HI-FI HITS THE ROAD • TAPE DECK BUYING GUIDE
TESTED: NEC CD PLAYER, ADVENT SPEAKERS, GRUNDIG FINE ARTS INTEGRATED AMP, MORE
Accelerate to audiophile performance in the automotive environment. Introducing the first high-power, pull-out cassette/receivers good enough to be called Harman Kardon.

Harman Kardon autosound is backed by more than thirty-five years of leadership in advanced audio technology. Always innovative, Harman Kardon is responsible for such audio breakthroughs as ultrawidebandwidth, low negative feedback, high instantaneous Current Capability, Phase Locked-Loop FM tuning and the world's first stereo and high fidelity receivers. Applying its technical expertise to autosound, Harman Kardon delivers quality performance that's designed for the home, built for the road.

The latest components from Harman Kardon's complete line of mobile electronics are designed to perform both together and in conjunction with existing systems. Sleekly styled, these units offer American-designed ergonomics for ease of operation: A calculated, precise front panel layout truly makes listening easy, even under the most demanding conditions.

The CR131 and CR151 powered cassette/receivers feature the same premium heads used in Harman Kardon's renowned high-end home systems. Teamered with Dolby B noise reduction and precise, bi-directional azimuth adjust, they provide true 20Hz to 18kHz bandwidth (+/−3dB) while driving hiss and distortion to new lows. Both models include quartz-synthesized FM sections, 18 FM and 6 AM presets, and dual fader-controlled pre-amp outputs. The CR151 adds Dolby C, full logic transport, special HI-Q interference rejection and external processor loop.

To double the output, add the CA212 half-DIN in-dash power amplifier for solid, clean, reliable power* with advanced protection circuitry and 0.5% THD. Incorporate the CQ10 7-band equalizer and you can optimally contour the sound to the specific environmental conditions of any automotive system. Convenience features include a front panel mini-jack input for portable stereos or CD's. It offers a built-in electronic crossover to allow for additional subwoofer system expansion. The CQ10's extraordinary flexibility makes it an important addition to any sophisticated component system.

Classically designed, innovatively driven. Accelerate to audiophile performance with Harman Kardon.

*Our ratings are as distortion-free as our amps. Unlike many manufacturers, Harman Kardon uses only the conservative FTC measurement standard. The CR131 and CR151 deliver 12 Watts per channel into 4 Ohms, 20Hz-20kHz with less than 0.9% THD. Beware of "peak power" ratings, measurements at 1kHz bandwidth only of those with as much as 10% harmonic distortion.

**Dolby is a trademark of Dolby Licensing Corp.

For more information and your nearest dealer call toll free 1-800-525-7000 Ext. 101 or write 240 Crossways Park West, Box 9101, Woodbury, New York 11797
In-Home Performance In-Dash. Inevitably Harman Kardon.
With the new Boston Acoustics Designer Series speaker systems, you can enjoy high fidelity music everywhere in your home. They mount flush in walls or ceilings, blending unobtrusively into any room setting. And unlike conventional speakers, they take up absolutely no shelf or floor space.

As main, surround, or extension speaker systems, our Designer Series speakers give you the accurate, uncompromised sonic performance you’ve come to expect from Boston Acoustics. Frequency response is smooth and accurate, and stereo imaging is unusually lifelike.

There are two Designer Series models. Shown above is the model 360, with a 6½-inch woofer. The smaller model 350 has a 5¼-inch woofer. Both have our CFT-4 one-inch dome tweeter. The contoured grille and trim, finished in matte white, can be painted to match or complement the surroundings.

The specially engineered woofers provide full bass performance without need for special enclosures. The tweeter is a new version of the one-inch domes used in our finest home systems. It is of a quality not normally found in built-in speakers. All drivers have waterproof diaphragms, allowing installation in moisture-laden places such as kitchens, baths, and boats.

For a Designer Series brochure, please write to us at 247 Lynnfield St., Peabody, MA 01960. Or call (508) 532-2111

Boston Acoustics
Cover: Sleek lines and sweet sounds fire up a 1985 Corvette. Details on page 84. Design by Sue Llewellyn, photo by Bruce Miller.

STEREO REVIEW BUYER POLL. SEE PAGE 121
Please fill in if you bought equipment in the past thirty days.

READER SERVICE INFORMATION CARD, FACING PAGE 121
Circle the items you want to know about.

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Marlboro Lights

The spirit of Marlboro in a low tar cigarette.

© Philip Morris Inc. 1985

SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.

10 mg "tar" 0.7 mg nicotine avg per cigarette. FTC Report Feb'85


by Christie Barter and Rebecca Day

**KLH RETURNS**

The KLH brand name has reappeared on speakers in the U.S. market following Wald Sound's purchase of the name from Kyocera in January. The new KLH line, designed by engineer Keith Johnson, includes two-way speakers with 6- and 8-inch woofers ($258 and $298 a pair), a three-way floor-standing system with a 12-inch woofer ($498 a pair), and a three-way tower speaker ($598 a pair).

**FREEBIES**

TDK will throw in a free 60-minute Rykodisc cassette if you buy a six-pack of TDK SA-90 blank cassettes or a five-pack of SA-100 tapes. The bonus cassettes will be available through the end of the summer or as long as supplies last. Maxell has published a handbook for consumers that offers safety and usage tips for various types of batteries, including NiCad, alkaline, lithium, and silver-oxide. To get a complimentary copy of the handbook, send a stamped (25¢), self-addressed #10 envelope to Maxell Battery Brochure, P.O. Box CN4780, Trenton, NJ 07410.

Maxell has also revised its consumer video handbook. The third edition, sixty pages long, covers such topics as differences between VCR formats, Super VHS, camcorders, tips for home video recording, and hi-fi video sound. To get a copy of the handbook, send a stamped (75¢), self-addressed envelope to Maxell Product Guide Offer, P.O. Box 4686, Reidsville, NC 27322-4686.

**TECH NOTES**

Denon is marketing a tabletop stereo system with receiver and speakers designed for offices and other secondary listening environments. The 25-watt-per-channel system lists for $399. Blaupunkt has introduced a five-channel, 350-watt car power amplifier, the BMA 5350B ($499.95), that has a fully integrated electronic crossover network with individually variable frequency and level controls for the front, rear, and subwoofer outputs. Ter Technologies, which has been granted a patent for the Gamma Loop design of its amplified FM indoor antenna ($85), has introduced a nonamplified version, called the FM 10, which will list for $20. International Jensen (Advent, Phase Linear, and Jensen brands) has entered a technology agreement with England's Goodmans Loudspeakers Ltd. (Goodmans, Tannoy, Mordaunt-Short, and other brands) for the joint development of car speakers. MB Quart has introduced what it says is the first speaker system that incorporates a true spherically radiating driver, the Quart Aera ($25,000 a pair). It has a 4-inch pulsating-sphere tweeter, a 2-inch dome midrange, and a 10-inch woofer.

**HONORS**

The Songwriters Hall of Fame celebrates its twentieth anniversary on May 11 with a gala induction ceremony and all-star concert at New York's Radio City Music Hall, to be taped by CBS for nationwide telecast later in the month. Elton John, Lee Adams (Put On a Happy Face), and the writing team of Anthony Newley and Leslie Bricuse (What Kind of Fool Am I?) are among the inductees, and Quincy Jones will receive a lifetime-achievement award.

On May 10 the Principality of Monaco is hosting the first World Music Awards show, which will be telecast worldwide from the Monte Carlo Sporting Club. The awards, covering "the whole spectrum of music," are based on record sales and special achievements in 1988.

**CD-I UPDATE**

Phillips and Sony have completed the development of specifications for Compact Disc-Interactive, or CD-I, which has the capability of combining high-quality video and sound with data storage. The new format is designed for use with microcomputers and is expected to find applications in the areas of entertainment, education, and information.

**NAKAMICHI CONCERTS**

The Nakamichi International Music Series, a program of weekly radio concerts, has just been launched by American Public Radio and WGBH in Boston. Beginning with three concerts taped at the Prague Spring Festival featuring the Czech Philharmonic and Prague Chamber Orchestras, the series will showcase vocal and instrumental artists, chamber groups, orchestras, and conductors in live performances from the major music centers of Europe, the Soviet Union, and Japan. Check with local schedules for dates and times of broadcasts.

**IMPROVED 8MM FORMAT**

Sony and Canon are countering Super VHS with a new 8mm video recording format, called Hi8, that provides hi-fi sound along with a higher-resolution picture than standard 8mm recording. Sony's Hi8 line includes the CCD-V99 Handycam camcorder ($2,200) and the EV-8900 videocassette recorder ($2,000). Canon's Hi-Band A1 camcorder lists for $2,299. The Sony vcr records stereo soundtracks with digital pulse-code modulation (PCM); the Canon machine uses audio frequency modulation (AFM).

**A VERY GOOD YEAR**

The American record industry had its best year ever in 1988, according to the Recording Industry Association of America. A grand total of 762 million recordings were sold, in all formats. The previous high, 726 million, was set in 1978. Overall revenues were up too. The leading format last year, as it has been for the past six years, was the tape cassette. It outpaced the cd by three to one—and the lp by about six to one. In dollar figures, cassettes were up 14 percent, cd's up 31 percent, lp's down 33 percent.

**BULLETIN**

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"They provide smooth, fast and incredibly well detailed sound."
"Polk's RTA Tower Loudspeakers Combine Legendary Polk Performance with Contemporary Style."

Big speaker performance with an efficient use of space.

RTA 11t
The RTA 11t is the finest conventional (non-SDA) speaker that Polk Audio manufactures. Its extremely high power handling (250 watts) and high efficiency (90dB) provide remarkable dynamic range from both large and small amplifiers. The RTA 11t utilizes the same technologically advanced fluid-coupled subwoofer design found in Polk's flagship model. Dual 8" sub-bass radiators are coupled to two 6½" mid-bass drivers, resulting in a fast, powerful, deep, and ultra-accurate bass response, without the boomy, undetailed sound of large woofer systems.

RTA 8t
In a slightly smaller package, the RTA 8t offers the same driver complement as the larger, more expensive RTA 11t, and thus shares its benefits of superior imaging, musicality, and detail.

Both Polk RTA series loudspeakers achieve the extremely rare combination of good looks and state-of-the-art performance. The tall, elegantly slender, and deep "tower" design cabinets allow for substantial internal volume for high efficiency and powerful bass, while requiring less than one square foot of floor space. The small baffle surface area around each driver minimizes diffraction (sonic reflections), thereby insuring outstanding imaging and low coloration.

Positioning the 1" silver-coil dome tweeter between the two 6½" tri-laminate polymer bass/midrange drivers achieves what is called "coincident radiation." This means that both the mid- and high-frequencies appear to radiate from the same place on the baffle resulting in perfect blending at the critical crossover point. (See illustration, below).

Polk RTA speakers have an uncanny ability to perfectly reproduce the human voice, pianos, guitars, and every other instrument whose faithful reproduction demands superlative midrange and high-frequency performance. Bass and percussion instruments are accurately reproduced with full visceral power and realism, without the heaviness, boombiness, or lack of detail that plague lesser designs.

The discriminating listener who seeks state-of-the-art performance and design will find the quintessential combination of both in Polk's RTA series loudspeakers.

THE PRINCIPLES OF COINCIDENT RADIATION

The benefit of coincident waveform propagation resulting in precise imaging, uniform vertical dispersion and startling midrange accuracy.

The perceived source of sound of two identical drivers is centered in the area between them.

In the Polk RTA loudspeaker, the tweeter is positioned at the acoustic center of the drivers.
Stereo Review

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LETTERS

Tape Recording

Compliments on Craig Stark's article on using a tape recorder (March). He made some excellent, nontechnical points based on a healthy appreciation of the medium—and an admission of its limitations.

Mr. Stark's suggestions about riding gain were well taken, but it should be noted that various very sophisticated compressors are now available for consumer use—items that were once available, at heavy expense, only in professional settings. In particular, the dbx company makes an excellent CD player with a built-in compressor (the same compressor is also available as an outboard unit). It can be totally switched out of the circuit or, when switched in, adjusted to work a slight compression or a considerable one. I find that just a bit of tailoring allows all but the most difficult CD's to be put down on cassette tape safely, without overload or noticeable tape hiss.

DAVID E. LICHT
Jackson Heights, NY

The New Jazz

According to the Marsalis brothers and Harry Connick, Jr., as their views were presented by Chris Albertson in "The New Jazz" (March), jazz, unlike any other type of music, must not evolve. Rather, it must remain static—frozen in a period and style of their choosing. Their efforts to pigeonhole jazz and give it some sort of unassailable definition serve no purpose. It's like asking if Mozart's symphonies are superior or inferior to Mahler's.

Yet the neoboppers have nothing to fear. The sounds of the great jazz icons are in no more danger of going silent than the sounds of a Bach fugue. Great music endures.

PAUL CERVANTES
Canoga Park, CA

Sony Shuffle: The Last Word

I am disappointed that my Sony CDP-50 compact disc changer repeats selections in the multidisc shuffle-play mode. Originally, I thought something was wrong with the machine and sent it to the district service center for repair, which sent it back, stating that repeats were normal.

When I read the letter from Mr. John H. Berry, Jr., in the March issue saying that Sony told him the repeats were abnormal and that a service bulletin had been issued for his model, the CDC-70, I hoped that one had also been issued for mine. I called the district service center and Sony headquarters, but no one knew of any service bulletin. The Sony representative did say that both models perform the same in the shuffle-play mode. Could you straighten this out?

MICHAEL MOORE
Philadelphia, PA

We have received a number of inquiries regarding a letter from Mr. John H. Berry of Hastings, Michigan, published in the March issue of STEREO REVIEW.

The shuffle-play function in all current Sony CD players makes selections on a truly random basis. This means that during some listening sessions selections will be repeated before all selections are played, providing for true variety in play sequence.

We called Mr. Berry but were unable to speak with him. We did speak with the servicer he referred to in his letter and learned that the service bulletin he mentioned address another microprocessor function.

We at Sony truly apologize for any confusion regarding this issue.

TIM MARSHALL
District Service Manager
Sony Corp. of America
Farmington Hills, MI

The Optical Turntable

How disappointing to read in March's "The High End" column that laser-read LP's are not on the horizon. I keenly remember the excitement of reading about this emerging technology several years ago, and I have been telling friends to delay buying a CD player because the new laser component was just around the corner.

How foolish I was.

WENDY A. BIE
Rolla, MO

Oh, optical turntable—where were you when we needed you? Devotees of the vinyl LP will wonder, and perhaps never know, if the O.T. could have saved the LP from oblivion. Could it yet bring it back?

BEN CALDERONE
Levittown, NY

Don't hold your breath.

Michelle Shocked Bonus

The review of Michelle Shocked's "Short, Sharp, Shocked" in March's "Best Recordings of the Month" states...
Most car audio components have their controls facing front and center. Which is great for drivers who like to sit on the transmission hump or the stick shift. But ridiculous for the rest of us.

So we designed ours with the controls angled towards the driver. Which seems to make a little more sense to us.

To see how it looks from your point of view, see your Toshiba car audio dealer.

If you sit on the left, it's the right thing to do.
The Brains.
Carver's new CT-Seven Remote Control Preamplifier/Tuner with Asymmetrical Charge Coupled FM Detection and Sonic Holography.

The Brawn.
Your choice of four high power advanced Magnetic Field amplifier designs.
Power and finesse. They've always been important factors in a serious listening system. Now there's a new way to achieve both without overpowering your budget.

Our new CT-Seven preamplifier/tuner combines a Sonic Holography® preamplifier and Asymmetrical Charge-Coupled FM Detection tuner into one convenient component.

It makes beautiful music with our whole line of Magnetic Field Power amplifiers. Including the new M-4.0t with the same transfer function and power output as Bob Carver's $17,500-pr. ultra-esoteric Silver Seven monoblock amplifiers.

**The CT-Seven as an audiophile preamplifier:** Like Carver's fine separate preamplifiers, the CT-Seven is designed as a "straight wire with gain," capable of perfectly passing input signals without adding or subtracting any musical nuances.

It includes a meticulously engineered, ultra-low noise phono stage that flawlessly duplicates the theoretical RIAA equalization curve.

**The CT-Seven as a complete sound control center:** From the comfort of your listening chair you can choose from six sound sources including dual tape monitors, CD input and video/auxiliary inputs (suitable for video sound or DAT). Unlike most remote volume adjustments which use distortion-inducing electronics, the CT-Seven employs a motorized volume control for smooth control and smoother sound quality. Also included are useful 3-band tone controls, mono switch, loudness equalization and a studio-quality headphone amplifier.

**The CT-Seven as your passport to musical reality:** The CT's Sonic Holography® Generator is capable of redefining your perception of music by recreating the sound stage and 3-dimensional spatial characteristics of a live performance. According to some of America's top reviewers, Sonic Holography® "seems to open a curtain and reveal a deployment of musical forces extending behind, between and beyond the speakers. The effect strains credibility." And you can create it from any stereo record, tape CD or even FM broadcast. With your existing speakers. At the touch of a remote button.

**The CT-Seven as a high performance quartz synthesized FM tuner:** You've simply never heard FM until you've heard it through the Carver Asymmetrical Charge-Coupled FM Detector circuit. Multipath distortion, interference and distant station noise are dramatically reduced. Weak stations emerge into dramatic clarity yet stereo separation, space, depth, and ambience were not only retained, but seemingly enhanced by the lack of background noise.

Choose 8 FM and 8 AM presets by remote control. Scan the broadcast band automatically or manually. With the CT-Seven's ACCD circuit on, you'll discover "new" stations which were previously unlistenable!

**The CT-Seven's power partners:** Only Carver gives you four high power amplifier choices from 140 watts to 375 watts per channel. Each is perfectly matched to the CT-Seven and each uses Carver's cool-running Magnetic Field Technology which dispenses with bulky power supplies and power-wasting external heat sinks... yet which is so rugged it's used in the world's largest touring professional sound systems.

Choose from the new "modestly-powered" M-0.5t (140 watts per channel RMS 20-20kHz both channels driven into 8 ohms with less than 0.1% THD), the M-1.0t (200 watts/ch. per channel RMS 20-20kHz both channels driven into 8 ohms with less than 0.15% THD), the M-500t (250 watts per channel RMS 20-20kHz both channels driven into 8 ohms with less than 0.15% THD), or the new M-4.0t (375 watts per channel RMS 20-20kHz both channels driven into 8 ohms with less than 0.5% THD).

**Hear brains and brawn together at your Carver dealer:** Switch the CT-Seven and the most expensive tuner in the room to hear Asymmetrical Charge-Coupled FM Detection work its magic. Put on your favorite CD, press the CT-Seven's Sonic Holography® remote button and feel the sound room "disappear." Turn up the volume to live performance levels and discover the impact of true dynamic headroom.

And then get ready for another pleasant experience when you discover what a super value the CT-Seven and Carver power amplifiers are.

For more information or the dealer nearest you, call 1-800-443-CAVR
that the album's length is thirty-four minutes and it contains ten songs. The CD has a timing of thirty-six minutes, thirty-three seconds and contains an additional, eleventh track that is not mentioned in the credits. Do you happen to know why it's not listed?

ROBIE CALLAHAN
Mobile, AL

According to Mercury Records, the bonus track on the CD, Fogtown, is "just there" so no annotation was given. It's intended "to lift you out of your seat for the final two and a half minutes." An earlier, acoustic version of the song was included in Shocked's "The Texas Campfire Tapes" LP.

CD Player Listening Tests

Congratulations on Ken C. Pohlmann's article in the December 1988 issue on perceived differences between six good CD players. The audio world has needed this for some time. You cannot have been unaware of the published views of some British magazines, which have left the man in the street a trifle confused. Thanks for bringing the discussion back to earth.

TONY HAWKES
Randburg, Republic of South Africa

It did not surprise me one little bit that you could find little audible difference between the mediocre players included in the December listening tests. Have you ever heard of McIntosh? Audibly superior in every way, the new Model 7007 is the most analog-sounding player I've ever heard.

THOMAS O. ELIASON
San Jose, CA

I concurred with the conclusions of Ken C. Pohlmann's article on CD player listening tests and felt he supported his claims well even in follow-up responses in the "Letters" column, so I took my three-year-old Yamaha CD player to an audio dealer and compared it for hours with top-rated new players. I switched between my own discs and listened through headphones. Audible differences were subtle if present at all, so I thanked the very kind dealer and felt good about saving myself $600 for a new player.

DENNIS FELA
Cheswick, PA

Strange Words

I have been receiving Stereo Review for many years and have been mystified by the "Performance" and "Recording" ratings in the review section. Not long ago I purchased a CD on the basis of the reviewer's word that the performance was "Fluent" and the recording "Resonant." The performance was only fair, and the recording was merely good. On a scale of 1 to 10, I would give the CD a 4 for performance and 5 for recording. I was looking for a 9 or better in both categories.

You need a table that would explain the meaning of all the strange words your reviewers use, such as "Animal crackers," "Energetic," "Dylan's garage sale," "Homespun," "Ear candy," etc. I found 109 of these terms in four issues of Stereo Review. A study of a year's issues might reveal 200 or more adjectives. Compared with a 1-to-10 grading system, would the word "Spacious" mean a 9, 8, 7, or what? "Wow" could be either a 1 or a 10. And where does "Not like Mom" fit into the system?

DON SAMSE
Ramona, CA

The brief comments following the "Performance" and "Recording" tags in our reviews are not intended as ratings. They just indicate the general thrust of the reviews as an aid to browsing.

New Age Essentials

As the producer and host of commercial radio's first and most widely listened to syndicated New Age program, I offer this list of ten "essential" compact discs (in no particular order) to those who might be interested in exploring the best of New Age music.

1. Kitaro: Silk Road [Gramavision]
2. Ray Lynch: Deep Breakfast [Music West]
3. Andreas Vollenweider: White Winds [CBS]
5. Michael Stearns: Planetary Unfolding [Sonic Atmospheres]
6. John Surman: And the Stars Go with You [Miramar]
7. Patrick O'Hearn: Between Two Worlds [Private Music]
8. Jean-Michel Jarre: Oxygène [Polydor]
10. Deuter: San [Kuckuck/Celestial Harmonies]

FRANK FOREST
Mill Valley, CA

Correction

In the review of "Cedar Walton Plays" on page 113 in the March issue, the record label is correctly identified as Delos in the heading, but the album is misidentified as a Denon release in the body of the review. We regret this error.
Every now and then, you've got to put some distance between you and the rest of the world. And nothing helps you do that like your music and components from Sherwood.

Sherwood audio components combine the right balance of legendary engineering with advanced electronics for superior music reproduction.

And if the Sherwood name isn't enough of a guarantee, there's our CERTIFIED PERFORMANCE. You'll see it right on the carton. Not a recap of the specs, but the actual measurements of the unit inside.

No one else takes that extra step. So look for Sherwood components and create a system that's good for your system.
THE REFRESHEST

SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide.
**Phase Technology**

Phase Technology’s Model 435ES is a two-way bookshelf loudspeaker with an 8-inch bass/midrange and an asymmetrically mounted 1-inch ferrofluid-cooled soft-dome tweeter. Sensitivity is rated as 92 dB sound-pressure level, power handling as 80 watts, and frequency response as 45 to 20,000 Hz ± 3 dB. The enclosure measures 22½ x 12 x 10⅛ inches and is finished in walnut or dark-oak woodgrain vinyl. Price: $300 a pair. Phase Technology, Dept. SR, 530 Rosselle St., Jacksonville, FL 32204.

