we felt justified in departing from the manual's suggestions, as we obtained *slightly* flatter response from the ferric TDK AD-X and the CrO₂-type TDK SA-X. We obtained very nearly identical results from Maxell XLI-S and XLII-S and BASF Pro I-Super. Both the high-frequency overload characteristics at the IEC 0-dB level (250 nanowebers/meter) and overall frequency response at -20 dB for the three tape types were typical of those of a high-quality deck. Noticeable by their absence were low-frequency response ripples (head bumps). As usual, when the FM-stereo multiplex filter was switched in, the response above 16 kHz dropped rapidly.

The signal-to-noise ratios were good, and the wow-and-flutter performance was very good. Dolby tracking error was particularly low,

especially with Dolby C. Fast-winding times, however, were slow. Input and output levels were normal.

Comments

Tape copies made of wide-range digital sources (Compact Discs) proved to be all but indistinguishable from the originals when we used the direct A-B comparison facilities the GX-R99 provides. At most there was a little additional hiss that survived even Dolby-C noise reduction, and there was a very slight roll-off of the highest frequencies when the level indicators ran up to maximum permissible levels (which is to be expected when overloading any tape).

We did find, however, that it was better to use the manual rather than the computerized level-setting procedure with such wide-range material. If the music began at a very soft level, subsequent downward record-level adjustments had to be made, and if it began very loudly, there was no provision for automatic upward adjustment during quiet passages. For nonclassical music, however, the ten-second sampling used by the CRLP circuit was adequate and convenient. Anyway, the manual procedure, simplified by the various level displays, is always available.

Since the GX-R99 contains so many features and buttons, learning to operate it does take some time, and while its technical features manual is extremely clear, its multilingual operating manual is not. We would have liked a switch to bypass the computerized tuning feature; the 4-second delay was a mild annoyance when using successive cassettes of the same tape type. And we would have liked continuously variable record-level and balance controls.

The fluorescent display panel was extremely informative, and the various memory-winding options (including a "record cancel" feature that takes you back to where you started if you wish to abort a copy quickly) were highly versatile. In sum, if you're looking for good performance with a wide variety of features, you should seriously consider the Akai GX-R99.

Circle 144 on reader service card

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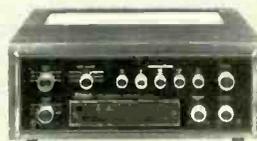
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CIRCLE NO. 32 ON READER SERVICE CARD

CD PLAYERS ON THE MOVE

As prices drop, the Compact Disc system moves into the mainstream

by Fred Petras

HAILED as the most revolutionary advance in recording technology, the digital Compact Disc system is moving speedily into the homes of more and more audiophiles. The system's advantages are obvious and well known. It offers unprecedented dynamic range, channel separation, and signal-to-noise ratio. It also provides very flat frequency response extending beyond the limits of most people's hearing and inaudible distortion at all reasonable listening levels.

Further, the small discs are easy to use. They require less care in handling than LP's and provide true lifetime playback with no deterioration of the original sound. CD players offer "personal programming" capabilities and (usually) utmost simplicity and versatility of operation.

Only two things are slowing the CD's progress toward becoming a common feature of American households. They are the relatively high prices of the players and discs and the still rather small selection of music available on the discs. But the situation is improving, and it's just a matter of time before these barriers are swept away.

A check of pricing over the past year reveals an overall halving of player prices, from a \$1,000-to-\$1,200 first generation to a \$500-to-\$600 second generation. At these

new prices you'll find a wide selection of players. And in most cases the second-generation players are technically superior to their predecessors, even at their lower prices. The third generation may be even less expensive. According to rumors, there will be new players with *list prices* well below \$400 by year's end.

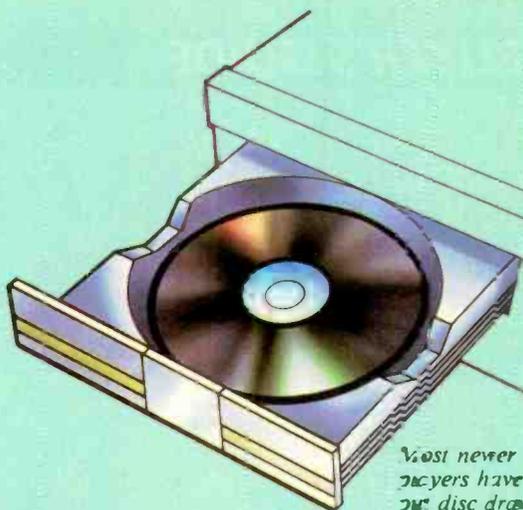
Disc prices are beginning to drop too, as audio and record shops and recording companies strive to attract customers. Discounts of 10 to 20 percent off previous CD price tags are becoming common. As for the musical repertoire available, more discs are flowing into stores and that flow will accelerate as demand increases and as the first U.S. Compact Disc factory (the CBS/Sony plant at Terre Haute, Indiana) goes "on line" at about the time you read this. All in all, the CD is well on its way into the hi-fi mainstream. Sooner or later you're likely to succumb to its attractions and consider the addition of a CD player to your hi-fi system. To make your choice a happy one, take this article along as a guide, especially the table on pages 52 and 53.

A check of CD players now available or soon to be available reveals a general similarity in their appear-



\$500

Technics' SL-P7 displays index numbers as well as time and track.



Most newer players have slide-out disc drawers. Radio Shack



\$399.95

Radio Shack's Realistic CD-1000 has digital filters and a 15-track program.



CD PLAYERS FOR \$600 OR LESS

Manufacturer	HITACHI	HITACHI	KEN-WOOD	MAGNA-VOX	MAGNA-VOX	MAGNA-VOX	MISSION	NAD	ONKYO	PARA-SOUND	QUASAR	RADIO SHACK
Model number	DA3500	DA550	DP-700	FD1040	FD2040	FD3040	DAD 7000	5255	DX-100	CDP-900	CD8994	CD-1000
Price	\$549.95	\$599.95	\$599	\$499.95	\$499.95	\$599.95	\$599	\$548	\$599	\$499.95	\$599.95	\$399.95
Remote control?	no	no	na	no	no	yes	no	no	no	no	no	no
Number of tracks that can be directly accessed ¹	99	99	99	20	20	24	99	—	99	—	99	—
Access method ²	seq	dir	seq	seq	seq	seq	seq	seq	seq	seq	seq	seq and dir
How many tracks can be programmed?	15	15	0	20	20	24	99	0	0	0	0	15
Order of programmed playback ³	ran	ran	—	ran	ran	ran	ran	—	—	—	—	ran
Cue by time?	no	no	no	no	no	yes	yes	yes	no	yes	no	—
Cue by index number?	yes	yes	no	no	no	yes	yes	yes	na	yes	no	yes
Skip to next track forward?	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes
Skip back?	yes	yes	yes	no	no	no	yes	yes	yes	yes	yes	yes
Fast forward and reverse?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Is program audible in fast modes?	no	yes	no	no	no	no	no	yes	no	yes	yes	yes
Repeat track?	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes
Repeat phrase?	yes	yes	yes	no	no	yes	yes	no	yes	no	na	yes
Repeat disc?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Displays track time elapsed?	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes
Displays track time remaining?	no	na	no	yes	yes	yes	no	no	na	no	no	no
Displays total time elapsed?	no	na	yes	yes	yes	yes	yes	no	na	yes	no	yes
Displays total time remaining?	no	no	yes	na	na	yes	no	yes	yes	yes	no	no
Headphone output?	no	no	yes	no	yes	yes	no	no	yes	no	no	no
Variable output level?	no	no	phones only	no	no	yes	no	no	phones only	no	no	no
Output filters	analog	analog	analog	digital	digital	digital	both	analog	analog	bath	analog	digital
Digital-filter resampling rate, kHz	—	—	—	176.4	176.4	176.4	176.4	—	—	88.2	—	—
Digital-to-analog converter(s) ⁴	1 mpk	1 mpk	1 mpk	2 sep	2 sep	2 sep	2 sep	2 sep	1 mpk	1 mpk	1 mpk	—
Player dimensions: (inches)	12.6 x 3.3 x 12	17.1 x 3.3 x 10.4	13.4 x 3.4 x 13.6	12.5 x 12 x 3.5	16.5 x 12 x 3.5	16.5 x 12 x 3.5	12.6 x 3.5 x 11.9	x 16.5 x 3.5 x 12.2	13 x 3.3 x 12.3	13.4 x 3.6 x 11.4	18.1 x 4.6 x 12.7	—
Weight: (pounds)	10	12	10.6	15.5	16.5	17.5	15.4	12.1	11	—	18	—

Compiled from manufacturers' data

1. The maximum possible is 99 according to the CD standard.

2. **Sequential access** is by repeated pressing of a key. **Direct access** is by entry of the track number with a numerical keyboard (some units do this through their remote controls). Players allowing direct access also usually permit sequential access.

3. **Sequential playback** is by numerical track order, regardless of the order programmed. **Random playback** can take any order programmed.

4. **1 mpk** is one D/A converter multiplexed between the two output channels. **2 sep** is two separate D/A converters, one for each channel.

SANSUI	SANYO	SCOTT	SHARP	SHARP	SHER. WOOD	SONY	SONY	STY. VANIA	STY. VANIA	TEAC	TECHNICS	TOSHIBA	YAMAHA	YAMAHA
PC-V300	CP200	939DA	DX-600	DX100	CDP-100	CDP-210ES	CDP-111	FDD104	FDD304	PD-11	SI-P7	XR-Z50K	CD-X1	CD-2
\$500	\$549.95	\$599.95	\$449.95	\$399.95	\$499.95	\$500	\$600	\$449.95	\$599.95	\$599.95	\$500	\$499.95	\$499	\$599
no	no	no	no	no	no	no	yes, standard	no	yes, standard	no	no	no	no	yes, standard
23	16	—	20	20	99	99	99	20	24	99	—	99	23	99
dir	seq	seq	seq	seq	seq	seq	seq & dir	seq	seq	seq	seq	seq	seq	seq & dir
23	16	23	15	15	0	0	0	20	24	23	0	0	23	12
ran	seq	seq	ran	ran	—	—	—	ran	ran	seq	—	—	seq	ran
yes	—	—	no	no	no	no	no	no	yes	no	—	no	no	yes
yes	—	—	no	no	yes	yes	yes	no	yes	yes	—	no	no	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
—	yes	yes	yes	yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes
yes	—	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
no	—	yes	yes	yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	yes	yes
yes	—	yes	no	no	no	yes	yes	no	yes	yes	no	no	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	—	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes
no	—	no	no	no	no	no	no	yes	yes	yes	no	yes	yes	yes
no	—	yes	no	no	yes	no	no	yes	yes	no	no	yes	no	no
no	—	yes	no	no	yes	yes	yes	no	yes	yes	no	yes	yes	yes
no	yes	no	yes	yes	no	yes	yes	no	yes	no	no	yes	no	no
no	—	no	no	no	no	yes	yes	no	no	no	no	yes	no	no
digital	analog	digital	digital	digital	both	analog	analog	digital	digital	digital	analog	analog	digital	digital
176.4	—	176.4	88.2	88.2	88.2	—	—	176.4	176.4	88.2	—	—	88.2	88.2
1 mpx	1 mpx	1 mpx	1 mpx	1 mpx	2 sep	1 mpx	1 mpx	2 sep	2 sep	1 mpx				
13.4 x 3.6 x 11.4	13.3 x 3.5 x 12.5	17 x 11 x ?	17 x 3.1 x 11.9	13 x 3.1 x 11.9	13.4 x 3.6 x 11.4	14 x 3.8 x 13.5	17 x 4.3 x 13.9	12.5 x 12 x 3.5	16.5 x 12	13.6 x 3.7 x 11.5	12.5 x 3.5 x 12.7	16.5 x 3.1 x 12.6	13.4 x 3.6 x 11.4	17.1 x 3.6 x 11.4
7	—	—	14.4	10.6	8	14.6	—	15.5	17.5	8.8	10.8	15.4	8	10.5

ance—a trait typical of audio components in general. A check of their operating specifications will also reveal general uniformity. Why is this? There are two reasons. First, CD products must adhere to rigid standards and specifications set by Philips and Sony, the co-developers and licensors of the CD system. Second, for the time being, only a relatively small number of companies are actually manufacturing CD players and/or assemblies that go into finished players. Thus, one of these companies may make basically identical but cosmetically individualized players for a half-dozen other firms that sell them under different brand names. (There's nothing new about this practice; it's the rule in the videocassette recorder business.)

Specs and Features

As the CD system becomes more popular, companies now relying on such "OEM" sources will shift into their own total production. From that point on the differences among players (in features and performance) may be somewhat more dramatic, and what could best be called a "spec-and-feature" race will be on. Since it'll be largely a corporate-ego matter, the sonic gains will probably be minor if they are audible at all.

Because of the high Philips/Sony standards (which exceed by quite a bit the typical quality of the recorded CD software), many critical listeners will be hard put to hear any significant differences in the sound quality of today's CD players. Player brochures and spec sheets show minimal differences in their printed specifications, and trying to hear those differences is likely to be an exercise in futility for all but those with extraordinary auditory capabilities. Even if differences are heard, they are rarely, if ever, of the kind which will allow an unambiguous "better" or "worse" judgment.

Your selection of a CD player should hence be a simple matter of picking one whose features and operating "feel" satisfy your tastes and needs. You might also want to consider design, styling, and overall dimensions.

Common to all CD players is the disc drawer, which contains the disc during playback. Many first-genera-

tion players utilized a vertical, tilt-forward-slot drawer, and the CD appeared to play on its edge. Virtually all second- and third-generation CD players are fitted with motorized front-loading disc drawers, with the CD positioned horizontally for playback. The drawers open and close at the touch of a button or a combination of a touch of a button to open and a gentle finger push to close. In using the NAD Model 5255 or Technics Models SL-P7 and SL-P8, among others, you place a disc in the tray and press the PLAY button, and the drawer slides closed automatically and the disc starts to play. Most drawers have cutouts on each side of the disc platter for easy placement and removal of the CD via its edge (the best way to keep fingerprints from its surface).

Major function controls for PLAY, STOP, PAUSE, FAST FORWARD, and REVERSE usually take the form of pushpads or pushbuttons. These are laid out on a player's front panel according to a company's idea of what constitutes sensible "human engineering," providing controls that can be easily located and are easy to operate.

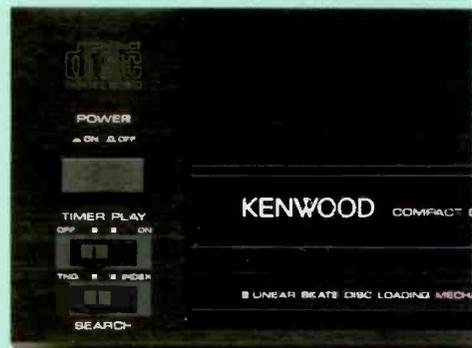
An example of good human engineering is evident in Luxman's new DX-103, where the major function controls are clustered in a shallow wedge configuration in the middle of the panel, with OPEN/CLOSE, PLAY, STOP, FAST FORWARD, and FAST REVERSE controls as flat pushpads and with PAUSE as a slender protruding control located between PLAY and STOP. There is another example in Marantz's CD54. It has a rocker bar for opening and closing the drawer, and adjacent to it there is a single four-way pad which you press at four different points to effect play, pause, fast forward, and fast reverse. In your quest for a player, operate the controls of several machines to determine which placement best suits your digital (no pun intended) preferences.

Programming

A big attraction of many CD machines is flexibility of playback programming. For example, if you don't like the sequence of songs on a favorite disc as they would ordinarily be played, you can punch a specif-

(Continued on page 116)

In most cases the second-generation CD players are technically superior to the first ones, though they average half the price of their predecessors.



\$599

Kenwood's DP-700 has program-segment memory, variable headphone output.





\$549.95

Sanyo's CP 200 has a 16-track memory and a headphone jack.



\$599.95

The Teac PD-11 has a 23-track memory and digital output filters.

SYSTEMS

Custom cabinetry for an exotic audio system / by Gordon Sell



THE task of getting a simple audio system to fit gracefully into a well decorated living room is difficult enough, but when you have a complex and sophisticated audio system it can be almost impossible. Robert Weisbein, a New York entertainment lawyer and long-time audiophile, wanted something that would match his existing decor. The white Formica storage unit designed by Rachid Chanoum of Manhattan Cabinetry is on rollers and can hold up to 250 albums and tapes in addition to the equipment. The speakers used with the system are 8-foot-tall Acoustat Two Plus Two's (flanking the windows) and a Dahlquist DQ-1W subwoofer.

The equipment in the cabinet is, from top to bottom, NAD 4150 tuner, Radio Shack APM-300 peak power meter, Hafler DH-200 power amplifier bridged to mono to drive the subwoofer, BIC Beam Box FM antenna, Dahlquist DQ-LP1 crossover, Audio Research SP-6 vacuum-tube preamplifier, Tandberg 340A cassette deck, Oracle Delphi turntable, Magnepan Unitrack tone arm, Accuphase AC-2 moving-coil cartridge, Fultron MC transformer, Audio Research D-70 power amplifier, and Double Monster Cable. Total retail value: \$10,643. Weisbein expects his next purchase to be a Compact Disc player. □

PHOTOS BY ROBERT LEVIN

SONY

CAR CD PLAYER & AM/FM TUNER

*Digital audio takes to the road with
the first Compact Disc player
meant for the car/A special
test report by Julian Hirsch
and Christopher Greenleaf*



ALMOST from the very first, the Compact Disc digital audio system was destined for automotive use. Take the CD's standard 12-centimeter diameter, for example. Besides holding a numerological kinship to the 12-inch long-playing record (and to the earlier 12-inch 78's), the diameter was chosen to make a disc large enough to hold Beethoven's seventy-minute-plus Ninth Symphony uninterrupted yet small enough for a CD player to fit in standardized car-dashboard cutouts!

It's not surprising, therefore, that the first car CD player, Sony's CDX-R7, has appeared so soon after the first home models. What is startling is that the CDX-R7 concedes nothing in sonic quality to its larger home-component brethren. (For our lab test-bench results and comments see the box on page 60.) And, to judge by Christopher Greenleaf's road tests, the CDX-R7 is fully equal to the best car-stereo cassette/radio units in operating convenience while surpassing them all in sound quality.

In many respects, the CDX-R7 does resemble a typical high-quality car AM/FM/cassette "head unit," what with its radio controls (scanning, presets, and so forth), dual line-level outputs with front/rear fader, remote antenna trigger, and \$800 to \$900 possible list price. But the usual cassette loading slot has been replaced by a wider and shallower opening that accepts a Compact Disc. Like a head unit, the CD-player mechanism and electronics *do* fit in a dashboard opening, a remarkable feat of miniaturization.

Overall, the main or control unit measures 7 x 2 x 6½ inches. Since the radio circuitry will not fit in along with the CD player—at least at this stage of car CD development—much of the AM and FM electronics

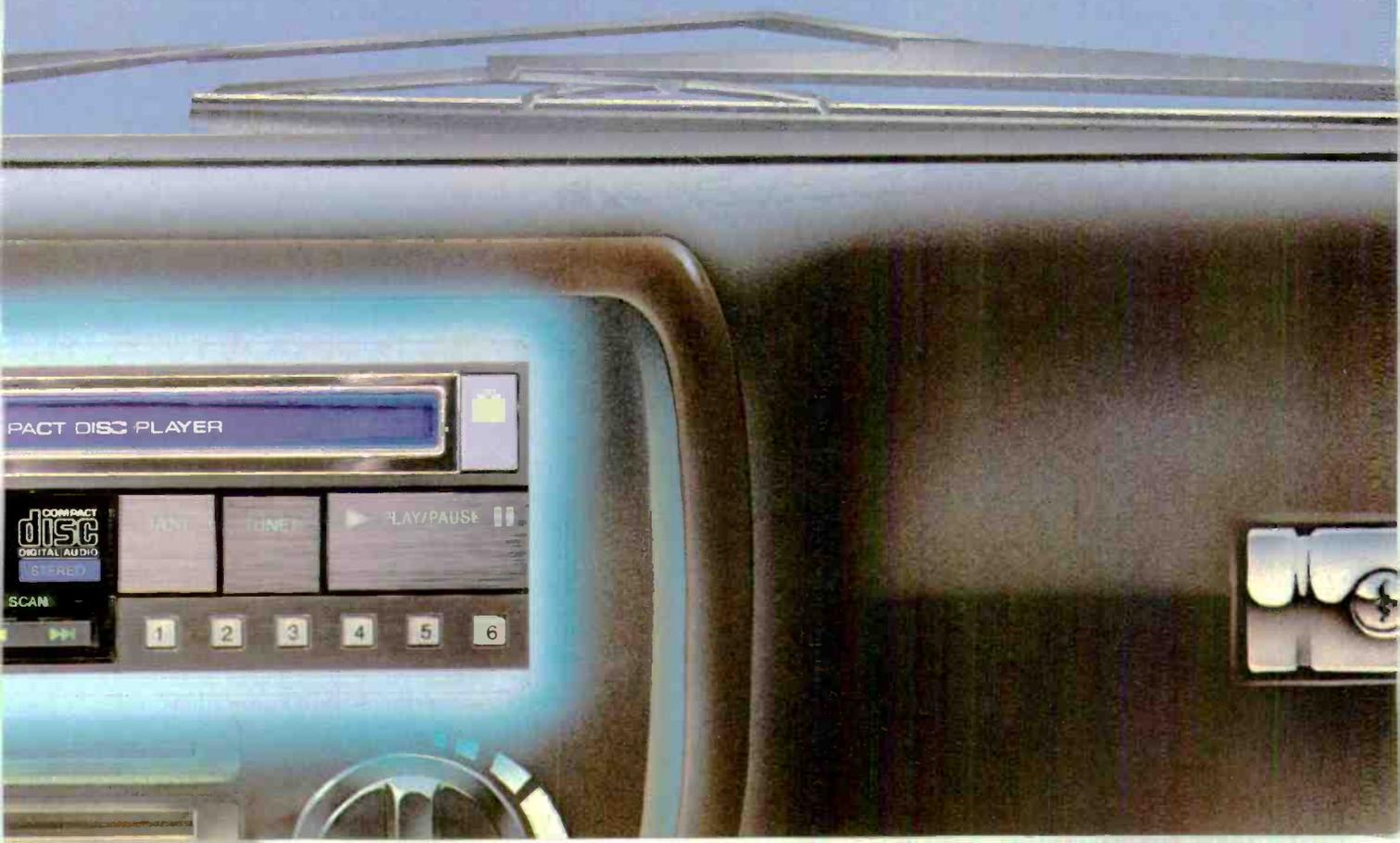
are housed in a separate, shielded, flat (7 x 1 x 5½-inch) package connected to the control unit via two five-foot cables. The antenna hooks up to this outboard unit, which itself has no controls. A small (5½ x 1¾ x 7/8-inch) d.c.-to-d.c. power-supply converter, which supplies some of the system's required voltages, can either be attached to the rear of the main unit or separated from it by a 6-inch integral cable.

Total Control

Even the front-panel controls of the CDX-R7 differ only slightly from those of other car radios. Obviously, no Dolby or dbx noise reduction is needed for the CD player, nor are any of the usual cassette-transport controls. In fact, the only controls on the CDX-R7 that are totally dedicated to CD operation are a flat plate that toggles the unit between pause and play modes and a smaller button that ejects the disc.

All other CD functions are handled by buttons that double up as tuner controls. For example, the tuning scan button also serves as the CD track selector, moving the playing point forward or back in one-track steps each time it is pressed. Tracks numbered up to the standardized limit of 99 can be selected by this control. The MANUAL button, which steps the tuner frequency by one tuning increment with every touch and tunes rapidly through the band when held in, provides a similar function when playing a Compact Disc. It speeds up playback by ten times—without changing the pitch of the sound—and allows the rapid location of favorite passages. Pressing the MEMORY button (used to store up to twelve FM and six AM station frequencies in the tuner's memory) while playing a CD returns the playing point to the start of the first track.

ILLUSTRATION BY JOHN JINKS



The numerical readouts on the CDX-R7's front panel serve a variety of functions. When the unit is first connected to a 12-volt d.c. power source, the digital readout displays the time. Pressing the TUNER button turns on the radio, whose tuned frequency replaces the time on the display. A BAND button cycles the tuner through its two FM memory ranges and the AM band.

When a Compact Disc is partially inserted, label side up, into the loading slot, a motor draws it inward and after a few seconds playback begins. The track number replaces the time display. Alternate operations of a DISPLAY button toggle the readout between time or frequency/track number. If a disc is loaded while the radio is on, the CD output replaces the tuner's; at any other time, operation can be swiftly changed between radio and CD simply by pressing either the TUNER button or the player's play/pause control.

Ejection of discs involves pressing the EJECT button to the right of the CD slot. The loading motor moves the disc outward so that it can be grasped without touching the recorded portions of the surface. The knobs for volume and bass and treble tone controls are all surrounded by a soft orange glow. The center-detented tone-control knobs, normally nearly flush with the front panel, are not usable until they are pressed and released, allowing them to extend outward from the panel. After setting, they may be pushed in for easy access to the volume control (which becomes a balance control when pulled out). The front/rear fader is concentric with the volume knob. *J.H.*

Chomping at the Bit(s)

My eagerness to try out Sony's latest technological tour de force made me pull over to the side of the road right after I picked up the box at Hirsch-Houck Laboratories. Except for the two small packets of electronics linked by umbilicals to the rear of the in-dash unit, the

CDX-R7 connects exactly like any other car stereo: twin power leads, ground, remote antenna-trigger wire, and two pairs of preamplifier line-level outputs (for front and rear power amps). I hooked up the system, slipped in Telarc's CD of the Shostakovich Fifth Symphony, and headed back toward Brooklyn.

The road back, though hardly as rough in its entirety as our standard test route, offered a respectable sampling of expansion plates, ripples, old trolley tracks, and garden-variety potholes. But for the most part I was driving on highway surfaces most drivers would call normal or good (here in New York we call them *rare*).

On this typical array of surfaces the CD player performed just like a good tape player (except for the sonic quality—see below). The orchestra played on and on, uninterrupted. Dips and abrupt shocks rarely caused major "skips" unless the car body itself shuddered noticeably. Where the player registered most of its objections was on my detour into a forlorn section of Queens with washboard pavement and irregular small chasms punctuating the few smooth stretches. At their worst, these undrivable roadways also proved "un-trackable," causing the laser optics to miscue entirely and even sending the laser scanner back to a "zero" setting (normally encountered only directly after disc insertion).

Heavy-Duty Shocks

So, you say, Sony has turned out a car CD player just as susceptible to mechanical shock as some of the first home machines, right? Not so, by a long shot. It took really rugged streets to disturb the music. Those same streets shook *me* up just as much, though I tried to avoid the very worst holes for my Volvo's sake. At highway or in-city speeds, on reasonable (read: normal) pavement, the occasional slight detracking was neither objectionable nor frequent. I do *not* suggest

IN THE LABORATORY

The CD-player portion of the CDX-R7 compared very well with the home CD players we have tested. The excellent flatness of its response, which was measured through the unit's tone controls, attests to the neutrality of those controls when in their detented positions. When the balance control was also centered, the levels of the output channels differed by only 0.6 dB.

An interchannel phase shift of 90° at 20,000 Hz indicates that the CDX-R7 has a single digital-to-analog converter that is switched (multiplexed) between channels. Square-wave signals showed ringing only after the level transitions, indicative of analog rather than digital output filtering.

Distortion and noise levels were at the typical incredibly low levels of other CD players. Only the channel separation was not quite the equal of some of the home players we have tested. However, since the separation figures we did obtain are literally thousands of times better than the inherent separation of any conventional program source—they are

hardly anything to be concerned about.

The error-detection and tracking capability of the CDX-R7 was superb—easily a match for any home unit we have tested and representative of the performance of the latest generation of CD players. This is perhaps understandable in view of the harsh conditions the player has to cope with, in addition to the less-than-pristine quality of the discs it will have to play in a car. On the other hand, impact resistance was adequate but not outstanding, with loss of tracking caused by moderately hard tapping on the case. This was, of course, a very crude and subjective test, and we feel that a road-test evaluation of the CDX-R7 is the best way to judge its vibration resistance.

And, of course, there is also a tuner section in the CDX-R7 (more accurately, attached to and controlled by the CDX-R7). Its performance conformed closely to the preliminary ratings supplied by Sony, ratings typical of the better car radios we have tested. The FM distortion was much higher in stereo

than in mono, a trait not uncommon to car radios. In this case, however, the availability of a very low-distortion signal source (a CD test-disc) allowed us to verify that the distortion came from the tuner; the audio circuits of the CDX-R7 had extremely low distortion, probably well under 0.002 percent.