**Yamaha**

The Yamaha AVC-70 preamplifier has five video and ten audio inputs and incorporates digital circuitry for four surround-sound modes: Dolby, hall, live, and simulated-surround. It has two S-VHS inputs, and there are front-panel video and audio inputs for an auxiliary source such as a camcorder. Delay is adjustable in four steps between 15 and 30 milliseconds. Additional features include bass, midrange, and treble controls for the audio output, a bass-extension switch, and a ten-position record-out selector so that an input signal can be routed to an audio or video recorder while another signal is fed to the main system. The supplied ninety-one-key remote control can also operate a variety of other Yamaha components. The available finishes for the AVC-70 are titanium-color and black. Price: $529. Yamaha, Dept. SR, 6722 Orangethorpe Ave., Buena Vista, CA 90620.

**Audio Control**

Audio Control’s 4XS car stereo electronic crossover can be used in either a four-channel two-way or a two-channel three-way configuration. It has a separate, independent subwoofer output and a bridging adaptor. Virtually any crossover frequencies between 10 and 20,000 Hz can be programmed using a plug-in module. The Programmable Frequency Match circuit is an additional steep-slope, high-pass filter that can be used to exclude infrasonic frequencies or be set to cut off at a higher point to help tune speaker enclosures or protect drivers. Price: $199. Audio Control, Dept. SR, 22313 70th Ave. W, Mountlake Terrace, WA 98043.

**JBL**

The JBL LX55 is a three-way loudspeaker with a 1-inch titanium-dome tweeter, a 10-inch high-polymer-laminate woofer, and a 5-inch polymer-laminate midrange. Its frequency response is rated as 40 to 20,000 Hz, sensitivity as 92 dB sound-pressure level with a 1-watt input. Crossover frequencies are 800 and 4,000 Hz. Nominal impedance is 8 ohms. Dimensions are 26 x 14 x 12 inches. Grilles are charcoal gray, and cabinets are black. Price: $798 a pair. JBL, Dept. SR, 240 Crossways Park West, Woodbury, NY 11797.
Sony

Sony's MDR-IF5K cordless headphone system uses infrared technology. The headphones themselves weigh 4 ounces and have semi-open-air earpads and individual volume controls for each ear. The accompanying TMR-15F stereo transmitter uses high-output infrared diodes for high-speed response and wide directivity and has an automatic-level-control circuit to optimize the frequency-modulated signal to the headphones. It serves as a combination recharger and stand for the headphones when they're not in use. Price: $200 complete, including headphones, transmitter, AC adaptor, and mini-plug adaptor. Sony Corp. of America, Dept. SR, Sony Dr., Park Ridge, NJ 07656.

Clarion

Clarion's Model 5630CD, a 20-watt-per-channel car CD receiver, is the company's first noncartridge-loading CD player. It has a three-beam laser tracking system and a low-vibration suspension system that is said to prevent mistracking. Users can sample each track of a disc for 10 seconds, and the repeat function allows repeat of a whole disc or a single track. The tuner section features Clarion's Magi-Tune FM reception system, eighteen FM and six AM presets, auto-seek tuning, and preset scan. The 5630CD has Clarion's antitheft security-code system. Price: $829.95. Clarion Corp., Dept. SR, 5500 Rosecrans Ave., Lawndale, CA 90260.

Lebo

Lebo's CD storage racks are available in a two-shelf and a three-shelf model, which can be stacked as shown. The Model 54596 holds ninety-six regular CD's or forty-eight double discs on three shelves. The two-shelf Model 54564 holds up to sixty-four single CD's or thirty-two doubles. Both have a laminated oak-grain finish and measure 19 inches wide and 5½ inches deep. The Model 54596 is 18 inches high, the Model 54564 12½ inches. Prices: $55.95 and $41.95. Lebo, Dept. SR, 60 West St., Bloomfield, NJ 07003-4998.

One Step Ahead

The CD Organizer & Evaluation System from One Step Ahead includes color-coded labels for filing CD's by music genre, artist, or period. Each label can be filled in with a numerical preference rating and tempo code for each track on the disc. Packages contain either forty-two or eighty-four labels. Prices: $2.95 and $4.95. One Step Ahead, Dept. SR, 4320 196th St. SW, Box 239, Lynnwood, WA 98036.

BASF

The Ferro Maxima I cassette, the third ferric cassette in BASF's audio line, uses dual-layer "micro-coating" technology and proprietary megadium iron oxide. The maximum output level is said to be almost 4 dB higher than that of BASF's Ferro Extra I cassette. Prices: C-60, $2.59; C-90, $2.89. BASF, Dept. SR, Crosby Dr., Bedford, MA 01730.
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Carver

The Carver TL-3300 compact disc player has an 18-bit, eight-times-over-sampling digital filter, dual digital-to-analog converters, and a three-beam laser system. It also features Carver's Digital Time Lens, which is said to restore ambience and balance that may have been lost as a result of the digital recording process. The player accepts CD-3's without an adaptor. A twenty-two-key remote control is included. Price: $699.95. Carver Corp., P.O. Box 1237, Lynnwood, WA 98046.

Onkyo's TA-RW400 dubbing deck has two separate computer-controlled transports. It features Dolby HX Pro, Dolby B and Dolby C noise reduction, automatic bias and equalization settings for tape Types I, II, and IV, and a switchable MPX filter. The deck's continuous-play design enables both sides of each tape to run sequentially for up to 3 hours of uninterrupted play. Price: $350. Onkyo, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

Superphon

The Superphon C.D. Maxx preamplifier, designed for listeners who have chosen CD's as their primary recorded music source, has only line-level inputs. Its top-accessed controls are mounted on the circuit board, directly in the signal path, which eliminates long signal traces to improve "articulation, clarity, and punch." The pure Class A circuitry uses MOSFET's and FET's. There is a straight-wire bypass that switches the line stage out of the signal path for passive operation. The C.D. Maxx has three line-level inputs, a tape loop, and two sets of output jacks. Total harmonic distortion is rated as less than 0.05 percent at 2 volts output, frequency response as 2 to 200,000 Hz, and signal-to-noise ratio as better than 95 dB. Price: $329. Superphon, Dept SR, 1035 Conger, Unit 3, Eugene, OR 97402.

Cerwin-Vega

A pair of CMW5 5¼-inch midrange/woofers, a pair of CD3 dome tweeters, crossovers, mounting hardware, and terminals make up Cerwin-Vega's new automotive speaker-system package. The overall frequency response is rated as 50 to 20,000 Hz. Sensitivity of the midrange/woofer is rated as 91 dB sound-pressure level at 1 meter with a 1-watt input, and that of the tweeter is rated as 94 dB. Recommended amplifier power is 45 watts. Price: $199.95. Cer- win-Vega, Dept. SR, 555 E. Easy St., Simi Valley, CA 93065.

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**New Products**

**Teac**

Teac's PD-700M six-disc CD changer has a front-loading magazine. It uses quadruple oversampling and has dual digital-to-analog converters. Up to thirty-two selections can be programmed, and there is a three-way repeat feature. The magazine is CD-3-compatible. A full-function remote control is included. Price: $479.95. Teac Corporation of America, Dept. SR, 7733 Telegraph Rd., Montebello, CA 90640.

**Denon**

The Denon DCD-1420 CD player features the company's Delta circuit, which incorporates an eight-times-over-sampling, 20-bit digital filter and dual 20-bit digital-to-analog converters. There are optical and coaxial digital outputs for connection to digital amplifiers, fixed and variable analog outputs, separate power supplies for the digital and analog sections, and linear-crystal oxygen-free-copper wiring in the analog filter. Other features include phrase repeat, twenty-selection programmability, auto space, auto edit, index search, and remote control. Price: $550. Denon America, Dept. SR, 555 New Rd., Parsippany, NJ 07054.

**Lazarus**

The Lazarus M200 is a hybrid dual-monaural power amplifier that uses vacuum tubes in the driver stages and MOSFET's in the final output stages. Designed with zero negative feedback, it is rated to deliver 200 watts rms per channel into 8 ohms, 375 watts into 4 ohms, and 525 watts into 2 ohms. Controls include buttons for power and standby mode (power on, outputs muted). Price: $1,750. Lazarus, Dept. SR, 8130 Coldwater Canyon, North Hollywood, CA 91605.

**Audio-Technica**

Audio-Technica's AT-ML170 is a dual-moving-magnet phono cartridge with the magnetic generators arranged in a "V" shape to match the geometry of the recording process. It uses a gold-plated boron cantilever and pure copper wiring in the proprietary Paratoroidal coils, which are said to offer low inductance for a flatter frequency response and reduced susceptibility to loading effects. The ML170 is rated to deliver 4 mV output at a lateral stylus velocity of 5 cm/s. Channel separation is given as 31 dB at 1,000 Hz, with the channels balanced within 0.5 dB. Frequency response is rated as 5 to 40,000 Hz. The recommended tracking force is 1.25 grams. Price: $345. Audio-Technica, Dept. SR, 1221 Commerce Dr., Stow, OH 44224.

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All the information in the "New Products" section was provided by the manufacturers and does not represent the results of tests by STEREO REVIEW. Prices given are suggested retail ("list") prices as of press time. For more information, write the manufacturers or circle the corresponding numbers on the reader service card facing page 121.
More For My Money

I'd always thought you needed big speakers to get good sound. So every couple of years, some department store would have a sale and I would buy the biggest speakers I could find for the money. Then I moved across the country to take a new job. I left my old speakers behind. I was sure they wouldn't fit in my new apartment and I was ready for new ones anyway.

After the move, I went shopping for new speakers at a specialty hi-fi store near my apartment. I told the salesman to show me something under $500. He took me into a room full of all kinds and sizes of speakers.

The first speakers he demonstrated were fantastic. The bass was big and tight. The stereo image was beautiful. Surely it was the biggest pair in the room.

"I don't have the room for those big speakers," I said. "And besides, I'm sure I can't afford them."

He stopped the demonstration to show me a KLIPSCH kg", a compact and elegant model. "Yeah, this is more my size," I said, "let's hear a pair of these."

"You just did," he said.

I bought those kg's. I paid a lot less than I had planned. And, believe me, I got a lot more for my money.

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

**by Ken C. Pohlmann**

*It used to be easy to tell when a person was into computers. If you got close you could hear him talking about chips—8080, Z-80, 8085, 6800, or whatever, but it was always chips. In contrast, audio people felt secure in their ritual discussions of cartridge impedance, watts per channel, and subwoofer diameters.*

*Today, things have changed. Computer people still talk about chips, but now audio people are talking about chips too. Debates rage about the relative merits of four-times- and eight-times-over-sampling CD players and whether 16, 18, or 20 bits are needed for good digital-to-analog conversion.*

Digital signal processing (DSP) is purely a technology of chips, and audio will eventually become, to a large degree, an implementation of digital signal processing. It will be just like computers and data processing—only in this case the data may be Mozart or Guns n’ Roses.

One existing example of DSP technology that links computers and audio is the NeXT computer, the electrical progeny of Apple Computer’s co-founder and former chairman, Steve Jobs. The NeXT is a personal computer incorporating a number of technological breakthroughs, including a removable read/write/erasable optical disc that can hold 256 megabytes of data and a DSP chip, the Motorola 56001, that’s used to process audio data. For the benefit of computer types, the 56001 is a fixed-point DSP chip using 24-bit architecture and two 56-bit accumulators. For us audio types, the 56001 is incredibly precise in its operation—for example, the accumulators provide 336 dB of dynamic range—and it is also blissfully fast.

The 56001 chip processes audio data with the same 16-bit word length and 44.1-kHz sampling rate as a compact disc player, performing both analysis and synthesis tasks. As a result, in addition to all of its computing assets, the NeXT offers the most advanced audio technology ever designed into a basic computer. Thanks to chips.

Meanwhile, while almost nobody was looking, stereo systems also took a quantum leap forward, thanks to still more chips. Chips instigated the digital audio revolution, and they are about to lead us into the next phase of the digital era. Soon DSP chips will process all parameters affecting high-fidelity sound recording and reproduction. Rather than cut short digital audio’s benefit at a CD player’s output, a DSP-equipped system will maintain the audio signal in the digital domain throughout the audio system, up to the amplifier (and eventually to the loudspeaker itself).

Two examples of audio DSP chips have been introduced by Sony, not surprisingly a leader in computer technology as well as in audio. The CXD-1160 and CXD-1355 DSP chips permit precision control of parameters such as bass and treble tone-control settings, parametric equalization, infrasonic and ultrasonic filtering, reverberation, delay, surround sound, and dynamic-range compression and expansion. Throw in a little random-access memory (about 256 kilobytes), and the chips can perform automation and programming functions.

The CXD-1160 is tailored for dynamic-range, equalization, and time-delay processing, performing 32-bit calculations on 24-bit words. The CXD-1355 is primarily intended for time-delay and surround-sound processing. It has a digital attenuation circuit, an eight-times oversampling circuit, and 18-bit digital input/output (I/O). Together, the two chips form the heart of a digital component capable of performing preamplifier functions.

Sony’s first consumer digital signal-processing component, the TA-V925E preamplifier, was introduced in Japan last November. It does everything you’d want a preamplifier to do, and it does it digitally. There is three-band parametric equalization with variable bandwidth and twenty-two adjustable frequency points. A digital dynamics processor permits three levels of compression: low-level (1:1.25 above —16 dB), mid-level (1:1.6 above —14 dB), and high-level (1:2 above —12 dB). A surround processor permits three modes of operation: movie surround (delay up to 80 milliseconds), music surround (delay up to 3 seconds), and simulated surround (delay up to 80 ms). There are a number of factory-set and user-programmable preset memories for all of the processing circuits. Fortunately, although its designers certainly needed Ph.D.’s in computer science, users of the TA-V925E do not.

While the TA-V925E will not be brought into the U.S., an export version of the preamplifier will be introduced here this summer. It is only a forerunner of many DSP products to come from Sony and its audio-manufacturing colleagues. In the same way that the CD player surmounted the stubborn limitations of analog music storage, DSP components will solve many of the problems of analog processing.

In addition, just as the CD format opened new markets, DSP will expand the horizons and functions of high-fidelity systems. Elements of DSP technology will appear in home, car, and portable digital audio products. Because DSP chips are programmable, custom software will provide new opportunities for audio designers. Even analog recordings will benefit, as DSP systems employ software for noise reduction and other processing.

On the other hand, DSP is not an easy technology. Whereas CD’s appeared on the scene fully formed, DSP will not. Audio processing taxes present chip technology to the limit, demanding the fastest and most accurate chips we can make to insure a high-fidelity signal. With the coming of DSP, we will embark on a digital audio evolution every bit as interesting and diverse as that which made analog audio evolution so exciting—and challenging.

Still not convinced? Consider this: In 1982 the Audio Engineering Society met to consider digital audio. Among topics on the agenda was a novel technology called compact disc. This May the AES convenes in Toronto for its second meeting on digital audio. The item at the top of the agenda? You guessed it: DSP.
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CIRCLE NO. 78 ON READER SERVICE CARD
Equalizer Boost

Q The addition of a graphic equalizer to my stereo system seems to increase the overall power level when many frequency bands are boosted. Is this a normal occurrence? And is it possible that the increase will drive my amplifier into clipping?

MICHAEL STUMPF
Montreal, Quebec

A It's certainly normal. Each control on an equalizer is the same as the volume control on your amplifier, except that it operates only in a fairly narrow frequency range. Increasing any of these controls will increase the overall level, although the effect may not be noticeable at high frequencies as relatively little energy is used in that part of the spectrum. Low frequencies, however, are very power-hungry, so boosting the bass with your equalizer will increase the overall level considerably. It is definitely possible to drive your amplifier into clipping doing this, particularly if you have little power reserve when the equalizer is set flat.

220-Volt Operation

Q My amplifier provides for operation at 220 volts, although the owner's manual only mentions overseas operation in this connection. I have a 220-volt line for my clothes dryer, and I'm considering using that to power the amplifier. Since power equals voltage times current, and this would double the voltage, shouldn't the output be doubled as well?

LARRY LUTMAN
West Streamwood, IL

A Your plan is probably possible, but there would be little or no benefit in pursuing it. True, an amplifier is designed to work with a certain voltage, but that is always much higher than the AC house current (110 volts in this country, 220 to 240 volts in many overseas areas). The power-supply section simply steps the house current up to whatever the amplifier is designed for. Units like yours provide for different line voltages not only as a convenience for buyers who may wish to move the component from continent to continent, but also to reduce the necessity of manufacturing different versions for different countries.

While different voltages may go into the power supply, what comes out is the same: the voltage the amplification circuits were designed for. So there would be no point in using 220 volts unless only that were available. And even if you could double the output of your amplifier in this way, it would only yield a gain of 3 dB, which would hardly be worth all the trouble.

Warped LP's

Q What can I do about warped record albums? Would putting an LP between two sheets of glass and placing it in my oven for 5 or 10 minutes at about 300 degrees flatten it?

R. LONG
Pontiac, MI

A The technique you describe has been used with some success over the years, but you have to be very careful when you do it. First, the oven should be set for its lowest temperature; 300 degrees would ruin an LP in no time. Second, the top piece of glass should be weighted down. Third, you should watch closely during the process and remove the record from the oven as soon as it looks close to flat. Finally, the whole works—glass, weights, and all—should be removed from the oven as soon as possible, placed on a flat surface, and allowed to cool before you remove the glass.

Even if you take all this care, you may well find that the vinyl has been deformed in the process, rendering the record extremely noisy or even unplayable. Before you risk it, therefore, try one of the various accessory weights or clamps designed to stabilize LP's; you may find that does the trick. Or if all you want to do is get one last good play that you can record, try applying small bits of strapping tape to the edge of the record and affixing it to the platter itself. Propping up the low spots with several layers of paper can also help to even out the record long enough to get one good copy.

Biwiring Speakers

Q I recently purchased a pair of speakers set up for biwiring. What does that mean, and is it worth doing?

F. R. COSIN
San Francisco, CA

A Several speaker manufacturers provide separate terminals for the high- and low-frequency drivers in a system, which allows you to run separate cables from a full-range amplifier to each driver while still using the speaker's internal crossover network. This practice is distinct from bi-amplification, which uses separate amplifiers for the different parts of the spectrum and an active crossover network in the circuit before the amplification stage.

Opinions vary as to whether biwiring results in any improvement in sound, and even its advocates seem reluctant to speculate on why it might work. I would hazard a guess, however, that whatever benefit there might be is caused by the doubling of the cable, which could be accomplished just as easily by using thicker wire.

Biamplified Hum

Q My audio system is biamplified, employing two stereo amplifiers and a separate electronic crossover network. Whenever I attach the stereo output of my television monitor to the system, a low-frequency hum appears, no matter which input is selected. If I eliminate the crossover and run the speakers directly, however, the hum disappears. Are audio signals from a video source unable to be biamped for some reason?

MARK D. DAGOSTINO
North Royalton, OH

A The line-level audio signals from a video monitor do not differ from other sources in any important way, and so there are no constraints on what you can do with them in terms of amplification or signal processing. In your case, it’s not the signal that’s causing problems—it affects all your sources—but the connection of the monitor to the rest of the system.

Hooking up your monitor is producing what is called a “ground loop,” one of the major gremlins of audio. Theoretically, the chassis of every audio or video component is grounded; there is zero electrical potential between it and the earth. In reality, however, such grounding is often imperfect, resulting in a
Quality Time. Your moments together are too precious to waste. That's why Pioneer created the PD-M700 6-disc CD player. Now you can enjoy up to six hours of digital music without interruption, at the touch of a single button.

Pioneer invented the 6-disc CD magazine system. The innovative format offers you multiple programming options, cataloging capability and is designed to work in both Pioneer home and car multi-CD players. Simply put, no other CD format offers you so many features and is so easy to use.

Pioneer offers a complete line of 6-disc CD players, all with Non-Repeating Random Play. Now you can spend less time changing your music and more time enjoying it.

Pioneer
We Bring The Revolution Home.
TDK's new MA cassettes have a voracious appetite for musical energy. Thanks to the awesome magnetic properties of their ultra-fine, ultra-dense Finavinx metal particles, they can consume (and store) massive quantities of the most powerful digital sources. Considering the high frequency MOL's (Maximum Output Levels) inherent in today's digital music, a tape must have extremely high coercivity and remanence to perfectly reproduce it. And MA's ultra-refined Finavinx, which contains nearly twice the magnetizable ions of normal and high position tapes, provides these two characteristics in a major way.

Compared to TDK's previous MA, an exceptional tape in its own right, new MA achieves a high frequency MOL (10 kHz) of 0 dB—an improvement of +3 dB! Combine this with an exceptional low bias noise of -58.0 dB, and you get a high frequency dynamic range improvement of 4.5 dB!

New MA's revolutionary particles also assure enduring storage and stable performance, thanks to TDK's special surface treatment. And to enhance these super characteristics, the anti-resonance SP-AR mechanism drastically reduces modulation noise.

So, it's no wonder why audio perfectionists who demand perfect reproduction select MA. It's even available in 110 minute lengths, which will accommodate two CDs. Due to TDK's unique combination of smooth, durable base film and special coating technology, long term reliability is finally possible in this length.

Of course, new MA is also available in 46 and 90 minute lengths. Now, exactly how hungry are you for metal?

Crosstalk Clarification

In February's column I discussed crosstalk cancellation: the technique of phase manipulation used by a number of manufacturers to widen the sound stage by removing information intended only for the right ear from the left speaker, and vice versa. The best-known versions are Carver's Sonic Holography and Polk Audio's Stereo Dimension Array, but there are several others. A reader asked whether such a technique could be used in the recording stage, removing the need for a decoder at the time of playback. In my reply, I said it couldn't be done, because the technique must be tailored to individual listening rooms and listener positions, and a recording engineer can't predict how his product will be heard.

I should have added that there have nonetheless been efforts to do exactly what our reader suggested. Carver itself experimented with this some years ago, and Bedini has more recently developed a system to do much the same thing. Such an altered signal can, of course, be produced at any point in the process, either during or after recording, and the effect it produces is no worse than that created by a playback decoder that can't be tailored to a specific listening circumstance (and most home units fall into this category).

Still, the only really satisfactory way to provide for enhancing the stereo image by crosstalk cancellation—and then only for a single listening position—is to make the effect user-adjustable, so that it can be altered when recordings are played, not when they are made.

“chassis ground” that is slightly at variance with absolute ground. In addition, the chassis grounds of two components may be different if they are connected to the AC house current at different points. When two such components are connected together the slightly different grounds allow a current to flow at the AC frequency of 60 Hz, and this is audible as hum, particularly when the low-level parts of the system are involved. It seems that this sort of mismatch exists between your TV monitor and electronic crossover, so that hum occurs whenever both are connected to the system.

The easiest solution is to break the connection between the two chassis. To do so, carefully remove a short length of the braided outer conductor at one end of the cable joining the TV monitor and the rest of your system (do it for both channels, of course). This will prevent current from passing from one chassis to the other, but the cable will still be shielded by virtue of its connection to ground at the unaltered end.

CIRCLE NO. 119 ON READER SERVICE CARD
"You don't have to spend an arm and a leg to get some of our best thinking."  

Peter Tribeman  
President, NAD (USA)

The 7225PE's front panel contains all the controls and displays needed for effective day-to-day use.

The rear panel contains additional controls and connections, including the Soft Clipping switch, speaker impedance selector, gold-plated phono-in jacks, heavy-duty binding-post speaker terminals, and preamp-out/main-in jumpers for system expansion.

Lately you have been hearing a lot about our take-it-to-the-limit Monitor Series components. We ask you to consider now a new member of the NAD Classic Series: The 7225PE Receiver. It is compact, shockingly powerful, and entirely affordable.