The FM tuner has a signal-controlled channel-blend circuit and a high-frequency rolloff at low signal levels. These features provide at least 50 dB of noise quieting for antenna-input levels as low as 33 dBf (12 microvolts in a 75-ohm antenna impedance) and permit satisfactory reception of signals that might otherwise be too noisy, but without a total loss of stereo separation.

When reading the test data listed at right, keep in mind that we tested a pre-production sample of the CDX-R7. As superb as some of the results are, it is in the nature of pre-production samples to perform *less* well than final production units. But with all-around performance as good as this unit demonstrated, who's complaining? *J.H.*

putting a CD-player mechanism in your Land Rover for your next fling through Maine hunting trails, but in any vehicle that has good suspension and travels on normal roads you will find Sony's player practical. I frankly thought it couldn't be done at all. Sony's engineering achievement is, as we have often seen in their past innovations, formidable.

And the Sound?

The sound quality out of the CDX-R7 was *the best* I have ever heard in a car. In fact, its clarity, impact, and tonal balance were such that my car's ambient noise level often made me unable to appreciate just how good the sound was. Pop-music CD's certainly show to great advantage here, because little of the music is recorded at levels far below peak volume. But the slow movement of the Shostakovich symphony, for all its gossamer quiet and eerie moments when the car was parked, was just as frustratingly elusive on CD as the same performance on my Dolby C chrome tape.

The problem of excessive dynamic range is probably the crucial one for the long-term acceptance of the CD system into the car. I certainly don't want the discs themselves to be compressed, thus making them sonically unsuitable for critical home listening. The best solution will be built-in or add-on compressors with user-settable compression ratios and otherwise innocuous sonic behavior. (Hint to prospective manufacturers: Such circuits would even be useful with home CD players.)

Both the AM- and FM-tuner sections were excellent. If AM were always this clear and rich, many who now justifiably scoff at it as a music medium might find reason to reconsider. The FM tuner resisted most multipath, with smooth and tolerable interference noise interjected when the incoming radio signal got just plain bad. The tone controls left the midrange essentially untouched in their action. To me, that implies

that the CDX-R7 is best used with a high-quality loudspeaker system that has well-balanced midrange qualities. The lack of a loudness control underscores this impression.

The CD-player controls—track selection, pause, fast scan, disc repeat, and eject—worked quickly, logically, and conveniently. The faceplate had a lot to do with this; you can't make one simpler than the one on the CDX-R7. If the CDX-R7 were enlarged to tabletop CD player size, it would appear and perform like an ultra-simple, beautifully organized home component. In my car, the CDX-R7 was a reminder of how very close to living-room audio this product has brought the once humble domain of car stereo.

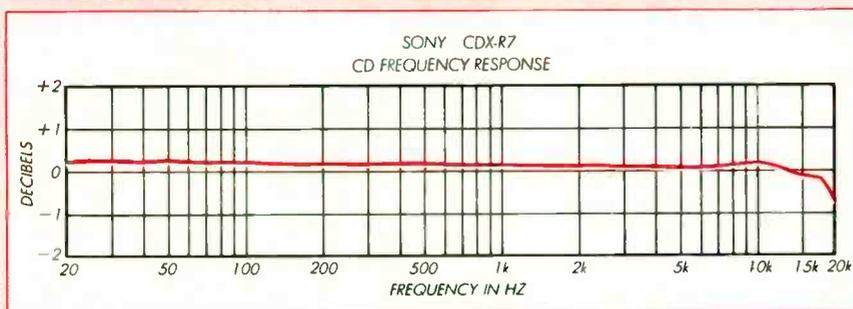
Nice Touches

The radio controls—scanning, presets, distant/local sensitivity, mono (affecting FM stereo only), and manual tuning—I found to be the only ones needed. The volume knob was conveniently large and obvious, and the extending-knob tone controls cleverly prevent inadvertent misadjustments while reaching for another control. Panel illumination (visible even in most daylight conditions) is beautifully executed. For example, playing a CD is accompanied by a lighting of only those controls and displays affecting CD playback. As an audible confirmation that you've reached the right control, each of the command buttons activates a short but quite audible "peep." With this extra little feature, your eyes can remain on the road.

Touches like these show the concern for detail which extends into every aspect of the CDX-R7's design. That concern has translated into a product with superb audio performance and outstanding operating convenience. The product proves to me that the digital Compact Disc is a viable program medium for the car, just as it was originally intended to be. Welcome to the car, digital age!

C.G.

HIRSCH-HOUCK LAB MEASUREMENTS



■ CD Player Section

Frequency response: +0.3, -0.6 dB from 20 to 20,000 Hz

Flutter (weighted peak): less than instrument residual of 0.001%

Total harmonic distortion at 1,000 Hz: 0.0032% referred to 0 dB; 0.006% referred to -20 dB

Intermodulation distortion: less than instrument residual

Channel separation: 80 dB at 1,000 Hz; 65 dB at 10,000 Hz; 59 dB at 20,000 Hz

Signal-to-noise ratio (referred to 0 dB): 84 dB unweighted; 90 dB A-weighted

Cueing time: 6 seconds

■ Cueing accuracy: B

Impact resistance: B

Defect tracking (figures are size of the largest defect successfully tracked): signal-surface damage, 900 micrometers; painted dots, 800 micrometers; simulated fingerprint, pass.

■ Tuner Section

Usable sensitivity (mono, 75-ohm input): 17 dBf (2 μ V)

50-dB quieting sensitivity (75-ohm input): mono, 16.3 dBf (1.8 μ V); stereo, 32.4 dBf (23 μ V)

Signal-to-noise ratio at 65 dBf: mono, 68.7 dB; stereo, 65 dB

Distortion (THD + noise) at 65 dBf: mono, 0.24%; stereo, 1.15%

FM frequency response (-3-dB limits): 20 to 18,500 Hz

Stereo separation at 100, 1,000, and 10,000 Hz: 35.5, 46, and 36 dB

Capture ratio at 65 dBf: 2.6 dB

AM rejection at 65 dBf: 66 dB

Alternate-channel selectivity: 86 dB

Adjacent-channel selectivity: 6.8 dB

Image rejection: 56 dB

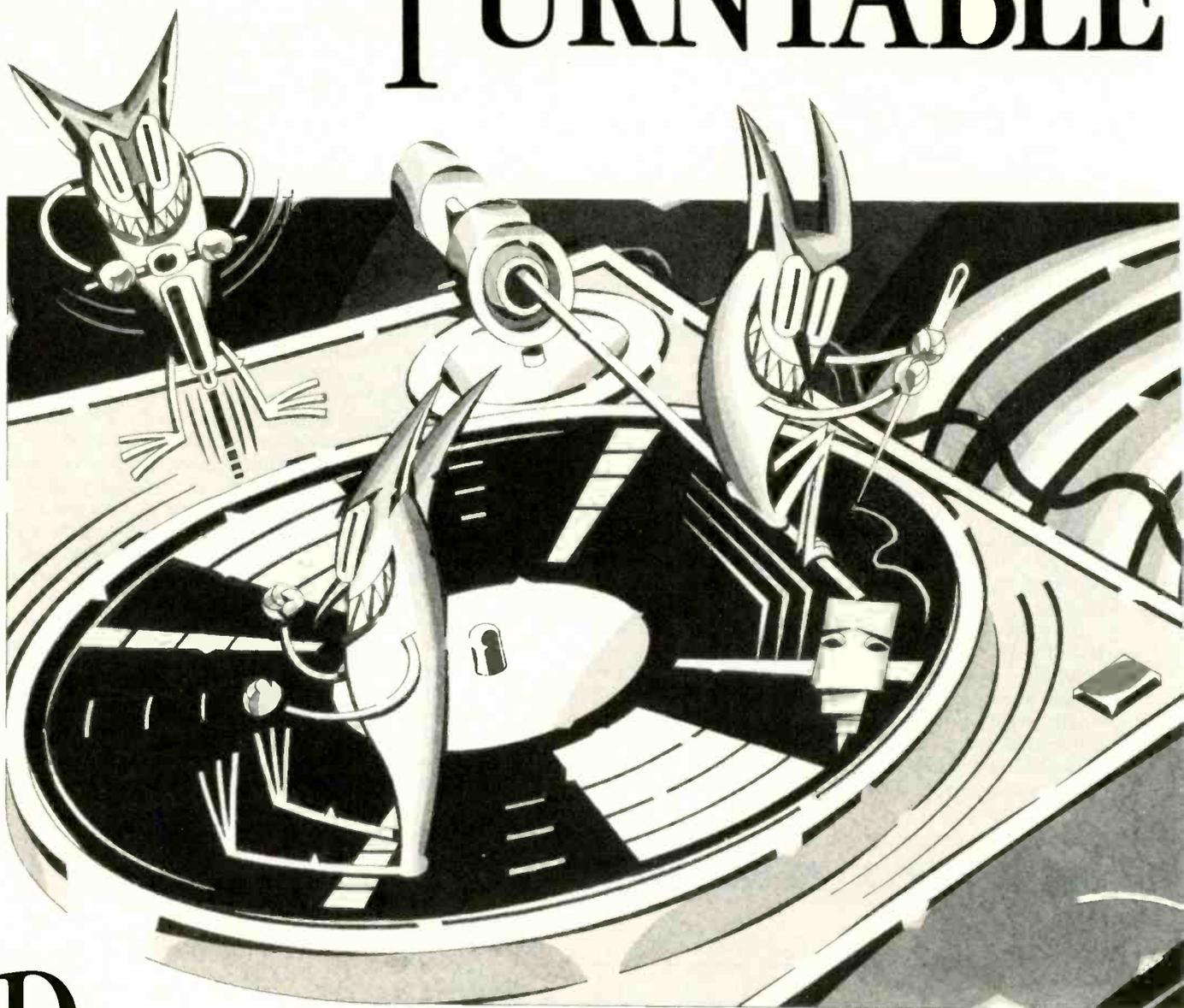
AM frequency response (-6-dB limits): 20 to 2,300 Hz

■ Preamp Section

Tone-control range: \pm 10.5 dB at 100 Hz; \pm 10.5 dB at 10,000 Hz

Amplifier power output at clipping (1,000 Hz): from 100% modulated FM signal, 1.1 volts (maximum available); from 0-dB level CD, 5.3 volts

TURNTABLE



D

by Howard Ferstler and David Ranada

DOES your turntable, in a display of untempered hostility, skip a few grooves every time you walk by? If you turn up the volume to danceable levels, does your system rebel by setting up a sustained howl or hum? If so, your system may have been infiltrated by a band of feedback-causing gremlins. The best way to exorcise these beasts and the various troubles they bring is to rid your system of turntable-isolation problems.

Skipped grooves and acoustic feedback are not the only problems that can result from a turntable's coupling to its vibratory environ-

ment. Claims for the "sound qualities" of turntables might have as part of their basis the ability of a turntable to ignore its environment and do its job of turning the record, just turning the record. Poor turntable isolation is claimed to be responsible for a muddying of sound quality even when skipping and feedback howls are not involved.

While skipped grooves, a feedback howl, and audible passing footfalls are obvious clues to insufficient isolation, how do you tell if the more subtle characteristics of feedthrough are present in a system? Data sheets and test reports are not

the answer. They are useful for some things, but they cannot tell you whether your setup—including the room acoustics, the construction of the turntable shelf, the relative placement of speakers and turntable—will interact beneficially with your turntable. But you can find out for yourself.

There is a relatively simple way to evaluate your system's susceptibility to acoustic isolation and feedback problems without using elaborate test equipment. The procedure outlined here is not a standardized lab test, but it will give you a good idea of the extent of the problem (if any).

GREMLINS

A simple test method helps track down causes and cures for feedback problems



PHILIP ANDERSON

The test uses your system's turntable as a *microphone* to pick up (via the stylus) ambient sounds, music and other vibrations in the listening environment. These sounds are recorded and analyzed. Repeated use of the test can help in tracking down the source(s) of feedback or resonance effects.

Read the instructions in all six steps of the procedure before starting. The only equipment you need is a tape deck and, in some

cases, a high-level signal source such as a tuner, a Compact Disc player, or a second tape deck.

1. Prepare your tape deck to record from the turntable. Set the recording levels fairly high; the signals you will record will be very soft, if they are audible at all. Use the best noise-reduction system your deck offers, preferably Dolby C or dbx.

2. Place the phono stylus on a *stationary* disc so that any sounds recorded will not include disc or turntable rumble, which can completely mask any feedthrough or feedback. Be very careful not to jar

the turntable and send the arm bouncing around, which can damage both disc and stylus. With some turntables you might have to start the disc playing and then turn the turntable off or pull its plug to leave the stylus on the disc. If you cannot disable turntable rotation, use a "silent groove" (unmodulated) disc and record it instead. Keep in mind that the results in this case will be tainted by turntable noise and disc rumble, hiss, ticks, and pops.

3. This is the crucial step: Play several kinds of music at your normal listening levels or *slightly higher while recording the (stationary)*

cartridge output on the tape deck. If your receiver or amplifier will allow you to record one input while listening to another, simply switch it to record the phono input while playing the tuner, CD player, or other high-level signal source.

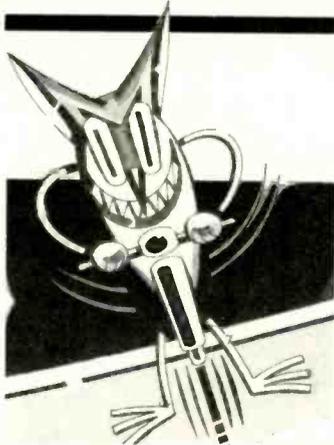
If you cannot do this with your equipment directly, you can fake it using the tape monitor input. For this you need an extra high-level signal source (separate tuner, tape deck, or CD player) to serve as the test-signal (music) generator. Disconnect your main tape deck's output from the amp or receiver, hook up the output of the extra high-level source to the TAPE INPUT you just disconnected, switch the amp or receiver input selector to PHONO, and finally switch in the amp's TAPE MONITOR so that it is monitoring the high-level signal source you just connected.

4. After recording a variety of music you can further test for turntable isolation by stomping, dancing, walking, and otherwise moving around your listening room. Also try tapping (carefully) on the turntable shelf, the turntable base and dustcover, and—if you are truly stouthearted—on the center of the disc itself. Any vibrations seeping into the turntable will be faithfully recorded by the tape deck.

5. Restore the normal connections in the system and listen to the tape you have made. The volume might have to be turned louder than normal, or you might have to use headphones. If nothing is heard but tape hiss, try raising the recording level by 10 dB or so and repeat Steps 3 and 4. If you still hear nothing but tape hiss with the record levels all the way up, you probably have no problems with either feedback or turntable isolation.

6. Evaluate any noises you hear. This is the most difficult part of the process. Chances are that you will hear little, if anything, in the music portions of the program. Some of the stomping, dancing, or turntable tapping will probably leak into the recording. Make sure these noises are not caused by electronic crosstalk within the switching/wiring set-up by repeating Steps 3 and 4 *while using headphones instead of speakers* to monitor the process. If the music still leaks onto the tape at the

Poor turntable isolation is often claimed to be responsible for a muddying of sound quality even when groove skipping and feedback howls are not involved.



same level, your system has more difficulties with interchannel crosstalk than with turntable feedback or acoustic feedthrough (the dancing and turntable tapping will get through regardless).

The music getting through to the tape should be very soft and unintelligible since it consists mostly of bass frequencies. If the feedthrough of a pop vocal selection is clear enough that you can understand the words of the song, you have a potential problem.

One or two pitches may stand out or "ring," especially if the music you "broadcast" out into the room had a thumping bass line. This ringing comes from a resonance somewhere in the system. Likely candidates are the disc itself, acting as a resonating microphone diaphragm; the turntable (dust cover, suspension, tone arm, platter, base, etc.); and turntable/speaker placement in the room that causes a room resonance to be picked up by the disc.

If the ringing has anything to do with speaker or turntable placement, Step 4 of the test will *not* create ringing sounds if it is conducted with the speakers *off*.

It is usually difficult to narrow down the cause of feedthrough and

ringing any further by means of a listening test. Naturally, if you get resonances only when you tap the turntable base, and not when you tap the dust cover or even the disc itself, the base is fairly well indicted as the culprit. But the most effective way of tracking down the resonances and feedthrough is a step-by-step elimination of all the possible causes.

The very simplest way to reduce the amount of vibration and music feeding through the turntable is to move the turntable out of the listening room altogether, preferably to another room or into a closet with a door. This is often not practical, so first try moving the turntable to a different location. The move doesn't have to be far; the next shelf or somewhere on the same shelf will do. Try to keep the turntable away from the walls and corners of a room, since bass frequencies are most intense there.

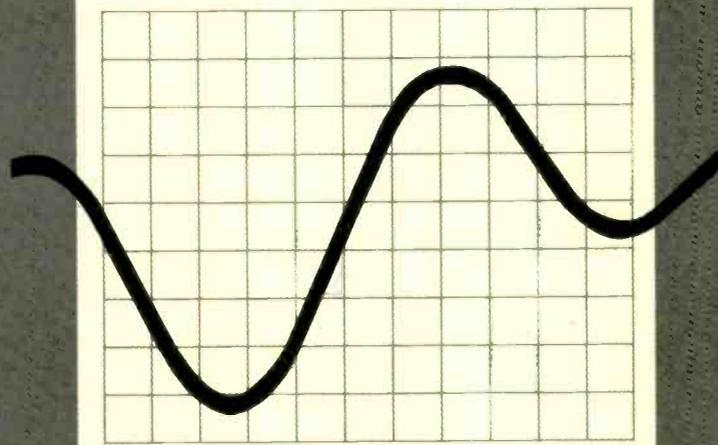
If this doesn't reduce the feedthrough and ringing to acceptable levels, it is time for more stringent measures and the use of "accessories." These needn't be expensive. A large paperback book placed on the turntable cover might sufficiently damp its resonances into inaudibility. So too might an inexpensive record weight or clamp designed to keep the disc from acting like a microphone diaphragm.

In some cases, the only way to reduce feedback, feedthrough, and isolation problems is to use a more effective vibration-isolation system than the one that came with the turntable. Several types and brands of supplementary or replacement turntable mats or isolation bases are available. The most basic of these consists of nothing more than a heavy-duty office-typewriter pad sold in office-supply stores. The most complex include spring suspension of the turntable from the ceiling.

Of course, if the liberal application of turntable relocation and accessories doesn't banish the gremlins, you can always buy another turntable or change your listening room. Regardless of the solution found, the disc-as-microphone test outlined here will give you a repeatable and reliable method of gauging the results. □

S T E R E O

H I G H
T E C H

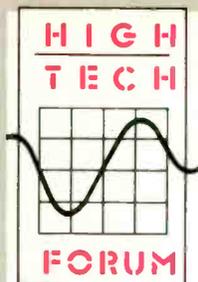


FORUM

HIGH TECH FORUM was created so that you and the manufacturers could share the ideas, concepts and philosophies behind their most advanced products.

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R E V I E W



Carver—The Man and His Company

In these days of faceless audio companies producing team-designed common-denominator products, Bob Carver and the Carver Corporation stand out as something special.

An authentic engineering genius in these days of me-too designs, Carver has always taken a uniquely clear-eyed look at audio design—its problems and potential solutions. Perhaps because his training is as a physicist rather than an electronics engineer, Carver is not constrained to conventional approaches or refurbished solutions to old problems.

Capping a long series of innovative and breakthrough designs were the 1979 introductions of Sonic Holography and the Magnetic-Field Power Amplifier—and within the past year, the Asymmetrical Charge-Coupled FM Circuit.

SONIC HOLOGRAPHY

Through a sophisticated phase-nulling technique, Carver's Sonic Holography circuit transmutes the limited image of conventional stereo into a precisely defined, three-dimensional musical stage. The liberating impact of Sonic Holography has been described by audio experts thusly:

"The effect strains credibility—had I not experienced it, I probably would not believe it...the "miracle" is that it uses only the two normal front speakers." Julian Hirsch, *Stereo Review*.

"...it brings the listener substantially closer to the elusive sonic illusion of being in the presence of a live performance." Larry Klein, *Stereo Review*.

"...seems to open a curtain and reveal the deployment of musical forces extending behind, between and beyond the speakers...terrific." *High Fidelity*.

THE MAGNETIC-FIELD POWER AMPLIFIER.

The elegant technology of the Carver Magnetic Field Power Amplifier solves four basic problems of conventional power amplifiers: cost, size, weight, and heat generation. The power supplies of conventional high-power audio amplifiers are oversized, costly, and inefficient because they produce a constant output voltage—irrespective of the demands of the constantly varying audio signal. The power supply in a Magnetic Field Amplifier

is a radically different, highly efficient design that delivers precisely the voltage and current needed at any moment to handle the audio signal with complete accuracy. See diagram at right.

The first product to employ this technological breakthrough was the Carver M-400t. Built as a 7-inch cube and weighing less than ten pounds, the M-400t is rated at 200 watts a channel! Even normally blasé reviewers were moved to state:

"It is hardly conceivable that a small, inexpensive, lightweight cube such as this could deliver as much clean power as any but a few of the largest conventional amplifiers on the market—but it does...An important new design." Julian Hirsch, *Stereo Review*.

"Music reproduction was superb and completely free of any false bass coloration or muddiness. The amplifier handled the toughest transients we were able to feed it, with ease. It is, to put it mildly, quite an achievement and one that is likely to change the way many of us think of power amp design." Leonard Feldman, *Audio*.

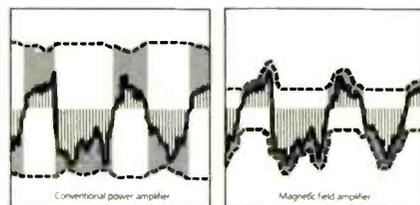
And of the recent Model M1.5t, it was said:

"...the equal of any power amplifier in transparency, focus and smoothness and, of course, far ahead of any other we tested in sheer gut-shaking power and dynamic range. We especially enjoy hearing spatial detail, instrumental definition and completely natural dynamics on familiar records...At this level of sonic performance, the astoundingly small size and cool operation of the M1.5t become the icing on the cake, rather than the main attraction." Peter Aczel, *The Audio Critic*.

FM RECEPTION BREAKTHROUGH.

Carver's most recent technological achievement is the Asymmetrical Charge-Coupled FM Detector Circuit. This unique circuit, which first appeared in the Carver TX-11 FM Stereo Tuner, drastically reduces the distortion of multipath and the noise of weak stations to mono levels while providing full separation, depth, and ambience.

The TX-11 has also received unprecedented acclaim:



Solid line: audio output signal. Broken line: power supply voltage. Shaded area: wasted power. Vertical lines: power to speakers.

"It is by a wide margin the best tuner we have tested to date...What distinguishes the TX-11 is its ability to pull clean, noise-free sound out of weak or multipath-ridden signals..." *High Fidelity*.

"A tuner which long-suffering fringe area residents and those plagued by multipath distortion and interference have probably been praying for..." Leonard Feldman, *Audio*.

"A major advance...Its noise reduction for stereo reception ranged from appreciable to tremendous...It makes the majority of stereo signals sound virtually as quiet as mono signals, yet it does not dilute the stereo effect." Julian Hirsch, *Stereo Review*.

THE CARVER RECEIVER.

The remarkable performance qualities of the Charge-Coupled FM Detector and the Magnetic Field Amplifier were recently brought together to create The Carver Receiver. The reviewers were unanimous in their praise: "I consider the Carver receiver to be the 'most' receiver I have yet tested in terms of the quantitative and qualitative superiority of almost all its basic functions." Julian Hirsch, *Stereo Review* April, 1984. And: "The Carver Receiver is, without question, one of the finest products of its kind it has ever been my good fortune to test and use." Leonard Feldman, *Audio*, June 1984.

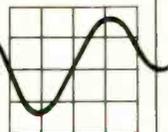
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H I G H
T E C H



F O R U M

Mission...in the service of Music.

Mission Electronics is one of those increasingly rare companies whose technological expertise is totally dedicated to the service of music. It is our intention—our mission, if you will—to raise the science of sound reproduction to the highest possible level. In working toward that end, Mission has in its short history become well established as a manufacturer of truly state-of-the-art products. Based in Huntingdon, England, Mission has achieved a formidable reputation in Europe that is only now reaching the United States.

DESIGN DIVERSITY.

Most audiophile equipment manufacturers have earned their reputations by concentrating their efforts on a particular component. Mission's reputation, however, is based not only on our superb loudspeaker systems, our phono cartridges, tone arms, turntables, and amplifiers are held in equally high esteem by knowledgeable audiophiles throughout the world. It should be understood that it was not merely the urge to have our fingers in a multiplicity of technical pies that drove us to such a wide range of equipment.



It is our position that without an in-depth technical and philosophical understanding of the problems of music reproduction, no single component can be optimally designed...and in any case, components are best designed as part of an overall system. The full explanation of our approach, which involves stage-by-stage bandwidth optimization, impedance matching, elimination of interface distortions, and so forth, is unfortunately more complex than can be covered in the limited space available.

THE 70 MK. II SYSTEM.

An example of our special approach to product design is provided by the new Mk. II version of our smallest loudspeaker, the Mission 70. Our design objective was to produce a very compact system that was capable of handling the frequency range and dynamics of live music without requiring an excessive amount of amplifier power. Satisfaction of that goal automatically assures the ability to reproduce digital master tapes, while remaining linear at all listening levels.

It is not generally appreciated that, for several reasons, it is far more difficult to design an excellent small speaker system than an excellent large one. A small enclosure's limited internal volume and high internal acoustic pressures demand special construction techniques. These are needed to suppress reflections or resonances occurring both in the air mass inside the cabinet and in the cabinet walls themselves.

SPECIFICATIONS MISSION 70 MK. II

Frequency range:	40 Hz-20kHz
Frequency response:	60 Hz-20kHz \pm 3db
Impedance, nominal:	8 ohms
Recommended power:	20-75 w/ch
Sensitivity	89dB (1W/1m)
Tweeter, dome:	3/4" Polymer
Woofer, cone:	7" Plastiflex
Crossover freq.:	2.2 kHz
Cabinet (h \times w \times d):	14 \times 8 $\frac{1}{2}$ \times 8 $\frac{1}{4}$ "
Finish, grille:	Walnut, black

RESONANCE CONTROL

If not properly controlled, enclosure resonances blur transients and impart a nasal, muddy, or boomy quality to upper-bass notes and male voices. In the Mission 70, internal resonances and standing waves are absorbed by special Mission-developed open-cell acoustic-foam blocks that occupy most of the enclosure's internal volume. Special construction techniques were employed in the 70's cabinet to achieve the desired acoustical characteristics without the need for heavy panels and internal bracing. We used a three-layer construction, thin panels of high-density composition board sandwiching a specially developed visco-elastic material. This arrangement provides an optimum combination of structural

rigidity, internal damping, and low mass.

Most manufacturers take their cabinet construction for granted—with the expectation that their customers will also. We have discussed assembly-details simply to illustrate the depth of our concern for every aspect of design that affects the sonic performance of our products. But, of course, the main determinant of a speaker system's performance is the quality of its drivers and crossover.

THE DRIVERS.

The 70 employs a 7-inch woofer with a unique Plastiflex cone crossed over at 2.2 kHz to a 3/4-inch Ferrofluid-damped polymer dome tweeter. The critically designed six-element crossover network operates in conjunction with Mission's inverted driver geometry to provide a startlingly realistic stereo sound stage.

Among the performance parameters detailed in the specification chart at left there is one whose significance is not universally appreciated. A loudspeaker's sensitivity specification indicates its efficiency in converting an amplifier's electrical output into acoustic energy. Every 3 dB increase in speaker sensitivity halves the amplifier power needed for a given acoustic output. The logical answer, therefore, to the wide dynamics of digital program material is *not* more powerful amplifiers—although Mission is prepared to supply them. Instead, we prefer to design loudspeaker systems that can deliver digital peak levels without requiring enormous power inputs.

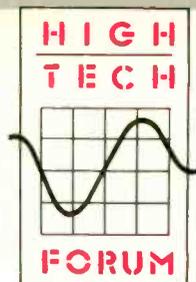
At this point, a critical listening session at your Mission dealer is worth far more than anything we could add. Of course, there is much more to the Mission Electronics story, and we would be pleased to make it available to you either by mail...or better yet, at your nearest Mission dealer. We would very much appreciate the opportunity to *demonstrate* the qualities that we've been telling you about.

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Unique Flat Wave Speaker Systems from SFI

You may be reading about SFI for the first time. Actually, SFI has been involved in loudspeaker driver design through its brother company in Japan, Sawafuji, since 1922. SFI's continuing research into transducer technology has led to a number of international patents and an enviable reputation among equipment manufacturers as a high-quality design and manufacturing source. Sawafuji-produced ribbon tweeters, flat-diaphragm headphone elements, and other transduction devices are found in respected high-end audio components throughout the world.

SFI recently successfully completed a research program dedicated to the development of a new generation of flat wave loudspeaker transducers. The result: a series of high- and low-frequency drivers with dramatically improved sound quality.

PROBLEMS AND SOLUTIONS.

To appreciate what SFI has achieved, it's necessary to understand the essential problems that have troubled conventional loudspeakers for almost 60 years. Conventional diaphragms tend to store energy, buckle, and break up into resonant modes under the impact of the large forces applied in a small area by the voice coil. This results in distortions in phase, amplitude, frequency, and dispersion—which covers just about everything that goes wrong in a loudspeaker.

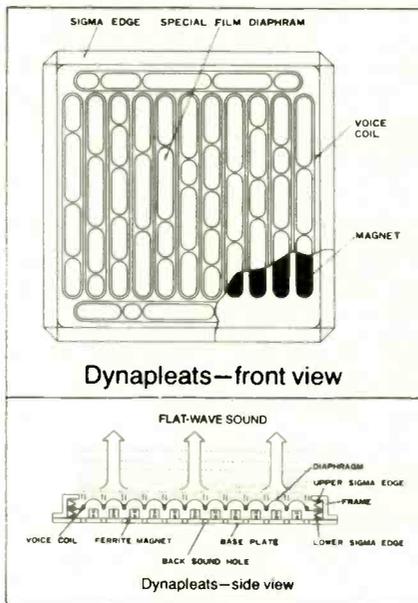
The solution to all these problems is a driver with a very low-mass, non-resonant diaphragm that is linearly driven over its entire radiating surface. However, the practical realization of such a planar speaker system is certainly not easy—as previous and current producers of such designs have discovered. The challenge is to combine the transient response, definition, and openness of an electrostatic transducer with the reliability, dynamic range, bass performance, and non-problematic drive requirements of a standard electromagnetic cone transducer.

SFI'S DRIVERS.

In 1922, Sawafuji's engineers abandoned the conventional cone and cylindrical voice coil. Instead they developed a flat voice coil etched on the entire surface of

a Polysolpon™ film diaphragm. The diaphragm, which is only a few thousandths of an inch thick, is immersed in an intense magnetic field. When used as a headphone element, the flat-wave ribbon tweeter has a smooth response extending from 10 Hz to 100 kHz. And, as a tweeter in a speaker system, its performance is equally impressive.

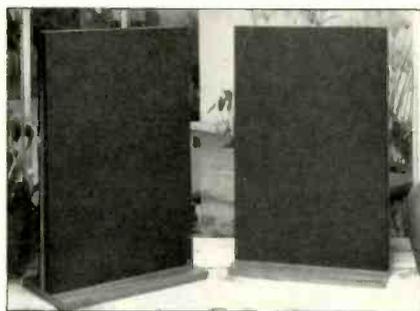
Applying the distributed-drive, voice-coil principle to a low-frequency transducer required an enormous amount of engineering time. Bass reproduction demands large air movements which, in turn, require large diaphragm excursions; a difficult task for a flat wave transducer. Sawafuji engineers persevered, and the Dynapleats transducer emerged from their laboratories.



The diaphragm of the Dynapleats, 6½ x 6½ inch, low-frequency driver utilizes a Polysolpon™ diaphragm that is aerodynamically pleated with the voice coil integrated into the entire surface of the driver. (See side-view diagram.) An array of high-energy strontium bar magnets set within the ridges interacts with the distributed voice coil, and a unique high-compliance, long-excursion Sigma edge suspension supports the diaphragm perimeter. This proprietary arrangement ensures thermal stability and ruggedness, wide dynamic range, and extended bass response.

SFI SYSTEMS.

The state-of-the-art SFI systems, the Digital Reference, employs an array of sixteen 6½" x 6½", low-frequency drivers, four 6½" x 6½" midrange drivers and eight ribbon tweeters installed on a handsome 35 x 56 x 3-inch dipolar radiating baffle. The low-frequency array has far more "cone" surface than an 18-inch woofer while simultaneously providing the resonance-free fast rise time of light-weight diaphragms. Crossover is at 600 Hz to the four midrange drivers arranged in a vertical line-source configuration for wide, but controlled, dispersion. The eight tweeters, crossed over at 5,000 Hz, form another vertical array for enhanced dispersion. The SFI systems, with their flat wave drivers, are inherently phase accurate. And the wide operating range of the Dynapleats drivers allows the use of simple, inductorless high-pass networks as crossovers.



For a demonstration of the range of SFI systems currently available—all using the state-of-the-art SFI flat wave drivers—visit your SFI dealer. You will hear, for the first time, the solid bass and dynamic range of the best of the conventional systems, combined with the open, transparent qualities and superb definition of the finest electrostatics. This is achieved without the limitations of electrostatics, i.e., special amplifiers and limited bass responses. For more technical information on this speaker and other products, along with the address of your nearest SFI dealer, write to:

SFI

Sawafuji America Corp.

23440 Hawthorne Boulevard
Suite 130, Torrance, CA 90505

EXILE



On a hot summer afternoon in Nashville, the five members of Exile, country music's most impressive new act, sit in the control room of the Soundshop recording studio mixing a track from their second Epic LP, "Kentucky Hearts." A sweet, bluesy sound pours out of the speakers, but drummer Steve Goetzman has a frown on his face: the kick drum seems out of phase.

"I think you just messed up our record," says producer Buddy Killen jokingly.

"Don't worry, Steve," says keyboard player Marlon Hargis. "Nobody listens to drums anyway."

"Everybody listens to the kick drum," Goetzman says, building up steam.

Suddenly the girl friend of lead-singer J.P. Pennington walks into the room wearing a blouse covered with hearts. "Why, Susie, you've got a heart-on," someone says, and the tension dissolves in laughter.

A new country image has taken a sock-hop rock band out of the bowling alleys and into the big time.

By Alanna Nash

Sometime later, the phase problem seems to have abated, and engineer Pat McMakin rewinds the tape to the beginning. On first listening, the new album sounds even more contemporary than the group's first Epic LP, "Exile." That record contained two Number 1 country-pop singles, *Woke Up in Love* and *I Don't Want to Be a Memory*, and established the band as a force to be reckoned with. Although the songs aimed for too many directions to give the album a cohesive sound, some nine months after its release

Exile went from being almost total unknowns in country music to being nominated for the Vocal Group of the Year award from the Academy of Country Music.

"We don't want to get away from doing that hard-core country music," says Les Taylor, who shares lead singing duties with Pennington. But at the same time, the quintet admits that the wealth of contemporary material has allowed the group to develop an "Exile sound"—one that is rooted not only in commercial, rock-influenced hooks and punchy melodies, but also in soulful harmony vocals.

Since their first appearance on the country charts last year, Exile has been compared to any number of groups, including the Oak Ridge Boys and Creedence Clearwater Revival. Most often, they are mentioned in the same breath as Alabama, country's pre-eminent superstars. But on close scrutiny, there are really few similarities between the two bands other than their emphasis on close vocal harmony and



“It came down to whether we had the fortitude to stick it out. You know, did we want to do it?”

the fact that up to now, self-contained, youth-oriented groups were rather a rarity in modern country music. There was that one other coincidence, however: *Take Me Down* and *The Closer You Get*, both monster hits for Alabama, just happened to have been written by two members of Exile. And why the Alabama boys—and not the five young men from Kentucky and Indiana—made those songs into immortal records is a fascinating tale indeed.

Six years ago, in 1978, a noxious, rather pre-fab teenybopper tune called *Kiss You All Over* hit the top of the rock charts like a ringer on a Test Your Strength pole at the fair. The group behind it was none other than Exile, who, after fifteen years as a high-class sock-hop band, came tearing out of Lexington, Kentucky, on Warner Brothers Records, ready to rock the world.

“If somebody had told me in 1972 that I was going to be in a country band with a number-one hit record, I would have beat ‘em to death with a tab of acid,” says the merry-faced Pennington, who organized the group in 1963. Pennington had *American Bandstand* and worldwide tours in his eyes then, and

most of his dreams came true. But then the all-crucial follow-up records failed to hit big, and it was all over but the shouting, even though Warner Brothers continued to cut the contractual albums, short-shrifting the promotion.

In the midst of the *Kiss You All Over* buzz, however, an extraordinary thing began to happen. Where most artists have to simultaneously do handstands, double back flips, and the third position of the Kama Sutra to get even small-time management companies to look their way, Exile found that a fellow by the name of Jim Morey kept turning up at their gigs around the country. He wanted to become their manager. But the band wanted to manage itself at the time, and besides, says Pennington, “We didn’t know who this guy was. He’d show up at this concert or that, and we’d sort of ignore him. I thought he was a slug.”

Before long, however, Exile learned that Jim Morey was part of one of the top L.A. management firms, Katz-Gallin (now Katz-Gallin-Morey), whose clients then included Dolly Parton, Joan Rivers, Lily Tomlin, the Osmonds, Cher, and the inimitable Kate Smith. Exile intelligently decided to rethink its management position, especially since things were going downhill faster than Jimmy Carter’s political career. By then, the group had added another member in lead singer/guitarist Les Taylor, who joined Pennington on vocals and guitar, Sonny Lemaire on bass and supporting vocals, Marlon Hargis on

keyboards, and Steve Goetzman on drums. But the situation continued to look so bleak that at one point the group held a meeting to decide whether to split up.

“It came down to whether we had the fortitude to stick it out,” said Lemaire. “You know, did we *want* to do it?”

“I think it took us about, oh . . . two minutes to decide,” Pennington adds, smiling.

But an all-important, second decision was made, too—that of taking Morey’s suggestion to become a country band, a thought that had already entered their minds. While today’s country music has become a virtual dumping ground for every past-his-prime pop singer and balding rock star (Dean Martin, Petula Clark, Connie Francis, Tom Jones, and Annette Funicello, to name a few), most of the members of Exile had undeniable closet country credentials. J.P. Pennington’s mother is Lily May Ledford, leader of the Coon Creek Girls, popular country radio stars of the Thirties and Forties, and his uncle was the late Red Foley. Besides, says Lemaire, “This is just kind of an extension of pop music from where we were ten years ago. But as far as mainstream pop *now*, we’re not in that at all.”

For a little more than two years then, while the rest of the world thought that Exile had retired to the Twilight Zone of rock and roll, the group was holed up in the bar of a Lexington bowling alley, getting its country licks down pat and refining its distinctive vocals. Jim Morey

Meanwhile the rest of the world thought Exile had retired to the Twilight Zone of rock-and-roll.

sent occasional glimmers of hope, loose talk about record deals and the like, and Pennington’s publisher was out peddling his stuff.

In short order, Pennington, Taylor, Lemaire, and company would be bopping around town, only to turn on the car radio and hear other people having a field day with their songs. Not just Alabama, understand, but Janie Fricke with *It Ain’t*

(Continued on page 121)

WHAT'S NEW

CD players, four-channel amps, exotic speakers, AM stereo, high-end cassette decks—car stereo is as rich as home audio / by Daniel Sweeney

THE biggest new thing in car stereo is the incredible variety of cassette/receivers, amplifiers, speakers, and accessories that are available now. More and more people are learning that cars are great places to listen to music if they have the right equipment and have it properly installed.

The hot news this fall and winter is the imminent arrival on the market of several Compact Disc players for the car. Else-

where in this issue we have the world's first complete test report of a car CD player, the Sony CDX-R7 (see page 58). No player is on the market yet, but Sony claims that the CDX-R7 will hit the streets this month, and Pioneer and Fujitsu Ten plan their CD player debuts in January. Mitsubishi, Kenwood, Panasonic, and Philips also have units under development.

All of these companies have demonstrated working prototypes of their car CD players, and we're told that the sticky prob-



TS / FF

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TRACK NO

MINUTE

SECOND

12 TOTAL 52' 12
DISC SET PLAY RPT

COMPACT DISC
DIGITAL AUDIO

SCAN

PIONEER COMPACT DISC PLAYER

RELOAD

CL
DISPLAY

DSP

REPEAT

RPT

SR CAR STEREO



lems of dust, extreme temperatures, shock, and vibration have finally been licked. So far all the players are designed for in-dash use, but some of the prototype chassis are about twice the size of a conventional car stereo. Pioneer uses a second remote chassis to house the circuitry that won't fit into the DIN-sized dash unit, but Sony's player-only unit is completely self-contained in a DIN-sized, in-dash chassis box.

So far the companies have refused to quote prices, but they are expected to be in the \$500-and-up category, with very limited initial product availability. Our experience in listening to the various prototypes suggests that the players show up the limitations of the associated car stereo components rather cruelly, and that they belong in systems

having plenty of clean power and wideband speakers with high power handling capabilities.

While Compact Disc players for car stereo have generated a certain amount of excitement in the high end of the business, the real action is in in-dash cassette/receivers, speakers, amplifiers, and accessories. More than fifty companies are selling cassette/receivers, and customers have never before been faced with so many choices.

Cassette/Receivers

Digital display and digital-synthesis tuning are becoming the norm rather than the high-priced exception. Jensen has just introduced five digital cas-

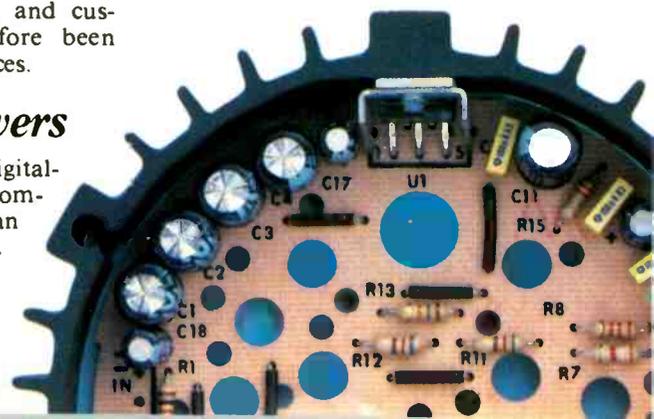
sette/receivers that have suggested retail prices ranging from \$199 to \$299 with 5-watt-per-channel amplifier sections. Analog tuners are now available mostly on promotionally priced items.

There seems to be something of a power race a little reminiscent of the situation in home receivers a few years back, though on a much lower-powered scale. Some of the power claims are as unrealistic as those made in the days before the Federal Trade Commission clamped down on the abuses in the home hi-fi industry.

Beware of exaggerated claims in car stereo specs. Companies often claim such things as total power rather than power per channel, or peak-to-peak power rather than the more realistic rms (root mean square) figure used for home components. Try to compare ratings at a common level of total harmonic distortion (THD) such as 1 percent. Don't compare one amp's 10-percent THD rating with another's 0.8-percent rating. The nature of car stereo products often adds to the confusion; many amplifiers have four channels, others have just two. There is no easy way to solve this problem except by being alert to it.

Alpine, always a reliable indicator of market trends, has recently introduced the Model 7263 cassette/receiver with 16 watts per channel rms with no distortion level specified. It has a suggested retail price of \$299.95.

Sanyo has six new electronically tuned receivers in its standard line, each with 9½ watts per channel rms at less than 1 percent THD, ranging in price from \$239.95 to \$349.95. The company also has a series of manually tuned models with the same power that sell for \$99.95 to \$229.95. Sanyo's new Ultrax subsidiary will sell higher-quality home and car components. The Ultrax car



stereo components feature a front panel with station preset controls that assume alternate functions when the deck is in the cassette-playing mode. Each mode has its own visual display, and all functions and displays are controlled by a 2-kilobyte computer. The units' amplifiers have 15 watts per channel with no more than 0.3 percent THD. Prices range from \$370 to \$470.

JVC is offering 12 watts rms continuous power per channel with less than 0.8 percent THD for its new top-of-the-line KSRX910 Audio Express deck (\$649.95). This same unit features a five-band graphic equalizer and tape-program scan and search.

Equally powerful is EPI's new LSR-12. And Sansui's SY-7 develops 20 watts per channel but with 10 percent distortion at that level. Interestingly, both the EPI and the Sansui cassette/receivers can drive two pairs of speakers. We expect such four-channel receivers to expand as a product category.

AM Stereo

Another major development is the recent announcement by Pioneer that the company would support the Motorola system of AM stereo. This fall Pioneer will start offering Motorola stereo on one of its Super Tuner III receivers.

Concord and Marantz have also endorsed the Motorola system, as has Sherwood, who incorporated it in the CRD-150, priced at \$209.95. These companies' endorsements, along with the GM and Chrysler decisions to support Motorola, will certainly advance Motorola's drive for AM stereo supremacy. In the meantime, Sansui still offers a car unit with the capability to receive all four AM stereo systems.

Tuner technology in general is

PHOTOGRAPHS: The new Pioneer CDX-1 Compact Disc player on page 71 showed excellent shock resistance. Highlighted on these two pages (counterclockwise from top left) are the JVC KS-C200 cassette/receiver with built-in equalizer, the Nakamichi TD-500 unidirectional cassette/tuner with adjustable azimuth, the first of the Ultrix cassette/receivers, Jensen's P/EQ-1 equalized speakers, Polk's automotive speakers, and Audiovox's Constant Velocity speakers.



getting better, and most units of reasonable quality have some sort of circuit for reducing the effects of multipath distortion and for getting optimum performance with weak signals. Concord's new FNR and Sansui's ASRC are just two of the many such circuits. Another tuner feature, the Diversity reception system, where two antennas are constantly sampled on the assumption that one of them will have a good signal, still has only two car-stereo adherents, Sony and Audia. There may be more introductions in the spring, however.

We also noticed the growing popularity of dbx and Dolby C noise reduction, along with the ubiquitous Dolby B, in automotive systems. Alpine has long endorsed both systems, but now Ultrix has dbx, Dolby B, and Dolby C in all its in-dash units. Likewise, Kenwood and Panasonic include them in some high-end models, while Concord, Audia, and Rockford Fosgate make provision for add-on noise-reduction modules. The dbx and Dolby C encoded tapes make con-

siderable demands on an audio system's amplifiers and speakers, but apparently a large body of consumers appreciate the dynamics. That ought to be good news for companies developing automotive CD players.

Aiwa made a big splash recently by introducing three new high-end cassette/receivers of highly unusual design and appearance. The front panel of each is covered with a hinged lid that completely conceals the deck and simulates an empty dash. The lid opens downward to reveal, on its inner surface, a full set of controls in addition to those on the front panel of the receiver. As well as hiding the units from thieves, this design gives them twice the available area for function controls as conventional receivers.

All three models are feature-laden, in fact, and the flagship CTX-500 has Dolby C, infrared remote control, seek and scan, electronic volume control, and numerous other niceties. To thwart thieves even further, the Aiwas can be easily removed from the dash only by





means of a special tool. Prices range from \$300 to \$500.

Nakamichi, which last year introduced the TD-1200 at almost double the price of the next most expensive cassette/tuner on the market, has developed the more affordable TD-800, TD-700, and TD-500. The TD-800, which has an azimuth fine-tuning device and remote control, is flat out to 22 kHz. The TD-700 has a closed-loop, dual-capstan drive and a built-in azimuth fine-tuning control, while the TD-500 employs a single-capstan transport and azimuth fine tuning. Prices are about \$890, \$790, and \$590, respectively. The TD-800 is on the market now; the others should follow shortly.

A final note on head units. Eight-track has finally joined the 78-rpm record and the elcassette in that great limbo of discarded formats. No more eight-track players are manufactured, and software availability will become increasingly problematic for diehard wow-and-flutter fans.

Equalizers

Moving up the signal path, we find some interesting developments in the equalizer category. Blaupunkt has just brought out a double equalizer, the nine-band BEQ F/R, for both the front and rear speakers. If your aim is truly flat frequency response in a car, and you are using more than two speakers, two equalizers are practically a necessity. Blaupunkt makes tandem equaliz-

ing fairly affordable at \$179.95.

Not especially affordable at \$540, but even more sophisticated, is the Zapco PX, the only parametric equalizer for the automobile. Zapco claims a THD of 0.05 percent and a signal-to-noise ratio of 102 dB for the PX. These would be excellent specs for a home unit, let alone an automotive product. The PX is for the purist with deep pockets.

A growing category in autosound today is the equalizer/amplifier combo, not to be confused with the old equalizer/power booster. Power boosters are add-on amplifiers that further boost the already greatly amplified signal from the power amplifier in the receiver. When a booster is placed in the signal path, in effect the audio system has two stages of current amplification and distortion is predictably high. But boosters are becoming rarer nowadays—the current generation of

eq/amps take their inputs from the line outputs of a tuner or receiver.

Blaupunkt offers two eq/amps, the two-channel BEA 40 and the four-channel BEA 80, each with 20 watts per channel rms with less than 3 percent THD. The BEA 40, a five-band graphic, costs \$119.95, and seven-band BEA 80 costs \$169.95, a considerable economy when you compare the units with combinations of separates.

Another equalizer-amplifier worth noting is the CY-SG100 Commander by Panasonic. This unit develops 100 watts total and can be used in four-channel configurations at 25 watts per channel. The unit also provides special ambience-enhancement circuitry. Sherwood has a 20-watt-per-channel eq/amp, the EQA-260 at \$129.95, and Aiwa has announced that it will offer an eq/amp this fall but has released no details.

Power Amps

The four-channel approach is also becoming more prevalent in the category of separate power amplifiers. Currently, four-channel single-chassis amps are offered by Sansui, Nakamichi, Yamaha, Rockford Fosgate, Bose, Alpine, Zapco, Clarion, Fujitsu, and Audiomobile.

With multi-speaker installations becoming increasingly common, the four-channel amplifier makes a lot more sense economically and in terms of space utilization than the custom bi-amp configuration. The power race of last year among separate amps appears to have ceased temporarily. Rockford Fosgate, with its four-channel, 325-watts-per-channel Power Punch 650, is well ahead of its nearest competitor.



Bridging the outputs of the Power Punch makes it into a two-channel 650-watt amplifier.

Another high-power setup is the Audiobile MDX Modular Docking System, which was announced last year but has only recently become available. A full multi-amp system with a total output of 1,000 watts, it employs a lot of novel circuitry, including transformerless power supplies, and costs \$2,900. Obviously it is for someone with very deep pockets.

Another tendency that is carrying over from home audio amplifiers is high-current capability. This capability enables amplifiers to put the maximum amount of energy into the speakers no matter what load

few others. Look for amplifiers whose 2-ohm power ratings are considerably higher than their 4-ohm ratings if you are interested in this kind of product.

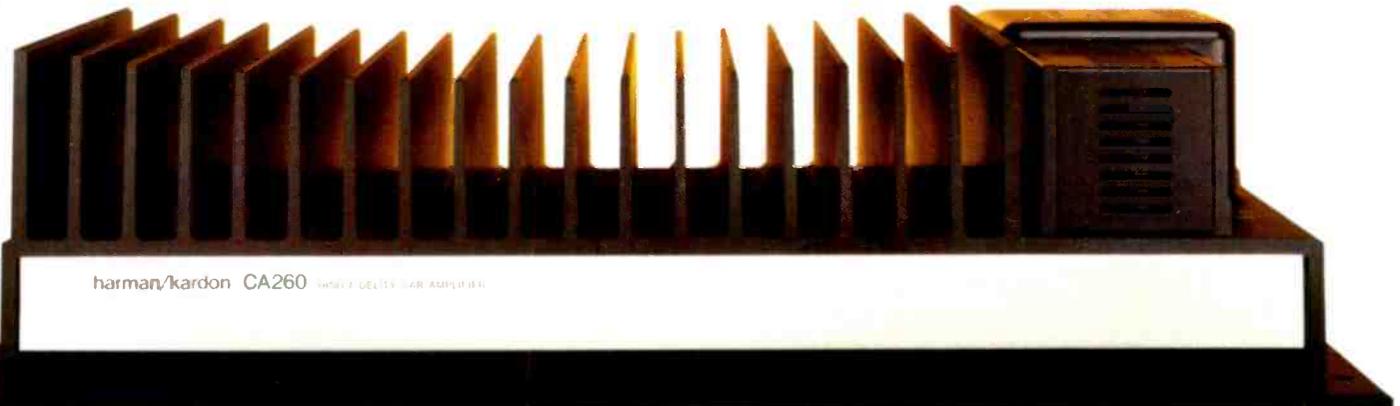
Speakers

The speaker category is where a lot of the excitement in autosound is focused these days. Everybody's coming up with new materials, new shapes, and new products.

The most unusual new speaker is an as-yet undesignated two-way surface mount designed by Soundmates. It uses a conventional cone woofer and an electrostatic mid-range/tweeter. Concord, which had acquired Soundmates, was to bring

superficial resemblance to the humble whizzer cone. But instead of being driven by the woofer voice coil, the Co-Motional tweeters use a piezoelectric element. Piezos have had a bad reputation in the automotive field for harsh highs, and they generally appear only in the cheapest speakers. JBL seems to have toned down the harshness by crossing the piezos over very high up, making them, in effect, supertweeters. Examples we heard sounded quite well balanced.

There's a more general trend in automotive speakers toward the growing use of adjustable-aim tweeters on coaxial and multiaxial speakers. A major problem with conventional car speakers is the in-



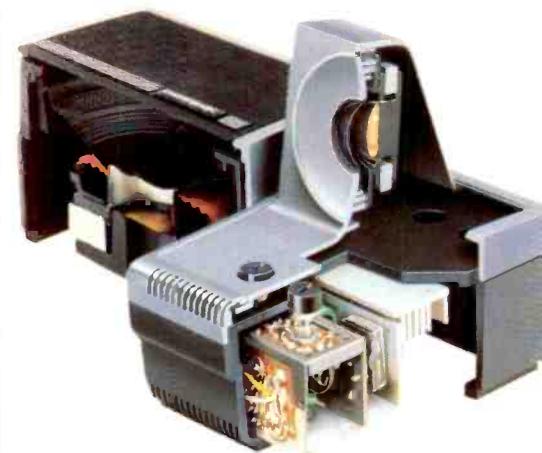
they present, even parallel-wired 4-ohm speakers. One of the more noticeable amps in this category is the Harman Kardon CA260, which has an instantaneous current capability of 30 amperes. Its power rating is 60 watts per channel into 4 ohms, 90 watts into 2 ohms, and 180 into 4 ohms in the mono, bridged mode. Among other amps with similar high-current capability are the Audia AFX-150, Proton 250, and various models from Alpine, Rockford, ADS, Concord, Visionik, Yamaha, and probably quite a

PHOTOGRAPHS: Alpine's Model 6254 two-way speaker system (top left) has separate woofers and tweeters and a crossover. Parasound's 300EQP (left) is a nine-band equalizer and preamplifier. Harman Kardon's CA260 (above) is a high-current-capable amplifier that is rated for 60 watts per channel into 4 ohms. Sparkomatic's Amplidyne loudspeakers (right) feature their own built-in amplifiers.

the speaker out this fall, but Soundmates has since been purchased by Koss, and the project has been delayed. Prototypes exhibited remarkable clarity and transient response.

Another unconventional driver is the flat mica tweeter developed by Clarion for its Audia line. Rigid and lightweight, the new design is said to have the extended frequency response and transient speed of leaf tweeters while offering vastly superior power handling. Clarion claims a 100-watt power handling capability and uses a 6-dB crossover, which is indicative of the driver's ruggedness.

Unusual driver technology is also apparent in JBL's Co-Motional series of loudspeakers. The speakers in this new budget line feature graphite and acrylonitrile butadiene styrene baskets and a most unusual coaxial tweeter arrangement. The tweeters are cones that are directly attached to the woofer and bear



evitable loss of high frequencies in off-axis listening positions, and it is a particularly acute problem when speakers are placed in standard cut-outs in the rear deck. If tweeters are placed in adjustable mountings, the problem can be overcome. To date, (Continued on page 115)

It dramatically broadens FM reception. And completely eliminates tape noise. The new Supreme Elite car audio system. Only from Panasonic.

This car audio system automatically helps prevent fading of weak FM stations. Stops interference from unwanted stations. And even goes beyond reducing tape noise. To totally eliminating it.

Ordinary car stereos can take you just so far before they let the FM signal fade. But Panasonic Supreme Elite gives you HyperTuner. So your music comes in longer and stronger than with ordinary car stereo.

Panasonic goes on to give you FM Optimizer circuitry. To further enhance fringe area reception. Impulse Noise Quieting reduces interference caused by other

traffic. There's even electronic tuning with automatic seek/scan. To automatically lock in stations.

High performance on the highway.

For your tapes, Panasonic gives you Dolby[®] and dbx.[®] To not only reduce tape noise, but eliminate it. Completely.