Simply put, a "25 watt" receiver is not expected to perform and sound like the 7225PE. Experienced listeners, in blind tests against receivers rated at twice and three times the power, have been moved to such comments as: "More open," "more dynamic," "richer sound." It was not news to us.

To obtain a glimpse into the reasons for this, ask your dealer to take the 7225PE off the shelf. Pick it up yourself. You will realize at once that you are holding a very substantial component. As you would expect from NAD, every ounce is there to enhance listening and ease of use.

For example, NAD's renowned Power Envelope amplifier design uses a two-stage "smart" power supply that provides higher power for musical peaks. Up to 85 watts of clean dynamic power. And our Soft Clipping™ circuit (which is defeatable) prevents harsh distortion when the demands of the music exceed most other amplifiers' limits.

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IS POLARITY AUDIBLE?

In recent years, a belief has developed among some audiophiles that the "absolute polarity" of a program should be maintained in order to realize its most accurate reproduction. Although this idea has received the greatest attention from high-end audio users, we are seeing components at widely different price points that now incorporate polarity-reversal switches. Presumably, if the program sounds better in one of the switch positions than in the other, the polarity is correct for that specific recording.

Let us see what this is about. In simplest terms, the rationale for this idea begins with the belief that the sound from most, if not all, musical instruments begins with compression of the air about them, which travels outward as a positive pressure wave. On the next half-cycle, as the diaphragm or air column that originally creates the sound reverses its direction of motion, the air is sucked in, and a negative pressure wave is radiated. I suspect that this basic premise is flawed (by oversimplification), but I have no evidence for or against it.

Believers in the importance of polarity hold that the reproduction of such a sound should match its generation. In other words, the loudspeaker diaphragm should move outward and compress the air in front of it during the portion of the waveform that was originally created by a compression and move inward during the part corresponding to a rarefaction. This concept does have an appealing logic at first glance. It should be possible to verify its validity, one would think, by inverting the playback signal's polarity and listening for a change (for better or worse) in the sound. As anyone who has tried this experiment knows, that is simply not the case. As a rule, nothing happens when polarity is inverted. Obviously, since there is no universal standardization with respect to microphone output polarity, phasing of multiple microphones, or microphone placement relative to the sound sources, it is quite difficult to establish a single-valued "polarity" for a recorded program. Only a monophonic recording of a single source (instrument or human voice) in an anechoic chamber would have any reasonable chance of capturing the original polarity of the sound being recorded.

The situation becomes impossibly complex when you are dealing with the typical music recording made in a studio or concert hall and using a multitude of microphones. Even if all those dozens of microphones were phased identically (unlikely), and if no unexpected reversals took place in the mixdown, and if the resulting polarity (whatever that might be) was recorded correctly by a standard method (which does not exist), and if the playback system had a known polarity—either inverting or noninverting—from source to speakers, the result would almost certainly still not be a true replica of the initial sound waveform. And if, by some chance, it was essentially perfect, it still would not sound exactly like the original program would have sounded to anyone present at the recording session.

Although I am setting up an impossible set of conditions for a true "absolute polarity" to exist throughout the recording/reproduction process, the validity of that concept is easily tested experimentally. As I said, as a rule nothing happens in such experiments, though it is possible that someone with extraordinarily acute hearing might hear a difference in the sound—whether or not it represented an improvement—when the polarity is reversed.

I have never heard of a convincing test showing that polarity reversal has positive results. In my own case, I have had occasion to test a couple of products containing polarity-reversing switches. The first, a receiver, startled me when a difference was plainly audible. Further investigation, however, revealed that the gain of its amplifier section changed by about 0.2 dB when the reversal was made, wholly invalidating the test. Later, a CD player having a polarity switch (and with an unchanging gain) defied my most careful attempts to hear any difference between its two conditions.

It is easy for you to test this for yourself, without risk of an undesired gain change, by reversing both sets of your speaker leads simultaneously. This should be done with a suitable four-pole, double-throw switch (nonshorting, if you value your amplifier). I would appreciate hearing from anyone who either

Tested This Month

NEC CD-830DS
Compact Disc Player
JVC XP-A1000 Digital Surround Processor
Advent Prodigy Tower Speaker System
Hitachi DA-C70 Compact Disc Changer
Grundig Fine Arts A-903 Integrated Amplifier
Mordaunt-Short MS55Ti Speaker System
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TECHNICAL TALK
concurs or differs with my conclusions, but only after trying the experiment himself. No unsupported opinions, please.

It is true that there is a real, and often very large, difference between the positive and negative halves of most instrumental (or vocal) waveforms. This asymmetry can require peak amplifier powers many times higher for one polarity than for the other. The requirement is equally valid for either direction of cone movement, however, and has nothing to do with the original polarity of the sound. Since an amplifier (and speaker, for that matter) must operate equally well with both output polarities, polarity asymmetry is a trivial matter in audio reproduction.

I recall my first-hand experience with this effect as a relatively new amateur radio operator some fifty years ago. For maximum communication effectiveness, it was desirable to modulate one's AM transmitter as fully as possible. Exceeding 100 percent modulation in the negative (downward) direction produced severe distortion and interference with other stations, but upward modulation could exceed 100 percent without harmful effects, and with improved communication effectiveness. I found that reversing my microphone polarity made a dramatic improvement in my signal reports, without any undesirable side effects. What I was doing, of course, was polarizing the microphone to modulate upward with the half of my voice waveform that had the largest peak amplitudes.

All this does not have too much to do with hi-fi, I suppose, except to show how easily a small grain of sense can be expanded into a volume of nonsense.

Only a monophonic recording of a single instrument or human voice in an anechoic chamber would have any reasonable chance of capturing the original polarity of the sound being recorded.
Tommy LiPuma produces music for Al Jarreau and David Sanborn.

But who produces music for Tommy LiPuma?

What kind of car audio system could meet the standards of a man with 4 Grammys?

It should have cassette, CD and DAT players that produce studio-quality response, immune from vibration.

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A remarkable combination of exceptional performance, flexibility and value.

The GFP-555's musical performance is outstanding—by any measurement or listening criterion. For example, Stereophile* calls it "one of the most satisfying preamps around in terms of overall tonal balance... You can go back to it after a few weeks and still feel it to be basically right; it reveals most associated equipment as more colored than itself."

At the same time, the GFP-555 is surprisingly affordable. Again, from Stereophile*: "It is unclear from close examination why it should cost only $500... it outperforms several competitors from the $2500 bracket."

Here are just a few examples of how we did it. The GFP-555's gain path includes the most innovative state-of-the-art linear amplifiers ever used in high fidelity components, and is simple and direct from input to output.

The speed of the gain stages is almost fifty times faster than CD or LP signals. And the noise and distortion measurements are incredibly low. Direct coupling makes possible a frequency response from below 1 Hz to beyond 400,000 Hz.

Superb construction, incorporating regulated power supplies with large filter capacitors, provides superior performance no matter how widely the musical signal or AC line voltage may fluctuate.

As for flexibility, you can listen to any source while taping from another. There's an unusual number of inputs and outputs, plus adjustable phono gain and capacitance.

If you'd like the full story of this remarkable preamplifier and the review from Stereophile*, please write. Of course, the fastest way to hear its demonstrably superior combination of sonic performance, flexibility and value is to visit your nearest Adcom dealer.

*Vol. 9 No. 7 (Nov. 1986)
NEC's top compact disc player, the Model CD-830DS in the Renaissance Series, is probably the most feature-laden product of its type that we have seen. In addition to an impressive array of operating capabilities, it embodies a highly sophisticated sixteen-times-over-sampling circuit design incorporating a variation of conventional digital oversampling technology that NEC calls "transversal filtering." For improved low-level linearity, it has four 16-bit digital-to-analog (D/A) converters.

To reduce playback errors resulting from noise pickup in the low-level signal path from the laser pickup to the circuits that follow it, NEC designed an integrated optical pickup with built-in impedance-conversion stages consisting of a photodiode and six current/voltage conversion amplifiers on a single chip. Other design features of the CD-830DS include a digital tracking servo for the pickup and a dual power supply with separate shielded power transformers for the analog and digital circuits. Mechanically, the player is exceptionally rugged, with damping applied to critical metal panels and circuit boards in order to isolate the analog section from mechanical vibration. It is supported on large feet that can be installed at either three or four points and can be mounted for either flat or pointed contact with the supporting surface.

In addition to all the usual CD player controls and operating features, the NEC CD-830DS has two random-play modes (one places the system into pause between tracks), programming for playing up to twenty-four tracks in any sequence, and a delete mode that excludes any selected tracks from playback. The CD-830DS provides direct access by track number, index number, and even time point within a track. A button inverts the output polarity for use with discs or amplifiers that contain a polarity inversion.

Among the other notable features of the CD-830DS are Intro Scan (playing the first 10 seconds of each track), Auto Space (inserting 4 seconds of silence between tracks), and three editing modes that simplify selecting the tracks on a disc that will fit into the recording time of a tape cassette (it can even be done for both sides of the cassette in a single operation). Auto Edit does the whole job at the touch of a button, Manual Edit accomplishes the same thing with the user selecting the tracks and the display indicating at which point the tape will be filled, and Disc Change Edit alerts the user when it is time to change discs.

The CD-830DS has a fade-out button that smoothly decreases the output level over a 10-second period and then places the player in pause mode. It can be controlled by an external timer for unattended playback. The output level at the front-panel headphone jack is controlled by an adjacent slider. On the rear of the player, in addition to the analog audio outputs, there are coaxial and optical digital outputs.

Most of the special control functions of the CD-830DS are operated by small pushbuttons on a hinged section that swings out from the bottom of the front panel at the touch of a finger. The supplied remote control duplicates all the controls on the player except headphone volume and power. The front-panel display window contains a music-calendar display of unplayed track numbers (up to twenty) and also shows track and index numbers, elapsed or remaining time on the current track or the
entire disc (selected by sequential operations of the time button), and the status of a number of other control functions.


Lab Tests

The frequency response of the NEC CD-830DS was flat within 0.02 db or less from 15 to 3,000 Hz and rolled off slightly to -0.2 db at 5 Hz and -0.5 db at 20,000 Hz. The maximum interchannel phase shift was -0.5 degree at 20,000 Hz. Channel separation was also superb, 123 db at 1,000 Hz and an impressive 102 db at 20,000 Hz. The player's internal de-emphasis response was within 0.4 db of the standard curve from 125 to 16,000 Hz. The noise spectrum of its output (playing an unmodulated track of its own CD-1 test disc) was typically between -120 and -130 db; its largest component was the 120-Hz power-supply hum at -100 db.

The total harmonic distortion (THD) plus noise at the 0-db level was between -93 and -95 db (0.0018 to 0.0022 percent) from 20 to 10,000 Hz and even less at higher frequencies (the minimum was 0.0014 percent at 15,000 Hz). At 1,000 Hz, distortion was less than -94 db (0.002 percent) at levels between -90 and 0 db. Low-level spectrum analysis showed no detectable linearity error down to a -80-db level and a moderate +2-db error at -90 db.

The output from the player's analog jacks was 2.51 volts from a 0-db input test signal. The dynamic range (EIAJ) was 99.5 db, and quantization noise (with the D/A converters active) was -93.65 db. The speed error of the player was -0.0019 percent. Playing the Philips TS5A test disc, the CD-830DS tracked the maximum calibrated errors (900 micrometers on the information layer and 800 µm in the surface black-dot portion of the test). In the more severe error-correction and tracking tests of the new Pierre Verany test disc #2, the player began to mistrack at the 750-µm level, where it skipped back to the previous track.

The player's slewing time from Track 1 to Track 15 of the Philips TS5A test disc was 2.4 seconds, a typical but not particularly fast time. It cued perfectly to a track that was not separated from the previous one by a silent interval. The massive construction and damping of panel resonances in the CD-830DS aided it in withstanding all but the hardest blows to top or side with the palm or fist.

Comments

The NEC CD-830DS offers a rare combination of innovative circuit design and enormous operating versatility. (Possibly its only omission, in the light of current CD design, is the ability to play 3-inch CD-3's without an adaptor.) When the control subpanel is hinged out of sight, the player presents a simpler external appearance than almost any other we have used. Even a neophyte will not be daunted by the transport controls and power switch, which normally are its only visible controls. Those who do not care to use the special features need never open the subpanel. Even the remote control separates the functions logically into two groups, with the basic transport buttons placed at the top on an off-white panel and the others on gray and blue panels below. The instruction manual explains the operation of all of the controls in clear, understandable language, and—unusual for a CD player manual—it also gives a "technical close-up" of the player's design features.

To us, the true distinction of the NEC CD-830DS is not in its sound per se, although it sounded just fine, but rather in its unusual—and ideal—combination of ultrasimple operation with remarkable versatility and overall performance that truly rates the "state of the art" sobriquet. These qualities easily justify a price that, while a little high as CD players go, is not excessive for what it buys.

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Introducing the Delco/Bose Gold Series Music System.

By now you know that the Delco/Bose music system is the most widely reviewed, and highly acclaimed, automotive music system available. For those who can truly appreciate the quality of Cadillac and the experience of superb music, we invite you to audition the new Delco/Bose Gold Series Music System.

The first Delco/Bose music systems earned their acclaim because they represented a bold new approach to automotive musical reproduction, made possible by the most intensive research effort ever made in this field. The new Gold Series Music System builds upon this technological foundation by incorporating the results of six years of additional research and development.

Every critical system component is completely new: amplifiers, equalization circuitry, speakers, digital sound source—even the wire that harnesses them together. In developing them, we made full use of the latest advances in electronic and acoustical technology, materials and design. The result: an automotive music system with even more clarity, power and accuracy—one capable of bringing you even closer to the realism of live music while sitting inside your car.

We submit that you simply must experience this new music system to believe it. The Delco/Bose Gold Series is an available option in Sevilles, Eldorados, Fleetwoods and DeVilles at your Cadillac dealer.
One of the fundamental reasons that music reproduced in the home does not sound like the original performance is the difference between the recording and playback acoustic environments. Inevitably, the listening room imposes its own absorption and reflection properties on the recorded ambience of the concert hall or recording studio, destroying the illusion of "being there" that we all strive for in home hi-fi listening. No matter how good the playback equipment and speakers are, no one can believe that he is hearing a "live" performance.

Until the availability of digital large-scale integrated circuits (LSI's), little could be done to solve this problem—early time-delay accessories helped but left much to be desired. A few years ago the Yamaha DSP-1 demonstrated the potential of digital signal processing in a consumer product, and subsequent advances in technology have further improved the art. Basically, this type of digital signal processor contains analog-to-digital (A/D) conversion circuits along with LSI's that create a number of time-delayed signals from the original program to simulate the early reflections and the subsequent reverberation that create the sense of a surrounding space (ambience) in a concert hall or other performance locale. The frequency content of the delayed signals is then modified to correspond to real-world listening conditions (there is normally a considerable attenuation of high frequencies, for example), and the signals are returned to analog form by digital-to-analog (D/A) converters, amplified, and delivered to the speakers.

Additional speakers and amplifiers are always required for this type of signal processing. As a minimum, you need speakers located toward the rear of the listening room to carry the delayed signals. Sometimes additional delay-channel speakers are placed along the sides of the room or in the front (in some systems, delayed signals are mixed with the main signal and heard through the front speakers).

Properly executed, with enough simulated first reflections and the proper reverberation characteristics, digital ambience enhancement can bring the home listener closer to the concert-hall experience than anything short of actually being there. You may not really believe that you are in the specific hall (or club, or arena) being simulated, but the total effect is much more realistic than any conventional hi-fi listening experience.

The JVC XP-A1000 is a new digital audio processor embodying a number of innovative designs and techniques. It processes the left and right channels separately. An A/D converter follows the analog input, and its digital output (or a signal coming directly from the coaxial or
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optical digital outputs of a CD or DAT player) goes to three LSI chips. Two of the chips generate the front and rear first-reflection signals, and the third generates the reverberation signals, which are combined with the other two. The combination of first reflections and reverberation is reconverted to analog form and supplied to external amplifiers and speakers. A single volume control simultaneously adjusts the levels of all the outputs.

The XP-A1000 can be used as part of a four- or six-channel system. In either mode, the rear speakers carry the rear-channel processed signals. In the four-channel mode, the main speakers carry a mixture of the original program and the front-channel processed signals. In a six-channel system, the main speakers receive only the unmodified input program, and a second pair of front speakers (with their own amplifiers) carries the front processed signals. The XP-A1000 can be connected between the preamplifier and the main power amplifier or in a tape-monitor loop of the preamplifier (it provides a loop to replace a starter's pistol fired on the stage for adjusting the unit, since the user can conceivably be behind a hinged door extending across the front panel). The XP-A1000 has a display window to aid adjustment.

The JVC XP-A1000 comes with a series of acoustic environments and had unity gain and clipping at about 6.5 volts output. The front- and rear-channel processed outputs clipped at about 0.75 volt in one measurement, but that figure is strongly affected by the many possible adjustments of the XP-A1000. The main output's distortion was less than 0.003 percent at 1 volt, and the processed front- or rear-channel distortion was about 0.03 to 0.05 percent (at 0.5 volt). The A-weighted noise level in the front channel was an impressive -114 dB referred to 0.5 volt.

Obviously, the electronic circuits worked well. But how to judge—other than subjectively—its sound characteristics? The answer was at hand in the form of the IQS FFT analyzer we use for loudspeaker measurements. As part of its operation, this instrument emits brief electrical impulses similar to those JVC engineers generated with pistol shots during the calibration of the digital audio processor. The signal return from these impulses (acoustic in the case of a speaker test, electrical in the present instance) appears on the computer monitor as a series of pulses along a time scale that, depending on the control settings, may span a few milliseconds or many seconds.

Using the test with several of the XP-A1000's programmed environments revealed some of the sophistication behind this product. In their amplitude and timing, the synthesized reflections were basically what one would expect from a given simulated environment and had little resemblance to the output of some of the analog time-delay ambience synthesizers of a decade ago. For example, the simulation of a hard-floored gymnasium had its major reflection at 55 milliseconds,
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with several smaller ones between 30 and 120 ms (at the speed of sound, 1 ms equals about 1 foot). After the first reflections disappeared, the low-level reverberation remained, at a low but visible level, for a few seconds. The Gothic cathedral was even more dramatic. The first, and largest, early reflection was at 100 ms, followed by a long series of gradually decaying reflections that came at ever-decreasing time intervals until about 1 second had passed. From that point, the reverberation remained at an almost constant (but rather low) level for a full 20 seconds, which was the limit of our measurement ability. These signals seemed consistent with the dimensions and acoustic properties of a large cathedral. In this case the front and rear outputs of the XP-A1000 were nearly the same, as might be expected for a cathedral, where the direct-arrival sound would probably be insignificant compared with the large number of reflections.

One of the concert-hall settings had its first, and largest, front reflection at 40 ms and about six weaker ones at intervals of 10 to 20 ms before fading into the reverberant background. Its rear reflections began at 80 ms, with several smaller ones at intervals from 10 to 40 ms. Obviously, although we did not make the same measurement with all the programmed environments, they differ substantially from each other, and are usually different from front to rear, as they would be expected to be in the real world.

**Comments**

The JVC XP-A1000 is an incredibly complex instrument, and you cannot expect to get the most satisfactory results from it without substantial study and practice. The number of possible adjustments it offers (and sometimes requires) is enormous—a rough calculation shows the availability of some 14 billion different combinations of control settings! Fortunately, most of the adjustment steps are so small that the effects are not likely to be audible to ordinary mortals (they weren't to me, at any rate). The best approach is to start with the programmed values and make changes one at a time only as necessary for the desired effect.

I found that it was usually desirable to increase the levels in the processed channels to produce a believable effect in my listening room. I did all my listening in the six-speaker mode, with the two front ambience speakers on the wall behind the main speakers and the rear speakers at the junctions of the ceiling and the side walls near the rear of the 15 x 20-foot room. All four ambience speakers were small, inexpensive units, but they proved completely adequate for their purpose.

Once I had spent the required time studying the manual (which was not always as helpful as I would have wished, although it contains most of the necessary information), followed by a period of hands-on practice, the previously “impossible mission” of setting up the operating parameters became straightforward. The eventual result was thoroughly satisfying, although I found many of the sonic differences to be so subtle as to be insignificant. The problem of evaluating the effects was slightly compounded by the muting of the audio output whenever any of the control buttons was pressed; it later unmuted smoothly over a period of a second or two. Thus, the effect of a parameter change was not immediately audible but came in gradually.

Since a side-by-side comparison with another digital sound processor is impractical given the complexity of these devices, I cannot say for certain how the JVC XP-A1000 compares with any similar product, but it was undoubtedly among the best of its kind that we have used and evaluated. Incidentally, unlike some other digital processors, its movie modes are not designed to decode the directional properties of Dolby Surround soundtracks but merely to provide the ambience of a movie theater for any type of audio program.

While the JVC XP-A1000 still did not convince me that I was in a concert hall or a cathedral, when I closed my eyes and listened to music with appropriate parameter settings, it provided the closest approach to “the real thing” that I have yet experienced in my home. The ambience had the room-filling quality of live sound. Especially impressive was the way a speaking voice could be heard in any sort of environment with complete clarity and not a trace of the unnatural echo that plagued the early time-delay units. Warning: This component is addictive once you get the hang of using it.

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CAR AUDIO IS WAR. 
CHOOSE YOUR WEAPONS.

There is a conspiracy of foot to keep you from getting great sound in your car. Car manufacturers load in second-rate systems or pitch big buck, "high-end" systems that still sound awful. Decent aftermarket sound means chopping up your car, overloading its electrical system and forgetting about trunk space. If you ever find a front end with the features you want, try finding the features while you're driving. And, when you finally install a system that sounds good, some jerk steals it, trashing your car in the process.

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ADVENT PRODIGY TOWER SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

THE Advent Prodigy Tower, a compact, floor-standing two-way speaker system, measures 28 1/2 inches tall, 10 1/2 inches wide, and 8 3/8 inches deep and weighs 25 1/4 pounds. Although its proportions probably justify the "Tower" name, it could be described more accurately as a minitower, for it will not dominate even the smallest room.

The cabinet, which appears to be made of 1/2-inch-thick fiberboard, is painted flat black on four sides. The top is covered by a solid piece of oiled pecan wood, and there's a matching trim plate on the bottom of the front panel. With the black grille cloth in place, the speaker presents an all-black exterior except for the accents of light-colored wood. The spring-loaded input connectors, recessed into the rear of the speaker, accept the stripped ends of speaker wires.

The 8-inch, long-excursion woofer, which operates in a sealed enclosure, is located in the middle of the front panel, with the driver's center about 16 inches from the floor. At 3,000 Hz there is a crossover to a 3/4-inch, soft-dome tweeter (cooled and damped by ferrofluid) located near the top of the panel. The nominal system impedance is 6 ohms, with a minimum of 4 ohms. The rated sensitivity is 89 dB sound-pressure level (SPL) at 1 meter with a 2.8-volt input, and the speaker is recommended for use with amplifiers capable of delivering up to 75 watts continuous or 300 watts peak.

Advent gives the frequency response of the Prodigy Tower as 45 to 23,000 Hz ± 3 dB, with a useful lower limit of 37 Hz (where its output is −8 dB). The tweeter's output variation (dispersion) over a 30-degree angle, either vertical or horizontal, is rated as ±1 dB. The system's harmonic distortion with a 1-watt input level is rated as less than 0.8 percent above 80 Hz. Price: $350 a pair. Advent, Dept. SR, 4138 N. United Parkway, Schiller Park, IL 60176.

Lab Tests

Advent encourages experimentation in the placement of these speakers, although the Prodigy Towers are designed to be placed on the floor about 1 to 6 inches from the wall. According to the instruction sheet, this placement puts the system close to the ear level of a seated listener, for optimum midrange and treble response, and also provides the flattest low-frequency response.

Since a tweeter only 24 inches from the floor would be at ear level only for listeners sitting on the floor (not our preferred location), we first installed the speakers on 7-inch stands a few inches from the wall. Later we placed them directly on the floor about 18 inches from the wall. The audible differences were quite minor, and we concluded that the speakers are relatively insensitive to placement.

The averaged room response of the left and right speakers was strikingly free from large peaks or dips. In fact, the raw (unsmoothed) room curve was flat within ±5 dB from 50 to 20,000 Hz, which is quite unusual in our experience. The close-miked woofer response had a broad maximum at 80 Hz, falling at 12 dB per octave below 60 Hz and gradually sloping off by about 6 dB per octave from 80 to 2,000 Hz. The woofer response cut off sharply above 2,000 Hz, but the absence of a significant response hole in the crossover region suggests that the effective crossover frequency may be nearer to 2,000 than to 3,000 Hz.

When the woofer curve was
spliced to the room curve, the composite frequency response (relative to the 1,000-Hz level) was $+4.1$ dB from 140 to 16,000 Hz. From 43 to 20,000 Hz the variation was $+6.1$ dB. The minimum system impedance was 4.2 ohms in the 100- to 200-Hz range and at 20 Hz. The bass resonance was at the rated frequency of 60 Hz, where the impedance reached its maximum of 20 ohms, and there was a broad impedance peak at 2,000 Hz (additional evidence that this was the true crossover frequency).

The measured sensitivity was 90 dB, slightly higher than the rated 89 dB. When we drove the speaker with 2.83 volts (equivalent to a 90-dB SPL), the woofer distortion was under 0.8 percent from 100 to 60 Hz, easily surpassing the manufacturer's bass-distortion rating. The distortion climbed gradually at lower frequencies, but only to 4.3 percent at 40 Hz, and below that the output was less than our measurement threshold. We also measured the distortion from 20 to 2,000 Hz using our highly sensitive Audio Precision test system. Up to 100 Hz the readings matched those of our point-by-point measurement, although we were also able to make a measurement at 20 Hz, where the distortion reading was only 5 percent. After reaching a maximum of 0.9 percent at 200 Hz, the distortion decreased steadily to 0.3 percent at 2,000 Hz.

Our quasi-anechoic FFT measurements of the Prodigy Tower generally confirmed the characteristics revealed in our other tests. A crossover dip appeared between 2,000 and 3,000 Hz, putting the actual crossover frequency somewhat in doubt again, although this figure is of little importance to a user. These tests revealed the excellent dispersion of the system’s tweeter: The maximum level change between the on-axis and 45-degree off-axis responses was about 5 dB over the tweeter range up to about 13,000 Hz. Since we operate in a “live” room environment, more precise measurements are difficult to make. In any case, the dispersion of the Advent Prodigy Tower’s tweeter was better than that of most other speakers we have tested.

The Advent system also had excellent phase linearity in its tweeter range, yielding a group-delay variation of about 0.1 milliseconds overall from about 4,000 to 20,000 Hz. Pulse power tests indicated an excellent power-handling ability. The woofer began to rattle with a 100-Hz input of 1,150 watts into its 4.8-ohm impedance. At 1,000 and 10,000 Hz, our amplifier clipped before the speaker output distorted, with an input of about 675 watts into respective impedances of 9.8 and 5.8 ohms.

Comments
Judging from their measured performance, the Advent Prodigy Tower speakers are among the better systems available in their modest price range. Happily, they sounded every bit as good as they measured. From the start, their sound was smooth and uncolored, with no noticeable emphasis or deficiency in any portion of the audible spectrum. Further listening revealed that their bass reproduction was more extended and cleaner than in many, if not most, speakers we have heard that are comparable in size or price.

It is difficult to describe or evaluate the sound of speakers heard in isolation; this is best done in careful comparisons with the sound of more familiar models. In this case, we were fortunate in having available a pair of speakers that are not too different in size from the Advents but sell for several times their price. The comparison system sounded superb, with an exceptionally open sound stage. We could not have expected the Prodigy Tower to equal or surpass this “reference” system (not our regular reference, incidentally), but we were surprised to discover what a minute difference there was between the two. Above the mid-bass, the two sounded (and measured) almost identical in their octave-to-octave balance. The Advent was clearly superior in the low bass. The only respect in which the reference system clearly outperformed the Advent was clearly outstanding value. You won’t find many $350-a-pair speaker systems with its combination of compact size, smoothness, wide dispersion, extended bass and treble response, high efficiency, high power-handling ability, and low bass distortion. Although calling a speaker of its size and proportions a “tower” might be considered hyperbole, the “prodigy” part of its name is not hard to justify.

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**HITACHI DA-C70**
**COMPACT DISC CHANGER**

Julian Hirsch, Hirsch-Houck Laboratories

Although a CD can contain over 70 minutes of music, there are times when that is not enough, and a changer is just the answer. Loading magazines that hold as few as five and as many as twelve CD’s have been available for some time, yet those that hold six discs appear to be today’s de facto standard. Hitachi has devised a logical extension of the six-disc system with its DA-C70, which holds two magazines and can play up to twelve discs in any sequence.

Most of the front-panel controls of the DA-C70 are perfectly conventional and will be familiar to anyone who has used another CD player. In addition to the large, flat transport controls, which include fast-search and track-skipping functions, there is a matrix of buttons that provides direct access to any numbered track (up to No. 99). The repeat function is usable in all the normal operating modes of the player, including programmed and random play, but no repeat of a user-defined segment is available. The slightly cryptic s&P control identification, for “scan and play,” refers to an intro-scan function that plays the first 10 seconds of every track.

The programming capabilities of the Hitachi DA-C70 are impressive. It can be set to play any tracks from any disc (or the entire disc) in either magazine in any desired sequence. The maximum program length is thirty-two steps, although playing a disc straight through involves only one step. The CHECK and CLEAR buttons verify a programmed sequence or clear it from the player’s memory. The player can be programmed before the magazines are loaded, for ease in checking the contents of the discs.

The display window shows the playing mode, operating status (stop, pause, play), elapsed or remaining time, the current magazine, disc, and track number, and the number of unplayed discs remaining in both magazines (if both are loaded). The front panel contains a headphone jack with a small knob that adjusts its level independently of the main output level.

The DA-C70 also has a built-in clock display, like the one found on most VCR’s, that normally appears only when the power is switched off. Unlike those CD players that can be controlled by an external timer, this one is designed to be switched on and off automatically at predetermined times by its own timer.

The furnished wireless remote control duplicates every front-panel control except the magazine-eject buttons. Optional wood side panels are supplied. The Hitachi DA-C70 is a compact machine, measuring 14½ inches wide (15¼ inches with the side panels installed), 12⅞ inches deep, and 5 inches high. It weighs 12½ pounds (14½ pounds with the side panels). Price: $449. Hitachi, Dept. SR, 401 W. Artesia Blvd., Compton, CA 90220.

**Lab Tests**

The Hitachi DA-C70 delivered a maximum output of 1.74 volts into a standard EIA load from a 0-dB test signal, slightly lower than the 2.0-volt standard. The channel levels were matched within 0.05 dB, and the output-level adjustment had the specified range of 50 dB.

No mention is made in the instruction manual or specifications of any circuit details, but the player’s front panel contains the inscription Oversampling Digital Filter. The square-wave response,
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however, lacked the characteristic symmetry of a digital filter and was more consistent with the ringing of an analog low-pass filter used to remove the sampling frequency and other ultrasonic components from the output. The interchannel phase shift, which reached 40 degrees at 20,000 Hz, suggests the use of a double-oversampling digital-to-analog (D/A) converter multiplexed between channels.

The frequency response varied less than \( \pm 0.2 \) dB from 8 to 10,000 Hz but rose to \( +1 \) dB at 20,000 Hz. Channel separation was 102 dB at 100 Hz and 98 dB at 1,000 Hz, narrowing to about 79 dB at 20,000 Hz. The total harmonic distortion (THD) plus noise at 1,000 Hz was 0.008 percent at levels from 0 to \(-70 \) dB. At a 0-dB (maximum) level, the THD plus noise was less than 0.01 percent from 20 to 12,000 Hz, rising to about 3 percent at 20,000 Hz (apparently because of image-frequency components falling in the upper end of the audio range).

The D/A converter's nonlinearity was undetectable at levels from 0 to \(-70 \) Hz. At \(-80 \) dB the error was \(+1.8 \) dB, and at \(-90 \) dB it was \(+0.5 \) dB. Wide-band spectrum analysis of the noise in the player's output showed readings from \(-120 \) dB at 30 Hz to \(-100 \) dB at 20,000 Hz.

Power-line hum and its harmonics were extremely low, barely detectable in the noise spectrum, and never exceeded a \(-110 \) dB level. The wide-band noise (A-weighted) was \(-92.5 \) dB referred to a 0-dB signal level, and the quantization noise (measured with the D/A converters operating on a 20-Hz signal) was \(-84 \) dB.

Dynamic range, measured according to the EIAJ standard, was 90 dB. The frequency error of the player's quartz-crystal clock was \(+0.0003 \) percent, and wow-and-flutter were 0.00027 percent (approximately the residual of our Audio Precision System One test equipment).

The various features of the DA-C70, including its programmable modes, worked exactly as specified. In defect-tracking tests, its error-correction system successfully coped with the maximum-level errors on the Philips TS5A test disc.

The Hitachi DA-C70 is obviously a lot of CD player for the money, but this result was not achieved by magic: Some design and performance features were sacrificed in order to include others. For example, the circuit design of the DA-C70 seems to be fairly basic, without much exotic touches as high-order oversampling or multiple D/A converters, separate power supplies for analog and digital circuits, and the like. If those features are important to you, look elsewhere.

But if you want a CD changer that measures and sounds good, and that will give more than 12 hours of uninterrupted music at a price just above that of the least expensive home players, you need look no further. Everything in the DA-C70 works straightforwardly (although you had better read the manual if you want to make most effective use of its capabilities), and it was surprisingly free of annoying idiosyncrasies for a player with such a host of features. The only mechanical sounds emerging from it were the inevitable "clunking" noises during disc changes. And if you want automatic, timer-controlled operation, its internal electronic timer beats any external timer we have seen. Overall, the DA-C70 is a well-designed and well-manufactured component that it would be hard not to like.

Comments

The more demanding Pierre Verany #2 test disc revealed that the player mistracked with data interruptions 1,250 micrometers long and with two closely spaced 1,000-\( \mu \)m interruptions. It played flawlessly through discrete interruptions of 770 and 500 \( \mu \)m.

The slew time of the tracking system was about average, requiring 2.8 seconds to shift from Track 1 to Track 15 of the Philips TS4 test disc. Typical track-change times when a disc change was also involved were 10 to 11 seconds. The cueing to tracks with no silent interval between them was excellent. The player's impact resistance was fair, mistracking with side impacts from a fist or moderate finger tapping on the top of the cabinet.

Features

- Can accept two standard six-disc magazines for uninterrupted playback of up to twelve discs.
- Direct keypad access to any track (up to No. 99) on any disc.
- Programmable by disc and track for playback in any sequence (up to thirty-two steps).
- Repeat by disc or magazine.
- Random playback of disc or magazine.
- Programmable with magazines removed.
- Scan-and-play mode to audition first 10 seconds of each track.
- Built-in electronic clock and timer for unattended playback start/stop.
- Display of elapsed time or remaining time on track or disc.
- Electronic adjustment of output level over 50-dB range.
- Front-panel headphone jack with independent volume control.
- Furnished with optional wood side panels.
- Furnished wireless remote control has all front-panel functions except magazine eject.

Laboratory Measurements

- **Maximum output level:** 1.74 volts
- **Total harmonic distortion at 1,000 Hz:** 0.008% from 0 to \(-70 \) dB
- **Signal-to-noise ratio (A-weighted):** 92.5 dB
- **Channel separation:** 102 dB at 100 Hz, 98 dB at 1,000 Hz, 79 dB at 20,000 Hz
- **Maximum phase shift:** 4 degrees at 20,000 Hz
- **Frequency response:** +1, -0.1 dB, 8 to 20,000 Hz
- **Low-level linearity error:** +1.8 dB at 80 Hz, +0.5 dB at \(-90 \) dB
- **Cueing time:** 2.8 seconds on same disc, 10 to 11 seconds with disc change.
- **Cueing accuracy:** A
- **Defect tracking:** tracked 770-micrometer defects on Pierre Verany #2 test disc.
- **Defect tracking:** tracked 770-micrometer defects on Pierre Verany #2 test disc.
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GRUNDIG FINE ARTS A-903
INTEGRATED AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

Fine Arts high-fidelity products manufactured by Grundig, a long-established West German manufacturer, have recently been introduced into this country. The Fine Arts A-903 is an integrated amplifier rated for 100 watts per channel into 8-ohm loads. It has a protection system that safeguards it against short-circuits, overloads, DC components in the outputs, and excessive heat.

The A-903 is a solidly built amplifier whose principal front-panel controls are a large volume knob and a number of flush-mounted, flat pushbuttons to select the program source. Other buttons connect one or both pairs of speaker outputs, bypass the tone controls, and activate the loudness-compensation circuit. Small amber lights above or next to the buttons indicate when they are active, and the volume knob carries a light that serves as an index marker. The power switch has a red pilot light above it. There is a headphone jack and four gold-plated phono jacks for the inputs and outputs of a tape deck (duplicated on the rear).

A section of the panel below the input selectors hinges down to reveal four small knobs and a pushbutton. The knobs for the bass and treble tone controls and the balance control are center-detented. The remaining knob, marked LEVEL, operates a six-position switch to adjust the overall amplifier gain from +6 to −9 dB (relative to the normal "zero" setting) in 3-dB steps. Its principal function is to adjust the degree of loudness compensation at a preferred listening level. The pushbutton parallels the signal channels for mono inputs.

The rear apron of the A-903 contains two pairs of insulated speaker connectors, which accept stripped wire ends but not banana plugs or similar connectors, and phono, CD, tuner, video/TV, and tape-monitor input jacks. The monitor input is used with a three-head tape deck in order to monitor the recording from the tape. There are two sets of regular tape input/output jacks, one of them wired in parallel with the front-panel jacks. A small screwdriver adjustment varies the phono-input sensitivity.


Lab Tests

Although the top of the A-903 became quite warm during its hour of preconditioning at one-third rated power and subsequent high-power testing, it was never too hot to touch. The output power at clipping into 8-ohm loads was 122 watts per channel, increasing to 170 watts with 4-ohm loads. The protection circuit shut off the amplifier when it was driving 2 ohms at an output of 175 watts, although the waveform had not yet clipped visibly. During our slew-factor measurement, the amplifier shut down at 50 kHz, corresponding to a slew factor of 2.5. Dynamic power readings were respectively 150, 242, and 196 watts into 8, 4, and 2 ohms.

The total harmonic distortion (THD) plus noise at 1,000 Hz into 8 ohms decreased from 0.085 percent at 1 watt to a minimum of 0.01 percent at 100 watts. Into 4 ohms, the distortion ranged from 0.1 percent at 1 watt to a minimum of 0.021 percent at 40 watts and 0.035 percent at 140 watts. The 2-ohm distortion readings were roughly similar, reaching their minimum of 0.011 percent at 100 watts. Driving 8 ohms, the amplifier's distortion was...
LABORATORY MEASUREMENTS

- Output power at clipping (1,000 Hz): 122 watts into 8 ohms, 170 watts into 4 ohms, 175 watts into 2 ohms
- Clipping headroom (relative to rated output): 0.86 dB at 8 ohms
- Dynamic power output: 150 watts into 8 ohms, 242 watts into 4 ohms, 196 watts into 2 ohms
- Dynamic headroom: 1.76 dB at 8 ohms
- Harmonic distortion (THD + noise at 1,000 Hz into 8 ohms): 1 watt, 0.058%; 10 watts, 0.028%; 100 watts, 0.01%
- Maximum distortion (20 to 20,000 Hz into 8 ohms): 0.0148% at 10 watts (20,000 Hz)
- Sensitivity (for a 1-watt output into 8 ohms): CD, 108 mV; phono, 0.25 mV at center
- Bass and treble tone controls setting (adjustable from 0.062 to 0.94 mV)
- Phono-input overload: 71 to 110 dB at center setting (adjustable from 19 to 500 mV)
- A-weighted noise (referred to a 1-watt output): CD, -89.5 dB; phono, -69 dB (at center gain setting)
- Phono-input impedance: 49,000 ohms in parallel with 100 pF
- A-weighted noise compensation
- Two sets of speaker outputs, individually switched
- Six-position level switch for optimizing amplifier gain
- Rear-axial phono-gain adjustment
- Mono switch
- Front-panel headphone jack

FEATURES

- Protection against shorts and overloads by output relays
- Protection against overheating by thermal switch in power transformer
- Pushbutton input selection for phono, CD, tuner, video/TV, two tape decks
- Duplicate set of Tape 2 input and output jacks on front panel
- Monitor switch for three-head tape deck
- Bass and treble tone controls with defeat switch
- Switchable loudness compensation
- Two sets of speaker outputs, individually switched
- Six-position level switch for optimizing amplifier gain
- Rear-axial phono-gain adjustment
- Mono switch
- Front-panel headphone jack

TEST REPORTS

relatively constant with frequency and power, with typical readings of 0.01 percent or so, a minimum of 0.005 percent at 1,000 Hz and 50 watts, and a maximum of 0.0148 percent at 20,000 Hz and 10 watts.

The input sensitivity (through the CD input) for a 1-watt output was 108 millivolts (mV), with an A-weighted noise level of -89.5 dB referred to 1 watt. Using the factory setting of the phono-input sensitivity control, 0.25 mV was required for a 1-watt output, and the noise level was -69 dB. The phono input over loaded at 71 to 76 mV through the middle- and high-frequency range and at 110 mV at 20 Hz. The sensitivity adjustment had a considerable range, from 0.94 to 0.062 mV, with corresponding overload limits (at 1,000 Hz) of 500 and 19 my. The phono-input termination measured 49,000 ohms in parallel with 100 picofarads.

The tone-control characteristics were conventional, with a maximum range of about ±15 dB at the frequency extremes. The range from 500 to 1,500 Hz was unaffected by the controls. The frequency response (CD input) with the tone controls centered was slightly different between channels but varied only about 1 dB overall. With the defeat (bypass) switch engaged, the amplifier's response was an impressive 0.03 dB from 20 to 20,000 Hz.

The loudness compensation boosted both lows and highs, by as much as 15 and 5 dB, respectively, as the volume was lowered. The level switch, as rated, shifted the amplifier gain in 3-dB steps from +6 to -9 dB. The RIAA phono equalization error was +0.2, -0.7 dB from 35 to 20,000 Hz and -3.5 dB at 20 Hz.

Comments

The Fine Arts A-903 had the look, feel, and sound of a fine audio product. For the most part, it appeared to be a perfectly conventional integrated amplifier with obvious control functions that could be understood without reference to the instruction manual. The manual, incidentally, was both clear and comprehensive.

The input selectors operated quietly, positively, and with little pressure. They were free of audible switching transients. The phono-level adjustment in the rear, intended for matching the phono volume to that of other sources such as a CD player or tuner, also permits optimizing the amplifier's noise and overload margin for any moving-magnet cartridge, regardless of its output. The volume control, which operated with a silky smoothness, had a tapered characteristic that simplified precise, noncritical volume adjustment. The only change, though a minor one, that we would like to see would be in the speaker-output terminals. Binding posts on 3⁄8-inch centers, able to accept single or dual banana plugs, would be a welcome convenience.

The A-903's protection system was exceptionally effective. Apparently with little or no conventional current limiting, it cuts off the outputs by a relay before the transistors can be damaged by an overload, and they recover automatically a second or two after the overload is removed. We must admit to a few worried minutes when the amplifier shut off entirely (including all front-panel lighting) during 2-ohm high-power testing. But about 45 minutes later, after the power transformer cooled down, it returned to life none the worse for its experience.

Removing the top cover of the A-903 should dispel any lingering doubts about its credentials. The mechanical assembly, the neatly cabled and dressed wiring, and the generally professional appearance were completely consistent with its image and performance. Noting the statement on the rear of the amplifier that it was built for Grundig in Portugal, we began to wonder how many other high-quality electronic products come from Portugal. Is this small country about to become the Korea of Europe? The Grundig Fine Arts A-903 is a fine piece of work in any case.

Circle 144 on reader service card
The one disadvantage of owning the Pioneer 6-Disc Multi-play CD Changer.

No, the disadvantage of owning our CD changer system is not the convenient trunk-mounted changer box. That's an advantage. And it's not the fact that you can control it at the touch of a button from inside your car. That's an advantage, too.

It's not the easy-loading magazine that allows you to catalog six of your favorite CD's. It's not the "random play" feature. It's not that you can choose from four Multi-play CD changer systems to meet your music and budget needs. Nor is it the fact that the Pioneer 6-Disc Multi-play magazine works in both home and car players. And it's not even the endless hours of incredible music. Again, those are all advantages.

Then what is the one disadvantage to owning a Pioneer 6-Disc Multi-play CD Changer system? It's that parking meters may run out before your music does. But you know what? Just pay the tickets. It's more than worth it.

For more information on the Pioneer 6-Disc Multi-play CD Changer system or your nearest Pioneer dealer, call toll-free 1-800-421-1404.

©1989 Pioneer Electronics (USA) Inc. Long Beach, CA
WELL known in its own country, the British loudspeaker manufacturer Mordaunt-Short is perhaps less of a household word among American audio enthusiasts. In its more than twenty years of existence, the company has earned a reputation for quality and value in the British audio market, but it has had only sporadic distribution in this country. Recently, however, Mordaunt-Short USA was formed, and a network of U.S. dealers has been chosen with the goal of establishing the Mordaunt-Short brand name in the American audio world.

The MS35Ti Series 2, a compact two-way bookshelf system, is typical of the Mordaunt-Short design approach. Its 7½-inch woofer operates in a reflex enclosure constructed of braced fiberboard. The woofer cone, formed of paper, has a rubber surround, long-throw suspension, and high-temperature voice coil. The crossover to a ¾-inch titanium-dome tweeter is specified as 4,000 Hz, with 12-dB-per-octave slopes. The tweeter’s fundamental dome “break-up” resonance is said to be at 23,000 Hz.

The drivers are individually protected against thermal overload by the Positec circuit, which consists of a bistable polymeric positive-temperature-coefficient resistor that is connected in series with the voice coil. The resistor’s normally low resistance does not affect the speaker’s performance. If excessive current passes through a driver for an appreciable time, the resistor heats up and its resistance suddenly increases to a high value, which cuts off most of the power to the speaker. When the overload is removed, the resistance returns to normal and the speaker’s operation is automatically restored.

The cabinet, which measures 19½ inches high, 10¼ inches wide, and 10¾ inches deep, is veneered in a choice of black ash or walnut wood-grain vinyl on the top, sides, and bottom. Each speaker weighs 18¾ pounds. The speaker board, covered by a removable black cloth grille, is painted silver gray, and the back is sprayed black. The woofer and tweeter are located as close together as possible on the front of the cabinet, with the woofer port above them. Banana-jack terminals are recessed into the rear of the cabinet, and mating plugs are supplied with the speakers (standard ¾-inch-spaced dual banana plugs can also be used).