The cassette deck section also gives you auto-reverse and locking fast-forward/rewind. So you can keep your hands on the steering wheel. Instead of on the dashboard.

So why buy an ordinary car stereo system? When you can buy a Panasonic that broadens FM reception and eliminates tape noise.



*Dolby is a trademark of Dolby Laboratories. ®dbx is a registered trademark of dbx, Inc.

Panasonic[®]
just slightly ahead of our time.

CIRCLE NO. 4 ON READER SERVICE CARD

by **Christie Barter and Steve Simels**

PUBLIC SERVICE DEPARTMENT: Operating on the theory that there are at least 180 million people in America who will not get the chance to see **Michael Jackson** and his brothers on the road this year, herewith a glimpse of what they'll miss. Yes, that's the **Gloved One** in Kansas City, the opening night of the Jacksons' **Victory** tour. By the way, if you're one of those aforementioned millions, not to worry: according to our spy there, Michael was good, "but he wasn't Prince." □

OUT OF LEFT FIELD DEPARTMENT: If any of the gentlemen in the picture below look familiar, you're showing your age—that's (right to left) **Chris Dreja**, **Jim McCarty**, and **Paul Samwell-Smith** of the legendary **Yardbirds**. As you may recall, the Yardbirds packed it in around 1969, but now,



COLUMBIA RECORDS

Frogs, as in Box of

calling themselves **Box of Frogs**, they're back (along with new vocalist **Jim Fiddler**). They've surprised everybody with a hit debut album (No. 49 on the charts as of this writing) and a very nice video version of their single *Back Where I Started From*. Several album cuts feature instrumental work by **Jeff Beck**, once lead guitarist for the Yardbirds. □

TIME-LIFE Music's new twenty-cassette audiophile package "The **Swing Era**" contains nearly three hundred all-time swing



EBL ROBERTS

Michael of the Brothers Five in Kansas City

classics performed by many of the original artists in the original arrangements reconstructed by **Billy May**. The set derives from re-creations recorded in the late Sixties and early Seventies and released, separately at the time, on LP's and tapes. These recordings, newly transferred to tape using state-of-the-art processes, are thus once again available but only as a single-purchase unit and only in the cassette format. The price is \$195, plus \$10 postage and handling, from **Time-Life Music**, 541 North Fairbanks Court, Chicago, Ill. 60611. Or call 1-800-621-8200 to charge by credit card. □

PIONEER ARTISTS has achieved a breakthrough in the video-disc field with its eight-inch format. The new LaserDiscs have a playing time equivalent to the so-called Video 45 cassettes, but at a suggested list of only \$10.99 the discs are priced to undersell the tapes by about six dollars. Artists featured on the first eight-inch discs are **David Bowie** (*Let's Dance*, *China Girl*, and *Modern Love*) and the **Motels** (*Suddenly Last Summer*, *Only the Lonely*, *Take the L*, and *Remember the Nights*). Pioneer will follow these with re-

leases by the **Stray Cats**, **Iron Maiden**, **Phil Collins**, and **Kajagoogoo**. □

POP POPE: Giuseppe Verdi used to get flack from the church over his operas, and recent musicals like *Godspell* and *Jesus Christ Superstar* got some clerical hard knocks as well, so it came as some surprise when we received the news that **John Paul II** has written a musical. It's more of a revue, really, called *One World, One Peace*, for which the pontiff has written twelve songs, including the title tune. The show was performed for the first time this summer in West Germany and is now on in what



PIONEER ARTISTS

Davis of the Motels

amounts to a pre-Broadway tour. The original-cast album is expected any day now. □

ENGLISH flutist **Michael Copley** and accordionist **Dag Ingram** got their start playing for change on streetcorners in Europe. Now known as the **Cambridge Buskers**, they are an international concert and recording act famous for their lighthearted renditions of the classics, and they're not missing a trick in building an up-to-date career.

To promote their latest Deutsche Grammophon recording, "Music Abbreviation 101," they did a quick North American tour this summer, and they'll be back this fall. "We must have a video," says Ingram, "and we're working on one."

Another album is also in the works. "With the four-hundredth anniversary of the birth of **Heinrich Schütz** and the three-hundredth of **Bach**, **Handel**, and **Scarlatti**, 1985 will be a big year for



MARITZA SWOPE

Buskers of Cambridge

Baroque music, and we'll have an album with those composers on it."

So fasten your seat belts—in 1985 everybody's going for Baroque. □

THREE young Russian pianists walked away with all three of the top prizes in the 1984 International Music Competition held in Montreal this summer. The first prize went to twenty-two-year-old **Ekaterina Sarantseva**, who gets a \$10,000 cash award, a major concert tour, and a recording contract with Musicmasters/Musical Heritage Society. □

SR RECORD MAKERS

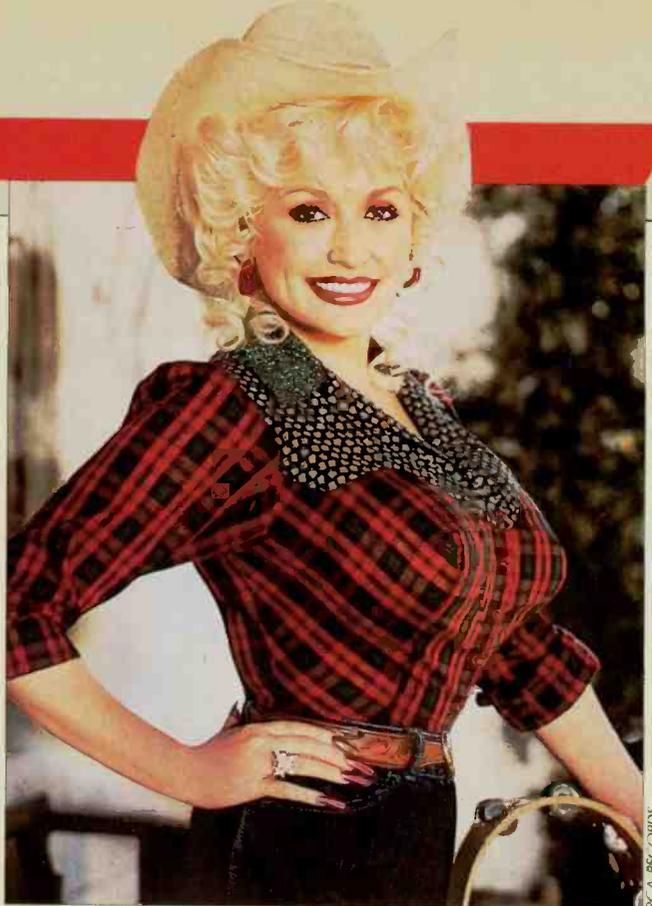
MICHAEL JACKSON'S *Thriller* has been outdistanced in at least one poll: the front runner as Best Pop Album of the Year in Germany's leading audio magazine was **Andreas Vollenweider's** "Caverna Magica" on CBS. The album was also a bestseller in the rest of Europe and recently came onto both the jazz and classical charts here. Domestic sales total about 100,000, which is phenomenal for any jazz or classical album.

But who is Andreas Vollenweider? Well, he's a thirty-year-old Swiss harp player. He's achieved his success as a recording artist

Reynolds or Stallone, Parton replied, "Well, I liked 'em both, and I made money off both of 'em."

Did anyone in Nashville feel she had abandoned country music by going to Hollywood? "If they do," cracked the voluptuous singer, "I'm just sorry they feel that way 'cause I think they know I went to Hollywood taking all that along. It's like I always said, I'm the only person in the world that left the Smoky Mountains and took 'em with me."

Meanwhile, Parton is working on songs for her Christmas album with **Kenny Rogers** and looking into buying the financially troubled Monument Records, the label that signed her in 1964 after every other record company in town had turned her down. **A.N.**



Parton: moving mountains in *Movieland*

MOZART'S historical opera *La Clemenza di Tito*, about good doings and bad during the reign of the Roman Emperor Titus, will be telecast on September 24 in public television's Great Performances series. The opera was filmed on location in Rome under the direction of **Jean-Pierre Ponnelle**. The principal singers include two Americans, soprano **Carol Neblett** and mezzo-soprano **Tatiana Troyanos**. The program is made possible by a grant from Exxon and by participating local PBS stations. . . . **Frank Corsaro's** production of *Carmen* will be shown on PBS two days later, in a performance by the New York City Opera.

Neblett in *Mozart*

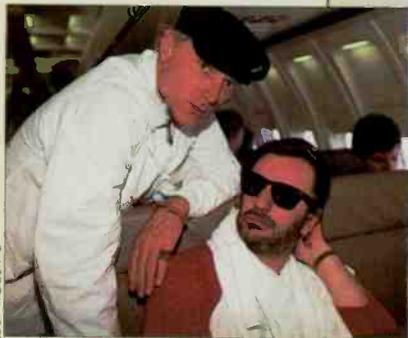


GREAT PERFORMANCES

Victoria Vergara sings the title role. . . . Consult local schedules to confirm dates and broadcast times. □

SOMEWHERE in the Friendly Skies, **Beach Boy Mike Love** hopped with the inimitable **Ringo Starr**. The topic of discussion? Probably Ringo's surprise appearance with the Boys at a Fourth of July concert in Washington, D.C., where the ex-Beatle pounded the skins for a version of his old band's classic *Back in the U.S.S.R.* Officially, of course, this was a one-shot, but speculation has arisen that it may have been a job audition: the **Beach Boys** are officially drummerless since the death of **Dennis Wilson**. □

Henry Edwards (who wrote the infamous *Sgt. Pepper* film) and **Tony Zanetta** (former president of **Bowie's** management company). According to reports, **Bowie's** ex-wife **Angie** and his ex-manager **Tony De Fries** have already spilled significant numbers of beans, and the book promises to be a fairly juicy affair. . . . **Gary**



Love and Starr in flight

U.S. Bonds, whose new self-produced album is currently in the stores, is a busy guy. He's contributed background vocals to two songs on the upcoming LP by **Phoebe Snow** and has performed similar duties on cover versions of his 1960 hit *New Orleans*—by **Joan Jett** and **Neil Sedaka**. □



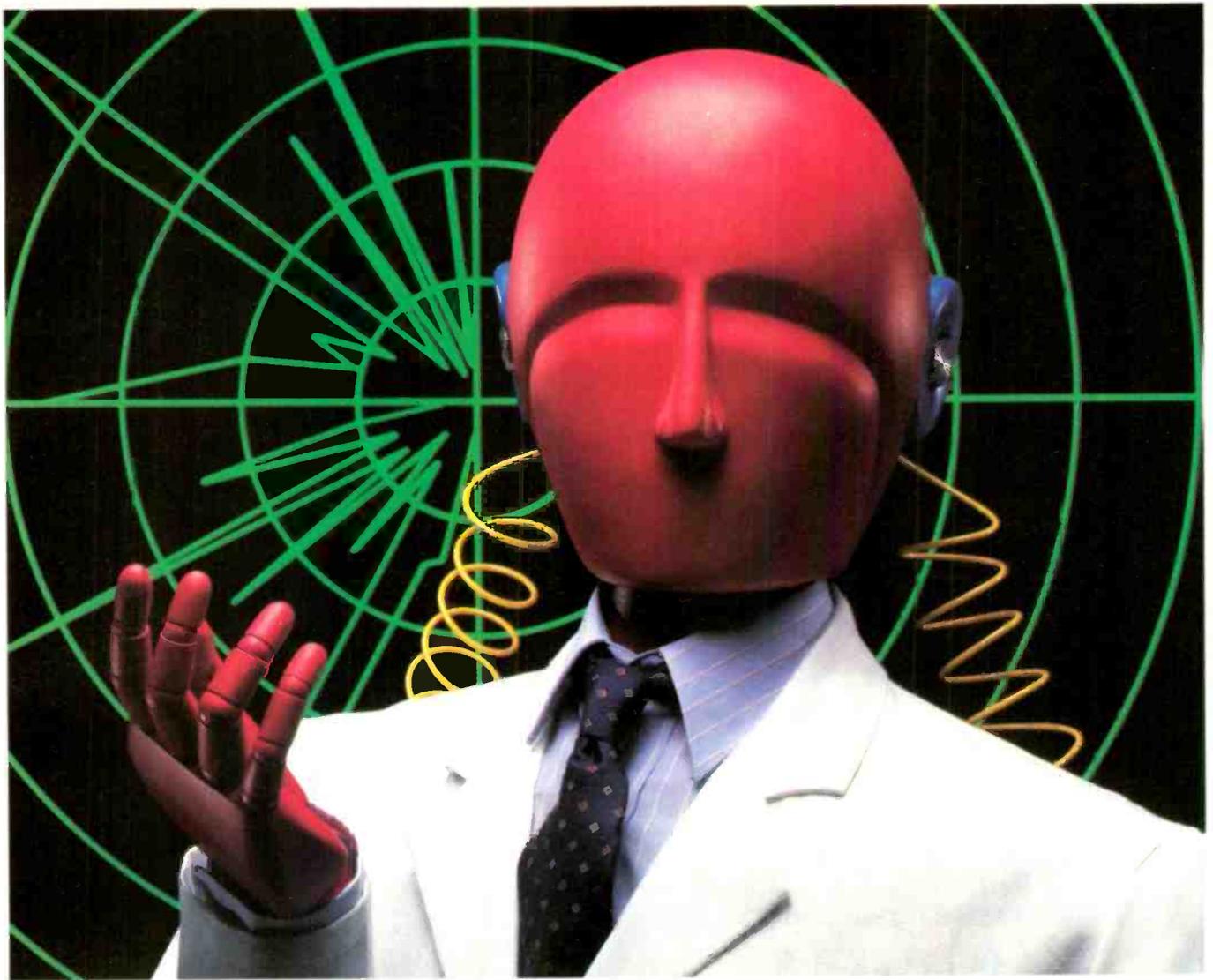
Vollenweider: Spacey

in this country largely through word of mouth and (in the last few months) with a video distributed to cable TV stations.

And what's his music like? Well, it's kind of spacey, as you'd figure from a title like "Caverna Magica." Americans will now have a chance to hear Vollenweider in person. He's making his first U.S. tour, coast to coast, this month. □

THE movie *Rhinestone* may be as tacky as a Porter Wagoner Nudie suit, but the press conference for the Nashville première was something to see: the pairing of two of Hollywood's most cantilevered bodies, **Dolly Parton** and **Sylvester Stallone**, trading one-liners for an adoring crowd.

Asked who she considered her favorite male singing partner in the movies, **Burt**



“Hard to swallow, but the Delco-GM/Bose Music System has even more technology than I do.”

Morgan

Born in 1979 at M.I.T., Morgan is a vital member of the Delco-GM/Bose Design Team.

“I don’t believe everything I read, but I must agree with what **Popular Science** wrote about the Delco-GM/Bose Music System, ‘It’s as good or better than the best home systems I’ve heard.’

“Why do critics continually rave about the sound? Quite simply, because the Delco-GM/Bose Music System has more technology than any other music system—for car or home. And believe me, I know technology.

“You see, I’ve been blessed with an acoustic computer brain that allows me to draw pictures of sound the way humans hear it. So engineers can design different Delco-GM/Bose Music Systems for specific models of Cadillac, Oldsmobile, Buick and Chevrolet.



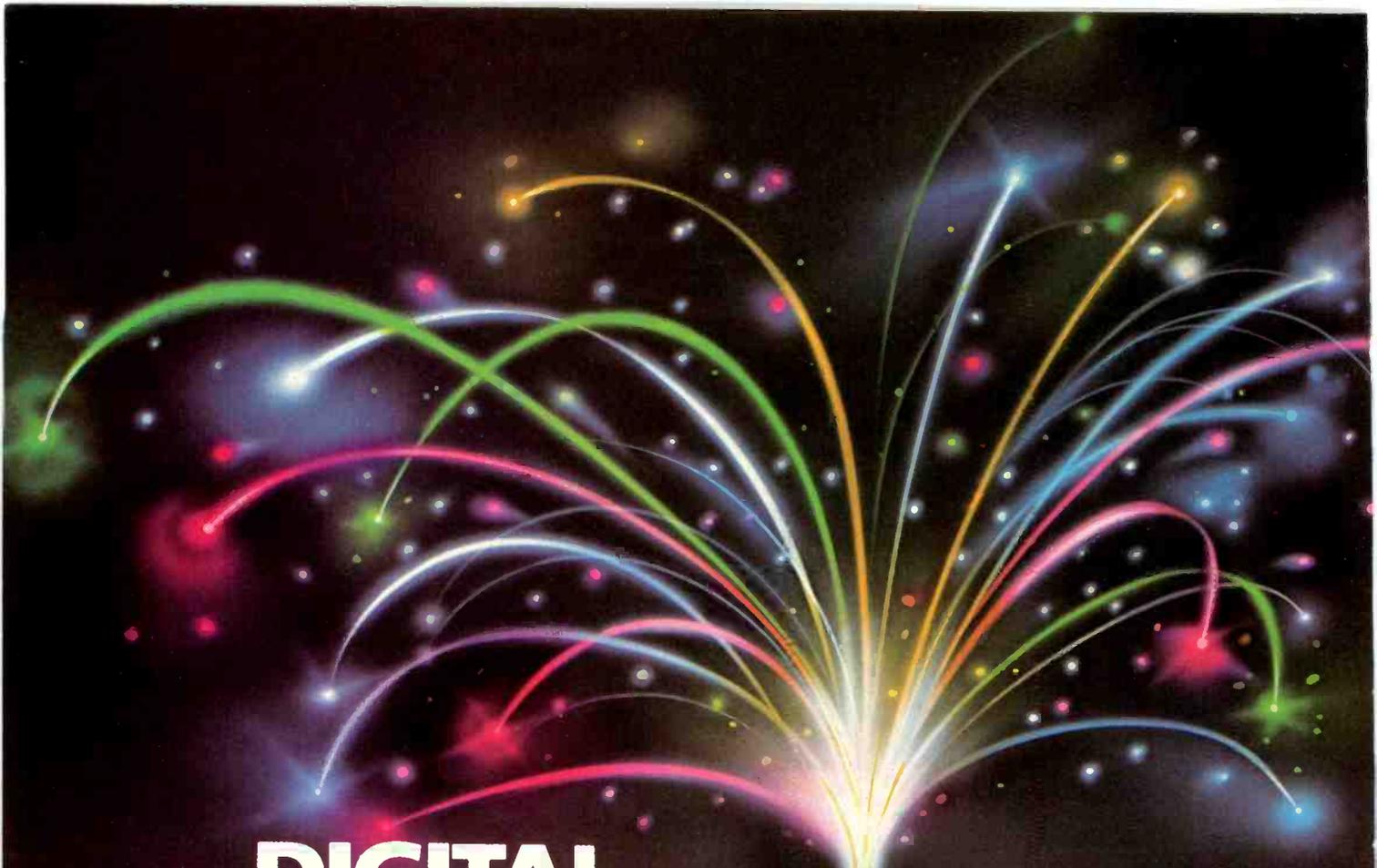
Morgan helps us design a different Delco-GM/Bose Music System to match the acoustics of specific GM car models.

“Every car has four separate sound modules, each with its own ‘digital mode’ amplifier that I match to the acoustics of the car. Plus helical voice coil speakers, reflex enclosures, exclusive Delco integrated circuits. . . The list is much longer than I can tell you about here.

“The technology is impressive, even by my standards. But that’s not why you should visit your GM dealer and ask for a demonstration. It’s simply that ‘you have to hear it to believe it.’” (Popular Mechanics)

Delco  **BOSE**

Sound so real, it will change how you feel about driving.



DIGITAL DYNAMITE FROM TDK.



TDK enters the digital recording era with a BANG! Introducing our exclusive HX-S metal-particle formulation for Type II (High-Bias) recordings. It delivers everything promised by metal tape—on any cassette deck with a Type II switch.

High frequency saturation ceases to be a problem since TDK HX-S is capable of an MCL of +4 dB at 10 kHz.

HX-S also delivers exceptional high-end response. Plus a wider dynamic range. With further improvements in overall sensitivity of up to 1.5 dB.

These superior recording characteristics make HX-S perfect for dubbing high-powered, treble-intensive digital source material with optimum results.

And TDK makes sure the performance never fizzles, with our specially engineered, trouble-free Laboratory Standard cassette mechanism for durability and reliability. Plus the assurance of our Lifetime Warranty.

So before you try any other cassette, pick up TDK HX-S, the first metal particle formulation for Type II (High-Bias) and digitally-sourced recordings.

It's absolutely digital dynamite!

 **TDK**[®]
THE MACHINE FOR YOUR MACHINE.
CIRCLE NO. 48 ON READER SERVICE CARD

PRINCE'S soundtrack album for the movie *Purple Rain* (Warner Bros.) has a cover motif of hearts and flowers. That motif and the profusion of purple—purple type, Prince's purple coat and motorcycle, and a purple vinyl disc—promise a lot of abandoned sexuality on the record, but the words and music are not the kind of purple we have come to expect from the Cupid of electric soul.

Prince has buttoned up some of his corporal frankness in favor of a more circumscribed approach—though circumscribed certainly doesn't describe the direct, visceral, and energized electric rock of "Purple Rain." Only *Darling Nikki*, about an encounter with a nymphomaniac that seems to have changed Prince's life, approaches the candor of "1999" or "Controversy."

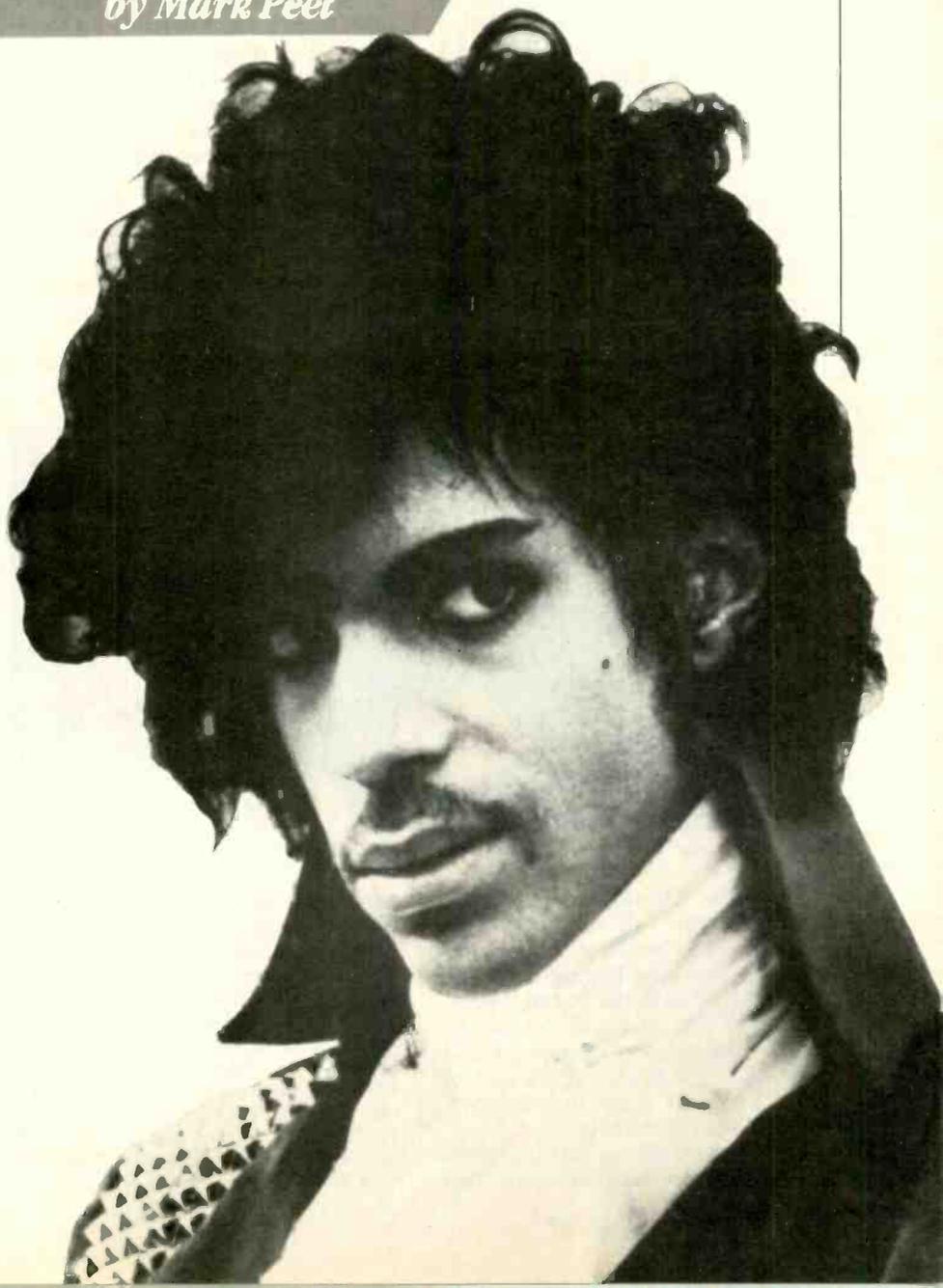
All directed at women, the songs here are in the first person, and they employ the traditional shorthand of love used on trees and bar tables (for example, *I Would Die 4 U*). Although Prince may plead, seduce, chide, and promise all over the record, this really is a party album, an orgy of searing electric guitar and calliope-cranking synthesizers, played with the frenzy of a band trying to raise this month's rent. When Prince frees his vocal cords to the spirit of a rave-up like *Let's Go Crazy*, he seems the heir to James Brown; on an extended jam like *Purple Rain*, Prince becomes the disciple of George Clinton.

The relative absence of lascivious material here focuses your attention on the almost diabolical energy of Prince's music. In fact, this record may actually cross over into markets Prince hasn't been able to reach; certainly anyone who liked the Jimi Hendrix classic *Purple Haze* is a candidate for the guitar hysteries of "Purple Rain."

PRINCE AND THE REVOLUTION: *Purple Rain*. Music from the motion picture. Prince (vocals, guitar, other instruments); vocal and instrumental accompaniment. *Let's Go Crazy*; *Take Me with U*; *The Beautiful One*; *Computer Blue*; *Darling Nikki*; *When Doves Cry*; *I Would Die 4 U*; *Baby I'm a Star*; *Purple Rain*. WARNER BROS. 25110-1 \$8.98, © 25110-4 \$8.98; © 25110-2, no list price.

PURPLE PRINCE

by Mark Peel



THE star of the new Angel recording of Mozart's *Don Giovanni* is its conductor, Bernard Haitink. He realizes the dark drama of the music superbly, threading it with all the requisite strands of airy lightness, elegance, passion, and wit. The vitality and momentum of the performance overall stem not so much from headlong tempos or the muscular playing of the London Philharmonic, but from an inner resource conveyed by Haitink to the forces under his control.

Although this *Don Giovanni* is only Haitink's third opera recording (*The Magic Flute* and Strauss's *Daphne* are the other two), he has been conducting opera for a good many years at the Glyndebourne Festival and has been its music director since 1978. This recording derives almost entirely from the Glyndebourne revival of 1982. Its fine orchestral and vocal ensemble are the kind that can only result from several live performances preceded by a generous amount of rehearsal time, an important factor in Glyndebourne productions.

American cast members—Maria Ewing, a vocally opulent Donna Elvira, and Carol Vaness, a fiery Donna Anna. Elizabeth Gale is an altogether winning Zerlina, John Rawnsley an ardent Masetto, and Keith Lewis a splendid Ottavio. Richard Van Allan's dark bass is perfect for Leporello, and he sings the role with a good deal more polish than it often gets.

The three discs in the LP package are among the first that Angel has pressed in Germany using the Direct Metal Mastering process, and the recorded sound fairly glistens against a background as quiet as LP surfaces could possibly permit. The recording is also available on Compact Discs, Angel's first release of a complete opera in that format.

This new *Don Giovanni* is the noble heir to the much-honored Glyndebourne recording of 1936 conducted by one of the festival's founding fathers, Fritz Busch. As the festival celebrated its fiftieth anniversary this summer, there could be no finer tribute to it than this recording, nor could there be a finer example of Glyndebourne's half century of devotion to excellence.

Christie Barter



Williams: macho blues

THERE are so many significant and integral things happening on Hank Williams, Jr.'s new album, "Major Moves," that on the first couple of listenings it may be impossible to catch them all—or to catch any of them, for that matter. That may be because Hank Jr. is doing what he's always done, except that he's doing it the way he probably wanted to in the first place.

For years now, Bocephus has been singing about basically the same things: his conquests and problems with women, his hangups about his long-dead Daddy, his red-neck opinions about gun laws, hunting, and fishing, his love affair with Jim Beam whiskey, his macho carousing, and how they all relate and interrelate with The Blues. The blues, as we all know, isn't just confined to twelve-bar musical forms or to the kind of song you sing but, as singer-songwriter Don Cooper used to say, "It's how you live each day." And in that context, Hank Jr. has been singing the blues all his life.

In recent years, however, particularly on his last few albums, Bocephus has been submerging himself in the blues, learning all about the tradition and teaching himself to play the immortal tunes, even putting them on his albums so that we all might mark his progress. On his new album, it is clear that his obsession with the blues has not only been refined but that it has taken him a long way. So far, in fact, that he can perform a Mississippi Delta blues medley with such heavy company as Ray Charles, John Lee



Allen and Gale: a seductive Don Giovanni, a winning Zerlina

Baritone Thomas Allen, who sings the title role here, charmed Los Angeles opera-goers last summer when he sang Papageno in *The Magic Flute* with the Royal Opera. He brings similar charm, sustained by an undercurrent of menace and guile, to his seductive portrayal of Don Giovanni. It's a stunning performance on all counts.

The recording is also distinguished by the singing of its two

MOZART: *Don Giovanni*. Thomas Allen (baritone), Don Giovanni; Maria Ewing (soprano), Donna Elvira; Carol Vaness (soprano), Donna Anna; Richard Van Allan (bass), Leporello; Keith Lewis (tenor), Don Ottavio; Elizabeth Gale (soprano), Zerlina; John Rawnsley (baritone), Masetto. Glyndebourne Chorus; London Philharmonic Orchestra, Bernard Haitink cond. ANGEL ● DSCX-3953 three discs \$39.98. © 4X3X-3952 three cassettes \$30.98; © CDCC-47036 three discs, no list price.

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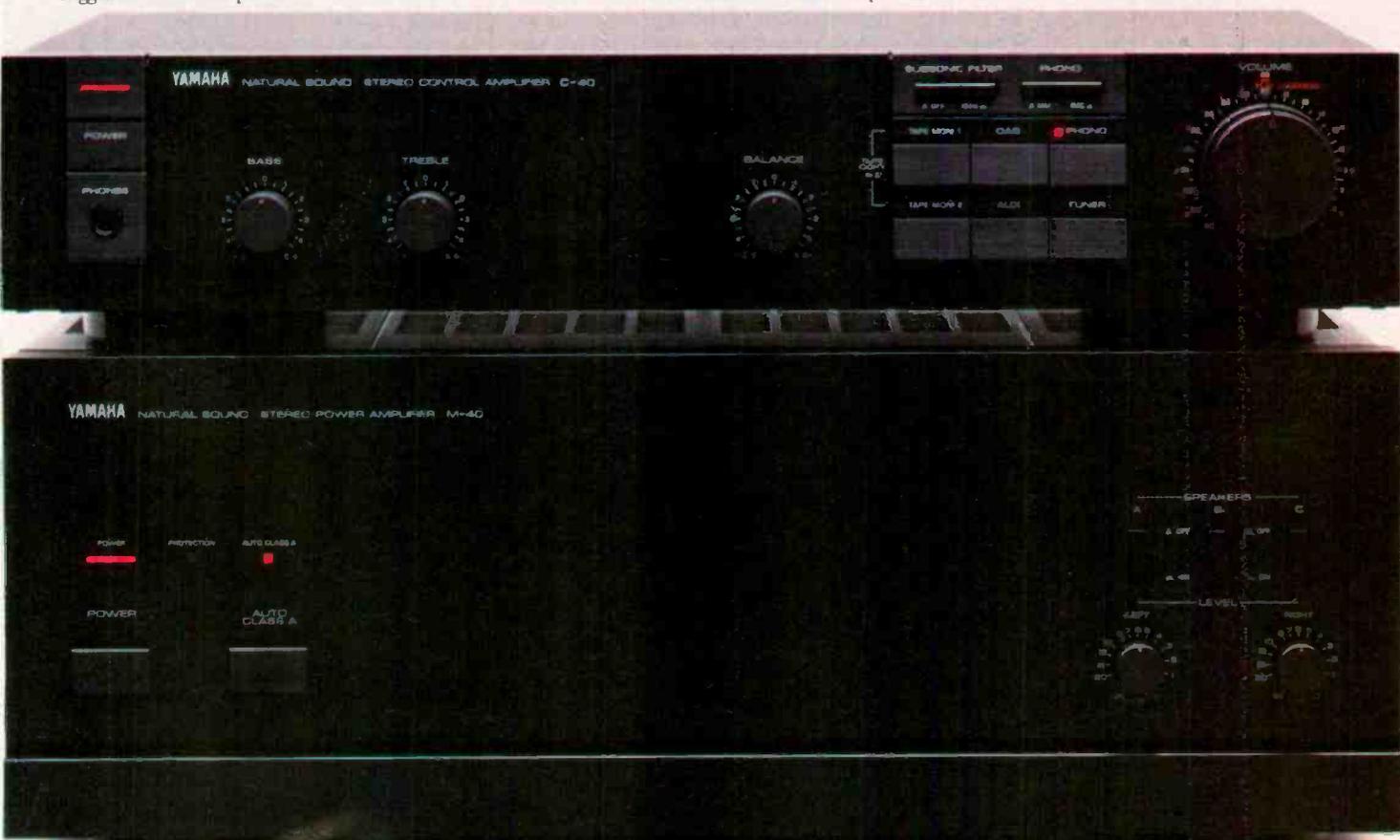


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Hooker, and Dickie Betts, and come out holding his own.

As much as I have admired Hank Jr.'s songwriting talents and musicianship through the years, I have usually faulted him for wearing his father's ghost around his neck in song. On "Major Moves," however, Bocephus finally stands on his own two feet. The subject of his father never comes up, and his usual mawkish attitude of "Why me, Lord?" in regard to his infinite unhappiness is replaced by, if not a *mature* attitude, at least a positive one.

He is still singing about the same old things, but he is presenting them in a fresh, new, creative way, experimenting not only in terms of approach, but in style. In one of his most affecting songs, *Mr. Lincoln*, he again comments on lawlessness and gun control, but in the novel context of asking Abe Lincoln how he would have handled the problem. Instrumentally, Hank is still using the woodwinds and horns in almost a Dixieland style to punctuate a mood, but he is also experimenting with the older, wiser sounds of the autoharp and concertina. In addition, the structure of his songs grows more graceful as time goes by, as do his vocal phrasing and the finesse with which he uses the dynamics of his voice.

"Major Moves" may not win Hank Jr. any awards from the Country Music Association (the CMA tends to ignore him, for some reason), and it may not even be that impressive on the charts. For me, though, it signifies that Hank Jr. has finally come of age. Whether he will seize this growth as a musician and build on it or settle back into formula is anyone's guess. For now Hank Jr. has undoubtedly made some real "Major Moves."

Alanna Nash

HANK WILLIAMS, JR.: *Major Moves*. Hank Williams, Jr. (vocals, electric guitar); vocal and instrumental accompaniment. *All My Rowdy Friends Are Coming Over Tonight*; *Promises*; *Video Blues*; *Major Moves*; *The Blues Medley—My Starter Won't Start This Morning/Hold Up Your Head/One Kind Favor/Trouble in Mind*; *Mr. Lincoln*; *Country Relaxin'*; *Attitude Adjustment*; *Knoxville Courthouse Blues*; *Wild and Blue*. WARNER BROS./CURB 25088-1 \$8.98, © 25088-4 \$8.98.



Abbado: fresh insights

CLAUDIO ABBADO'S performance of Berlioz's *Symphonie fantastique* with the Chicago Symphony on Deutsche Grammophon belongs among the top four of the more than two dozen currently listed in Schwann. Abbado's approach to the work is on the poetic, lyrical side but not at the expense of the classical aspects of the music's melodic line and structure.

Notable in the opening movement are the extraordinary refinement and accurate intonation of the string playing. The *Ball* moves at just the right pace, and the distance effects in the English horn/oboe dialogue of the slow movement come off to perfection.

The Witches' Sabbath movement is even more atmospheric than usual, and the *ponticello* and *col legno* violin passages at the end raise goose flesh. It is both a surprise and a pleasure to hear the *Dies irae* and round dance, when played in counterpoint, sound so balanced. There are three or four other exceptionally distinguished versions of the *Symphonie fantastique* to choose from, but interpretively this version offers some fascinating fresh insights.

The stereo imaging is excellent, and only occasionally does the rather reverberant acoustic surround muddy up detail. All in all, a fine recording.

David Hall

BERLIOZ: *Symphonie fantastique, Op. 14*. Chicago Symphony, Claudio Abbado cond. DEUTSCHE GRAMMOPHON © 410 895-1 \$11.98, © 410 895-4 \$11.98, © 410 895-2, no list price.

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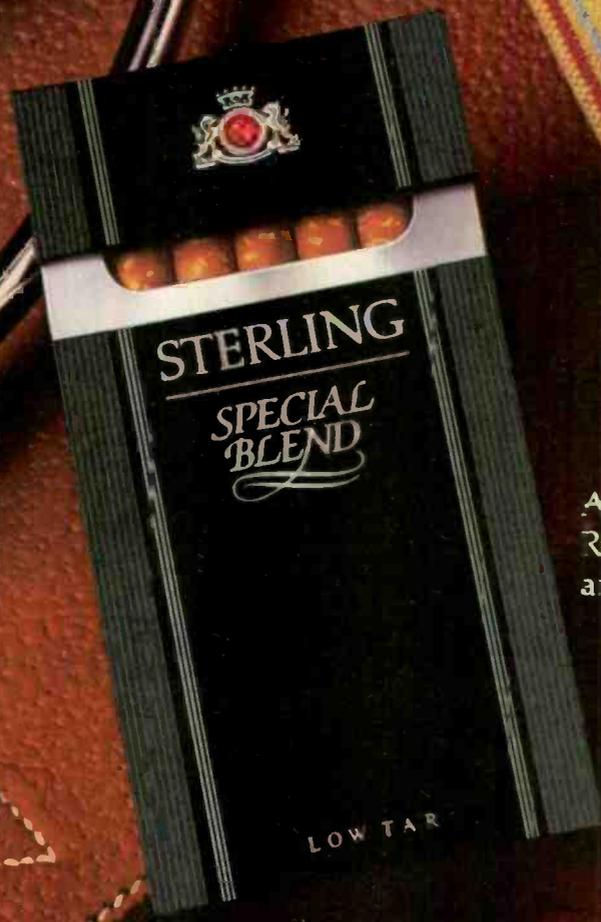
POPULAR

- **ALABAMA:** *My Home's in Alabama*. RCA PCD1-3644. "Sweet." (November 1980)
- **PEABO BRYSON:** *Straight from the Heart*. ELEKTRA 60362-2. "One of the best ballad-oriented pop albums of the year." (September 1984)
- **A CHORUS LINE.** Original Broadway cast. COLUMBIA CK 33581. "... can tear your heart apart." (October 1975)
- **BOB DYLAN:** *Blood on the Tracks*. COLUMBIA CK 33235. "Muscular and confident." (April 1975)
- **KEITH JARRETT:** *My Song*. ECM 1115-2. "Outstanding." (November 1978)
- **KING CRIMSON:** *Beat*. WARNER BROS. 23692-2. "Poetry and rhythmic power." (November 1982)
- **THE MOODY BLUES:** *The Present*. THRESHOLD 810 119-2. "Magic carpets of sound." (January 1984)
- **JEAN-LUC PONTY:** *Mystical Adventures*. ATLANTIC 19333-2. "Vigorous fusion." (June 1982)

CLASSICAL

- **BACH:** *The Notebook for Anna Magdalena Bach*. Blegen, Luxon, Kipnis. NONESUCH 79020-2. "A treasure." (February 1982)
- **BRUCKNER:** *Symphony No. 3*. Karajan. DEUTSCHE GRAMMOPHON 413 362-2. "High drama." (January 1982)
- **COPLAND:** *Appalachian Spring, Suite*. IVES: *Three Places in New England*. Davies. PRO ARTE CDD 149. "Remarkable performances." (May 1979)
- **HAYDN:** *The Seasons*. Marriner. PHILIPS 411 482-2. "A beautiful recording." (September 1982)
- **MAHLER:** *Symphony No. 7*. Levine. RCA RCD2-4581. "Flawless performance and production." (November 1982)
- **NAZARETH:** *Brazilian Waltzes and Tangos*. Lima. PRO ARTE CDD 144. "A gem." (December 1983)
- **SCHUBERT:** *Songs*. Margaret Price. ORFEO C 001811. "Exquisitely sung." (December 1983)
- **CARLO BERGONZI, DIETRICH FISCHER-DIESKAU:** *Famous Duets*. ORFEO S 028821. "A rare treat." (December 1983)

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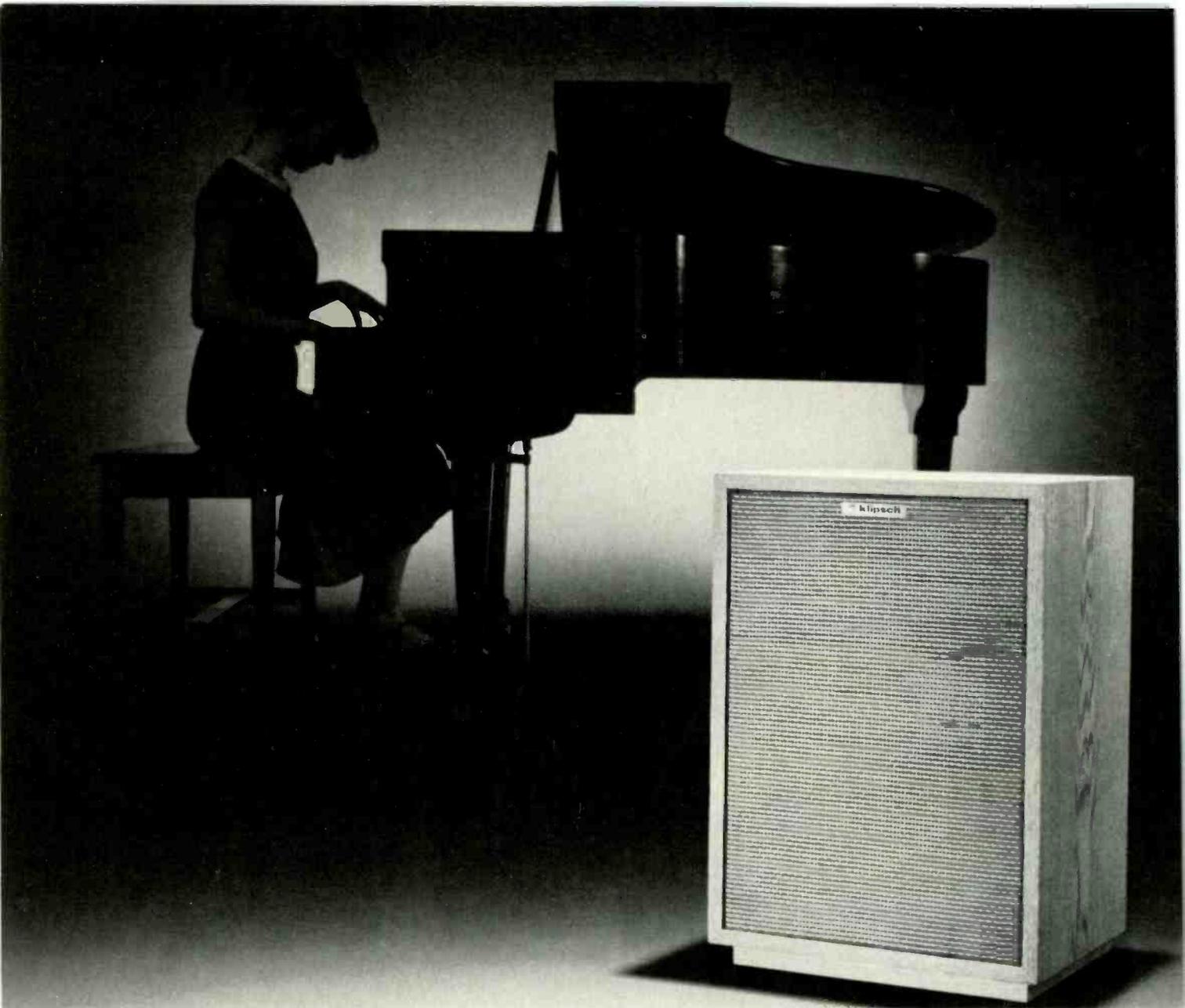
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Discs and tapes reviewed by
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J. S. BACH: Oboe Concertos in F Major (BWV 1053), D Minor (BWV 1059), and A Major (BWV 1055). Heinz Holliger (oboe, oboe d'amore); Academy of St. Martin-in-the-Fields, Iona Brown cond. PHILIPS ① 6514 304 \$11.98, © 7337 304 \$11.98; © 411 108-1, no list price.

Performance: Invigorating
 Recording: Excellent

Although Bach gave the oboe an important part in his orchestral writing, he left no concertos or chamber music for the instrument. Musicologists have remedied this omission by returning the harpsichord concertos and various movements of cantatas to what is conjectured to be their original versions. Thus Heinz Holliger has come up with these three effective oboe concertos, which to me are more striking than the harpsichord versions we usually hear today.

Both Holliger and the Academy of St. Martin-in-the-Fields under Iona Brown are, as we have come to expect, superb. While they pay little heed to Baroque articulations, their phrasing is so elegant, their sense of rhythm so invigorating, and their sound so well defined that you simply sit back and revel in their performances. S.L.

BACH: Violin Concerto in A Minor (BWV 1041); Violin Concerto in E Major (BWV 1042); Concerto in D Minor for Two Violins (BWV 1043). Gidon Kremer (violin); Academy of St. Martin-in-the-Fields, Gidon Kremer cond. PHILIPS ① 411 108-1 \$11.98, © 411 108-4 \$11.98; © 411 108-2, no list price.

Performance: Exuberant
 Recording: Excellent

Here is another recording of the famous trio of Bach violin concertos, but this time with a new twist: rather than share the honors with another violinist, Gidon Kremer plays both parts of the Double Concerto. The performances throughout are wonderful, with brisk tempos and carefully wrought phrases. Needless to say, the solo lines of the Double Concerto are beautifully matched, and having Gidon Kremer play both makes it all sound twice as good. S.L.



Alicia de Larrocha

by Richard Freed

Two recently released recordings of Falla's *Nights in the Gardens of Spain* represent repeat performances by both the soloists and conductors involved. There are now three current versions by pianist

Alicia de Larrocha. Her new one boasts the most distinguished orchestral contribution and sonics as sumptuous as the knowing performance itself. With the sumptuousness, however, is a rather too-close focus on the piano that makes for a less than ideal balance with the orchestra conducted by Raphael Frühbeck de Burgos. The Albéniz and Turina pieces on side two are extremely welcome. There is no other recording of the *Rapsodia española* now, and neither of these performances is likely to be matched, let alone bettered, very soon.

Aldo Ciccolini and Enrique Bátiz are no less fluent or well matched in their performance of the *Nights*, and the superb balance of the more naturally focused Angel recording is a considerable point in their favor. The Lisztian concerto of Albéniz may be a less interesting work than his *Rapsodia española* (it is entirely lacking in the Spanish element so prominent in all his finest works), but here, too, Ciccolini and Bátiz give so persuasive an account of

it, and are so very handsomely recorded, that it seems to be an inspired coupling.

Both performances of the Falla classic are outstanding; those who invest in both in order to have all three of the less familiar works in really first-rate versions will probably not regret the duplication.

FALLA: *Nights in the Gardens of Spain*. ALBÉNIZ: *Rapsodia española, Op. 70.* TURINA: *Rapsodia sinfónica, Op. 66.* Alicia de Larrocha (piano); London Philharmonic Orchestra, Rafael Frühbeck de Burgos cond. LONDON ① 410 289-1 \$11.98, © 410 289-4 \$11.98; © 410 289-2, no list price.

FALLA: *Nights in the Gardens of Spain*. ALBÉNIZ: *Piano Concerto ("Concierto fantástico"), Op. 78.* Aldo Ciccolini (piano); Royal Philharmonic Orchestra, Enrique Bátiz cond. ANGEL ① DS-38038 \$12.98, © 4XS-38038 \$9.98.

Explanation of symbols:

- ① = Digital-master analog LP
- © = Stereo cassette
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- Ⓜ = Monophonic recording

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COLUMBIA ARTISTS MANAGEMENT

Kathleen Battle: zest and rhythmic vitality

BEETHOVEN: Quintet in E-flat Major for Piano and Winds (see MOZART)

BERLIOZ: Symphonie fantastique (see Best of the Month, page 84)

BRAHMS: A German Requiem, Op. 45; Eight Songs. Kathleen Battle (soprano); Håkan Hagegård (baritone); Chicago Symphony Chorus and Orchestra, James Levine cond. RCA ● ARC2-5002 two discs \$25.98, © ARE2-5002 two cassettes \$25.98; © RCD1-5003 one disc (songs omitted), no list price.

Performance: Mixed
Recording: Variable

Seldom have I been disappointed in any James Levine recording, but I suppose there is always a first time. From an interpretive point of view, my disappointment with this one stems from the painfully slow pace Levine adopts for the processional sections of the second movement, "*Denn alles Fleisch*." It is a full two minutes slower than Klemperer's. From here on, matters improve. The choral fugue at the end of the third movement comes off splendidly and with fine delineation of inner voices.

Soprano Kathleen Battle delivers the famous "*Ihr habt nun Traurigkeit*" with its high tessitura in a manner that in my imagination I would associate with Elisabeth Schumann in her prime. Baritone Håkan Hagegård handles his solo role in both the second and sixth sections with the utmost musicality, if not quite with the magisterial power of Fischer-Dieskau in Klemperer's Angel album.

These plus factors notwithstanding, it is the recorded sound that had me baffled by its curious lack of body and focus as compared with other recordings featuring the Chicago Symphony Chorus. I took Solti's digitally mastered recording of Mahler's *Resurrection* Symphony from Medinah Temple for com-

parison, and it seems that Orchestra Hall, in its renovated state, presents serious microphone setup problems.

The two-record and two-cassette albums, but not the single CD, offer a mini-recital of eight Brahms songs. Battle sings her four with great zest and rhythmic vitality, Hagegård his with masterly vocal inflection and coloration. Levine contributes piano accompaniments of the highest sensitivity and distinction. *D.H.*

BRAHMS/SCHOENBERG: Piano Quartet in G Minor, Op. 25. Baltimore Symphony Orchestra, Sergiu Comissiona cond. VOX CUM LAUDE ● D-VCL 9066 \$7.98, © D-VCS 9066 \$7.98.

Performance: Mostly very good
Recording: Good

Arnold Schoenberg's arrangements of other composers' works include two Bach chorale-preludes and the *St. Ann* Prelude and Fugue, a concerto of Georg Mathias Monn, a Handel concerto grosso, and, most ambitiously, the Brahms G Minor Piano Quartet. This last Schoenberg took on in 1937, and Otto Klemperer gave the world première performance in Los Angeles in 1938.

With its colorful gypsy rondo finale, this probably is the most immediately accessible masterpiece of the Brahms chamber repertoire, and I would guess that Schoenberg thoroughly enjoyed the challenge of transferring it to the orchestral medium as "*Brahms's Fifth Symphony*," as he facetiously called it.

Except for the intrusion of the decidedly un-Brahmsian xylophone at various strategic spots, Schoenberg's orchestration is wonderfully resourceful and imaginative, notable to my ear in its masterly handling of woodwind coloration. The finale, of course, is as colorful and brilliant as it can be. Unless you are a hardline purist, the

Schoenberg arrangement, when played with spirit and as effectively recorded as this, makes for splendidly entertaining listening. *D.H.*

CHOPIN: Piano Concerto No. 2, in F Minor, Op. 21; Polonaise in F-sharp Minor, Op. 44. Ivo Pogorelich (piano); Chicago Symphony Orchestra, Claudio Abbado cond. DEUTSCHE GRAMMOPHON ● 410 507-1 \$11.98, © 410 507-4 \$11.98; © 410 507-2, no list price.

Performance: Stirring
Recording: Excellent

The powerful orchestral contribution in the opening of the concerto is in this case a reliable indication of what is to follow. Ivo Pogorelich has power to burn, and it is not at all out of place in his large-scale view of this work. There is abundant delicacy, too, and if there is a lot of shifting of gears, it is managed with the dazzling flair that suggests spontaneity rather than calculated effect—and Abbado is with him every step of the way. The slow movement takes on new and utterly convincing depth in the very expansive pacing followed here, and the final one is no less striking for its mercurial drive.

This may not be the only way to listen to the Concerto (I suspect Arrau, on Phillips, will always remain my first choice), but the overall exuberance, power, and poetry here add up to something too special to pass up, and the encore offered by Pogorelich is pretty special too. Opus 44, surely the grandest and most bellicose of all Chopin's polonaises, fills out the second side and is tumultuously stirring. The recording itself is rich and full-bodied, excellent in every respect. *R.F.*

HOLST: Savitri, Op. 25; Choral Hymns from the Rig Veda, Op. 26, No. 3. Janet Baker (mezzo-soprano); Robert Tear (tenor); Thomas Hemsley (bass); Ossian Ellis (harp); Purcell Singers; English Chamber Orchestra, Imogen Holst cond. ARGO/PSI ZK 98 \$10.98.

Performance: Superb
Recording: Very fine

HOLST: Savitri, Op. 25; The Dream City. Felicity Palmer (mezzo-soprano); Philip Langridge (tenor); Stephen Varcoe (bass); Patrizia Kwella (soprano); Richard Hickox Singers; City of London Sinfonia, Richard Hickox cond. HYPERION ● A66099 \$13.98.

Performance: Good
Recording: A bit over-spacious

Those who think of Gustav Holst only in terms of such sonic blockbusters as *The Planets* and *The Hymn of Jesus* are in for a surprise here. The expressive content, in Holst's *Savitri* at least, is mystical, the performing forces modest, and the scoring of the utmost delicacy. *Savitri*, a chamber opera with a libretto drawn by the composer from a Sanskrit original, is a pioneering work of twentieth-century chamber opera—and a little masterpiece. The first and only re-

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GOODYEAR

ording until now was this one on Argo (1966) with the composer's daughter Imogen as conductor and Janet Baker, in her prime, as the heroine. It has been unavailable for a few years.

Despite the considerable merits of the 1983 digitally mastered Hyperion disc, the newly reissued Argo performance remains unsurpassed as a recording from the standpoint of presence, definition of instrumental color, and spatial localization of the protagonists. Richard Hickox directs the Hyperion performance with devoted care, but I find problems with both Felicity Palmer

(Savitri), whose voice tends toward edginess at the top, and Stephen Varcoe (Death), who acquires an uncharacteristic tenor timbre in the upper range. Philip Langridge (Satyavan) is altogether splendid, however.

The overside of the Hyperion release offers ten of the twelve masterly songs that Holst composed in 1929 for solo voice and piano to poems of Humbert Wolfe (1885-1940), in sensitive arrangements and orchestrations by Colin Matthews under the title *The Dream City*. This was the title given to the songs when they were sung for the first time in

Paris. I find a strong Ravelian flavor in Matthews's instrumentation, an element well suited to the more fantastic and mystical texts. Soprano Patrizia Kwella, associated on records heretofore with Baroque repertoire, sings with care and conviction. I am not, however, wholly convinced that any real musical gain has come of orchestrating these songs.

The overside of the Argo *Savitri* reissue gives us the third set of hymns from the *Rig Veda*, which Holst set in 1909-1910, again translating from the original Sanskrit. As in his handling of the off-stage wordless chorus in *Savitri* and in his choral works, Holst's "scoring" for voices and his explorations of harmonic coloration is one of the glories of the repertoire—one more reason I would recommend the Argo recording without reservation. *D.H.*

MAHLER: *Symphony No. 4, in G Major*. Kiri Te Kanawa (soprano); Chicago Symphony Orchestra, Sir Georg Solti cond. LONDON Ⓞ 410 188-1 \$11.98, © 410 188-4 \$11.98; © 410 188-2, no list price.

Performance: *Con amore*
Recording: Very good

Chalk up yet another distinguished recorded performance of the Mahler Fourth Symphony. A particular distinction of this second recorded version by Sir Georg Solti is the exquisitely sensitive and unmannered singing of Kiri Te Kanawa in the *Knaben Wunderhorn* song that comprises the final movement. Her handling of vocal coloration is cunningly contrived without for a moment becoming coy, and the balance between voice and orchestra is just as it should be.

Solti himself has taken the most painstaking care with inner balances and textures throughout the three preceding movements, and he shows himself here a true master of the Mahler *portamento* style in the best sense of that word. Everything from start to finish flows with effortless ease.