The performance specifications for the MS35Ti include a sensitivity of 88 dB sound-pressure level (SPL), an 8-ohm nominal impedance, a recommended amplifier power rating between 20 and 300 watts per channel, and an overall frequency response of 55 to 20,000 Hz at the -3-dB response points. Mordaunt-Short recommends that the speakers be located at least 14 inches above the floor and away from the rear wall, and well away from the side walls. Stand-mounting is suggested, and the company manufactures suitable stands for its entire speaker line. The bottom of the MS35Ti (like the other models in the line) is fitted with threaded inserts enabling it to be bolted firmly to the top of the matching stand, which is designed to be supported
Smooth character.

16 mg. "tar", 1.0 mg. nicotine av. per cigarette by FTC method.

SURGEON GENERAL'S WARNING: Cigarette Smoke Contains Carbon Monoxide.
**Lab Tests**

Our test samples of the MS35Ti were supplied with the IS2 stands, which are shipped knocked down and must be bolted together. Although the necessary wrenches were included, the assembly process was clumsy in places, but once fastened together, the combination of speaker and stand formed an extremely solid and rigid unit.

The room-response curve had only moderate fluctuations superimposed on a gently downward-sloping output as the frequency increased. The close-miked woofer response decreased slightly from its maximum at about 100 Hz, to -3 dB at 1,000 Hz and then fell sharply above 2,000 Hz. When the port output was combined with the cone output, the resulting bass response varied over a total range of 6 dB from 20 to 1,500 Hz. It spliced easily to the room curve to form a composite frequency response that sloped downward from its maximum level, at 50 to 100 Hz, all the way to 20,000 Hz, with an overall level variation of ± 5 dB referred to the 1,000-Hz level. Although it is not important to the user, our tests suggested that the actual crossover between the woofer and the tweeter is closer to 2,500 Hz than to the rated 4,000 Hz.

The system's impedance minimum of 3.5 ohms was reached at 150 to 200 Hz. Its bass-resonance impedance of 14 ohms was measured at 70 Hz, and the maximum value in the audio range was 15 ohms at 1,500 Hz. Sensitivity was 89 dB SPL at 1 meter with a pink-noise input of 2.83 volts. Bass distortion, measured separately at the port and the woofer cone with a constant input of 1.6 volts (equivalent to a 90-dB SPL midrange output), was reasonably low, ranging from about 0.5 percent at 100 Hz to 2.6 percent at 70 Hz, which was the effective crossover frequency between the woofer and port radiation. It increased to 4.6 percent at 50 Hz and 9.3 percent at 35 Hz.

Our quasi-anechoic frequency-response measurements with the IQS analysis system closely matched the downward-sloping curve we had obtained from swept sine-wave measurements. The frequency-response curves obtained on-axis and 45 degrees off-axis were closely parallel up to 10,000 Hz, diverging moderately above that frequency but remaining within 6 to 8 dB of each other all the way to 20,000 Hz. These results indicate very good dispersion for a tweeter with a 3/4-inch dome radiator. The group-delay variation was ±0.2 millisecond from 3,000 to 20,000 Hz and less than 1 ms down to 180 Hz.

Pulse power tests showed that the MS35Ti had a very high power-handling ability for a small, two-way speaker. As usual, our amplifier ran out of power before significant distortion could be induced at 1,000 and 10,000 Hz (at 575 watts into 12 ohms and 765 watts into 9 ohms, respectively). The woofer emitted the rattling sounds indicative of cone-bottoming with a very high input of 680 watts into its 5-ohm impedance at 100 Hz. We had no indication that the Positec circuit was affecting this measurement, which does not subject the speaker to thermal stresses.

**Comments**

The MS35Ti delivered a very smooth, relatively uncolored sound that compared very favorably with that of some much more expensive speakers in A/B tests or extended listening. Somewhat surprisingly in view of its downward-sloping response, it did not sound in the least soft or bass-heavy. In fact, a slight forwardness was audible at times when we switched to the MS35Ti from a speaker with an unusually smooth and flat response, but it would not usually be noticeable except in such a direct comparison.

Although the close-miked bass response made it appear that the lower limit of this speaker was 20 Hz, this is an artifact of measurement. Its effective lower limit is in the 45- to 50-Hz range, and it performed very well indeed down to that point. Overall, the MS35Ti managed to perform like a much more expensive speaker and totally belied its modest price.

The Mordaunt-Short MS35Ti speaker is as attractive as one could expect from a simple box. Even the stands are attractive, besides being very stable and forming a true union with the speakers. Nonetheless, it is plain that the primary design effort went into achieving the speaker's fine acoustic qualities, and that is as it should be. If you want a handsome piece of furniture, you will have to pay for it, but a surprisingly high caliber of sound is available from this speaker at a very modest price.

*Circle 145 on reader service card*
Digitizing audio is easy.

Humanizing it takes some really impressive technology.
Welcome to the human side of...
In the rush to digitize everything in audio—seeking ever higher levels of sound quality—it seems that one thing has been almost completely forgotten.

Humanity.

The audience for music isn't made up of oscilloscopes and signal processors. It's made up of human beings.

That's the simple premise behind a new line of precision audio components—Fisher's Professional Digital Reference Series. The flagship of which is our RS-Z1 Receiver. Which comes with a full-function remote control capable of accessing other PDRS components as well. The RS-Z1 retains the incredible richness, depth and warmth which characterized Fisher's first vacuum tube amplifiers. Yet, at the same time, it optimizes all the benefits of digital processing: greater accuracy, range, resolution and speed.

In fact, the RS-Z1's advanced fiber optics make the most of today's CD recordings. And ensure compatibility with the digital technology of tomorrow.

Other specifications of the RS-Z1 are just as uncompromising. It delivers 150 watts of power per channel. Along with a total harmonic distortion rating of 0.007%.

But while you're sure to appreciate the technology that went into the RS-Z1, we suspect there's something about it you'll like even better. The sound that comes out.

PROFESSIONAL DIGITAL REFERENCE SERIES
Listening well is the key to good sound.
There are some audiophiles who still refuse to believe compact disc technology can match the sound quality of a fine turntable.

So, with their concerns in mind, we developed a five-disc CD changer just for their ears: The DAC-Z1.

Proof that a CD changer can distinguish itself in fidelity, without calling for a sacrifice in convenience.

By using fiber optic coupling, eight-times oversampling and dual 18-bit linear digital/analog converters, the DAC-Z1 delivers pure, natural sound reproduction. Superior frequency response. And unbelievably low harmonic distortion.

But while its specs are sure to move you, you needn't bother getting up.

Because a 30-function wireless remote control gives you access to all the DAC-Z1's features and programmability. Allowing you to program, edit, scan, clear, repeat, pause, skip and jump from wherever you sit.

And with our optional EQ-Z1 14-band graphic equalizer (see inset), you can tailor the sound to the exact acoustics of your room.

But enough talk. See the DAC-Z1 for yourself.

Then hear why some rather avid turntable enthusiasts will be giving CD technology a second listen.
A violin string vibrate just o
No matter how much we might like to change the laws of physics, it makes more sense to respect them.

With that in mind, the Professional Digital Reference Series approach to speaker technology is starkly realistic. Yet wonderfully sophisticated.

Our STV-Z10 Twin-Drive Speakers are specifically designed to respond to the broad range of sound made possible by digital technology. Two 12-inch woofers are symmetrically mounted on an aluminum honeycomb diaphragm. The voice coils of the two drivers face each other, generating a "push-pull" movement—avoiding phase distortion and delivering crisp, clean bass. The midrange and tweeter show similar ingenuity. Both are constructed of titanium and coated with an amorphous diamond film for better detail and faster transient response.

All three components in the STV-Z10 have heavy-duty stray field compensated magnets, so you can operate them near a TV monitor without affecting picture quality.

Clearly, everyone's reaction to musical sound is unique. But those who listen through STV-Z10s are likely to get the same effect:

Good vibrations.
Our goal in creating the Professional Digital Reference Series can be summarized in a few words:

To reproduce music as much like the original performance as is humanly possible.

And we stress the word "humanly."

Because no matter how highly our systems are rated by a roomful of lab equipment, your ears are the most important judge of all.

Since you demand a sophisticated sense of reality, that's exactly what we strive to deliver. And that's precisely what you'll find in the Professional Digital Reference Series' receiver, CD player, CD changer, dual cassette deck, graphic equalizer and speakers. Each of which is designed with every other PDRS component in mind.

In fact, our devotion to reality can be seen as well as heard—in the video components that complete the series.

These include the PG-Z1 TV, with a 27-inch screen that boasts up to 700 lines of horizontal resolution. And the FVH-Z1—one of the first VCRs to combine Super VHS, digital noise reduction and an array of digital effects.

Experience the fully integrated Professional Digital Reference Series for yourself.

And find out how beautiful reality can be.

For the Fisher Professional Digital Reference Series dealer nearest you, please call 1-800-462-PDRS.
Car makers and hi-fi companies are teaming up to build in sophisticated stereo systems that let you drive right out of the showroom with great sound.

BY KEN C. POELMANN

No one really knows for sure, but apparently the first car audio system was a uniquely American phenomenon. It probably appeared at the Louisiana Purchase Exposition, a World's Fair held in St. Louis in 1904. The American DeForest Wireless Telegraph Co. displayed an automobile radio called the Auto Wireless No. 1 that received Morse code from a radio transmitter located on the fairgrounds. The car, a rather forward-looking bit of technology itself, was electric.

With a CD player, the Ford/JBL system is a $1,350 option in the 1989 Thunderbird. With a cassette player only it costs $850. The system contains nine speaker drivers powered by two amplifiers.

In 1926 William Heina filed for a patent on his car radio, the Heinaphone, the true forerunner of modern autosound. The Heinaphone used a four-stage tuner and a two-stage audio amplifier run off batteries mounted in a box under the floorboards. The radio was installed behind the dashboard, with holes cut for the control knobs. A speaker was mounted in the headliner above the windshield. On good days the received signal was able to overcome the interference.

From these humble origins, car audio has become a giant in today's consumer electronics industry. Receivers, cassette players, compact disc and digital tape players, equalizers, signal processors, crossovers, power amplifiers, and loudspeakers (not to mention security systems)
Two of the four JBL speaker enclosures in the 1989 Thunderbird are located in the front door panels just below the electric-window controls; two more are in the rear. Each contains a 4-inch midrange, a 1-inch tweeter, and a dedicated four-band parametric equalizer. A four-channel, 60-watt amplifier powers the four satellites, and an 85-watt amp drives a 7-inch subwoofer located in the rear.

are all part of sophisticated mobile sound systems. More and more people are doing much of their listening not in the home but in the car, and the profit potential of the car audio market has stimulated tremendous competition in both the automobile and electronics industries, leading to considerable product diversity across a wide spectrum of prices. In short, now there is a car sound system available for every car and to fit every budget.

At the heart of the boom is the competition between car companies and audio companies. Car makers sell sound systems pre-installed in the cars, as standard equipment or as pricier options; this is called the original-equipment-manufacturer market, or the OEM market for short. On the other hand, audio companies sell autosound equipment separately, for consumers to install in cars they already own; this is called the aftermarket.

Over the years the balance has shifted from one side to the other. For a period in the Seventies, for example, an aftermarket stereo system was de rigueur—mainly because everyone wanted the hot new cassette players while Detroit was still installing eight-track cartridge players.

Today, the situation has changed dramatically. The OEM side has fought back with stunning success, ironically tapping the expertise of the aftermarket companies to design competitive systems.

Automakers now regularly enlist the aid of audio manufacturers to supply their cars with high-quality, factory-specified components. Such an association may be used as a selling point, but often it is kept rather quiet. You can buy a Thunderbird with a well-advertised Ford/JBL sound system in it, for example, or you can get a BMW 300 series without ever knowing that the sound system in it is made by Pioneer. In addition, the car makers have improved the quality of their own audio designs. The result of both these trends is a real renaissance in mobile sound.

Bose is perhaps the only audio company most identified with factory-installed car sound—and one of the few audio companies collaborating with automakers that is not thereby directly competing with its own aftermarket equipment. Beginning with its legendary Cadillac and Corvette systems, Bose loudspeakers and electronics have appeared across the General Motors line as well as in cars from Acura, Audi, Honda, and Nissan.

THE new Cadillac/Bose system, available in the 1989 Cadillac Seville, Eldorado, DeVille, and Fleetwood, is representative of the state of the art. This Gold Series system uses a Delco-GM receiver with a cassette deck or CD player (featuring selectable 2:1 compression) in the dash; an atypically floor-mounted DAT player may be installed along with the cassette receiver as a dealer option. The Bose front speakers, 4½-inch bass-reflex models, are mounted in the front door panels in tuned, ported enclosures. Two Bose 6 x 9-inch rear speakers are placed in the package shelf, and high-efficiency Bose amplifiers are mounted on the speakers themselves. Total power available is 200 watts in the DeVille and Fleetwood systems, 170 watts in the Seville and Eldorado versions.

The Acura/Bose system (standard in the Legend Coupe, an option in four-door models) uses an Alpine cassette receiver and four individually amplified and equalized Bose
Seven different Chrysler/Infinity sound systems are currently available in more than twenty car models. The Dodge Caravan system features a CD tuner and four coaxial speakers. One pair of coaxes is mounted on either side of the rear cargo-hatch door (bottom left), and the other pair is mounted in the front doors (bottom right). In addition to the speakers, Infinity supplies the amplifiers and customized equalization.
loudbspeakers: two 4½-inch speakers in tuned, ported enclosures in the front doors and two 6 x 9-inch drivers in the rear package shelf. The Audi/Bose system is standard in the Audi 200 series, optional in the 100 series. A Blaupunkt cassette receiver drives four independently amplified and equalized speakers, two 4½-inch ones in front and two 6 x 9-inch speakers in the rear. Audi/Bose systems are installed at Audi’s assembly plant in Neckarsulm, West Germany.

In an unusual twist, the Bose systems for Hondas are installed in the U.S. before the cars are exported to Japan. The system, now standard in the 1989 Accord SEi four-door sedan, includes two 3-inch Bose “twiddlers” in tuned, ported enclosures in the front doors, two 6 x 9-inch speakers in the rear deck, a multichannel amplifier/equalizer module, and an Alpine cassette receiver in the dash.

The results of the Nissan/Bose collaboration are available in the 1989 Maxima. The Clarion-made cassette receiver drives three 4½-inch front speakers and two 6 x 9-inch rear speakers, each individually amplified and equalized. A Clarion CD player is available as a dealer-installed option.

ORD has blazed new paths in car audio through its highly successful collaboration with JBL, introduced in 1985 for the Lincoln. The latest Ford/JBL system is now also available as an option for the 1989 Ford Thunderbird and Taurus and the Mercury Cougar and Sable. The T-Bird and Cougar systems use a Ford Audio cassette receiver with a CD option. Nine JBL drivers are mounted in five locations: four 5½ x 7½-inch enclosed two-way speakers with 4-inch midranges and 1-inch tweeters and one 7-inch subwoofer in a 10-liter sealed enclosure. The satellite speakers and the subwoofer are separately amplified. The satellite speakers are driven by four 15-watt amplifiers, and the subwoofer has its own 85-watt amp.

There is a four-band parametric equalizer for each satellite and a two-band parametric equalizer for the mono subwoofer.

The Taurus and Sable systems use no fewer than ten drivers mounted in four locations: six drivers in two 6 x 9-inch three-ways and four drivers in two 5½-inch coaxes. Up to 140 watts of power are distributed to four channels. Other Ford cars have not been neglected. A CD option is available for the Lincoln Town Car, the Continental (along with a DAT player), and the Probe, and Ford plans to introduce a trunk-mounted CD changer with remote control.

Chrysler has teamed up with Infinity to produce the Chrysler/Infinity sound systems. Unlike some premium systems, this one is available in a wide range of Chrysler vehicles at a relatively low price. Since its introduction in January 1987 in the New Yorker, LeBaron GTS, and Lancer, the Chrysler/Infinity line has expanded to include seven different systems available in more than twenty current models. Ultimately, the goal is to offer a premium system for every Chrysler vehicle. Chrysler’s own head units are employed, and Infinity supplies all the speakers, amplifiers, and equalization. The front speaker complement includes separate tweeters and woofers. Two 3-inch polycell-dome tweeters with 2½-ounce ceramic magnets are mounted in the instrument panel, and two 5½-inch polypropylene woofers with barium-ferrite magnets are mounted in the front door panels. (Minivans use two coaxial speakers mounted in the instrument panel.) The rear speakers are 5½ x 7½-inch or 6 x 9-inch oval coaxes (depending on the car line), with polypropylene woofers and polycell tweeters mounted on a pad ring and bracket. Chrysler’s TC by Maserati has two 6 x 9-inch oval speakers mounted under the storage area behind the seats.

Chrysler/Infinity systems are bi-amplified and tuned to each car. All the woofers are individually amplified, with circuitry attached to the back of the speaker baskets. Individual low-pass filters allow better crossover control and greater frequency separation, and hence a higher power level to each speaker, than would be possible with a single multichannel crossover. The tweeters are individually driven by four amplifiers in the head unit. Optional CD players are also available for the systems (one is standard in the Maserati). A nice touch in some models is rear-seat headphone jacks that defeat the rear speakers.
A Bose sound system is standard equipment in the 1983 Audi 200 Turbo. A Blaupunkt-made cassette tuner with Dolby B supplies audio signals to four independently amplified and equalized speakers—two 4½-inch drivers in the front doors and a pair of 6 x 9-inch speakers in the rear deck. The Bose system is optional in the Audi 100 series.
et
6-Series, the dealer simply screws in a bracket and attaches the leads. The changer uses the same six-disc magazine as Pioneer’s home changers and features a double-oversampling filter.

Although Alpine’s work for BMW (and Acura) is unheralded, one Alpine OEM venture that is well documented is its sound system for Lamborghini. Lamborghini’s twenty-fifth-anniversary Countach (with a mild-mannered 420-horsepower, 5.2-liter, V-12 engine) has an all-Alpine sound system. This limited-edition car (only two hundred were made) comes complete with an Alpine Model 7390 cassette tuner or Model 7903 CD tuner, a Model 3528 four-channel amplifier, and pairs of both the Model 6255 and Model 6256 speakers.

The newest player on the high-end OEM sound-system field is Toyota, which has embarked on a program of providing sophisticated systems using equipment from a variety of audio companies. The first system is for the Lexus models, from Toyota’s luxury division. The flagship Lexus LS 400, a V-8-powered sedan scheduled for a fall 1989 debut, will be the first car to offer a factory-installed Nakamichi system as an original-equipment option. Pioneer will supply the standard audio system for the LS 400 as well as for the ES 250, a V-6-powered sedan. Both systems include a cassette receiver with a CD option, individually placed tweeters, midrange drivers, and full-range drivers. The LS 400 features a biamplified subwoofer, and the CD option is a multidisc changer. Toyota has entered the fray at the head of the pack, and we can expect high-end audio upgrades in future generations of Toyota cars, from such Japanese audio giants as Nakamichi and Pioneer, to join the systems now available from Fujitsu Ten and Panasonic.

Blaupunkt, one of the early developers of car audio, is the exclusive supplier for Porsche, and Porsche’s standard factory-installed radios
Pioneer’s Gemballa Avalanche is a heavily customized 1988 Porsche 911 that sports a cassette tuner, a six-disc CD changer, a video cassette player, and a 6-inch TV set—all Pioneer equipment, of course. Maximum system power is said to be a hefty 2,440 watts.

Bear the Blaupunkt name. As any Porsche owner knows, these cars present high ambient noise levels and limited space for audio systems. Nevertheless, Blaupunkt has managed to squeeze a high-power, ten-speaker system into the Model 928 and highly respectable systems into the 911 and 944. Blaupunkt also supplies audio components to other car makers, including Audi, and is aggressively pursuing several concept cars with German automakers, including one containing a mobile office of the future complete with two-way communications, fax machine, touch-screen controls, and, of course, an executive sound system.

At the other end of the automotive spectrum, Jeep has established a collaboration with Jensen. The factory-option Jensen Accusound system, available in high-end Jeep models such as the Wagoneer, features the legendary Jensen coaxial speakers, 6 x 9-inch or 5-inch depending on the car model. When a car as utilitarian as the Jeep is available with high-fidelity sound, car audio has clearly come of age.

Soon only the imagination of the designers will limit the performance of automotive sound systems. Increasingly, car manufacturers are talking to their audio partners at earlier stages in the design of new models, and sound systems are being better integrated into cars, so that they are better looking as well as better sounding. As cars themselves are becoming more sophisticated, so is autosound. Just down the road, for example, is digital signal processing. Collaboration was the best possible move for both the car makers and the audio manufacturers, and the audio systems you can buy with your car have never been better.

Lee De Forest died in 1961 with nearly three hundred patents under his name. Imagine what he would think if he could hear the descendants of that car radio he showed in St. Louis in 1904.
1988 Acura Integra LS: A Sony/Pioneer system that satisfies

There are a lot of different kinds of car stereo systems out there, from the basic bass-banger to the heavyweight wattage champ to the one-speaker tinhorn. And then there are high-fidelity car stereo systems, the ones that will satisfy drivers who have good stereo systems in their homes. Hi-fi car systems can be expensive or not so expensive, complex or straightforward, but they should all have one thing in common: They should be designed by the installer for good sound as judged by the same standards that apply to home systems.

The system in Richard Citrin's 1988 Acura Integra LS—installed by DSL Professional Automotive Services of Paramus, New Jersey—is a good example. It offers three program sources, fully adequate power, and great sound—and it doesn't devour the generous cargo space offered by the Integra's rear hatch area.

The system's heart is a Sony XR-7200 DIN-size cassette tuner ($650), a flexible head unit that not only offers tape playback with Dolby B and Dolby C and AM/FM tuner reception, but also serves as a remote control for the Sony CDX-A20 ten-disc CD changer ($750) that DSL installed in the trunk. And for upgrade-minded car audiophiles, the XR-7200 has a built-in active crossover that can be set at 80 or 120 Hz for use with component subwoofers.

Power is provided by a pair of 120-watt Sony XM-701 amplifiers ($270 apiece) mounted behind the spare tire. The amps drive a set of Sony's XS-HL55 component speakers ($300) mounted in the front doors and a pair of Pioneer's TS-6966 6 x 9-inch triaxials ($160) mounted in the removable rear parcel shelf. The amps and CD changer are far enough out of the way to leave plenty of room for luggage.

The complete system has a list price of $2,400 (Citrin paid $1,965), and DSL's installation took only 8 1/2 hours, which cost an additional $340. Other nonstereo extras for the car were tinted windows and a Maxi-Guard security system. The total effect is flashy but functional—just like the sixteen-valve, 1.6-liter, four-door Integra LS.
The Acura's dash holds a Sony XR-7200 cassette tuner, the trunk (top) a side-mounted Sony CDX-A20 ten-disc CD changer. The rear deck sports 6 x 9-inch Pioneer TS-6966 triaxials, and two Sony XM-701 amplifiers are mounted forward of the spare tire. At left, a look at the removable rear deck.
1988 BMW M3: An installer’s personal road machine

The BMW M3 is a rare automobile on American roads, and the owner of this one is a rare bird himself. Jim Nagy is in his thirteenth year as owner of Safecar Autosound Engineering in Downer’s Grove, Illinois, and the M3 is not only his personal car, but as a result of his classy installation it’s the car stereo show car for Pyle Industries.

The Bimmer’s head unit is Alpine’s Model 7390 cassette receiver and CD controller ($600), which operates an Alpine 5952 six-disc changer ($650) mounted under the passenger seat. An Alpine 4390 wireless remote control ($60) eases life for both the driver and backseat DJ’s. Source signals are routed to two Audio Control EQT’s—mono thirty-band, one-third-octave equalizers ($300) used to smooth out the inevitable peaks and dips of an automotive interior. The signal is then sent to an Alpine 3656 six-channel electronic crossover ($350), where it is divided and parcelled out to the amplifiers.