The Orchestra Hall acoustic captured by the London production team is most kind to the strings and woodwinds, with only the timpani and cymbals seeming a trifle out of focus at the ecstatic climax of the slow movement. *D.H.*

MOMPOU: *Piano Works. Impresiones intimas; Preludio VII a Alicia de Larrocha; Música callada IV; Cançons i dansas I, II, III, XIV.* Alicia de Larrocha (piano). LONDON Ⓞ 410 287-1 \$11.98, © 410 287-4 \$11.98.

Performance: Exquisite
Recording: Fine

Federico Mompou, ninety-one this year, is a sort of Catalonian Poulenc. What he lacks in wit is made up for in elegance and nostalgia, and Alicia de Larrocha's reading of his music is a loving one. Several of the works in this collection are in fact dedicated to her—the *Preludio VII* and the seven short pieces

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that make up the fourth book of *Música callada*. Altogether the recital spans over half a century, beginning with the *Impresiones intimas* of 1911-1914. De Larrocha projects the clear lines and pianistic coloration common to most of Mompou's music and in so doing brings out all the best there is in it—and sometimes a little more. S.L.

MONTEVERDI: *Selva morale et spirituale*. Emma Kerkby (soprano); Rogers Covey-Crump, Nigel Rogers (tenors); David Thomas (bass); Taverner Consort, Choir, and Players, Andrew Parrott cond. ANGEL ● S-38030 \$12.98, © 4XS-38030 \$9.98.

Performance: Splendid
Recording: Splendid

Admirers of Monteverdi's *Vespers of 1610* will welcome this album, which offers a varied selection from his monumental anthology of 1640, *Selva morale et spirituale*, a collection of religious music written for the Republic of Venice. The authentically styled performances are fresh and vital, offering the translucent sonorities of naturally produced voices and precisely played early instruments. This welcome addition to the catalog amply demonstrates that Monteverdi's religious music is as great as his madrigals and operas. S.L.

MOZART: *Arias. Le nozze di Figaro: Venite inginocchiatevi; Deh vieni, non tardar. Don Giovanni: Batti, batti, o bel Masetto; Vedrai, carino; Mi tradi quell'alma. Così fan tutte: Come scoglio immoto resta; Per pietà, ben mio. La Clemenza di Tito: Deh se piacer mi vuoi; Non più di fiori.* Veronika Kincses (soprano); Budapest Symphony Orchestra, Géza Oberfrank cond. HUNGAROTON ● SLPD 12386 \$12.98.

Performance: Very good
Recording: Excellent

The Hungarian soprano Veronika Kincses may be heard in leading roles in complete recordings of *Madama Butterfly* and *Simon Boccanegra*, among others, and she appears to be an assured Mozart stylist as well. The many positive qualities of her singing are best shown perhaps in Vitellia's two arias from *La Clemenza di Tito*, in which lyric fluency and dramatic resolve are neatly combined. Although presenting similar challenges, the music of Donna Elvira finds the artist less responsive to them, but she copes with the florid and tricky writing of Fiordiligi's music (*Così fan tutte*) quite well. The arias of Zerlina and Susanna are expertly and charmingly done.

Without indulging in too many superlatives, I find that Kincses holds up well even in the eminent company of Kiri Te Kanawa and Lucia Popp, two sopranos featured in similar recorded programs. The orchestral backgrounds lack only the ultimate touch of refinement. There are good contributions from various obligato instruments, and the recorded sound is excellent. G.J.

MOZART: *Piano Concerto in D Minor (K. 466); Piano Concerto in F Major (K. 459)*. Richard Goode (piano); Chamber Orchestra of the Vienna Symphonic Orchestra, René Klopffenstein cond. GALLO 3060 \$12.98 (from Qualiton Imports, 39-28 Crescent St., Long Island City, N.Y. 11101).

Performance: Strong
Recording: Very good

The name of Richard Goode should be added to the growing list of excellent young Mozart players. He brings a rare combination of power and lyricism to these difficult concertos, as well as a sparkling technique and fluid passage-work. René Klopffenstein displays the same qualities in his reading of the orchestral accompaniments and makes the reduced Vienna Symphonic Orchestra a perfect partner.

The F Major Concerto, despite what



Richard Goode

the cover states, is not the Coronation Concerto, and whoever translated the notes into English deserves some sort of a prize for mangled syntax. Otherwise, musically, this recording is highly recommended. S.L.

MOZART: *Don Giovanni* (see Best of the Month, page 82)

MOZART: *Quintet for Clarinet and Strings (K. 581); Trio for Clarinet, Viola, and Piano (K. 498)*. Les Musiciens. HARMONIA MUNDI HM 1118 \$11.98, © 40.1118 \$11.98; © 90.1118, no list price.

Performance: Mellow
Recording: Very good

At first the tempos in these performances of Mozart's Clarinet Quintet seem slow, but as you get into it you realize they are leisurely and wonderfully relaxed. This kind of playing is not often heard these days, for we seem to be obsessed with brilliance and energy.

Everything just flows into its proper place, and the beauty of Mozart's world shines forth. Michel Portal is a sensitive clarinetist, Jean-Claude Pennetier understands Mozart's piano style very well, and the other members of Les Musiciens round out an excellent quintet. A winner. S.L.

MOZART: *Quintet in E-flat Major for Piano and Winds, K. 452*. BEETHOVEN: *Quintet in E-flat Major for Piano and Winds, Op. 16*. Alfons Kontarsky (piano); Winds of the Berlin Philharmonic. DENON ● OF-7009-ND \$11.98; © 38C37-7090, no list price.

Performance: First-rate
Recording: Superb

Although there have been some memorable pairings of these amiable works, I think Alfons Kontarsky and the splendid first-chair players of the Berlin Philharmonic are at least a match for any of them musically. The pleasure of hearing performances of such elegance and vivacity as these, in such wonderful sound—ideally balanced and utterly lifelike as well as distortion-free, and pressed on absolutely silent surfaces—would have to put the new Denon at the top of the list. It is certainly one of the most stunning demonstrations of the advantages of digital recording since Denon introduced the process a dozen years ago. R.F.

MOZART: *Violin Sonatas (K. 301-304)*. Itzhak Perlman (violin); Daniel Barenboim (piano). DEUTSCHE GRAMMOPHON ● 410 896-1 \$11.98, © 410 896-4 \$11.98; © 410 896-2, no list price.

Performance: Suave
Recording: Splendid

These four remarkable sonatas for violin and piano, all written in a two-movement format, display the wide range of Mozart's emotional palette, from the lyricism of the G Major (K. 301), the orchestra-like scale of the E-flat Major (K. 302), and the brilliance of the C Major (K. 303) to the tragedy and pathos of the E Minor (K. 304). Itzhak Perlman and Daniel Barenboim capture the essence of these moods and project them in highly polished performances. Each matches the phrasing of the other carefully and each understands his role in the musical dialogue of the two instruments. S.L.

NAZARETH: *Brazilian Tangos and Waltzes. Ouro sobre azul; Ameno resedá; Tenebroso; Elegantissima; Labirinto; Nene; Confidências; Famoso; Mercedes; Vem cá, Branquinha; Turbilhão de beijos.* Arthur Moreira Lima (piano). PRO ARTE ● PAD 170 \$11.98, © PCD 170 \$11.98.

Performance: Sinuous
Recording: Good

Ernesto Nazareth is Brazil's latter-day Chopin and brings the tango to the same artistic level that Chopin achieved

in his waltzes and mazurkas. This tantalizing handful of his piano pieces reveals him as a highly sophisticated composer with a true melodic gift and complete control of his idiom. Arthur Moreira Lima's performance is supple and sinuous, and his understanding of the spicy Brazilian rhythms and feeling of improvisation are just right for Nazareth's poetry. This refreshing disc belongs in every piano collection. S.L.

OFFENBACH: *Concerto Rondo in G Major for Cello and Orchestra; Overture to a Grand Orchestra; Schüler Polka; Souvenir d'Aix-les-Bains Waltz; American Eagle Waltz.* Ofra Harnoy (cello); Philip Collins (trumpet); Cincinnati Pops Orchestra, Erich Kunzel cond. VOX CUM LAUDE ◊ D-VCL 9058 \$7.98, ◊ D-VCS 9058 \$7.98.

Performance: Topsl
Recording: Just fine

Here is a recording that can be guaranteed to chase away the blues. So can most collections of music by Jacques Offenbach, of course, but this one is unusual: much of it has been unearthed by conductor Antonio de Almeida, who has been preparing a definitive Offenbach catalog.

The Concerto Rondo is the *pièce de résistance*. With a terrific virtuoso solo part, here played to the teeth by cellist Ofra Harnoy, it is filled to the brim with music contrasting Parisian style with unabashed sentiment.

The Overture dates from Offenbach's pre-Paris days and is decidedly in the German Romantic manner of the 1840's. But the *Schüler Polka*, dedicated to one Mlle. Clara Schüler, is vintage Offenbach, and the *Souvenir d'Aix-les-Bains* is an utterly delicious and all-too-brief waltz essay. The *American Eagle* Waltz was composed for Offenbach's 1876 American tour and was intended as a display vehicle for celebrated American cornetist Jules Levy. Philip Collins here brings the solo off with flying colors.

Conductor Erich Kunzel and his Cincinnati players enter wholly into the spirit of the occasion, and the spaces of Cincinnati's fine old Music Hall provide an ambiance both bright and warm. D.H.

PURCELL: *Songs.* Andrew Dalton (countertenor); Freek Borstlap (viola da gamba); Anneke Uittenbosch (harpsichord). ETCETERA ◊ ETC 1013 \$12.98, ◊ XTC 1013 \$12.98.

Performance: Excellent
Recording: Excellent

This is a wonderful collection of Purcell songs wonderfully sung by the Australian countertenor Andrew Dalton, who is justifiably gaining a fine reputation for himself throughout Europe. His voice, in the alto range, is rich and virile. His phrasing and diction are exquisite, and his inner passion conveys the full depth of Purcell's genius as a songwriter. S.L.

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M A S T E R W O R K S



THOMAS: *Hamlet*. Sherrill Milnes (baritone), Hamlet; Joan Sutherland (soprano), Ophelia; James Morris (bass), Claudius; Barbara Conrad (mezzo-soprano), Gertrude; others. Welsh National Opera Orchestra, Richard Bonyngne cond. LONDON 410 184-1 three discs \$32.94, © 410 184-4 two cassettes \$32.94.

Performance: Elegant
Recording: Well balanced

Ambrose Thomas's *Hamlet* is certainly not to be compared with Verdi's masterly treatments of Shakespeare's plays or with Gounod's lyrical *Roméo et Juliette*. If Shakespeare's *Hamlet* were merely a revenge tragedy, the action would translate easily to the operatic



NEW YORK CITY OPERA

Sherrill Milnes

stage, but the dark moodiness of the play, in the pedestrian Carré-Barbier libretto and in Thomas's often tepid music, makes less for gripping drama than for rather static or monochromatic tone-painting. In the gentle sentimentality of *Mignon*, the composer is entirely at home; in the broodingly sinister emotions of *Hamlet*, he seems out of his depth.

As Hamlet, Sherrill Milnes handles the French text with exceptional clarity, even when, unfortunately, he covers his voice for "introspective" effect in asides and soliloquies. His sense of line is admirable, and his reading of the celebrated Drinking Song is a real show-stopper. If his total performance seems to lack conviction and dramatic thrust, the fault again lies in the composer's inability to crystallize the various facets of Shakespeare's intricate hero.

Joan Sutherland as Ophelia continues to astound listeners with the liquidity of her vocalism. Her singing is not always effortless, but her performance of the enormously difficult Mad Scene in Act IV is truly dazzling. The less spectacular passages, however, offer only a suggestion of Ophelia's fragility.

James Morris's Claudius is well conceived and strongly delivered, and the other soloists are certainly adequate. The well-rehearsed chorus is effectively spirited throughout.

In sum, this is a fine performance conducted with taste and polish by Richard Bonyngne.

Robert Ackart

VERDI: *Four Sacred Pieces*. Swedish Radio Choir; Stockholm Chamber Choir; Berlin Philharmonic Orchestra, Riccardo Muti cond. ANGEL 4 DS-38000 \$12.98, © 4XS-38000 \$9.98.

Performance: Very good
Recording: Excellent

For many years now I have regarded Carlo Maria Giulini's 1963 recording of the *Four Sacred Pieces* on Angel as the decisive front-runner, surpassing a number of later releases. Its sound holds up quite well too. But there is no denying the sonic superiority of the same label's new contender: its warmer overall ambience, its more differentiated textures, and its wider dynamic range.

Giulini and Riccardo Muti do not differ radically in their approach to these late flowerings of Verdi's genius. Both understand that a basically reverent view need not exclude passion. Muti manages to clarify certain details in the *Stabat Mater*, but he drives the chorus too hard in the "Pro peccatis" section, a temptation Giulini avoids. And in the *Te Deum*, it is Giulini who provides a more unified flow.

Muti's choruses are as good as Giulini's excellent Philharmonia, and he leads them with fine precision and secures ethereal harmonies in the two purely choral pieces (*Ave Maria* and *Laudi*). Arleen Augér's brief soprano solo in the *Te Deum* could have been given more presence, but overall the recorded sound is excellent.

G.J.

Collection

KIRI TE KANAWA: *Portrait of Kiri Te Kanawa*. Puccini: *Tosca: Vissi d'arte. Gianni Schicchi: O mio babbino caro. Verdi: La Traviata: Ah, fors'è lui. Humperdinck: Hansel und Gretel: Der kleine Sandmann. Mozart: Don Giovanni: Ah fuggi il traditor; Mi tradi quell'alma.* R. Strauss: *Morgen; Ruhe, meine Seele.* Schubert: *Gretchen am Spinnrade.* Schumann: *Du bist wie eine Blume.* Fauré: *Après un rêve.* Walton: *Old Sir Faulk; Daphne; Through gilded trellises.* Kiri Te Kanawa (soprano); Richard Amner (piano); various orchestras, John Pritchard, Lorin Maazel, Andrew Davis cond. CBS M 39208, © MT 39208, no list price.

Performance: Refined and remote
Recording: Very good

When is a recording artist a "superstar"? When his or her record company, anxious to fill the void between legitimate new releases, repackages the artist's recordings in such a way that previously available material can be made to look like new and sell like new. Hence "Portrait of Kiri Te Kanawa."

There is much to enjoy here. The soprano floats a pure, steady, freely produced, and securely sustained sound. Her singing is best enjoyed in the brief Humperdinck segment, the Strauss songs, the affecting Schumann miniature, and in the *Don Giovanni* snippet,

where Lorin Maazel coaxes a surprising amount of passion from her. In Elvira's more extended aria, "Mi tradi," that passion is already more subdued. Dame Kiri fails to convey Gretchen's predicament with sufficient involvement, and the Puccini arias here are compromised by the conductor's sleepy pacing. Reservations abound, then, about the work of this serene and placid singer, but there is no denying the ravishing beauty of her tones.

G.J.

In a few words

BACH: *Sonatas and Partitas for Solo Violin*. MHS 834032 \$25.50 (from Musical Heritage Society). A lot of fiddlin' to cover "in a few words." Not even the most copious outpouring in print could fully describe the richness and expressive power of Oscar Shumsky's playing in this set. There are now twelve recordings of this music in Schwann, an extraordinary thing in itself, and Shumsky's must rank among the very finest available.

BLOCH: *Quartet No. 2; Prelude; Night; Two Pieces*. LAUREL LR 126 \$8.98, © 126C \$8.98; © LR 126D, no list price. Ernest Bloch's Second Quartet, dating from 1945, is a minor masterpiece—minor in scale only—and the Pro Arte Quartet turns in an exemplary performance.

DEBUSSY: *La Mer; Nocturnes*. ANGEL 4 DS-37929 \$12.98, © 4XS-37929 \$12.98. Glowing, even summery readings by the London Symphony (and the Ambrosian Chorus in the Third Nocturne) conducted by André Previn.

DVOŘÁK: *Symphony No. 7*. SUPRAPHON 1110 3139 \$15.98. The first digitally mastered recording of Dvořák's D Minor Symphony. Vaclav Neumann conducts the Czech Philharmonic in a strongly lyrical performance. Excellent sound.

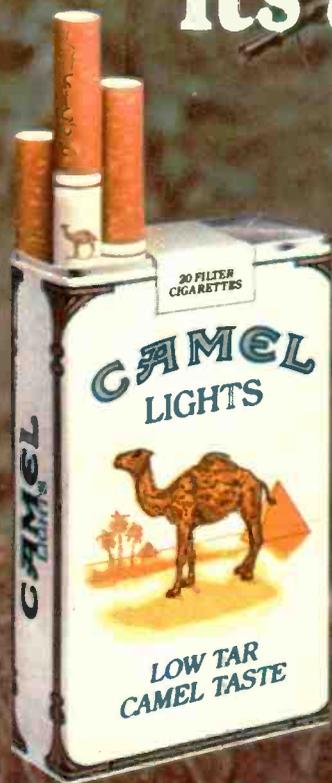
RESPIGHI: *Brazilian Impressions; Church Windows*. CHANDOS 4 ABRD 1098 \$13.98, © ABTD 1098 \$13.98; © CHAN 8317, no list price. Entertaining examples of Respighi's wizardry as an orchestrator, sumptuously served up by Geoffrey Simon and the Philharmonia Orchestra. Gorgeous sound.

MARIA CALLAS: *Unissued Recordings*. RODOLPHE 4 RP 12413-15 three discs \$35.94 (from Harmonia Mundi USA). Rare glimpses of the young Callas singing Verdi in Mexico City in the early Fifties, along with a real gem, only recently discovered: Callas as Turandot ("In questa reggia") in Buenos Aires in 1949.

KURT MOLL: *Famous Opera Arias*. ORFEO 4 S 009821 \$13.98. Arias by Mozart, Beethoven, Weber, and others sung by an abundantly gifted bass blessed with an ample range and rolling sonority.

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STYLE COUNCIL

A lovely, warmhearted tribute to several jazz and r-&-b styles of the recent past

by Steve Simels



PAUL WELLER, who heads the Style Council, used to front the Jam, a British band that was widely beloved in its homeland but never drew flies in the States—for good reason. The Jam was a third-rate version of the early Who, and as smugly self-righteous as any rockers in recent memory.

The Style Council, however, is an entirely different kettle of fish-and-chips, and "My Ever Changing Moods," the group's new album—a lovely, warmhearted tribute to various jazz and r-&-b styles of the recent past—is one of the nicest surprises of the year. Actually, tribute may be the wrong word. Weller and his colleague Mick Talbot aren't so much interested in aping old Stax/Volt or Jimmy Smith records as they seem to be with mating easily recognizable genre riffs with lyrics reflecting their current personal politics, which are understatedly humanist and a big improvement over the Jam's haranguing.

Musically, of course, what keeps all this admittedly retro carrying-on from lapsing into mediocre Playboy Club cocktail fodder is the band's palpable inability to sound slick. Weller and Talbot are playing in styles that don't come as naturally to them as rock-and-roll, and consequently the songs here have a slightly askew quality—analogue to the "fake" jazz of the Lounge Lizards, perhaps, but a somewhat MOR version of it.

In any case, whether it's the modified barrelhouse piano clatter of *Mick's Blessing* or the modified early Seventies dance groove of *A Solid Bond in Your Heart*, the music here is mostly unlike anything else you've heard in a while, and it's highly recommended. The sound is first-rate too.

STYLE COUNCIL: *My Ever Changing Moods*. Paul Weller (guitar, vocals); Mick Talbot (keyboards, vocals); Steve White (drums); other musicians. *My Ever Changing Moods*; *The Whole Point of No Return*; *Blue Cafe*; *The Paris Match*; *Dropping Bombs on the White House*; *A Solid Bond in Your Heart*; *You're the Best Thing*; *A Gospel*; *Strength of Your Nature*; *Here's One That Got Away*; *Headstart for Happiness*, *Mick's Blessings*. GEFEN GHS 4029 \$8.98, © M5G 4029 \$8.98.

Explanation of symbols:

- ① = Digital-master analog LP
- © = Stereo cassette
- Ⓢ = Digital Compact Disc
- Ⓜ = Monophonic recording

Discs and tapes reviewed by
Chris Albertson
Louis Meredith
Alanna Nash
Mark Peel
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Steve Simels

BANGLES: *All Over the Place*. Bangles (vocals and instrumentals). *Hero Takes a Fall; Live; James; Restless; All About You; Dover Beach; Tell Me*; and four others. COLUMBIA BFC 39220, © BCT 39220, no list price.

Performance: Rousing
 Recording: Excellent

If the idea of reviving the garage band in the electronic age seems pointless to you, the Bangles will surely change your mind. One of the premier bands in L.A.'s "paisley underground," these four mop-heads recall a more innocent time with their catchy, intriguing songs. They could almost be the Eighties echo of the Byrds—bright, clangy guitars, three-part folk-style vocal harmonies, springy, hook-filled melodies, even tambourines.

As their name suggests, the Bangles will also remind you of the Beatles, especially in their unschooled musical enthusiasm, which is happily unmitigated by the affected inattention to technique typical of revisionist rock-and-roll. In fact, they attack their parts with relish—particularly Vicki Peterson, whose psychedelic guitar effects are mesmerizing. It's not until you listen to the lyrics that it really sinks in: how different a woman's perspective can make otherwise familiar rock-and-roll sound.

The Bangles, you see, is a "girl group," and when it comes to the vicissitudes of love, these members of the fairer sex are much less apt to whine and whimper the way your average heavy-metal act does when met with rejection, and much more likely to suggest that a guy take a hike. Songs like *Hero Takes a Fall*, *All About You*, and *Restless* are as no-nonsense and formidable as the searing guitar work and popping rhythm section that drive them. And when they're not on the subject of love, the Bangles can capture the spirit of a burned-out age, as in *Going Down to Liverpool*, an existential updating of *Hey Joe*.

The Bangles aren't a great girl band or a great garage band. They're just a great band. M.P.



The Bangles: a woman's perspective

RUBÉN BLADES: *Buscando América*. Rubén Blades (vocals, guitar); Seis del Solar (vocal and instrumental accompaniment). *Decisiones; Desapariciones; Todos Vuelven*; and three others. ELEKTRA 60352-1 \$8.98, © 60352-4 \$8.98.

Performance: Authentically Latin
 Recording: Fine

For a dozen years I have been prophesying a revival of Latin popular music in Anglo America, and now this genuine crossover salsa album comes along. But I'm disappointed. The political sentiments of the lyrics (Spanish only) may be sincere, but they sound glib, and the music is monotonous. Let's give that Julio Whatsisname another chance.

William Livingstone

JOHN CALE: *Caribbean Sunset*. John Cale (vocals, guitar); vocal and instrumental accompaniment. *Hungry for Love; Experiment Number 1; Model Beirut Recital; Caribbean Sunset*; and five others. ZE RECORDS IT 8401 \$8.98, © ZCIT 8401 \$8.98.

Performance: Unmusical
 Recording: Unvarnished

John Cale is an uncompromising artist, which is another way of saying it can be a real chore getting through his albums. In spite of its sunny title, Cale's latest record is more like the storm on the heath—a fury of blunt rhythms, tuneless songs, and railing, somewhat insane vocals. With the exception of *Praetorian Underground*, which features a driving bass ostinato and scorching guitar, "Caribbean Sunset" seems to go out of its way to make the listener miserable. Cale comes from two periods when that was a principal aim of rock (both in his days with Velvet Underground and later as a major figure in New York's punk scene), but the audience for abuse seems to be shrinking, and even the critics may grow tired of it soon. Cale will have to come across with a little more

invention—or a tune or two, at the very least—and not give in so easily to his self-indulgent *Angst* if he wants to get my vote. M.P.

ELVIS COSTELLO AND THE ATTRICTIONS: *Goodbye Cruel World*. Elvis Costello (vocals); the Attractions (vocals and instrumentals); other musicians. *The Only Flame in Town; Home Truth; Room with No Number; Inch by Inch; Worthless Thing; Love Field*; and seven others. COLUMBIA FC 39249, © FCT 39249, no list price.

Performance: Cold
 Recording: Okay

Elvis Costello's latest is a fairly irritating album. Stylistically, the music is a bland amalgam of cabaret, reggae, and r-&-b, but the melodies, such as they are, are very nearly as tortured and ugly as the worst of early Seventies art-rock or fusion. Costello's singing, meanwhile, has lapsed into purest David Bowie hambone; he sounds freeze-dried. The emotions are built in, rather than felt, and his phrasing is on automatic pilot, with the passion obviously programmed. True, he retains his flair for word-play, but, mostly, the cleverness is there to deflect any potential emotional involvement on the part of the listener, and the effect is most unpleasant. S.S.

JOSIE COTTON: *From the Hip*. Josie Cotton (vocals); orchestra. *License to Dance; Life After; Gina; Stop Me*; and six others. ELEKTRA 60309-1 \$8.98, © 60309-4 \$8.98.

Performance: Intense
 Recording: Noisy

Josie Cotton looks like a young, punked-out version of Elizabeth Taylor, has a voice that sounds like a Cuisinart set at medium-fast speed, and probably is most famous for her mini-hit of a few years ago, *Johnny, Are You Queer?* While Johnny never did give Josie a

straight answer, she continues her amatory research with the lead song here, *Jimmy Loves Maryann*. She seems so relieved to learn that "Jimmy Loves Maryann/Jimmy wants to be a man" that she sings this refrain over and over until the final fade-out. On the remainder of the album she whizzes through such things as *School Is In*, *Way Out West*, and *Stop Me(!)* with all of the noisy hauteur of a Tex-Mex waitress explaining the menu to a party of Eskimos. I'm not that hungry. *P.R.*

ECHO & THE BUNNYMEN: *Ocean Rain*. Will Sergeant (guitar); Ian McCulloch (vocals); Les Pattinson (bass); Pete de Freitas (drums); other musicians. *Silver*; *Nocturnal Me*; *Crystal Days*; *The Yo Yo Man*; *Thorn of Crowns*; and four others. SIRE 25084-1 \$8.98, © 25084-4 \$8.98; © 25084-2, no list price.

Performance: Strange
Recording: Cavernous

In going after the big score, Echo and the Bunnymen have produced one of the strangest albums in recent memory. Everything here is on the grand scale: the wall of shimmering acoustic guitars, backed by a string section; Ian McCulloch's arch vocals, which sound more like Jim Morrison all the time; the operatic themes and apocalyptic, lumbering tempos; and the constant repetition of

images from song to song—blue horizons, fire, and lots and lots of ice, at least a glacier's worth. The temptation is to think "major work," so unusual and original is this music, but it's also repetitive, excessively dramatic, and unintentionally hilarious.

A singular album, a work of monumental oddity perhaps, but not nearly as important as it sounds. *M.P.*

EDDY GRANT: *Going for Broke*. Eddy Grant (vocals, guitar, synthesizer, percussion); horn accompaniment. *Romancing the Stone*; *Boys in the Street*; *Come On Let Me Love You*; *Till I Can't Take Love No More*; *Political Bassa-Bassa*; and five others. PORTRAIT FR 39261, © FRT 39261; © EK 39261, no list price.

Performance: Entertaining
Recording: Excellent

If Eddy Grant is trying to be the "acceptable" face of reggae, he's going about it the right way. Aiming straight for the middle of the middle class, "Going for Broke" is reggae shorn of its social and cultural message and pared down to "da riddim"—fast tempos, neat arrangements, sparkling production (none of which are particular hallmarks of reggae)—and about as controversial as an Oxford-cloth button-down. There's nothing wrong with this ap-

proach; frankly, it's a pleasant change to find reggae this well recorded. But if you're looking for something beyond entertainment, you won't find it here.

Typical of this collection of love songs is *Romancing the Stone*, on which Grant sets himself the procrustean task of building an intelligible song from a title that doesn't mean anything (writing a love song for *Ghostbusters* would have been easier). The result, like most of the lyrics on "Going for Broke," is a patchwork of pop catch phrases. But if Grant never says much, he says it with style: overdubbed vocals, multitracked synthesizers carrying the rhythm and bass parts, muscular guitar fills—all played by Grant himself. In fact, Eddy Grant is virtually a one-man record company. He not only sings and plays all the instruments except for horn accompaniment on one song here, he handles production, and he also owns his own label (Ice, distributed by Portrait/CBS) and even his own pressing plant! No wonder, then, that he knows what it takes to sell records: a polished, danceable, and eclectic brand of reggae even young Republicans can enjoy. *M.P.*

THE GUN CLUB: *The Las Vegas Story*. The Gun Club (vocals and instrumentals). *Walkin' with the Beast*; *Eternally Is Here*; *My Dreams*; *Bad America*; *Give Up the Sun*; and four others.

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ANIMAL APE 6006 \$8.98, © APEC 6006 \$8.98 (from Jem Records, 3619 Kennedy Rd., South Plainfield, N.J. 07080).

Performance: Possessed
Recording: Raw

Certified crazy-man Jeffrey Lee Pierce has left behind the swamps, freight trains, and other rural features of his first two albums. With his band, the Gun Club, he prowls the sidewalks, crumbling waterfronts, and hotel rooms of southern and western America. Singing of "filthy streets and trucks," "low rates and color TV," and "paint melting off the wall," Pierce concludes that "today is the end of the world."

Tinges of country and blues penetrate the scratchy-sounding rock-and-roll. Shriill guitar and slide guitar by Pierce and sidekick Kid Congo Powers lend the music a nervous edge that blends with Terry Graham's crashing drums. Written in first person and sung by Pierce in a sort of quavering wail, the songs reveal a man who's a victim of demons and nightmares. Yet, despite the ominous background, the album has a gutter grandeur. His outlook is bleak, but Pierce seems to triumph over the sleazy landscape of heroin and pain as much as he grovels in it. *Bill Neill*

LATOYA JACKSON: Heart Don't Lie. Latoya Jackson (vocals); vocal and instrumental accompaniment. *Think Twice; Private Joy*; and six others. PRIVATE BFZ 39361, © FZT 39361, no list price.

Performance: Where's the talent?
Recording: Very good

She is pretty, and she has talented brothers, including the current music scene's hottest star, but Latoya Jackson has nothing to contribute to music. Judging by "Heart Don't Lie," producer Amir Bayyan is aware of her limitations—at least, that would account for his drowning her voice in some very strong, rhythmic arrangements. This is an eminently forgettable release. *C.A.*

THE JACKSONS: Victory. Marlon, Michael, Tito, Jackie, Jermaine, and Randy Jackson (vocals, instruments); instrumental accompaniment. *Torture; Wait; One More Chance; Be Not Always*; and four others. EPIC/CBS QE 38946, © QET 38946, no list price.

Performance: A worm-up
Recording: Good

In spite of the two million units shipped on the first day of its release, no one really expected "Victory" to come anywhere near the success of "Thriller," either artistically or financially. To me, "Victory" sounds disappointingly like a dry run for the Jacksons' tour, a chance for each brother to take a turn in the spotlight and for each to cash a royalty check.

There is some good stuff here, and from surprising quarters. Jackie Jackson's *Torture* and *Wait* are the album's best songs, both great dance tunes with

that shuffling, Billie Jean beat. Brother Marlon's funky paean to getting it on, *Body*, is another good one. Tito's Latin *We Can Change the World* and Randy's ballad, *One More Chance*, are both pleasant and forgettable fillers.

Michael's contributions are the weakest. *State of Shock* is a monotonous riff that gets by on nothing more than the sound of Michael Jackson and Mick Jagger mugging before the mikes. If you're not starstruck, it's a bore. Worse is *Be Not Always*, a cloying, precious meditation on war, peace, and the fate of the earth in general. Michael's tremulous soprano is hard to take at this drawn-out pace; somewhere up in his upper register is the sound of a split reed squeaking. Elsewhere, though, his backing vocals remind you why he's the star of this show. The Jacksons are an amazingly talented family, but when Michael makes an entrance—even if it's just a short phrase at the end of the chorus, as on *Torture*—he completely devours the scenery.

The patchwork quality of "Victory" isn't helped by the production. This would have been a much better album had Quincy Jones produced it instead of having each Jackson produce his own songs. There's no continuity from track to track—they could have been scrambled up in any order and it wouldn't have mattered. On "Thriller," Quincy Jones was able to fill up the musical space without cluttering it up. "Victory" sounds thinner, but at the same time it seems to have more superfluous detail. Some of this may be a result of the rush to get the album made before the tour, and these songs doubtlessly come off better over the Jacksons' 50,000-ton P.A. system. But with a huge, ready-made market eagerly awaiting its arrival, the new Jacksons album is only as good as it had to be. This "Victory" is a hollow one. *M.P.*

WAYLON JENNINGS: Never Could Toe the Mark. Waylon Jennings (vocals, guitar); Jessi Colter (vocals); vocal and instrumental accompaniment. *Never Could Toe the Mark; Talk Good Boogie; Sparkling Brown Eyes; Settin' Me Up; Where Would I Be (Without You); The Entertainer*; and four others. RCA AHL1-5017 \$8.98, © AHK1-5017 \$8.98.

Performance: Classic Waylon
Recording: Okay

At the end of *Talk Good Boogie*, one of the drollest songs on this unusually upbeat album, Waylon Jennings leans into the microphone and says, somewhat laconically, "Sometimes it has a tendency to hang loose."

Sometimes, indeed, especially on this good-natured and affectionate collection of originals and covers that stands up as one of Waylon's most enjoyable albums to date. Through the years, Jennings has usually aimed for a raw, spontaneous sound on his records, and he comes closer to the mark on this one than most. The material is good, not al-

ways great, mind you, but *good*, from such disparate writers as Waylon himself, Dire Straits' Mark Knopfler, Billy Joel (a magnificently honest and unfussy version of *The Entertainer*), and Nashville's Bob McDill.

Like Hank Williams, Jr., Waylon almost runs that no-strings-attached, ramblin' man stuff into the ground, but he gets away with it by doing it so convincingly. And he also takes time to be tender—on Paul Kennerly's *Where Would I Be Without You*, where he's joined by his wife, Jessi Colter. The album has a definite pace to it, too, with Waylon starting out in first gear and moving through various speeds, cruising in fourth about the time he hits Knopfler's *Settin' Me Up* and then shifting down again for the quieter head-and-heart pieces. And throughout it all, his smart, sly brand of humor keeps things purring underneath.

As with anything that's got some head work in it, "Never Could Toe the Mark" may not be all that accessible—nor that impressive—at first. But it grows on you, pardner. It grows. *A.N.*

ELTON JOHN: *Breaking Hearts*. Elton John (keyboards, lead vocals); vocal and instrumental accompaniment. *Restless; Slow Down Georgie (She's Poison); Who Wears These Shoes?; Breaking Hearts (Ain't What It Used to Be); Li'l 'Frigerator*; and five others. GEFEN GHS 24031-1 \$8.98, © MSG 24031-4 \$8.98; © 24031-2, no list price.

Performance: Old pros at work
Recording: Superb

"*Breaking Hearts*," Elton John's twenty-sixth album (I aged ten years when I saw that figure), is big-league rock-and-roll. Davey Johnstone does his best Keith Richards imitation, which is to say he hits three or four nasty riffs over and over with lots of distortion, getting maximum impact with minimum effort. Dee Murray and Nigel Olsson hammer away right on the beat, unimaginatively but in workmanlike fashion. Elton's in great voice, emoting as though it were his first appearance on "Top of the Pops." With a high-gloss finish on the recording, it's an unadventurous but dauntingly professional outing, the kind only big leaguers like the Stones and Rod Stewart can pull off.

Admitting that Elton John isn't my cup of tea, I found "*Breaking Hearts*" less self-conscious and more fun than I'd expected. The only downer is the brooding prince of glitter rock, Bernie Taupin. From the ill-focused malaise of *Restless* and the backbiting paranoia of *Slow Down Georgie* to the banal, poor-little-starlet story line of *In Neon*, Bernie continues to ride a never-ending bumper. By the time you get to *Sad Songs*, the single from "*Breaking Hearts*," you're ready to throw yourself off a building. The great thing is that Elton John seems to have ignored Bernie's lyrics. Most of the songs are jumpers, whether the words call for it or not. Way to go, Elton. *M.P.*

DAVID KNOPFLER: *Release*. David Knopfler (vocals, guitar); instrumental and vocal accompaniment. *Soul Kissing; Come to Me; Madonna's Daughter; The Girl and the Paperboy; Roman Times*; and five others. PASSPORT PB 6030 \$8.98, © PBC 6030 \$8.98.

Performance: Excellent
Recording: Very good

"*Release*," the solo debut of Dire Straits' other Knopfler, is a surprisingly strong work by the group's former guitarist. As you might expect, it sounds a lot like Dire Straits—not just in David

Knopfler's nasal, sing-speak vocals, which are somewhat rougher edged than his brother Mark's, but in the relaxed, shuffling rhythms and fluid guitar work as well.

The new album is more interesting musically than lyrically, although Knopfler seems to have labored hard over the words. Too hard. The results are erratic—he's good when he keeps it simple, as on *Soul Kissing* and *The Girl and the Paperboy*, and annoying when he lays on the "poetry," as in *Madonna's Daughter*.

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by Chris Albertson

COLLECTORS and connoisseurs of historic jazz have good reason to celebrate an arrangement by which the DRG label is making a treasure of early sounds available in this country again. With 320 albums planned, this has to be the most ambitious reissue project ever attempted. Drawn largely from the English EMI and French Pathé-Marconi catalogs, but, oddly enough, also from American Okeh, these sets are released here on the Swing label. Swing, founded in 1935 by French critics Hugues Panassié and Charles Delaunay, was the world's first dedicated jazz label, and some of the greatest American performers recorded for it.

Among the initial releases are "Ridin' in Rhythm" (Swing SW 8453/54) and "Harlem Comes to London" (SW 8444), two extraordinary collections of recordings made between 1926 and 1939, the golden years of Le Jazz Hot in Europe. The former set is made up of more common material, mostly by Coleman Hawkins and Benny Carter, which last appeared here on Prestige but ought always to be available in some form. "Harlem Comes to London," on the other hand, is filled to the brim (a whopping twenty selections on one disc!) with rare and wonderful sounds by the likes of the Nicholas Brothers, Ike "Yowse Suh" Hatch and His Harlem Stompers, Buck and Bubbles, Lavaida Carter, and trumpeter/singer Valaida Snow, whose work until now has only been available on poorly mastered bootleg releases. With tracks by Duke Ellington, Adelaide Hall, and Fats Waller too, this album is a shiny gem indeed.

"Fats Waller in London" (SW 8442/43) contains all the recordings made by

the pianist in London in 1938 and 1939—including the famous six-part *London Suite*—and his first two piano solos (1922). Wonderful stuff. That also describes "The Chocolate Dandies 1928-1933" (SW 8448), sixteen tracks by five different groups, all of whom feature some of the most outstanding jazz men of any period, from guitarist Lonnie Johnson and Coleman Hawkins to Fats Waller, Teddy Wilson, and Rex Stewart.

A strange combination appears back to back on "Satchmo Style" (SW 8451). Side one is the real thing, common but great Louis Armstrong big-band tracks that actually belong to American Columbia; side two features Jack Purvis, a pale but spirited Armstrong imitator whose 1930 sides were assured a long shelf life by the presence of Coleman Hawkins and J. C. Higginbotham. A fine album, but I prefer the torrid goings-on of a two-record set called "Fletcher Henderson and the Dixie Stompers 1925-1928" (SW 8445/46). The Dixie Stompers was what Henderson called his band on Columbia's low-priced Harmony label. It was one of the greatest big bands, and its sound heralded the Swing Era a decade early.

These marvelous reissues are marred by poorly written liner notes, and, although the packaging is attractive, I'm afraid that careful examination reveals some sloppy editing. The Fletcher Henderson album lists the personnel for the Chocolate Dandies set, for example, dates are wrong, and the photographs are not properly credited.

But the sound quality from album to album is superb, and great care has obviously gone into the mastering and pressing. It's the music that counts: these performances come across as vigorously and as freshly as ever.

uniformly catchy, tuneful, and intricately made. This is a smartly paced album and outstandingly arranged. The principal voices—guitar, synthesizer, saxophone, and Knopfler's gravelly, trench-coated vocals—play off one another with effortless agility, and almost every song has something memorable about it. David Knopfler may find himself in the company of Dave Davies, Tom Fogerty, Bob Crosby, and Wilhelm Friedrich Bach as the brother no one remembers, but "Release" can stand on its own as accomplished and often very affecting rock. *M.P.*

THE PALM COURT THEATRE ORCHESTRA: *Vintage Parade*—“Childhood Memories.” The Palm Court Theatre Orchestra, Anthony Godwin cond. *Parade of the Tin Soldiers; Cinderella's Wedding; Teddy Bears' Picnic; Dainty Feet;* and eight others. CHANDOS ● LBRD 012 \$13.98, © LBTD 012 \$13.98.

Performance: Delightful
Recording: Excellent

Here's another delightful collection of performances by the Palm Court Theatre Orchestra, direct from the mythical Palm Court Theatre, suavely led by Anthony Godwin. As before, Godwin and his ingenious cohorts tread the fine line between camp, satire, and parody in performances that genuinely re-create the sound of the music-hall era and of the slightly tacky Grand Hotel ensemble. This time out the spotlight is on "children's music," such things as *Teddy Bears' Picnic* and *Cinderella's Wedding*. The smash hit track here, however, is the old music-hall turn (*He'd Have to*) *Get Out and Get Under*—about the perils of "motoring" in its early days—which is such a triumph of boisterous authenticity that you can almost see the old arc-lamp spotlights and smell the greasepaint. The digital sound is never less than excellent and at times superb. *P.R.*

PRINCE AND THE REVOLUTION: *Purple Rain* (see Best of the Month, page 81)

EDDY RAVEN: *I Could Use Another You*. Eddy Raven (vocals); vocal and instrumental accompaniment. *I Got Mexico; Keeper of the Flame; Solo Sometimes; She's Gonna Win Your Heart; I Could Use Another You;* and five others. RCA AHL1-5040 \$8.98, © AHK1-5040 \$8.98.

Performance: Winning
Recording: Very good

Though Eddy Raven is still better known as a songwriter than as a performer, RCA has held him to only four of his own songs on "I Could Use Another You," his debut album for the label. Fortunately the other songs are well up to his own high standards. The main difference between this album and the records Raven did for Elektra is that RCA is taking him in a slightly more

mainstream direction without sacrificing his considerable integrity.

Amazingly, most of the songs on this album manage to be both commercial and artistically sound. With this more upbeat approach, and with Raven's newly confident singing sounding better than ever, he may soon find the sort of success he deserves. "I Could Use Another You" is a good start. *A.N.*

SHEILA E.: *In the Glamorous Life.* Sheila E. (vocals, percussion, other instruments); orchestra. *Oliver's House; Noon Rendezvous; The Belle of St. Mark;* and three others. WARNER BROS. 25107-1 \$8.98, © 25107-4 \$8.98.

Performance: Expert
Recording: Good

Sheila E. is actually Sheila Escovedo, who already has an established reputation as a percussionist and who has worked with Azteca (with her father Pete Escovedo), George Duke, Lionel Richie, and Prince, among many others. This is her first solo album. She wrote most of the songs, sings them, and plays, at various times, the bass, drums, guitar, and keyboards. As a singer she has a sassy, flamboyant approach that beautifully zings across such things as the title song and *Noon Rendezvous*, and as an instrumentalist she has a rhythm and a beat that could induce a cast-iron statue to begin tapping its foot. Lively, inventive music-making. *P.R.*

TINA TURNER: *Private Dancer.* Tina Turner (vocals); instrumental and vocal accompaniments. *I Might Have Been Queen; Show Some Respect; Let's Stay Together; 1984; Steel Claw;* and four others. CAPITOL ST-12330 \$8.98, © 1T-330 \$8.98.

Performance: *À la mode*
Recording: Very good

Her real name is Annie Mae Bullock, but as Tina Turner and partner to her

husband, Ike, she has burned her initials into the trunk of rock-and-roll. Now on her own and somewhere around fifty, Turner continues to score. Her new album quickly yielded a hit, *What's Love Got to Do with It?*, but my favorite is her marvelous rendition of Al Green's *Let's Stay Together*, which reveals a vocal quality Phil Spector's "wall of sound" all but hid.

Almost twenty years after *River Deep, Mountain High*, Tina Turner's talent is not just undiminished, but in greater abundance than before. The proof lies in the grooves of "Private Dancer," and this is one good Turner that deserves another, and another. *C.A.*

HANK WILLIAMS, JR.: *Major Moves* (see Best of the Month, page 84)

In a few words

JOE ELY: *Hi-Res.* MCA MCA-5450 \$8.98, © MCAC-5450 \$8.98. The subjects of Ely's songs are as gothic as any by Randy Newman, but they're also strangely flat, like cartoon cutouts.

DAVID GILMOUR: *About Face.* COLUMBIA FC 39296, © FCT 39296, no list price. Pink Floyd's former guitarist with an album that is practically upbeat: the songs almost have melodies, almost seem to say something.

GEORGE HOWARD: *Steppin' Out.* TBA TB 201-N \$8.98 (from Palo Alto Records, Palo Alto, Calif.). First-rate party music with infectious, funky rhythms.

PEGGY KING: *Oh What a Memory We Made... Tonight.* STASH ST-238 \$8.98. Back in clubs after time out to raise a family, Peggy King has not forgotten how to give pleasure to lovers of classy American songs. *W.L.*

KING CRIMSON: *Three of a Pair.* WARNER BROS. 25071-1 \$8.98, © 25071-4 \$8.98. Daring technically, but without the lyrical dimension of its predecessors.

ROD MACDONALD: *No Commercial Traffic.* Rod MacDonald (vocals, guitar, harmonica). CINEMAGIC HR-8007 \$7.98 (from Cinemagic Pictures, 1460 Broadway, New York, N.Y. 10003). A poetic first solo effort from a New York based folkie. The music, all MacDonald's own, is both intelligent and hummable, with a comfortable familiarity to it. *F.R.*

CARMEN McRAE: *You're Lookin' at Me.* CONCORD JAZZ CJ-235 \$8.98. The latest artistic document from that national jazz treasure called Carmen McRae is this collection of beautifully performed and beautifully recorded songs by Nat King Cole. *W.L.*

MADE IN FRANCE. CACHALOT CA 130 \$8.98 (from Cachalot Records, 611 Broadway, Suite 214, New York, N.Y. 10012). A cross section of rock-and-roll from twelve French performers. Intelligently packaged with French lyrics and English translations. *Bien fait!* *F.R.*

THE RINK (John Kander-Fred Ebb). Original-Broadway-cast album. Chita Rivera, Liza Minnelli, others (vocals); orchestra, Paul Gemignani cond. POLYDOR 823 125-1 \$8.98, © 823 125-4 \$8.98. This may not be Kander and Ebb's strongest score, but the performances—by the two stars, particularly—make it sound as if it were. *C.B.*

WEATHER REPORT: *Domino Theory.* COLUMBIA FC 39147, © FCT 39147, no list price. Joe Zawinul and Wayne Shorter shine on their new one, which includes a vocal by Carl Anderson, who appeared in the film version of *Jesus Christ Superstar.*



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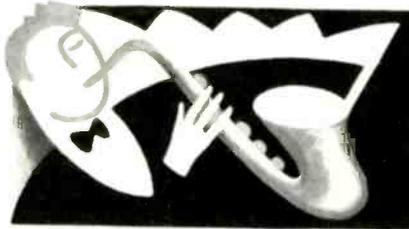
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JAZZ



RON CARTER/JIM HALL: *Live at the Village West.* Ron Carter (bass); Jim Hall (guitar). *Bag's Groove; Blue Monk; Embraceable You; New Waltz;* and four others. CONCORD JAZZ CJ-245 \$8.98, © CJ-245-C \$8.98.

Performance: Perfect match
Recording: Excellent remote

Guitarist Jim Hall and bassist Ron Carter have much in common, and that includes exquisite taste, fresh ideas, awesome musicianship, and a rare sense of dynamics. Small wonder that their forty-two minutes of duets on the album "Live at the Village West" seem to end too soon. C.A.

CRAIG HARRIS: *Black Bone.* Craig Harris (trombone); George Adams (tenor saxophone); Donald Smith (piano); Fred Hopkins (bass); Charlie Persip (drums). *Homeland; Conjure Man; Blackwell;* and two others. SOUL NOTE/PSI SN 1055 \$9.98.

Performance: Distinguished
Recording: Quite good

Trombonist Craig Harris has been active on the avant-garde scene for a few years, but he has yet to establish himself in a position that befits his talent. "Black Bone," a recent import from Italy that was recorded in New York last year, should go a long way toward that end. It is a brilliant quintet set featuring Harris's playing along with the sonorous tenor of George Adams and a superb rhythm section. All five compositions are by Harris, and they are as thought-provoking as his playing is. Don't pass up this exciting album. C.A.

SONNY STITT: *The Last Stitt Sessions, Volume Two.* Sonny Stitt (alto and tenor saxophones); Bill Hardman (trumpet); Walter Davis (piano); George Duvivier (bass); Jimmy Cobb (drums). *At Last; As Time Goes By; Swifty; The Jumpin' Blues;* and three others. MUSE MR 5280 \$9.98.

Performance: Good
Recording: Fair

The second volume of "The Last Stitt Sessions" fails to reflect the saxophonist's best work, but it is a good, sometimes very good, set of straight-ahead bop played by men who all have written their names indelibly into the annals of modern jazz. Stitt made many superficial albums in his lifetime, sessions with little thought given to content. This is not one of them. C.A.

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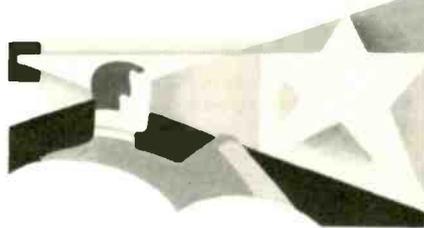
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FILM & THEATER



GREYSTOKE—THE LEGEND OF TARZAN, LORD OF THE APES (John Scott). Original-soundtrack recording. Royal Philharmonic Orchestra, John Scott cond. WARNER BROS. ① 25120-1 \$8.98, ② 25120-4 \$8.98; ③ 25120-2 \$15.98.

Performance: Good
Recording: Good

Greystoke is a somber, elegaic, often beautiful film that uses Edgar Rice Burroughs's legend of Tarzan as the jumping-off point for a contemplation of "primitive" versus "civilized" man. The film has its *longueurs*, as does John Scott's elaborate score for it. Part of the problem, perhaps, is that Scott has cued in too heavily to the film's Edwardian setting, with the result that the orchestrations seem heavy, the themes starchy, and the atmospheric incidental music clotted with pseudo-profundities. The Royal Philharmonic heaves and saws away at all this, under Scott's direction, as if it were prime Elgar. P.R.

THE HOTEL NEW HAMPSHIRE. Original-soundtrack recording. London Philharmonic Orchestra, Raymond Leppard cond. CAPITOL SV-12337 \$8.98, ④ 4XT-12337 \$8.98.

Performance: Glittering
Recording: Excellent

While Tony Richardson's opulent film version of John Irving's *The Hotel New Hampshire* has turned out to be a critical bomb, Raymond Leppard's score for it, drawing on the music of Jacques Offenbach, is a glittering success at every level. He has taken those insinuating *Belle Époque* melodies and arranged them, or parts of them, into an evocative and charming score that stands on its own as an original suite, "in the manner of." The London Philharmonic responds to Leppard by providing a kind of lush stylishness that is as un-English as sex in the afternoon or a Gauloise in an ebony holder. P.R.

INDIANA JONES AND THE TEMPLE OF DOOM (John Williams). Original-soundtrack recording. Orchestra, John Williams cond. POLYDOR ① 821 592-1 \$9.98, ② 821 592-4 \$9.98; ③ 821 592-2, no list price.

Performance: Rousing
Recording: Large and loud

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runs a thunderous gamut from an interpolated performance of Cole Porter's *Anything Goes* (in Chinese) to intro music for the Temple of Doom itself that sounds as if Fu Manchu were holding a speed-dosed Mahler captive in the Great Control Room. Williams's music continues to be great fun as, for the most part, do Spielberg's outsize melodramas. There is, however, the sense that perhaps the formula might by running thin for both of them. *P.R.*

REPO MAN. Original-soundtrack recording. Iggy Pop: *Repo Man!* Black Flag: *TV Party.* Suicidal Tendencies: *Institutionalized.* Circle Jerks: *Coup d'etat.* And seven others. **SAN ANDREAS/MCA** MCA-39019 \$6.98, © MCAC-39019 \$6.98.

Performance: Loud and funny
Recording: Variable

Repo Man is an odd little film (brought to you by ex-Monkee Mike Nesmith) about a disaffected punk kid working for a sleazy outfit that repossesses cars. The soundtrack features various obnoxious noises provided by a cross-section of hard-core California punk bands, and much of it is both amusing and kinetically exciting. Fear, a group beloved of the late John Belushi, is on hand with *Let's Have a War* ("It could start in New Jersey," they observe wistfully),

Black Flag offers the jauntily nihilist *TV Party*, and Iggy Pop, the godfather of the whole shebang, shows up on the title track (inspirational verse: "I'll turn you into a toadstool!"). Best, however, is the Plugz's relatively straight Spanish version of the old *Secret Agent* theme. All in all, an interesting artifact, and one of the better lease-breakers of 1984. *S.S.*

SUNDAY IN THE PARK WITH GEORGE (Stephen Sondheim). Original-Broadway-cast recording. Bernadette Peters, Mandy Patinkin, Barbara Bryne, others (vocals); orchestra, Paul Gemignani cond. **RCA** HBC1-5042 \$9.98, © HBE1-5042 \$9.98; © RCD1-5042, no list price.

Performance: Inspired
Recording: Excellent

Stephen Sondheim's *Sunday in the Park with George* is a supreme exercise in theatrical imagination, giving dramatic life to a well-known nineteenth-century pointillist painting (Georges Seurat's *Sunday Afternoon on the Island of the Grande Jatte*) and setting it all to music. Writing it, fleshing out the concept—giving each individual pictured in the painting a character, something to say and to sing about—must have given its composer-lyricist the kind of satisfaction that derives from completing a doublecrostic or a jigsaw puzzle.

It's not "easy" music, in any case. There are certainly no hits in it. If you were to translate pointillism to music, this is what it would sound like. But, like a lot of Sondheim, it grows on you, and the performances by the cast as a whole and the two stars in particular are enormously winning.

Mandy Patinkin, as the painter George, and Bernadette Peters, as his girl friend, really carry the show and have the lion's share of the singing to do on the recording. But my favorite number is a song simply titled *Beautiful*, beautifully sung by Barbara Bryne at the beginning of side two. The music for Act II, which occupies most of that side, has been heavily edited down from what you hear in the theater. Inspiration seems to have petered out on Sondheim and his book writer/director, James Lapine, as they moved toward the finale, but the last few minutes do pick things up a bit.

The digital recording, produced by RCA's Thomas Z. Shepard, is bright and fine-grained and comes with a set of lyrics. Side one of the LP has no cueing bands (the music is meant to be cantata-like in its continuity), but neither can it hold all of the music of Act I, which has an unedited running time of an hour and twenty minutes in the theater. The cassette *does* offer one act to a side. The CD is banded. *Christie Barter*

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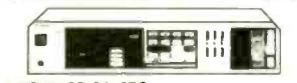
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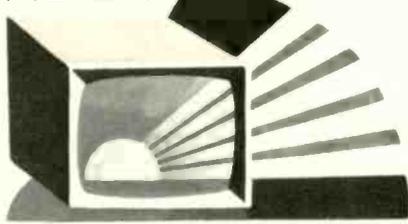
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VIDEO



EURYTHMICS: *Sweet Dreams*. Annie Lennox (vocals); Dave Stewart (guitar); other musicians. *Prologue*; *This Is the*

House; *Never Gonna Cry Again*; *Take Me to Your Heart*; *I've Got an Angel*; and eleven others. PIONEER ARTISTS LaserDisc PA-84-078 \$24.95.

Performance: Yawn
Recording: Excellent

I suspect that even Eurythmics fans will find this new Eurythmics video disc rather tough sledding. Frankly, these guys are a rotten live act. Annie Lennox may be a classically trained singer, but here, at least, her relationship with pitch is pretty casual. The back-up band, meanwhile, sounds canned, and Dave

Stewart, who runs the show from behind his guitar, stands revealed as having all the presence and charisma of a dial tone. The generally dreary proceedings, taped at a small club in London, are occasionally enlivened by some effective stop-motion animation, and, as usual, the LaserDisc sound is impressive. But all in all, Lennox and Stewart's vaguely ominous brand of synth-pop Jacques Brel doesn't seem to translate in a live context. *L.M.*

BARRY MANILOW: *In Concert at the Greek Theatre*. Barry Manilow (vocals); instrumental and vocal accompaniments. *Here We Go Again*; *I Write the Songs*; *Copacabana*; *Even Now*; *Daybreak*; *It's a Miracle*; and eleven others. PIONEER ARTISTS LaserDisc PA-84-065 CX stereo, extended-play \$24.95.

Performance: Entertaining
Recording: Fine video and audio

Many Manilow fans will have seen this 1978 concert on the Showtime cable TV channel, but they will appreciate the sharper picture and stereo sound made possible by the LaserDisc technology. I must confess that I am not a fan, but Manilow knows how to entertain, and when he applies that talent to a varied program of likable songs, his vocal weaknesses seem to matter little. Actually, his singing is at its best when he tackles the old Lambert, Hendricks, and Ross tongue-twister *Cloudburst*.