All of the speakers and amplifiers are made by Pyle. Two WL1580/4 15-inch Pro subwoofers ($260 each) fire through the modified back seat, which has had much of the inner foam removed, new support put in, and a new perforated-leather cover installed. The subwoofers are powered by an A-400 amp ($665) strapped into mono and delivering up to 400 watts. Another A-400 running in stereo at 200 watts per channel powers the four WL870 8-inch Pro “midwoofers” ($138 each) located in the side panels on both sides of the back seat.

In order to keep the rear deck in its original condition, Nagy mounted the rear satellite system—two WP5216 5½-inch midranges ($39 each) and two D3580 1-inch dome tweeters ($60 a pair)—in the factory enclosures. The eight-speaker front-imaging system consists of two custom Z-Box 325 MP2 enclosures ($580 a pair), each loaded with a K-499W 4-inch dual-cone midrange ($79 a pair) and a D3580 tweeter, that replace the BMW’s door map pockets; two WP5216 midranges in the factory kick-panel locations; and two D210 3/4-inch dome tweeters ($33 a pair) in the car’s factory tweeter locations. The front and rear satellite systems and the Z-Box enclosures are each powered by 200-watt A-200 amplifiers ($465 each). All of the wiring and connectors are by Nakamichi or Phoenix Gold ($1,255 total).

Total retail cost of the sound system is $8,280, plus $6,950 for the installation, which includes a stock power-window switch for raising and lowering the amp rack. There’s also a shock-mount system crafted from the scrapped differential mount of a Lotus Elan.
The Alpine 7390 cassette receiver and CD controller unit looks natural in the BMW's dash. Two 15-inch Pyle subwoofers are hidden inside the back seat (top), and each front door has a midrange and tweeter in a custom Z-Box enclosure (middle). There’s even room for a Mitsubishi Mesa 95 cellular phone. The trunk holds the Pyle power amplifiers that make this system scream.
1985 Corvette Coupe:
Cost no object, no holds barred

When Joe Lotito took his '85 Vette to Rich Malanga, Jeff Hoover, and Tom Mangs at Audio Advisors in Lake Worth, Florida, he told them he wanted the best of everything. Little did he know that the system they put in his car would bring him seven first-place finishes in 1988 car audio competitions.

The dash sports a complete array of Eclipse source units: an EQZ-200 cassette tuner ($1,350), an ESD-230 CD player ($750), and an EST-240 DAT player ($1,600), all of which feed into an Alpine Model 3401 parametric equalizer ($500). The signal then travels to a pair of Rockford Fosgate XV-1 active crossovers ($135 each) and from there to five Rockford Fosgate 45-watt Punch 45 power amplifiers ($220 each).

The front-half speaker system runs through a Nakamichi PC-100 passive crossover ($90) and consists of two MB Quart 25 HC 1-inch titanium-dome tweeters ($300 a pair) in the dash and two Nakamichi SP-40 4-inch midranges ($129 a pair) mounted on full-direction servomotors in the tops of the doors. Each door contains three Nakamichi drivers, an SP-65C 6½-inch coaxial ($325 a pair), an SP-50 5-inch midrange ($150 a pair), and an SP-10 1-inch soft-dome tweeter ($195 a pair). The rear speakers, mounted in the trunk, include four M&M Electronics 6201SPR4 mid-bass drivers ($60 each) and two Nakamichi SP-1010 10-inch subwoofers ($190 each).

The total retail cost of the audio components was $7,400, but that's just the beginning. Special installation work included motorized rosewood panel covers for the equalizer and amplifiers, a special cooling system, a five-stage alarm system, a TV set, a cellular phone, radar detectors, and plenty of custom carpeting, woodwork, and leatherwork—plus a 170-ampere tri-phase fire-engine alternator to run the whole thing. Audio Advisors labored for 145 hours on the Vette, at $35 an hour (total: $5,075), and by the time the entire job was finished the audio and communications system was worth a whopping $21,862.75.

We want one.
The Corvette's in-posing dash has a "rack" of Eclipse gear. Custom door work (top) accommodates Nakamichi speakers, and part of the car's electrical system was modified (middle). Five Rockford Fosgate amps revile in the trunk along with a custom fusebox and the rear speakers. At left, the finished trunk layout, with the M&M mid-bass drivers, Nakamichi subwoofers, and Alpine 3401 parametric equalizer.
The conducting career of Jeffrey Tate substantiates the theory that the best way to learn something is by doing it. In ten short years, the forty-six-year-old British musician has become one of the busiest conductors on the international scene. In the United States his engagements have included the Metropolitan Opera, the Boston Symphony, the Philadelphia Orchestra, and the Los Angeles Philharmonic. In his own country he has been appointed principal conductor of the Royal Opera at Covent Garden and of the English Chamber Orchestra. On the continent he has established regular bases in Paris, Geneva, and Salzburg. His compact disc releases now exceed thirty, and the list is expanding.

Yet as recently as 1980 Tate was earning his living mainly as a vocal coach, rehearsal pianist, and operatic assistant, and his education at Cambridge had been medical rather than musical, culminating in an M.D. degree and two years of practice at St. Thomas's Hospital in London.

"Musically, I was a gifted amateur," Tate told me when we spoke in Boston.

"It's a terrible thing to tell people, especially young people, but there is an element of luck in making a success."
recently. "I was a great sight-reader, but I stopped taking piano lessons at the age of ten because my parents wanted me to concentrate on school work. But I kept right on playing, mainly operatic scores. Even today, I can't play the Liszt sonata to save my life, but I can sight-read my way through Götterdämmerung without trouble."

Complicating Tate's childhood—and his life ever since—were a series of disabling physical afflictions, principally spina bifida and kypho-scoliosis, which left his torso twisted and his left leg shorter than his right. A handsome man nevertheless, he navigates his way to the podium surprisingly briskly with the aid of a cane, and he conducts with vigor perched on a high stool with an elevated back.

"The seated position actually has its points," Tate remarked philosophically. "Christoph von Dohnányi once told me, 'When you start conducting you'll find that sitting in a chair is very good. You'll have a lot of control that way.' And I've found that to be true."

Jeffrey Tate first came to the notice of American music lovers in 1980, when he conducted Alban Berg's Lulu at the Metropolitan Opera. James Levine, whom he had met in Salzburg, had invited him to work at the Met as a vocal coach and as a "cover" or standby conductor; in the latter capacity he was asked to take over Berg's difficult score—without benefit of a stage rehearsal.

"I'd never actually conducted it before, but I had prepared it for Pierre Boulez' performances of the complete score, so I really knew it. Jimmy Levine said, 'Of course you can do it,' and he turned out to be right."

TATE went on to conduct other operas at the Met over the next few years, with the reviews ranging from highly favorable for Mozart's Idomeneo to decidedly tepid for Johann Strauss's Die Fledermaus. He acknowledged that Fledermaus had been "problematical," adding, "I tried to be untraditional, and it didn't turn out the way I'd hoped. I also did a couple of Bohèmes at the Met, but that's really not my part of the musical world. I don't feel too emotionally comfortable in most Italian opera, and since I don't have an affinity for it, I try to steer clear of anything south of the Alps.

"I do have a feel for the Germanic tradition: Mozart, Richard Strauss. That's the world I live in. If I had to name my style, I'd say I was of the Karl Böhm school, the German classical school. French repertoire also is very much up my street, and there are some Verdi works I'd love to do, like Don Carlos."

Far from being strictly a Haydn-Mozart-Schubert conductor, however, Tate displays an extraordinary musical range and adaptability. His latest CD releases from EMI/Angel encompass Schoenberg's Verklärte Nacht and Chamber Symphony No. 2 and Richard Strauss's Le Bourgeois Gentilhomme suite and Metamorphosen, all with the English Chamber Orchestra, as well as Beethoven's Seventh Symphony with the Dresden Staatskapelle. This spring he's recording the Missa Solemnis in London for release early next year. On his most recent visit to the U.S., in January, he conducted the Boston Symphony in a program consisting of Franz Schreker's Chamber Symphony for Twenty-three Solo Instruments, Benjamin Britten's Nocturne for Tenor Solo, Seven Obbligato Instruments, and String Orchestra, and Schubert's Symphony No. 2.

"When I suggested that program to the Boston people, I thought they'd scream for fear it would empty the hall," Tate said. "But they didn't. They're wonderful. Boston is always interested in new works and rare programming."

Tate thinks that his scientific training may have contributed to the sense of discipline with which he approaches his work, whether performing or recording. "I don't like wasting time," he said, "either mine or the musicians'. I learned that working as a répétiteur [vocal coach] for Georg Solti at Covent Garden, I think I know how to plan a three-hour session. Seventy-five percent of a conductor's function is organization, twenty-five percent inspiration."

The urging of his parents that Tate studied medicine. His father, a postal worker, figured the boy had more of a chance of making a decent living as a physician than as a musician. "If I had stayed in medicine, I would have become an ophthalmologist," Tate said. "It's fascinating. Surgery, neurology, and general medicine all come together in the eye."

But even as he interned at St. Thomas's Hospital, Tate was pursuing his musical interests. At the age of twenty-seven he began serious work at the London Opera Centre, a training institution, and after a year he won a job as rehearsal pianist at Covent Garden. There he worked for Solti—indeed, Tate played the harpsichord part for several of Solti's operatic recordings. In 1976, his medical career now well behind him, Tate assisted Pierre Boulez at Bayreuth, musically preparing the modern-dress production of Wagner's Ring of the Nibelung, staged by Patrice Chérreau, that created such a sensation on television (it's now on videodisc from Philips).

EVEN then, Tate said, he never thought he'd become a conductor, but an offer came in 1978 to direct Bizet's Carmen in Sweden. It was followed by an invitation to conduct opera in Cologne, and he was on his way. "I hadn't gone to a conservatory," he said, "but all the strands just seemed to come together for me. It's a terrible thing to tell people, especially young people, but there is an element of luck in making a success."

Although Tate believes that opera is "the most difficult thing for a conductor to pull off," he expects to go right on conducting his share of it, with his immediate schedule including Beethoven's Fidelio in Geneva in May followed by Strauss's Der Rosenkavalier at Covent Garden in June and Mozart's Le nozze di Figaro in Vienna in September. But his chief priority at the moment is to concentrate on the symphonic repertoire, largely through the English Chamber Orchestra. He was recently also named principal guest conductor of Loren Maazel's French National Radio Orchestra. He'll be doing some work with the Rotterdam Philharmonic, which he regards as a vastly underrated orchestra. And he expects to continue conducting orchestras in North America at least one month a year; next January he will appear in Cleveland, Pittsburgh, and Toronto.

Tate particularly likes working with American musicians. "There are a lot of misconceptions about
It has been like a musical love affair between Uchida and myself from the moment we first worked together in London.

musical nationalities,” he said. “German orchestras, for instance, are not necessarily the most disciplined. American and English orchestras are the most disciplined. There’s a special quality of warmth and enthusiasm about American musicians once they know and trust you. I feel a conductor shouldn’t get in the way of the musical inspiration of his players. I always want the personality of the players to come through. You have to encourage people to be themselves. You have to trust your players or you’re finished.”

Tate enjoys recording and is partial to compact discs. “I’ve always been interested in clarity of sound,” he said. “That’s part of the Boulez influence. Compact discs provide both clarity and detail. But that can also be a bit frightening because everything has to be so exactly right.”

He has an exclusive contract “for everything except opera” with EMI, for which he’s scheduled to record the Mozart Symphonies Nos. 25 through 41 and the Haydn London Symphonies (Nos. 93 to 104). He also plans to record the Elgar symphonies and other English music, some French pieces, possibly a Bruckner Ninth, and “some small-scale music.” His EMI contract allows him to do some work for Philips, for which he is recording an admirable sequence of Mozart concertos with the Japanese pianist Mitsuko Uchida and the English Chamber Orchestra. Three discs, containing Nos. 20, 21, 22, 23, 26, and 27, have been issued so far, with at least ten more concertos to follow.

“It has been like a musical love affair between Uchida and myself from the moment we first worked together in London,” he said. “We understand each other instinctively and have developed a close personal as well as musical relationship.” In 1991 Uchida, Tate, and the ECO plan a tour of Japan.

Having skipped music school, so to speak, Tate naturally is a believer in the educational value of practical experience. “Some people are good in competitions,” he said, “and some aren’t. I think I would have fallen apart if I’d entered one. My advice is to go out and do, rather than compete. The idea of a working apprenticeship appeals to me. That’s the European method, though I hear that assistant conductorships work well in America.

“Conducting opera is the basis of all conducting; all the great German conductors started out as Kapellmeisters in opera before moving into symphonic repertoire. It really helps to have blooded yourself in Germany conducting those endless Saturday matinees of Zigeunerbaron. So I’d say a good way to start a career is to go get a job as a répéteur or an odd-job man in a small German opera house.”

Inevitably, one asks Jeffrey Tate what suggestions he has to offer those who, like himself, suffer from a serious disability. Although less militant than violinist Itzhak Perlman, whom he has never met, Tate does interest himself in the cause of the disabled in England. “The way I treat my own disability,” he concluded, “is by ignoring it. In this business, the music business, no one makes allowances for you. All that matters is if you can deliver the goods. So my advice to anyone facing the problem would be to minimize your disability—ignore it as much as you can. My answer to being disabled is to be normal.”

Despite the mushrooming sales of compact disc players, the cassette deck remains one of the most popular hi-fi components. Late 1988 and early 1989 brought many new models into the stores offering more features for less money than ever before. Inexpensive dual-well decks and superior three-head machines are now common purchases.

Our listings here are necessarily selective because of space limitations. All the information about features and performance specifications was supplied by the manufacturers and does not reflect independent testing or evaluation by STEREOR REVIEW. Prices given are suggested retail; actual selling prices may vary. The manufacturers' addresses appear on page 100.
CRW980B Double Cassette Deck

- High-speed synchronized dubbing
- MPX filter
- Headphone jack
- Weight: $650

DRM-700 Cassette Deck

- Two-head, three-motor, silent-mechanism cassette deck
- Features Integral System (IS) non-slip reel drive; Dolby B, C, HX Pro
- Weight: $550

Denon DRM-700

- Compact, full-logic cassette deck with Dolby B, C, HX Pro
- Weight: $779

Tape Decks

- Features
  - Automatic tape selector
  - Multi-speed playback
  - S/N ratio of 75 dB

Model 460 4-Track Cassette Deck/Mixer

- Features
  - 4 independent tape recorders
  - 4 line inputs
  - Stereo bus
  - Weight: $439

Model 160 4-Track Cassette Deck/Mixer

- Features
  - 4 mic inputs
  - Stereo bus
  - Weight: $2,495

Dual by Ortofon

- Features
  - Full-log autoreverse mechanism
  - Weight: $350

HARVESTARD

- Features
  - Direct-drive drive motor
  - Weight: $329

JVC

- Features
  - Direct-drive motor
  - Weight: $2,495

STEREO REVIEW MAY 1989
TAPE DECKS

high-rigidity chassis; Ft. digital peak display; level meters; digital counter; auto record mute; music scan; blank skip; A/B repeat; timer start; auto tape selector; headphone jack with adjustable level: FR 20-17.000 Hz ± 3 dB (metal tape) — $480

TDW999BK Double Cassette Deck
Features twin auto reverse transports with flip reverse heads; sequential or simultaneous recording from 2 tape heads; computer controlled; full-logic mechanisms; high-speed editing with synchro dubbing; continuous play. Dolby B and C NR, LED level meters; dual electronic digital counters; auto/synchno rec mute; music scan on both decks; timer start; auto tape selector; headphone jack

$380

TDW777BK Double Cassette Deck
Features twin auto reverse transports with flip reverse heads; computer controlled, full-logic mechanisms; high-speed editing with synchro dubbing; continuous play. Dolby B and C NR, LED level meters; dual electronic digital counters; auto/synchno rec mute; music scan on both decks; timer start; auto tape selector; headphone jack

$440

LKX Autoreverse Cassette Deck
Features 3-motor, dual-capstan auto reverse transport system; rotating head assembly; patented Duo-Delta dual feedback-loop audio amplifier circuitry; LED diodes; electronic tape counter; bias adjustment; record mute/auto space; system remote jack; FR 20-20,000 Hz ± 3 dB (Cr02); S/N with Dolby C 72 dB (Cr02); 0.7% THD at 1000 Hz (normal); W&F 0.05% w rms; 17w x 4w x 12 in; 9.5 lb

$600

K-111 Cassette Deck
Features soft-touch, full-motion controlled, single capstan transport system; Hexalam head assembly; OFC wire windings; tape monitoring; Dolby B, C and HX Pro; patented Duo-Delta dual feedback-loop audio amplifier circuitry; remote control capability; FR 30-17,000 Hz ± 3 dB (Cr02); S/N with Dolby C 70 dB (Cr02); 1.0% THD at 400 Hz (normal); W&F 0.06% w rms; 17w x 4w x 12 in; 9.5 lb

$550

KX-1100HX Cassette Deck
Features auto reverse with flip reverse head; computer controlled, 2-motor, full-motion mechanism; LED multi-peak level indicator for each channel; auto record mute; auto tape selector; headphone jack; tape running indicator

$270

KENWOOD

KX-6601HX Cassette Deck
Features 3 motors; super Twin Loop Linear Exciter. Dolby B, C and HX Pro; separate recording and bias level calibration controls; built-in signal generator; FR 20-19,000 Hz ± 3 dB (chrome); SN 75 dB with Dolby C (metal); <0.6% THD at 1000 Hz (metal/normal); W&F 0.025% w rms; 7w x 4w x 12 in

$650

KX-6601HX Cassette Deck
Features auto reverse, well -bi directional recording playback. Dolby B and C NR; high-speed dubbing; full-motion computer controlled tape transport; program search; music search; auto recording mute; index scan; FR 20-16,000 Hz (chrome); SN 75 dB with Dolby C; <0.6% THD at 1000 Hz (normal); W&F 0.06% w rms; 4w x 16w x 10 in; 11.9 lb

$389

SD655 Autoreverse Double Cassette Deck
Features autoreverse, record, and playback for both transports: 15-song quick search; fixed hair tauter: music search; auto tape selector; high-speed dubbing: mixing; auto record mute; Dolby B and C NR; 2 heads; 2 motors; memory stop/play; LED meters; soft-touch controls; audio inputs; headphone jack; W&F 0.12% w rms; FR 35-15,500 Hz; S/N 65 dB; 4w x 16w x 10 in

$430

SD285 Autoreverse Double Cassette Deck
Features autoreverse for both transports: quick music search; auto tape selector, high-speed dubbing; Dolby B and C NR; 2 heads; 2 motors; memory stop/play; LED meters; soft-touch controls; headphone jack; W&F 0.3%; FR 35-14,000 Hz; S/N 60 dB; 4w x 16w x 10 in

$300

MITSUBISHI

M-7500 Double Cassette Deck
Full-logic, dual-well cassette deck with autoreverse. Features high-speed synchronous one-touch dubbing; continuous playback of 2 cassettes; music search; repeat functions; blank skip; automatic muting. Dolby B and C, automatic bias calibration; remote control...

$450

M-7410 Double Cassette Deck
Dual-well cassette deck featuring autoreverse, one-touch, high-speed dubbing from tape 1 to tape 2. 7-cassette programmable auto-changer; direct-access selection of tracks on any cassette; music search, blank-skip; repeat playback; synchronized recording. Dolby B NR, automatic tape selection switching; record mute...

$349

NAD

6300 Cassette Deck
Features Dolby B, C and HX Pro NR; play trim to adjust playback EQ; 3 heads; fine bias tuning; elapsing time counter; nonsymmetric dispersed resonance dual-capstan transport; wireless remote; circuit to boost soft passages 20 dB. Speed accuracy ± 1%; W&F 0.03% w rms; FR 30-19,000 Hz ± 3 dB; S/N 78 dB with Dolby C...

$898

6100 Cassette Deck
Features play trim, circuit to boost soft passages 20 dB, Dolby HX PRO and Dyneq headroom extension: rack mountable...

$498

240 Cassette Deck
Features play trim; Dyneq headroom extension, chrome and metal tape compatibility; bias fine tuning: peak-reading LED meters. Speed accuracy ± 1%; W&F 0.06% bias; FR 30-19,000 Hz ± 3 dB; S/N 77 dB with Dolby C...

$298

Nakamichi

Nakamichi Dragon
Microprocessor-controlled 3-head cassette deck with Dolby B and C NR. Features auto azimuth correction system; asymmetrical dispersed-refuse transport; Super Linear Torque direct-drive motors; auto-retracting slot guides; tape-ped lifter; auto tape slack take-up; 2-speed cueing; 2-speed master fader; auto record pause; record-level and bias-calibration controls with 2-tone oscillator; dual-gal leg ferrite/sendust erase head; separate tape and EQ switches for ZX, SX, and EZ cassettes; direct-coupled recording and playback amplifiers; left, right, master input levels; output level control; record mute; high-output headphone jack; delectable infrasonic filter; 4-digit LED electronic counter with memory stop; LED: 0.9% w rms, FR 20-22,000 Hz ± 3 dB with ZX tape; S/N Dolby B and C 66/72 dB at 400 Hz with 3% THD (A-wise with ZX tape at 400 Hz, 0 dB); sep/crosstalk 37/60 dB at 1,000 Hz; 0 dB; input sens/imp 50 mA/50 kilohms line; output level/imp 1 V/2.2 kilohms line, 45 mA/8 ohm headphone jack...