The outdoor concert, taped at Los Angeles' Greek Theatre, runs 107 minutes and features twenty-four selections, nine of them in two medleys. Sights and sounds are well captured. *C.A.*

DIANA ROSS: *In Concert*. Diana Ross (vocals); vocal and instrumental accompaniment. *Ain't No Mountain High Enough*; *Too Shy to Say*; *Touch Me in the Morning*; and fourteen others. PIONEER ARTISTS LaserDisc PA-84-070 \$24.95.

Performance: Glitz run amuck
Recording: Good remote

Diana Ross's new video more or less defines the concept that is "Las Vegas." Taped at Caesar's Palace in 1979 for an HBO special, "In Concert" finds the former Supreme simply oozing love for the audience, competing (successfully) with expensive Star Wars theatrical lighting effects, dashing from one dazzling costume change to the next, and (occasionally) doing something as mundane as just singing. Needless to say, all of this is as slick and glitzy as humanly and financially possible. As spectacle, it can't be faulted. Emotionally, however, it's as numbing and showbiz-phony as the comparable shows you might get from Wayne Newton or Jerry Vale. The late Marvin Gaye, coaxed here into singing two ringside choruses of *Reach Out and Touch*, manages to exude more warmth and feeling in only thirty seconds than in the entire hour-plus of Ross's zillion-dollar star turn. Excellent picture and sound, though. *L.M.*

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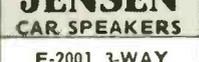
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Computer Yellow Pages

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By Drew Kaplan

It was nearly 1 AM. I was about to head off to bed. I had already accessed Grolier's Encyclopedia to get some information on magnetism for an article I'm writing.

I had a print-out of 73 of San Francisco's top restaurants, complete with phone numbers, menus and addresses to take with me for a weekend trip. And, I'd already studied the detail and the history of a few stocks I'm interested in.

But look at this. Before I signed off, I called up Entertainment for a few minutes of games to help me unwind. As I was deciding between Trivia Unlimited, MegaWars, or Hangman, I spotted something I didn't recognize.

It was called, "Do you know me?". It looked like a 20 question type game about people. And, since I'd just read the 'Personal Profile of the Day' about Greg Louganis, the Olympic Diver, I was ready.

Well, was I in for a surprise. It turned out to be a compatibility test between you and your mate. Or, you and your kids.

Well, my wife is really terrific. Here it was 1 AM, she'd been trying to get me to leave my computer and call it a night for an hour, but she said OK. So, off we went.

The test was sort of like the old 'Newlywed Game', only more sophisticated. The computer takes your names and then asks one of you to leave the room while it asks a long series of really searching questions of the other. Then it asks you to trade places and it re-asks the questions.

Finally, it asks for both of you to sit down while it compares answers. Well, we haven't called in the divorce lawyers, but we're still laughing about some of our answers. I plan to take the next test with my son.

ALL THE INFORMATION

Imagine being able to find out about anything you want to know without ever leaving home. Think of your hobbies, think of your occupation, think of your interests. Now information about anything is just a push of a button away.

There are data bases about medicine, law, education, computer programming, aviation, investing, exchanging and hundreds more. Just dial a number on the Modem Phone, switch to 'Data', and the world of information will rush into your home or office.

And, look at this. You can transfer information from your computer to a friend or business associate. It's called electronic mail. Just call them on the Modem Phone. (They need a modem too.) You can send them files, letters, figures or you name it. It's great for business and personal use.

A TECHNICAL MOMENT

There's so much you can do once you're hooked in, it's hard to break away to talk about the equipment.

After all, the Modem is just your gateway to the seemingly never-ending wealth of information and entertainment that's available. The more hours I spend 'on line', the more totally new things I find. I've had my biorhythms charted for a

\$99 Breakthrough



month, looked up information about public companies, and played Concentration.

I've looked in on Apple, Atari and Commodore User groups to see what's new. (I have one of each). I've played Lunar Lander (I crashed), and checked the loan amortization rates on my new home.

Every day you'll find a list of what events occurred on that day in history. You'll choose from classic quotes or an almost non-ending list of one line political jokes. The list just goes on and on.

By now you must be wondering how hard all this information is to get and how much it's all going to cost. Well, fear not. It's all incredibly easy.

The main problem has been that there just aren't enough people around to tell you how to do it. With the Phone Modem, you'll get all the numbers and addresses you'll need, and with our Optional (\$24) CompuServe Kit, which includes 5 free hours of use, you'll be able to sign on the moment your package arrives.

Later you'll read about both the free and pay data bases and bulletin boards. But, first let's look at the phone.

IT'S A PHONE TOO

The DATA Phone is a unique state of the art device. It acts just like a regular telephone. It has a conventional phone company style handset, a built-in speakerphone and 10 number memory, including last number redial.

It's Tone/Pulse switchable, desk or wall mountable, and has all the features you'd expect, including flash and mute. But, nestled within the phone's circuits is a powerful 300 baud full duplex Modem.

You'll use it as a regular automatic telephone. But, when you want to hook into a data base, the fun really begins. Here's all you do. Just dial the number manually or automatically. You can use the speakerphone or the handset.

When you reach a data base, you'll hear a tone instead of a person answering the phone. Just switch the blue switch at the top of the phone from 'Phone' to 'Modem' and you'll be on line.

It's easy, It's fast. And, it's your gateway to information and entertainment that would take an encyclopedia to describe.

The Modem Phone simply plugs into

any modular phone jack in your home or office and an AC outlet. It even has battery back up (batteries not included) to protect the memory and operate the modem in case of a power failure.

To hook the Modem Phone to your computer you simply need one of our inexpensive cables (\$8 to \$12) and a serial interface.

But look at this. Computers such as Commodore and Radio Shack's TRS80 Color Computers already have serial interfaces built-in.

Interfaces are easily available at any computer store. Plus, we're offering them for the Apple and IBM PC.

Finally, you need a program to tell your computer that it's no longer a computer. You need to tell it that it's a 'Terminal' and that it's going to talk to the world. We've got these programs on disk for the most popular computers for just \$10. But Terminal Programs are universal and are available very inexpensively at any computer store for virtually any computer.

So, you'll need the (\$8 to \$12) cable from us, maybe the interface, and our \$10 terminal program or anyone else's.

BUT WHAT ABOUT THE INFORMATION?

The information is everywhere. There are over 400 Electronic Bulletin Boards listed in just one book. I'm using one in Los Angeles called 'Buy Phone'. It's like an educated yellow pages. I tell it where I live. It asks me what I want to buy.

I've asked for cars, hamburgers, TVs, stereos, phones and a dozen other things. 'Buy Phone' will arrange all the possible stores it finds that carry the product I want, by the geographic distance each store is from my home.

I just turn on my printer. (You don't need a printer, but they sure are nice to have.) And when I leave the house to go shopping, I've got a list of as many as 30 stores, complete with phone numbers, addresses and business hours, to take along.

Another service I've used is an electronic department store. It has 5 floors with about 12 stores per floor. You can walk forward, back, left or right.

You even go up and down the elevator. Anyway, with your credit card you can actually buy from any of the stores you're in.

My next effort was a 'Social Bulletin Board'. I didn't know quite what I was into until the question about 'sexual preference' popped up. Well, being married, I signed off. But, there are lots of dating bulletin boards. And, if you'd like a date with someone into computers, wow!

All of the above boards are free. And with the Modem Phone we'll include an address where you buy a directory of 400 of the estimated 1500 Electronic Bulletin Boards in operation. I've also found that there are lots of boards that aren't listed in the directory that have their numbers listed on the Boards I call.

THE TOP BANANAS

I'm using two top professional data base services. The Source and CompuServe. In my opinion, The Source is stronger in daily news and CompuServe is stronger in history and research. They are both loaded with educational thinking games and the type of wide ranging

special interest information I've described above.

Enclosed with your Modem Phone will be a discount application to the Source, complete with an 800 number for instant signup. It's a great service. I use it mostly at night at the \$7.75 per hour rate.

CompuServe is my favorite. But since I'm selling it direct, you'll have to judge it for yourself. The \$24 kit includes a full manual, your secret ID number and password to sign on. Both The Source and CompuServe offer local telephone numbers for you to call in many cities.

CompuServe only costs \$6 per hour after 5PM. And with our kit you get 5 free hours to really look around and enjoy the service. It has everything, from 1300 recipes and menus, to the National Satirist. Auto Net/Auto Base tells you how the new cars match up and much more.

CompuServe has Grolier's Academic American Encyclopedia and 14 reference data bases including Science, Wine, Family, Election 84, and Gardening. Of course there are hundreds of data bases, each with its own menu of specific information.

From Stocks and Business news, to Translations, CompuServe can answer your questions. I printed out an on-line index that contained 285 entries, from Aviation Rules and Regulations to the Belmont Golf Association to the Department of State to Educational Research. The volume of information is astounding.

There's a host of games and tests, including a full IQ test and the compatibility test I mentioned at the beginning. A few services cost extra, but most are included in the \$6 per hour rate.

Now that you know all about data bases, isn't it time you turn your computer into a window on the world of information? The Modem Phone is made by Unitech. It's backed by their full one year limited warranty.



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It's all yours, risk free with your credit

card when you call toll free, or send your check for DAK's incredible introductory hook-in price of just \$99 plus \$5 for postage and handling. Order No. 4110. CA res add tax.

You'll need just three things to turn your computer into a communications marvel. 1) You'll need our special cable. 2) You'll need a serial interface card if your computer doesn't have one built-in. 3) You'll need a modem program. It can be ours or anyone's.

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For your IBM PC. (Or Clone) Your special connecting cable is just \$8 (\$1 P&H) Order No. 4114. We have Practical Peripherals' Serial Interface for just \$79 (\$2 P&H) Order No. 4115. And we have a Modem Program on disk for just \$10 (\$1 P&H) Order No. 4116.

For your Commodore. (Both Vic 20 and 64) Your special connecting cable is just \$12 (\$1 P&H) Order No. 4117. And, the great news is that you don't need an interface. The Modem program is available for just \$10 (\$1 P&H). Use Order No. 4118 for disk, or Order No. 4119 for cassette.

For TRS80. Your special connecting cable is just \$12 (\$1 P&H) Order No. 4120. For the Color Computer you don't need an interface. For the Black and White Computer Interface, you'll have to see Radio Shack. You'll also need a standard Modem Program as well.

SPECIAL SUPER BONUS

We've made a large cash purchase of CompuServe Starter Kits. You get a full manual, a detailed description of the service. And, look at this. You'll get 5 free hours of online information. It's a \$39 value. It's yours for just \$24 (\$2 P&H) Order No. 4121.

Everything you need, including phone number, secret passcode and instructions, is included. You'll be on line immediately. Note: The CompuServe Kit is covered by our standard 30 day risk free trial. But, if you return it you will be billed \$6 per hour only for the time you used.

It is said that knowledge is king. With the information you can acquire through the all new Modem Phone, you'll have informational power of 10 kings. And you'll have a full range of entertainment thrown in as an extra bonus.

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WHAT'S NEW

(Continued from page 75)

JBL, Panasonic, Philips, Sansui, and Pioneer have adopted this approach, and we expect to see other companies using it as well.

There was a mass influx of home speaker companies moving into the lucrative automotive market in 1983. They included Polk, Boston Acoustics, JBL, Infinity, and Acoustic Research, and most of them have been successful.

Among the most successful was Boston Acoustics, which introduced a single model, the C-700, last year. The company has recently added some woofer/tweeter separates, the System 741, a separate 5 1/4-inch woofer and a 4-inch full-range

Polk has also brought out separates, among them the MM5 system, the MW 6502 6 1/2-inch woofer, and the HF-1000 tweeter. Polk's entire speaker line has been upgraded with new crossover networks and stamped steel grilles.

The trend toward separates is evident in a number of new speaker lines. Nakamichi is introducing the SP-10 component tweeter, the SP-50 midrange-bass, and the SP-80

8 1/4-inch subwoofer. Yamaha has the YCS-500 5 1/4-inch midrange, the YCS-602 6 1/2-inch subwoofer, and the YCS-300 1 1/2-inch dome tweeter. Adaptors and crossover networks are available for the assembly of complete systems.

Alpine has a complete new line of speakers featuring exotic driver materials. Woofers are made of high-density polymer (not polypropylene), and midranges and tweeters are manufactured from black polyester film. Alpine makes extensive use of exotic magnet materials in the new line, including barium ferrite, cobalt, and strontium.

ADS has a new extended range two-way component system called the 315i which also uses barium ferrite magnets. The 315i, which is rugged enough for marine installations, resembles the older 300i plate speaker in general specifications, but it is 1 dB less efficient and, at \$299 a pair, it is somewhat more expensive.

Philips, who recently entered autosound by releasing some very expensive loudspeakers, is now shipping some moderately priced models, among them, the 6 1/2-inch 8864

coaxial at \$69.95 each, and the 5 1/4-inch 8853 coaxial at \$69.95 apiece. For the really budget-minded, a 4-inch full-range is available at \$39.95. Shown earlier, but only now available, is a unique wedge-shaped box speaker, the Model 8241, specifically designed for hatchbacks. Sold for some time in Europe, it is now offered in the U.S. for \$99.95.

Finally, Clarion has released seventeen new speakers initially shown last January. Earlier announced prices have been lowered and power-handling capabilities increased.

In this brief survey of new products, we've tried to focus on significant innovations and product trends. The list of products is not intended to be a representative sampling of the market. Indeed, the sheer number and diversity of autosound components currently offered to the public would render any capsule product roundup necessarily unrepresentative. Autosound, once the poor stepchild of home audio, has become a whole other kingdom with its own high end, low end, midline, and esoteric segments. There's a lot to listen to—and a lot of it's very good. □

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CD PLAYERS

(Continued from page 55)

ic playback sequence into the player's memory system, press the PLAY button, and hear the music in the sequence in which you want it to be played.

There are two basic programming systems. One is called sequential, the other random-access. The former, a feature of Yamaha's CD-X1, for example, permits you to play individual tracks on a selective basis—that is, only the ones you want to hear, but also only in the order in which they are listed on the disc. The random-access type, found on the Technics Model SL-P8 for example, offers greater potential for individualized playback programming. A random-access system lets you program into the player's microprocessor memory any tracks on a disc in any sequence you want. For example, you can play nine tracks of a popular music disc in the order 4-7-2-9-1-3-8-6-5 as a "personal" program sequence that fits your mood of the moment.

Some programming memories are larger than others. Sylvania's FDC303SL permits programming of up to fifteen selections, Sansui's new PC-V300 for up to twenty-three selections, Revox's B225 up to thirty tracks, and Technics' SL-P10 allows random-access programming of as many as sixty-three musical choices.

Critical listeners will be hard put to hear any significant differences in the sound quality of today's CD players.

The most extensive programming capability in terms of *playing time* is offered in the Technics multiplay Model SL-P15. Its oversized disc compartment holds fifty-one CD's, for a *theoretical* continuous playing time of over two full days. And up to twelve commands can be programmed, encompassing full sequential play and individual track and disc choices.

CD players present various playback alternatives. With most units, you can press the PLAY button and the machine will play all of the

music as listed on a disc or in the order you've programmed it into the player's memory. Press the REPEAT button and the entire disc or program will be repeated. If you want to hear just one or two tracks repeated, you may also have that choice. With some players you can repeat all the music between any two selected points on a CD (phrase repeat, it is called).

The SKIP buttons on CD players provide quick access to any desired track on a CD or to prerecorded index points within a track. (Few of today's CD's contain index points, but more will be available as recording firms improve their production techniques or respond to music lovers' expressed demands.)

To sample or find bits of individual songs or segments of a CD, use the fast-forward or reverse modes, which move the laser pickup across the disc at a fast clip (three to thirty times normal speed in the Technics SL-P7 and SL-P8). The fast modes are also handy for finding specific passages or vocal or instrumental solos in classical music when index numbers are not provided. Players such as Sansui's PC-V1000, NAD's 5255, the Sony models, and Technics' SL-P7 and SL-P8 provide audible scanning, allowing you to cue the player to any precise point in a recording with even greater ease.

There's some confusion relative to CD-player control designations. For instance, a button tagged SEARCH on some machines performs the same functions as the SKIP and CUE buttons do on other players. Hitachi's Model DA-3500 has designations of SELF PROGRAM SEARCH, INDEX SEARCH, and SKIP SEARCH. Sansui calls its PC-V300 quick-access control MUSIC SEARCH/SCAN. Pioneer gives four ways to find what you're looking for on a CD played on its PD-70. INDEX SEARCH serves a cue-and-review function that locates the beginning of a track, plays the first few seconds as a sample, and then moves on to the next cut until you program it to stop. For random access, TRACK SEARCH locates the beginning of a track at the touch of a button. MINUTE SEARCH allows a listener to find the beginning of a track or a specific passage by entering time-code numbers. Finally, SLOW SCAN (which I would prefer to call "fast scan") lets you listen to the music at an accelerated rate while the sound remains audible. In this light, I'd suggest that in examining units you're thinking of buying make sure that you know precisely

what each control actually does, regardless of its designation.

One reason why it is so easy to operate technologically complex CD players is that "user friendliness" is an integral part of their design. One manifestation is in the multifunction displays typical of CD machines; they let you know what the player is doing at all times.

Sooner or later you're likely to succumb to the CD's attractions and add a player to your own hi-fi system.

All CD players are fitted with digital displays that indicate CD track numbers and playing time (in minutes and seconds). Some also show the remaining playing time, total disc time, the number of selections remaining on the disc or in the programmed sequence, and an index number. The extent of function-selector indication varies. In Kyocera's deluxe DA-01 red and green LED's light up to show what control or controls are being used at any given moment and where the optical head is scanning the disc. Laser-positioning indication is also available on Technics' SL-P10, Phase Linear's 9500, the Akai CD-D1, Sony's CDP-701ES, and Yamaha's CD-2.

Another aspect of user friendliness—plus a touch of the sybaritic—is the remote-control capability of many CD players. Wireless infrared controls normally duplicate most of the functions on the panel of the CD player, including sequence programming, permitting you to enjoy operation from your lounge chair and so forth. NEC features a "docking" wireless remote control in its Model CD705E. The control is fitted into a small front-panel drawer, and it can be operated there or can be removed and operated at a distance. Sony's CDP-400 and CDP-610ES feature a wireless remote with variable line-out volume control, enabling you to change the volume level from a comfortable listening position, bypassing the system's main-amplifier volume control. This feature is especially

valuable in taming the varying volume levels and dynamic-range extremes of many CD's with utmost ease.

While you don't ordinarily regard a volume control as a "feature," taking it for granted in most hi-fi gear, such controls are less common in CD players. Those that you do find are usually double-duty models. They serve as combination headphone-level and output-level controls. In the latter function they permit you to adjust the level of the CD player to match that of other program sources, so that when you switch from any one of them to the CD mode, you won't have to turn down the master gain control on your system's amplifier. CD players with such combination controls include the Toshiba XR-Z70, Luxman DX-103, Hitachi DA-800, JVC XL-V2, and Aiwa DX-1000.

Warning: Some players have front-panel headphone jacks without a volume-level control. Make sure that the listening-level setting of the machine is right for your ears and headphones.

If you want your CD player to lull

you to dreamland, awaken you, or start to play at a specific time, seek out a model with timer-playback capability. It is featured in various models, such as the Kenwood DP-800, Sony CDP-101 and CDP-701ES, Toshiba XR-Z70, JVC XL-V2, and Technics SL-P8.

Shock Resistance

Off-beat features appear in a few CD players. Notable is an antishock slide switch on Hitachi's DA-800. In the ON position it ameliorates the effects of the set's placement where it is subject to excessive vibration. In its Model DA-910, Kyocera gets around problems from external vibration by incorporating a massive base of ceramic compound to minimize resonances and feedback. Denon, in its DCD-1800, uses a single-point-pivot laser transport system to reduce mechanical shock/vibration effects. Effective shock resistance is an important aspect of CD player performance. While improvements are steadily being made in this regard, some machines are still quite sensitive to shock and

vibration such as dancing on a nearby floor. When you've narrowed down your choices and have reached the point of trade-offs in choosing, bump and tap (lightly at first) the machine you're auditioning to see how much shock it will take.

Other machines with uncommon features include the Technics SL-P8, which boasts a pitch control that can be switched into operation and adjusted continuously as much as ± 6 percent (a musical semitone), and Pioneer P-D70, which has an oversized display panel that shows peak channel levels on a lighted twelve-dot bar graph in addition to showing the unit's four function modes.

Features like these are precursors of the fourth and fifth generations of CD players. They may include such niceties as video output to show the texts, lyrics, and liner notes for each album. But there's no need to wait for future technological wonders. The CD system is a technologically wonderful realm as it is now. The only key you need to enter is a Compact Disc player. □

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EXILE (continued from page 70)

Easy Being Easy, Kenny Rogers with *Take This Heart*, Dave and Sugar with *Stay with Me*, and Sheena Easton, Rita Coolidge, Stephanie Winslow, Juice Newton, and a continuing list of others.

It's one thing to be a songwriter and have an artist make your song a hit, but it's another to hear that same hit when your own recorded version went nowhere: Both *Take Me Down* and *The Closer You Get* were on Exile's 1980 album, "Don't Leave Me This Way."

Meanwhile, the band was still appearing nightly at the local bowling alley, "cussin' a whole lot, to say the least," says Taylor. "At first, it was real hard to deal with," admits Lemaire, co-writer of five of the songs on Exile's first album. Pennington says, "It was kinda bittersweet, because as a writer I was getting some truly healthy royalty statements in the mail, but I was sweating blood for the group."

Pennington was nearly anemic, then, by the time Morey and Nashville producer/publisher Buddy Killen met in L.A. to discuss Exile's future. Killen, as it turned out, had been impressed with *Kiss You All Over*, thought the band could easily go country, and offered to try to get them on Epic. Once CBS big-shot Rick Blackburn heard their distinctive harmonies live, he realized he not only had some formidable competition for RCA's Alabama, but a Nashville rarity: a self-contained band that could play all their own instrumental tracks in the studio (no session pickers), and a writing team that could make the Brill Building gang look like college interns. Their debut single for the label, the hard-country *High Cost of Leaving*, rose to No. 27 on the charts, and their next two country-pop releases zoomed up to No. 1.

"It's funny, because we as a band haven't changed that much," says Lemaire. Nor, adds Pennington, has the songwriting changed a great deal, since both *Take Me Down* and *The Closer You Get* were originally written as pop songs. "We changed our instrumentation a little bit," he muses. "We put an acoustic guitar on everything, and suddenly it became country."

All the same, the group is sensitive to suggestions that they're just another rangy rock group in cowboy clothing, sprinting to catch a lucrative bandwagon. Even though the second album definitely has a more mainstream quality than the first, "We didn't change over to country with the thought that after the first album we'd do some heavy cross-over stuff," insists Taylor. "We were searching on that first album, and we really weren't sure how we wanted to go with it, so we tried a lot of different things. Now we have more confidence and direction."

They also have more fans. At a "Grad Night" performance at Florida's Disney World in May, Exile had both the beehived chaperones and the Clearasil crowd hitting the dance floor and elbowing for room. And when they got to *Kiss You All Over*, the thirty-plus generation came out of the woodwork to boogie with the kids.

How does Exile see its overall contribution?

"I think if we're helping country music at all, we're helping to bring it a little more toward the middle," says Pennington. "And we're not the only ones: Kenny Rogers is, Dolly Parton is. I'd like to think that before our careers are over and done with, we would have made a few people like country music who didn't like it before. To me," he adds, "that would really be a great compliment." □

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The Sophisticated Loudspeaker

HERE'S a speaker system, the Infinity IRS, costing \$16,000 per channel, each *channel* incorporating six 12-inch woofers and several dozen mid-range and tweeter drivers of novel design, shared between two cabinets each standing 7½ feet high. It is generally thought to be a high-end speaker system.

Here's another, the Celestion SL600, priced comfortably under \$1,000 and consisting of a 6½-inch woofer and a 1¼-inch dome tweeter in a 14½-inch box. It, too, is considered a high-end speaker by many.

Finally, a third speaker system, which shall be nameless here, boasts a 15-inch woofer of complex and unique cone composition, plus three other drivers of equivalent technological pedigree, in a floor-standing enclosure approaching 3 feet in height. When it is considered at all by the cognoscenti, it is usually considered a mistake: something from the vast demimonde of "appliance" speakers that get bought by the inexperienced because they look the part and sound like they're really trying.

The key words in that last sentence are of course "sound like." A high-end speaker isn't supposed to "sound like" anything. Insofar as art and science permit, it is supposed to "be" something—a musical performance in most cases. It certainly shouldn't sound like it's "trying," which implies bombast, strain, or a false glamorization that is inappropriate to the business at hand.

Yet mere words cannot take the place of experience in listening. In the view of Magnepan's Jim Winey, a manufacturer of exotic and celebrated high-end products, the typical appliance speaker is still being designed to capitalize on the inexperience of the beginner's untaught ear and his expectations that a better speaker will transcend what he's accustomed to by delivering more of everything, especially more excitement.

A sophisticated loudspeaker, on the other hand, is contrived, like music, to deliver its excitement through contrast—loud *and* soft, bright *and* dull, heavyweight *and* slim. It's precisely balanced between too much and too little, and this balance may make it seem unremarkable in a crowd except to a listener who is secure in his recognition of authentic musical sounds and values.

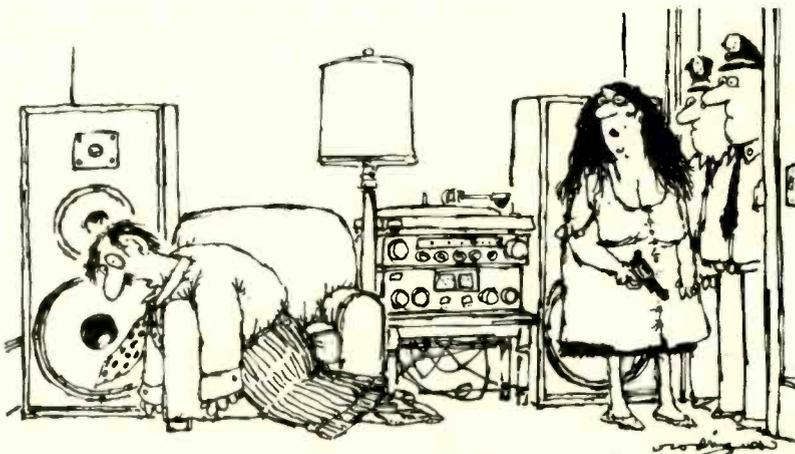
Evidence of high technology in a speaker design is often seized upon hopefully as an indication of high-end performance potential, but it can mislead as often as it guides. Dynamite may be more potent than blasting powder, but its use in granite quarries has not inevitably led to superior architecture. New principles, materials, and manufacturing techniques have expanded the performance potential of loudspeakers without in any way guaranteeing that their performance will be controlled in a way that achieves real refinement.

Steve Eberbach of DCM, manufacturer of the Time Window speaker systems, looks upon high-end designing as the creation of a customized loudspeaker that painstakingly respects and caters to the wants of listeners who are deeply interested in subtleties of sound. According to Eberbach, "The high-end manufacturer's first priority, and ideally his only one, is to fashion a certain 'style' of sound that he feels in his heart will make his customers hap-

py, because it is—or seems to be—a close approximation to the truth."

The "truth" is, of course, undefined for designer and customer alike, because you can't take the concert home with you, or be at all certain that its "truth" has been captured on any recording you buy. "If a speaker, over extended listening periods, confers on me pleasure akin to what I get from live music, I figure it's getting pretty close to what I'm after, and pretty close to the real thing," says Eberbach. "Also, I take keen interest in other speakers that have won high praise from experienced listeners, and I measure them for anything I can imagine being responsible, and for some things I can't. Sometimes I learn a little, but more often not. Then it's back to listening."

Alas, it's back to listening for all of us at this time, since the measurements that might distinguish a true high-end speaker from an appliance job do not yet appear in the lab manuals. This is bad news, particularly for the uncertain beginner. How can he rationalize a preference for the 6½-inch woofer of the plain-Jane Celestion SL600 over the comparably priced 15-inch woofer of the unnamed system above? It's the sort of thing sleepless nights are made of, and even high-end manufacturers admit that the agony of the decision may not be worth it except for those to whom music will become very, very important. They're the ones the high end is for. □



"He never knew what hit him. I got him during the 'Great Gate of Kiev' passage of Mussorgsky's 'Pictures at an Exhibition,' and I turned up the volume . . ."

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