$2195

Kenwood KX-87C

Kenwood KX-87C

Kenwood KX-87C

Kenwood KX-87C

Kenwood KX-87C
<table>
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<th>TAPE DECKS</th>
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| **CR 7A Cassette Deck**  
Discrete cassette deck with asymmetrical diffused-resonance dual-capstan transport. Features 3 heads; 3 motors; auto bias/Q; Dolby B and C NR; manual azimuth adjust; elapsed-time counter; remaining-time counter; output level control; memory stop; play, LED meters; soft-touch controls; headphone jack; rec mute; wireless remote; auto and manual tape/EO selection; auto fade; auto repeat.  
WAF 0.027% WAF; FR: 18-21,000 Hz ± 3 dB; S/N (A-wtd) 66 dB; THD < 1.0%; sep > 37 dB; reading 50 mV; line-output level with 0-DB indication 1,000 mV; 17.8 x 5.8 x 12 in ... $1,595 |
| **RX-505 Cassette Deck**  
Discrete cassette deck with unidirectional auto-reverse to eliminate bidirectional azimuth error. Mechanism turns cassette over at end of side during record or playback. Features 3 heads; asymmetrical dual-capstan closed-loop transport; auto fade (20 secs before end of tape); Dolby B and C NR; DC servo motors; auto record pause; LED peak-meter levels reading from -30 to +10 dB; dual-speed master fader; punch-in/record with DC memory stop/play; DC servo controls; WAF < 0.04% WFR; FR 20-20,000 Hz ± 3 dB; S/N > 70 dB with Dolby C and metal tape; THD < 0.9% with 2X tape, line-input sensit for 0-DB reading 50 mV; line-output level with 0-DB indication 1,000 mV; 17.8 x 5.8 x 11 1/2 in; 22 lb ... $1,395 |
| **CR 5A Cassette Deck**  
Discrete cassette deck with asymmetrical diffused-resonance dual-capstan transport. Features 3 heads; 3 motors; Dolby B and C NR; bias fine tuning control; output level control; memory stops; LED meters; soft-touch controls; headphone jack; record mute with auto repeat; dual-speed master fader control; independent L/R.  
WAF 0.027% WAF; FR: 18-21,000 Hz ± 3 dB; S/N 72 dB A-wtd with Dolby C, line-input sensit for 0-DB reading 50 mV; line-output level with 0-DB indication 1,000 mV; 17.8 x 5.8 x 12 in; 18 lb, 2 oz ... $1,095 |
| **CR-4A Cassette Deck**  
Discrete 3-head system. Features asymmetrical dual-capstan direct-drive transport with FG-servo capstan motor; manual bias and level calibration; built-in test signals; Dolby B and C NR; independent tape and EO selection; 13-segment 50 dB peak-level meters; one-touch/rec/pace; 4-digit LED counter with memory stop and auto repeat; calibration, concentric record level and balance controls; output level; gold-plated input; output, and headphone jacks; OPC wiring and copper-plated chassis; optional remote control; FG servo, brushless, slotless, coreless motor; DC motor mechanism.  
WAF < 0.04% WFR; FR 20-20,000 Hz ± 3 dB; with Dolby C > 72 dB, THD < 0.8%; sep > 37 dB; 17 x 4 x 10 1/2 in; 13 lb ... $995 |
| **CR-3A Cassette Deck**  
Discrete 3-head system. Features asymmetrical dual-capstan transport; bias fine tuning control; Dolby B and C NR; independent tape and EO selection; 13-segment 50 dB peak-level meters; 4-digit LED counter with memory stop and auto repeat; record mute, source/tape, stop, play, pause and record indicators; concentric record level and balance controls; output level control; gold-plated input/output jacks; headphone jack; extractable recording and remote control; DC servomotor; DC motor mechanism.  
WAF ± 0.06% WFR; FR 20-20,000 Hz ± 3 dB; S/N Dolby C > 72 dB, THD < 0.9%; sep > 37 dB, 17 x 4 x 10 1/2 in; 12 lb, 13 oz ... $795 |

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**ONKYO TA-RW470**

Integra TA-2909 Cassette Deck  
Computer-controlled cassette deck with Dolby B, C, and DBX NR. Features 3 heads; 3 motors; auto bias/Q; dual-capstan bias fine-tuning control; direct drive; elapsed-time counter; remaining-time counter; music search; output-level control; memory stop/play; mic input; headphone jack; record mute; record calibration controls; sendust heads; MPX filter; fluorescent meters; 2-color peak-hold indicators; optional remote control and side panels; WAF 0.02% WFR; FR 25-17,000 Hz ± 3 dB (Type I tape), 25-19,000 Hz ± 3 dB (Type II tape), 25-21,000 Hz ± 3 dB (Type IV tape); S/N (Type IV tape) 60 dB no NR, 70 dB Dolby B, 80 dB Dolby C, 87 dB DBX, 17.8 x 3 7/8 x 15 1/2 in ... $950 |

**TA-2800 Cassette Deck**  
Three-head tape deck features computer-controlled, 3-motor silent-mechanism transport; Dolby B and C NR; Dolby HX Pro; automatic Accu-Bias system; record calibration; real-time counter; switchable MPX filter; forward and reverse AMCS remote compatible ... $650 |

**TA-RW490 Double Cassette Deck**  
Features computer-controlled transports with autonomous and 2 motors; Dolby B and C NR; real-time counter; standard and high-speed dubbing; continuous play; AMCS remote; compatible ... $500 |

**TA-2600 Cassette Deck**  
Three-head tape deck. Features computer-controlled 3-motor silent-mechanism transport; Dolby B and C NR; Dolby HX Pro; Accu-Bias system; real-time counter; switchable MPX filter; forward AMCS, remote compatible ... $480 |

**TA-R200 Autoreverse Cassette Deck**  
Autoreverse cassette deck with 2 heads; full-logarithmic controls; Dolby B, C, HX Pro; Accu-Bias system; auto tape selector; 2-mode repeat; remote compatible ... $260 |

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**OKSA D/HX-600 Cassette Deck**  
Features Dolby B, C, and HX Pro; sendust-alloy head; LED peak and peak storage meters; polystyrene capacitors and other hand-selected parts; single DC servo motor; soft-touch controls; S/N 75 dB with metal tape and Dolby C; 17 1/4 x 4 9/16 x 11 in; 12 lb ... $360 |

**D/HX-550R Autoreverse Cassette Deck**  
Features LED peak metering; slider controls for recording; polystyrene capacitors; soft-touch controls; Dolby B, C, and HX Pro; FR 20-20,000 Hz; S/N 77 dB (metal), <0.1% THD; 17 1/4 x 4 9/16 x 11 in; 11 1/2 lb ... $330 |

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**PHILIPS FC 567 Dual Cassette Deck**  
Features dual cassette wells; auto-reverse; logic controls; playback EQ with digital filtering; high-speed dubbing; 4 motors; continuous playback and recording for up to 3 hours; dual azimuth settings; double-gap erase heads. FR 30-18,000 Hz (chrome); S/N 60 dB (chrome); WAF < 0.04% WFR; 16 x 4 x 10 1/2 in; 11.5 lb ... $479 |

**FC 566 Cassette Deck**  
Same as above except 2 motors; 10 lb ... $379 |

**PIONEER Elite CT-91 Cassette Deck**  
Features Dolby B, C, and HX Pro; logic controls; 3 heads; 2 motors; 3 power supplies; bias...
Introducing “The System” by Proton.

You’re looking at the perfect synthesis of advanced electronics, sophisticated design and uncompromising sound. It’s “The System,” Proton’s incomparable new, integrated audio components with remote control.

There’s a fully programmable compact disc player that lets you play up to 20 of your favorite selections—in any order—totally free of distortion or noise.

A digital tuner that locks in the precise station frequency for clean, undistorted listening. Powered by a component-quality amp with 22 watts per channel.

An auto-reverse cassette deck with Dolby® B Noise Reduction that plays and records in both directions for continuous enjoyment.

And our AL-200, two-way acoustic suspension speaker system. Its 6.5 inch woofer and wide dispersion dome tweeter deliver sound so breathtaking, you simply won’t believe your ears.

Even the sleek, comfortable remote control is a work of art that’s exceptionally easy to work. While you may find a system with similar components as “The System,” that’s where the similarity ends. Because when it comes to sound, nothing comes remotely close.

Call for your free Ultimate Systems Guide. Proton's Ultimate Systems Guide for Audio Videophiles tells you all about the innovative technology and design in our renowned line. For your copy, and the name of the Proton retailer nearest you, call (800) 772-0172. In California, (800) 428-1006.

PROTON CLEARLY THE BEST
5630 Cerritos Ave., Cypress, CA 90630

CIRCLE NO. 93 ON READER SERVICE CARD
TAPE DECKS

fine tuning; anti-vibration design; dual-caps; amorphous head; flat display; remote-control compatibility; electronic real-time tape counter; power eject; auto monitor; FR 20-22,000 Hz; S/N 80 dB; WAF 0.024% w rms. 5.5 x 4.5 x 3.2 in; 2 lb 3 oz. $950

CT-S800 Cassette Deck
Features 3 heads, 2 motors; remote control: logic controls; Dolby B, C, and HX Pro; automatic tape selector; closed-loop dual-caps mechanism; cassette stabilizer; copper-plated honeycomb chassis; 3 power supplies; 15-segment level display; electronic real-time tape counter; auto record/mode; 2 motors; 15-track music search; one-touch tape return; auto monitor and power eject. $750

CT-W900R Double Cassette Deck
Features Dolby HX Pro: two autozure transports; two-sided continuous recording of each tape; relay play; cassette stabilizer; separate keys for operating each deck; remote-control compatibility; blank search; blank skip; skip search; automatic recording mute ........................................ $650

CT-W700R Double Cassette Deck
Features Dolby HX Pro; playback on transport 1 and recording or playback on transport 2; relay play; cassette stabilizer; separate keys for operating each deck; remote control compatibility; blank search; blank skip; skip search; automatic recording mute. ........................................... $435

CT-S600 Cassette Deck
Features 2 heads, logic controls; Dolby B, C, and HX Pro; cassette stabilizer: copper-plated honeycomb chassis; 15-segment level display; electronic real-time tape counter; 15-track music search; one-touch tape return; auto monitor and power eject. ........................................... $375

CT-1280WR Double Cassette Deck
Features autorverse playback and recording on deck 2; autorverse playback on deck 1; Dolby B and C; relay play; high-speed dubbing; logic controls; music search; skip search; auto tape selector; record mute. Compatible with Pioneer’s SR unified remote control. WAF <0.09% w rms; S/N 57 dB no NR. 16.8 x 4.4 x 10.2 in; $360

PROTON
740 Autorverse Cassette Deck
Autorverse cassette deck with logic controls and Dolby B, C, and dbx NR. Features 2 heads: 1 motor; auto bias/EQ; elapsed-time counter; music search; output level control; memory stop/play; LED meters; soft-touch controls; mic inputs; headphone jack; reset mute; sleep timer; 9-program memory selection; WAF 0.05% w rms. FR 25-18,000 Hz; ± 3 dB (chrome); S/N (A-weight) with Dolby C 71.5 dB (chrome); < 1.8% THD (chrome); mic input sens 0.35 mV; 16.9 x 4.8 x 10.4 in; 11.2 lb. $349

AD-300 Autorverse Cassette Deck
Autorverse cassette deck with Dolby B and C NR. Features logic controls; tape counter; peak-reading level indicators; memory stop/off/play; WAF 0.8% w rms; MPX filter: auto bias selector; FR 40-16,000 Hz; ± 3 dB (chrome); S/N with Dolby C 70 dB (chrome); < 1.8% THD (chrome); optional remote control. ................................................ $319

AD-200 Cassette Deck
Features one-button recording; Dolby B and C NR; defeatable MPX filter; LED peak-level indicators; record/stop; playback; tape counter; headphone jack; locking rewind and fast-forward; tape selector; WAF: 0.8%; line-input sens 80 mV; FR 40-15,000 Hz; ± 3 dB (chrome); 16/5 x 4 x 10 in; 8.8 lb. $229

RCA
MTR225 Double Autorverse Cassette Deck
Dimensia dual-well deck with remote-control. Features on-screen status when used with Dimensia monitor; Dolby B and C NR; high-speed duplex; Dolby electronic controls; microprocessor control; peak meters; random-access programming; scan-and-play system; automatic tape cueing; auto tape selection; status display; tape mode display; record-level control; S/N 70 dB with Dolby C; WAF <0.07% 14 x 3 x 10 in. $399

REALISTIC BY RADIO SHACK
SCT-84 Double Cassette Deck
Features single or multiple repeats; auto tape selector; syncrono-stutter Dubbing; auto stop; record mute button; permalloy record/playhead; ferrite erase head; Dolby B and C NR; high-speed duplex; metal tape compatibility; mic and headphone jacks; 2-color LED peak-level meters; sequential play; soft-touch controls. WAF 0.06% w rms; FR 20-15,000 Hz; ± 3 dB (chrome); S/N 70 dB with Dolby C; 1.0% THD: 5 x 17 x 12 in. ........................................ $260

SCT-83 Autorverse Cassette Deck
Features music search; Dolby B and C NR; sole-noid operation, plays 1 side, both sides, or repeats continuously; metal tape compatibility; mic and headphone jacks; intro scan; WAF 0.06% w rms; FR (± 3 dB) high bias 40-15,000 Hz; S/N 70 dB with Dolby C. $220

REVOL B215-S
B215-S Cassette Deck
Employs 3 microprocessors to control bias, recording level, EQ, and tape transport. Features a real-time mask that computes elapsed time on partially wound tapes; 3 heads; 4 motors; Dolby B, C, and HX Pro; digital memory to store bias and recording levels; EQ settings for 6 tape formulations; manual or auto record-level setting; die-cast transport chassis; azimuth-stable pivoting headblock; 2 programmable buttons for track location; loop mode. WAF 0.1% w rms; FR ferric 30-18,000 Hz; ± 3 dB; S/N 72 dB with Dolby C... $230

ROTEL
RD870 Cassette Deck
Features Dolby B, C, HX Pro; sendest record/ playback head; 2 motors; bias fine tuning; direct drive; LED meters; soft-touch controls; mic and headphone jacks; WAF 0.055% w rms; FR metal 20-20,000 Hz ± 3 dB $499

RD835 Cassette Deck
Features Dolby B and C; sendest record/playback head; ferrite-core erase head; soft-touch controls; LED meters; mic inputs; DC servo motors; headphone jack; WAF 0.08% w rms; FR high bias 30-17,000 Hz ± 3 dB; S/N high bias: 72 dB with Dolby C; 17 x 4.5 x 10.4 in; 9 lb. ................................ .................. $349

SANSUI
C102 Cassette Deck
Features tape transport enclosed in electronic sliding drawer: logic controls; 2 heads; 2 motors; Dolby B and C NR; manual azimuth adjustment; elapsed-time counter; remaining-time counter; music search; blank skip; memory stop; 15-track automatic music program; PL display; FR 30-20,000 Hz; S/N 80 mV $950

SANSUI
D-X301i
Cassette Deck
Features 3 heads; 2 motors; dual-caps transport mechanism; logic controls; Dolby B and C NR; separate record and playback DC amplifiers; fine bias adjustment; headphone jack with adjustable level; record/pause; auto-monitor; memory stop; 15-track automatic music program; PL display; FR 30-18,000 Hz; WAF 0.035% w rms; S/N 60 dB $650

D-X501 Cassette Deck
Features Dolby B and C NR; 2 heads; 2 motors; logic controls; record cancel; headphone jack with adjustable level; record/pause; auto-monitor; memory stop; 15-track automatic music program; PL display; FR 30-18,000 Hz; WAF 0.045% w rms; S/N 58 dB $450

D-X301R Autorverse Cassette Deck
Features autorverse; 20-track automatic music search; remote control; remote monitor; auto-correct bias adjustment; record/play timer; remote control compatibility; record cancel; time measurement; music scan; headphone jack with adjustable level; memory stop; FR 26-19,000 Hz; WAF 0.5% w rms; S/N 72 dB with Dolby C. $390
INTRODUCING PROOF THAT WE KNOW ACCURATE SOUND INSIDE AND OUT.

PRESENTING THE NEW INDOOR/OUTDOOR MINI ADVENT LOUDSPEAKERS.

Now you can hear the traditionally natural Advent sound in a totally different environment. Outside.

Because our new Indoor/Outdoor Mini loudspeakers are resistant to water, humidity, heat and cold, the sound from your speakers will be accurate, even when the weatherman is not.

Plus, they've been designed with the same type of features that have made the Advent sound a legend indoors. Including 5 1/4" long throw polypropylene woofers. Polycarbonate hard dome tweeters. And 120 watts peak power (165, when connected to our Mini Subwoofer.) They sound terrific by themselves or completing a surround sound system. Wrap it all up in sleek, black Eurostyle cabinets that go just about anywhere (especially when using our optional wall and ceiling mounts) and you have a pair of speakers that will definitely get you out of the house more often.

To hear our Indoor/Outdoor Mini loudspeakers, or any of the fine line of Advents (including the new Prodigy II), just step inside your nearest Advent dealer.

ADVENT®
Sound as it was meant to be heard.

CIRCLE NO. 30 ON READER SERVICE CARD
### TAPE DECKS

<table>
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<tr>
<th>Model</th>
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<tr>
<td><strong>SHARP</strong></td>
<td><strong>RT-W800 Double Cassette Deck</strong> Dual-well deck with autoreverse, high-speed dubbing, and Dolby B NR. Features soft-touch controls, auto program search, LED peak-level meters, metal-tape compatibility, 2 heads, 1 motor, music search, output-level control, mic and headphone jacks. W &amp; F 0.08% wrms, FR high bias 40-14,000 Hz ± 3 dB, 5 x 7 in.</td>
<td>17  x 4  x 9 in.</td>
<td>$290</td>
</tr>
<tr>
<td><strong>SHERWOOD</strong> DS-7000R</td>
<td><strong>Cassette Deck</strong> Features microprocessor supervised, soft-touch logic control, 3 heads, 2 motors, Dolby B, C, and HX Pro. Fine bias control, digital readout, auto tape selector, separate left/right rec level adjustment, output-level control: microphone and headphone jacks, 13-segment rec level indicators; record mute button, timer switch; 2-line input jacks with record cross fader; air-damped soft-eject cassette door. Optional Digi-Link remote control. FR 30-18,000 Hz; S/N 75 dB with Dolby C, 40 dB channel sep at 1 kHz; W &amp; F 0.05% wrms, 5 x 17 1/2 x 11 in.</td>
<td>17  x 5  x 7 1/2 in.</td>
<td>$470</td>
</tr>
<tr>
<td><strong>TC-WR700 Double Cassette Deck</strong> Dual-well deck with autoreverse and recording on both decks. Features 4 motors (2 per deck): Dolby B and C NR; laser-ampomous heads; relay play; recording-level control; automatic music sensor; blank skip; electronic linear counter; direct-coupled electronics; remote control capability. FR 30-20,000 Hz ± 3 dB.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$700</td>
<td></td>
</tr>
<tr>
<td><strong>TC-YX00ES Cassette Deck</strong> Features 2-motor transport with DC servo motors for capstan and separate motor for reel hubs; laser-ampomous head; autoreverse: Dolby B, C, and HX Pro; 5-band spectrum analyzer; real-time counter; recording-level calibration with 10-second test tone; variable bias; auto tape selection; automatic music sensor; blank skip; music scan; auto space; record mute; timer/rec/play; 160-kHz Super Bias circuitry; remote-control capability.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$600</td>
<td></td>
</tr>
<tr>
<td><strong>TC-YX010 ES Cassette Deck</strong> Features 2-motor transport with autoreverse motor for capstan and separate motor for reel hubs; laser-ampomous head; autoreverse: Dolby B, C, and HX Pro; linear real-time counter; automatic tape selection; automatic music sensor; blank skip; music scan; auto space; record mute; timer/rec/play; 160-kHz Super Bias circuitry; remote control capability.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$450</td>
<td></td>
</tr>
<tr>
<td><strong>SONY</strong> TC-K700ES</td>
<td><strong>Cassette Deck</strong> Features: 4 motors (2 per transport); autoreverse; Dolby B and C NR; electronic digital tape counter; 3-position tape selector; high-speed cue; auto space record mute; timer/rec/play; mic inputs; 160-kHz Super Bias circuitry; remote control capability.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$350</td>
</tr>
<tr>
<td><strong>TC-YX010 ES Cassette Deck</strong> Features 2-motor transport with DC servo motors for capstan and separate motor for reel hubs; laser-ampomous head; autoreverse: Dolby B, C, and HX Pro; linear real-time counter; autoreverse deck with Dolby B and C NR; digital tape counter; normal and high-speed dubbing; bidirectional audio music search; auto tape selector; uninitiated dubbing; synchronized, one-touch dubbing; relay play with alternate playback deck; continuous play; record-mute button; separate record-level and balance control; 13-segment record-level indicators; timer-record and start; illuminated tape-direction indicators; air-damped soft-eject cassette doors; 3 playback modes. Optional Digi-Link remote control. FR 30-16,500 Hz; S/N 75 dB with Dolby C, 40 dB channel sep at 1 kHz; W &amp; F 0.12% wrms, 4 x 17 1/2 x 5 in.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$300</td>
<td></td>
</tr>
<tr>
<td><strong>TC-TW-11ES Double Cassette Deck</strong> Features: 4 motors (2 per transport); soft-touch logic controls; autoreverse; Dolby B, C, and HX Pro; digital readout; auto tape selector; 2-line input jacks with record cross fader, auto music search system; 3 playback modes; mic and headphone jacks; record-level and balance control; output-level control; 12-segment record-level indicators; record mute button; relay play; continuous play; air-damped soft-eject cassette door; timer switch. Optional Digi-Link remote control. FR 30-16,500 Hz; S/N 75 dB with Dolby C, 40 dB channel sep at 1 kHz; W &amp; F 0.09% wrms, 5 x 17 1/2 x 11 in.</td>
<td>17  x 5  x 11 1/2 in.</td>
<td>$290</td>
<td></td>
</tr>
</tbody>
</table>
Double Scoop
When one is plainly not enough ...indulge!
TEAC

Esoteric R-919X Auto Reverse Cassette Deck
Three-head cassette deck with Dolby B, C, and DBX features; bidirectional transport control; bias fine tuning; bi-polar power supply; direct-coupled circuits; music mute with auto space; hard permalloy; playback/bias head; multi-function FL display; electronic tape counter with index and tape-run time modes; L & R peak-level meters; master recording-level control with L & R preset; auto tape selector; MPX filter; timer/rec/play function. FR 20-21,000 Hz (metal); W & F 0.06% w/m; S/N 80 dB with Dolby C, 174 x 4/10 x 10/11 in; 11 lb. $450

V-570 Cassette Deck
Features two motors: Dolby C, and HX Pro, IC-logic control transport; bias fine tuning; bi-power supply/direct-coupled circuitry; music mute with auto space; hard permalloy; re/playback head; multi-function FL display; electronic tape counter with index and tape-run time modes; L & R peak-level meters; master recording-level control with L & R preset; auto tape selector; MPX filter; timer/rec/play function. FR 20-19,000 Hz (metal); W & F 0.06% w/m; S/N 74 dB with Dolby C, 174 x 4/10 x 10/11 in. $350

W-450R Double Cassette Deck
Bidirectional continuous playback deck. Features bidirectional recording on deck II; Dolby HX Pro on deck II; Dolby B & C NR; rotating-head reverse system; sync reverse, sync dubbing, normal/high-speed dubbing, one program skip function in deck II; L & R microphone inputs on deck II; auto tape selector, peak-level meter; headphone jack; timer/rec/play function. FR 30-17,000 Hz (metal); W & F 0.06% w/m; S/N 70 dB with Dolby C, 174 x 4/10 x 10/11 in. $290

W-455CHX Autoreverse Cassette Deck
Bidirectional playback deck. Features auto-reverse/repeat; accurate rotating-head reverse system; Dolby B, C, and HX Pro; one-program skip function; 2-color peak-level meter; music mute function; output-level control for line and headphone outputs; headphone jack; timer/rec/play function. FR 30-17,000 Hz (chrome); S/N 70 dB with Dolby C, 174 x 4/10 x 8/11 in; 6.6 lb. $220

R-445. Same as above except no HX Pro or output-level control. $210

Technics

RS-T330R Double Cassette Deck
Four-head, two-motor deck with autoreverse, record, and playback for both transports. Features 4 reverse modes; parallel and 3-hour series recording on both transports; series playback; syncro start; dual-motor transport; 2 motors; dual capstans; bias fine tuning; remote control compatibility with some Technics receivers; high-speed editing; Dolby B, C, and DBX NR; elapsed-time counting. Master recording level with L & R preset. $330

RS-T80R Cassette Deck
Three-head deck with NR circuitry for decoded monitoring while in record mode. Features close-loop dual-carriage transport; Dolby B, C, HX Pro, and DBX; 2-motor transport; FL display; bias control; record calibration tone generator; MPX filter; auto rec-mute; headphone jack with adjustable level. $660

RS-T905 Cassette Deck
Three-head deck with NR circuitry for decoded monitoring while in record mode. Features close-loop dual-carriage transport; Dolby B, C, HX Pro, and DBX; 2-motor transport; FL display; bias control; record calibration tone generator; MPX filter; auto rec-mute; headphone jack with adjustable level. $660

RS-755R Double Cassette Deck
Features autoreverse for both transports; Dolby B, C, and DBX NR; high-speed dubbing; auto bias/EQ; syncro start; stop; rec mute; auto space; anti-resonant metallic feet; edit search on transport A; soft-touch controls; 28-bit digital peak readout. $460

RS-B605 Cassette Deck
Features 3 heads with NR circuitry for decoded monitoring while in record mode; Dolby B, C, HX Pro, and DBX; 2-motor transport; FL display; bias control; auto record mute. $390

RS-T30M Double Cassette Deck
Dual-well cassette deck with autoreverse record and playback in transport A. Features high-speed editing; Dolby B and C NR; FL display; series play; synchro-start; synchro-rec-mute; synchro-stop; electronic switching; LED indicators; cue and review; headphone jack; automatic tape selection; timer capability. $330

TOSHIBA

PC-5855 Double Cassette Deck
Features IC-logic design; high-speed dubbing; Dolby B and C NR; continuous play between decks; quick search selection; repeat function. $399

Stereophone

RS-455CHX Autoreverse Cassette Deck
Features high-speed dubbing; auto bias/EQ; syncro start; stop; rec mute; auto space; anti-resonant metallic feet; edit search on transport A; soft-touch controls; 28-bit digital peak readout. $460

CR-160A Portable Cassette Deck
Compact front-loading portable cassette recorder with monitor facility. 8 hours recording time, and voice activation recording. Features 3 heads; 2 motors; dual capstans; bias fine tuning; manual azimuth adjust; direct drive; elapsed-time counter; output-level control; memory stop/play; LED meters; soft-touch controls; mic and headphone jack; record mute; 3 tape speeds: 1/8 ips, 1/4 ips, and 16 ips. $399

CR-160A Portable Cassette Deck
Compact front-loading, cassette recorder with autoreverse and remote control. Features 8 hours recording time; voice activation; Dolby B NR; switchable ALC with two time constants; separate channel record level meters, 4 tracks; 1% and 1.5% bias; 3 heads; 2 motors; soft-touch controls; built-in speaker. Operates on dry cell, 12-V car battery, or 110V/220 V A/C. W & F 1.75 w/m; FR 20-19,000 Hz ±3 dB. $1,799

CR-160A Portable Cassette Deck
Portable 2-head deck with Dolby B and C NR; switchable ALC with two time constants; separate channel recording level control; 3 built-in speakers. Operates on dry cells, 12-V car battery or 120 V A/C. W & F 0.2% w/m; FR high bias 30-16,000 Hz ±3 dB; S/N high bias 57 dB. $999

CR-160A Portable Cassette Deck
Compact front-loading cassette recorder with autoreverse and remote control. Features 8 hours recording time; voice activation; Dolby B NR; switchable ALC with two time constants; separate channel record level meters, 4 tracks. $1,799
Deceptive Engineering

Obvious but very deceptive...
You'll probably notice our 50-watt RX-533 offers obvious features such as Digitas AM/FM cassette/radio with Dolby® B & C noise reduction, 24-preset stations, preset scan, tape program search, separate bass & treble tone controls, etc., and of course, it's removable!

But you'll probably overlook the not-so-visible but specially engineered features such as FM optimizer II circuitry designed for superior FM reception and built-in Automatic Radio Monitor for filling the void with music while you are fiddling with your tape. Special cassette features such as "Auto Azimuth Correction System" rotates the tape head 180 degrees whenever tape direction changes to keep perfect azimuth alignment, Keyoff Pinch Roller Release minimizes wear and tear of tape pinch roller and DC servo motor accurately controls tape movement thus minimizing wow and flutter.

Plus pre-amp outputs and CD/AUX input capability designed for flexible system expansion, two-tone illuminated control panel guarantees easy viewing and identification and replaceable Lithium back-up battery helps protect and store information in the microprocessor.

Though not in plain view, these state-of-the-art engineering innovations are obviously what you have come to expect from a company with over 11 years of manufacturing experience. Coustic...a sound investment.

Coustic 1987

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**VECTOR RESEARCH**

VECTOR RESEARCH 470R Autoreverse Cassette Deck
Features autoreverse, 2-motor transport; soft-touch logic controls; Dolby B, C and HX Pro; high-frequency trim, fine bias adjustment; wireless remote control; music search; microphone inputs; switchable MPX filter; headphone jack; volume control; variable line output; auto tape selector.

**VCX-450 Autoreverse Cassette Deck**
Features autoreverse; 9-song programmable music search; send/stop head; solid state circuitry; switchable MPX filter; record balance; Dolby B and C.

**VCX-325 Double Cassette Deck**
Features Dolby B, C and HX Pro; 8-second peak-level meter; 28-key wireless remote control; integrated-system remote compatibility; recording-level indicator; random program play; intro scan; music search; repeat; record return; auto record mute; auto tape selector; memory stop; headphone jack with adjustable level. S/N with Dolby C 77 dB, FR 20-22,000 Hz ≤ 3 dB.

**KX-W302U Double Cassette Deck**
Features autoreverse play in both decks, recording in one deck; logic controls; amorphous head; Dolby B, C and HX Pro; one-touch dubbing at normal and high speed; relay play; auto tape selector; auto record mute; music search; MPX filter; optional remote control.

**KX-900U Cassette Deck**
Features Dolby B, C and HX Pro; high-speed dubbing; Dolby B, C and HX Pro; high-speed dubbing; manual dubbing; cross-Dolby dubbing; simultaneous independent recording; random control; random play and music search on both decks; intro scan; rec return; auto rec mute; blank skip; auto tape selection; 4-digit electronic tape counter; 12-segment peak-level meters on both decks; remaining-time indicator.

**KX-W900U Double Cassette Deck**
Features Dolby B, C and HX Pro; high-speed dubbing; manual dubbing; cross-Dolby dubbing; simultaneous independent recording; random control; random play and music search on both decks; intro scan; rec return; auto rec mute; blank skip; auto tape selection; 4-digit electronic tape counter; 12-segment peak-level meters on both decks; remaining-time indicator.

**KX-R430 Autoreverse Cassette Deck**
Features Dolby B, C and HX Pro; autoreverse; amorphous head; bidirectional intro scan; 2 heads; 2 motors; music search; full, single, and phrase repeat; record return; auto record mute; auto tape selector; record and playback timer; front-panel headphone jack; 7-segment LED peak-level meters; MPX filter; blank skip; manual bias adjustment; ±20%; RS integrated-system remote-control compatibility. 11-key wireless remote control included. FR 20-19,000 Hz ≤ 3 dB; S/N 74 dB with Dolby C; 1% THD; WAF 0.05% w/rms.

**YAMAHA**

**KX-1200U Cassette Deck**
Features 3 heads; 28-key wireless remote control; dbx dynamic expansion; Dolby B, C and HX Pro; optical balance tuning system; closed-loop, dual-capsaon tape transport; amorphous head; logic controls; recording-level indicator; integrated-system remote compatibility. Black. 22 lb.

**KX-800U Cassette Deck**
Features autoreverse and playback heads; play, record, and autoreverse on both decks; relay play and rec; Dolby B, C and HX Pro; high-speed dubbing; digital dubbing; random program dubbing; manual dubbing; cross-Dolby dubbing; simultaneous independent recording; random control; random play and music search on both decks; intro scan; rec return; auto rec mute; blank skip; auto tape selection; 4-digit electronic tape counter; 12-segment peak-level meters on both decks; remaining-time indicator.

**KX-900U Cassette Deck**
Features autoreverse record and playback; full-logic, 3-motor tape transport; amorphous record/playback head; Dolby B, C and HX Pro, and dbx; electronic record-level control; recording-level indicator; power eject and close; remaining tape/time display; auto fade in/out; auto tape selector; record return; bidirectional intro scan; 9-selection random program play; music search; programmable timer-clock; 39-key wireless remote control; MPX filter; display real-time counter; blank skip; zero memory; auto record mute; memory stop; integrated-system remote compatibility.

**KX-900U Cassette Deck**
Features 2 motors; 38-key wireless remote control; 12-segment peak-level meter; 28-key wireless remote control; integrated-system remote compatibility; recording-level indicator; random program play; intro scan; music search; repeat; record return; auto record mute; auto tape selector; memory stop; headphone jack with adjustable level. S/N with Dolby C 77 dB, FR 20-22,000 Hz ≤ 3 dB.

**KX-W202U Double Cassette Deck**
Features one-way operation of both tape mechanisms; hard-permadel record/playback head; Dolby B and C NR; one-touch dubbing at normal and high speed; relay play; music search; record return; auto record mute; MPX filter; auto tape selector; integrated-system remote compatibility. Optional remote control.

**KX-900U Cassette Deck**
Features Dolby B, C and HX Pro; 2 motors; Dolby manual bias adjustment ±20%; MPX filter; 7-segment peak-level meter. 10-key wireless remote control; integrated-system remote compatibility; play trim; bidirectional intro scan; music search; repeat; record return; auto record mute; auto tape selector.

**KX-W202U Double Cassette Deck**
Features Dolby B, C and HX Pro; 2 motors; Dolby manual bias adjustment ±20%; MPX filter; 7-segment peak-level meter. 10-key wireless remote control; integrated-system remote compatibility; play trim; bidirectional intro scan; music search; repeat; record return; auto record mute; auto tape selector.

**KX-900U Cassette Deck**
Features Dolby B, C and HX Pro; autoreverse; amorphous head; bidirectional intro scan; 2 heads; 2 motors; music search; full, single, and phrase repeat; record return; auto record mute; auto tape selector; record and playback timer; front-panel headphone jack; 7-segment LED peak-level meters; MPX filter; blank skip; manual bias adjustment; ±20%; RS integrated-system remote-control compatibility. 11-key wireless remote control included. FR 20-19,000 Hz ≤ 3 dB; S/N 74 dB with Dolby C; 1% THD; WAF 0.05% w/rms.

**KX-R430 Autoreverse Cassette Deck**
Features Dolby B, C and HX Pro; autoreverse; amorphous head; bidirectional intro scan; 2 heads; 2 motors; music search; full, single, and phrase repeat; record return; auto record mute; auto tape selector; record and playback timer; front-panel headphone jack; 7-segment LED peak-level meters; MPX filter; blank skip; manual bias adjustment; ±20%; RS integrated-system remote-control compatibility. 11-key wireless remote control included. FR 20-19,000 Hz ≤ 3 dB; S/N 74 dB with Dolby C; 1% THD; WAF 0.05% w/rms.

**Yamaha KX-1200U**
Features 2 motors; 38-key wireless remote control; 12-segment peak-level meter; 28-key wireless remote control; integrated-system remote compatibility; recording-level indicator; random program play; intro scan; music search; repeat; record return; auto record mute; auto tape selector; memory stop; headphone jack with adjustable level. S/N with Dolby C 77 dB, FR 20-22,000 Hz ≤ 3 dB.

**KX-W202U Double Cassette Deck**
Features one-way operation of both tape mechanisms; hard-permadel record/playback head; Dolby B and C NR; one-touch dubbing at normal and high speed; relay play; music search; record return; auto record mute; MPX filter; auto tape selector; integrated-system remote compatibility. Optional remote control.

**KX-300U Cassette Deck**
Features Dolby B, C and HX Pro; 2 motors; Dolby manual bias adjustment ±20%; MPX filter; 7-segment peak-level meter. 10-key wireless remote control; integrated-system remote compatibility; play trim; bidirectional intro scan; music search; repeat; record return; auto record mute; auto tape selector.

**KX-900U Cassette Deck**
Features Dolby B, C and HX Pro; autoreverse; amorphous head; bidirectional intro scan; 2 heads; 2 motors; music search; full, single, and phrase repeat; record return; auto record mute; auto tape selector; record and playback timer; front-panel headphone jack; 7-segment LED peak-level meters; MPX filter; blank skip; manual bias adjustment; ±20%; RS integrated-system remote-control compatibility. 11-key wireless remote control included. FR 20-19,000 Hz ≤ 3 dB; S/N 74 dB with Dolby C; 1% THD; WAF 0.05% w/rms.

**KX-R430 Autoreverse Cassette Deck**
Features Dolby B, C and HX Pro; autoreverse; amorphous head; bidirectional intro scan; 2 heads; 2 motors; music search; full, single, and phrase repeat; record return; auto record mute; auto tape selector; record and playback timer; front-panel headphone jack; 7-segment LED peak-level meters; MPX filter; blank skip; manual bias adjustment; ±20%; RS integrated-system remote-control compatibility. 11-key wireless remote control included. FR 20-19,000 Hz ≤ 3 dB; S/N 74 dB with Dolby C; 1% THD; WAF 0.05% w/rms.
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ELVIS COSTELLO: Spike. Elvis Costello (vocals and instrumentals); Chrissie Hynde (vocals); Marc Ribot, Paul McCartney, Roger McGuinn (guitars); Benmont Tench, Allen Toussaint, Mitchell Froom (keyboards); Jim Keltner (drums); Dirty Dozen Brass Band; other musicians. This Town; Let Him Dangle; Deep Dark Truthful Mirror; Veronica; God’s Comic, Chewing Gum; Tramp the Dirt Down; Stalin Malone; Satellite; Pads, Paws and Claws; Baby Plays Around; Miss Macbeth; Any King’s Shilling; Coal-Train Robberies (cassette and CD only); Last Boat Leaving. WARNER BROS. 25848-1, © 25848-4, © 25848-2 (65 min).
**BEST RECORDINGS OF THE MONTH**

**ORPHEUS CHAMBER ORCHESTRA**

The conductorless Orpheus Chamber Orchestra has done it again with a beautifully conceived program, impeccably played and recorded, of Prokofiev's *Classical Symphony*, Britten's *Simple Symphony*, and Bizet's Symphony in C Major. Elegance, precision, and vitality characterize the performances from start to finish. It is a pleasure to listen to the Prokofiev *Classical Symphony* with all the inner details of wind scoring clearly audible, not overwhelmed by a full symphonic string body. It is also good to hear the slow movement done at a pace that lets the music flow rather than bog down. Judiciously applied rubato makes the famous gavotte more than usually fascinating, and the finale is sizzling and zesty.

The performance of the Britten symphony for strings is characterized by razor-sharp attacks and rhythmic alertness. There's terrificizing in the "Playful Pizzicato" movement, great tonal richness in the "Sentimental Saraband," and virility to spare in the "Frolicsome Finale." The symphony by the seventeen-year-old Bizet goes with all the charm and spirit one could wish for, with the solo oboist shown to particularly lovely advantage in the slow movement. The scherzo has real lift and verve, and the finale is swiftly played and virtuosic to the last degree.

The recording locale, the concert hall at the State University of New York at Purchase, is ideal for the Orpheus ensemble, enhancing the astonishingly powerful sonorities they generate. Unhesitatingly recommended.  

David Hall


**LYLE LOVETT'S LARGE BAND**

Lyke Lovett's music has always made people a little uncomfortable. Like his trademark Brillo-pad hair ("It looks like it has emotional problems," he cracks), his songs lie just outside the usual frame of reference, presenting themselves as both a little freaky and a little threatening in their defiance of conventional thought and form. *God Will*, for example, sent half the Bible Belt to its knees to pray for the young singer's soul, and *She's No Lady* had hard-core feminists shrieking and running for arms. There was just no telling what the boy would come up with next.

Musically, Lovett's songs are just as schizophrenic as his lyrics, the tunes in his first two albums alternately wearing scuffed-up cowboy boots and fancy black-patent dance slippers, hanging around jazz clubs one moment, rodeos the next. The bebop sensibility of several of his songs, especially the finger-popping *An Acceptable Level of Ecstasy (The Wedding Song)*, made it clear that Lovett had big-band leanings far outside the Nashville way of doing things.

In his third album, "Lyle Lovett and His Large Band," he draws the line sharper and more emphatically than ever before. Side one, which kicks off with Clifford Brown's instrumental *The Blues Walk*, lays the foundation for the next five tunes—all dinner-jacket blues, cocktail jazz, and, well, large-band selections. Side two, on the other hand, hauls out the fiddles and the weepy steel guitars for songs about horses and saddles and guns.

Of course, little is really as it seems in Lyle Lovett's world—songs about horses and saddles and guns are really about emotional conflict and longing, and Lovett's decision to record *Stand by Your Man* probably says as much about his refusal to accept musical limitations as it does about his cockeyed and sardonic (and occasionally cartoon-like) view of women. And though his jazz meanderings in the earlier albums worked—in part because they were in such stark contrast to his other material—their
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critical acceptance has spawned several noodlings here that run thin, evoking not so much a mood as an aspiration toward one. In *What Do You Do/The Glory of Love*, a clever dialogue depicting marital discord using two songs written fifty-two years apart, Lovett sounds like a rank amateur—no, a poseur—up against the black A&B singer Fran- cine Reed, who performs with an entire life experience, not just an attitude, behind her. And in *Here I Am* Lovett, the beat-poetry kid, alternates a spoken, bebop stream of consciousness with cool, knowing jazz, stretching the hip factor to the breaking point. As in *Good Intentions*, parody eats its young in a tedious, nonsensical examination of superficial life and love.

On the cowpoke side of the fence, however, Lovett starts out with a smart-aleck, hipster view of country, *I Married Her Just Because She Looks Like You*. But the joke only goes so far before he stops himself and reconsidersthat he really does love country music, and he might as well admit it. By the time he gets to *Which Way Does That Old Pony Run* and *Nobody Knows Me*, he has let down his musical and romantic guard. Still, he takes his real chances in *If You Were to Wake Up*, as nothing utter it. By the time he gets to *Which Way Does That Old Pony Run* and *Nobody Knows Me*, he has let down his musical and romantic guard. Still, he takes his real chances in *If You Were to Wake Up*, as a naked portrait of intimate love as ever there was. Here, in a shattering confession of pain, Lovett the misogy-nist is finally understood, and forgiven. The next selection, *Once Is Enough*, finishes up the album with a return to what at first appears to be jazzy poses. But now it is Lovett's heart speaking, not his head. And no large band, or big one, for that matter, can drown such an eloquent voice.

**ILY LOVETT: And His Large Band**


**BEST RECORDINGS OF THE MONTH**

CLAUDIO ABBADO'S MAHLER NINTH

CLAUDIO ABBADO'S new Mahler Ninth with the Vienna Philharmonic on Deutsche Grammophon is simply one of the three or four best, and best-sounding, recorded performances the work has had. It was taped live at a concert in May 1987, but you'd never know an audience was present—most remarkable considering the chamber-music-like textures and the suspenseful pauses in the first and last movements.

The Ninth is coupled with the Adagio from Mahler's unfinished Tenth Symphony, recorded live in June 1985. Even though Abbado chose to record only this fragment rather than the full version of the Tenth completed by Deryck Cooke, it is hard not to believe that an awareness of the completed version has affected his interpretation of the Ninth. He gives us a Mahler who bids farewell to the world with passionate regret but without bitterness. Somehow, and not to the music's detriment, Abbado manages to dispel the element of morbid angst that generally clings to this symphony.

The first movement is still a tremendous drama of the life and death of the spirit, performed here with the highest musical artistry. Abbado shows an unerring sense of line and pulse from start to finish, and the orchestra achieves a stunning climax in the martial-funereal episode.

The *Ländler* second movement has a less rural feel than we get from Bruno Walter, say, but it has a fine lift of its own thanks to the superb woodwind articulation. The *Rondo-Burleske* has had more savagery in the hands of Bernstein and Karajan. Abbado treats it the way I fancy Toscanini in his prime would have done, had he ever chosen to conduct the music of his rival of the baton. Every linear strand and rhythmic figure is crystal clear; mockery and wit overrule the nihilistic aspect. The final pages of the movement, taken at a hair-raising pace, amount to a veritable miracle of orchestral execution. The performance of the great adagio finale is truly an act of love and caring. Seldom have the last, barely audible pages been more movingly set forth.

Abbado lavishes similar loving care upon the fragment of the Tenth, with special attention to line, detail and balance. In keeping with his approach to the Ninth Symphony, Abbado lets the startlingly dissonant chord at the movement's climax make its full effect, but more as a cry of protest than of desperate agony. Throughout both performances, Abbado exhibits a fine command of subtle rubato and a tasteful and effective use of Mahlerian portamento in the strings.

A very large measure of credit for the overall artistic success of this production belongs to Deutsche Grammophon's production team, which has come up with one of the label's very best recordings. There's fine lateral imaging, a superb sense of depth, especially in the contrasts between muted and open brass, and a breathtaking range of dynamics (the Mahler Ninth is made to order for digital recording technology). For anybody immersed in the Middle-European aesthetic, Abbado's Mahler Ninth may seem a bit off-base. But for me this performance makes a convincing case for freeing Mahler from the limits imposed by his cultural milieu.

**MAHLER: Symphony No. 9, in D Major; Symphony No. 10, Adagio. Vienna Philharmonic Orchestra. Claudio Abbado cond. Deutsche Grammophon © 423 564-4 two cassettes, © 423 564-2 two CD's (105 min).**
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THROWING MUSES

With "Hunkpapa," Throwing Muses has vaulted into the absolute front rank of American new-music bands. Their songs are tuneful enough to be immediately engaging yet sufficiently challenging to reward repeated exposure. When they threaten to fly out of control, they'll unexpectedly resolve into colorfully melodious moments or get collared by a bright, bold guitar hook.

The songs in "Hunkpapa," most of them written by band member Kristin Hersh, have the taste of life lived with eyes wide open. Hersh's cool, crisp voice is a joy to hear, and her dual guitar work with Tanya Donelly creates geometric textures you can visualize. The third woman in the group, Leslie Langston, sends an avalanche of bass notes thumping into the fracas like boulders rolling down a mountain. All of this high-flying energy is anchored by David Narcizo's inventive drum patterns.

"Shocking is therapy/Electric your head," Hersh sings in "Mania," and those lines could pass for Throwing Muses' credo as they shake loose of linear form and sense to redefine a reality based on raw feeling. By actively engaging the world, they have become infatuated with its possibilities. In "Dizzy," for instance, a succession of travelogue-type images induces a heady vertigo, and "I'm Alive" cuts close to the bone, courting danger while reveling in the sensuality of risk taking.

Throwing Muses aspires to a larger-than-life sound in "Hunkpapa," and you can tell from the confident, sure-handed performances that they got what they were after. Rarely will you find an album as driven and purposeful as this one, which succeeds on its own terms without compromise or caution.

Parke Puterbaugh


Performance: Mechanical
Recording: Thin

After "I'm Alive," their first album, "Take Me to Your Heart," the band members deviated from the careers they planned and handclenched the fading charts. "I Don't Want to Lose Her" was recorded for a label and released on a single, but with no follow-up, the group's charts were down.

"Give Up on Love," "Ain't Too Proud to Beg," and "Never Gonna Give You Up" were hits that made the band's name household. "I'll Never Let You Down" was a hit for "I Don't Want to Lose Her" on another label and was included in a Motown cover. The band had their first number one hit with "Never Gonna Give You Up."

The album "Mania" was released in 1989 and included hit singles like "I'll Never Let You Down." It was a commercial success and showcased the band's unique sound and style. The album was later re-released with additional tracks and a new cover art.
one minute, I Don't Want to Be Your Lover the next).

At the push of a button, the music rises to an instant boil as Astley enters the synthetic fray. His pleasantly husky voice falls somewhere between Paul Young and Michael McDonald. Despite the mechanical sparkle, however, this is soul that's been removed from its flesh-and-blood sources and tooled into product.

CHET ATKINS: C.G.P. Chet Atkins (guitar, vocals); Darryl Dybkwa (keyboards); Mark Knopfler (guitar); Johnny Gimble (fiddle); other musicians. Chinook Winds; Imagine; Knock, knock; Jethreaux; Daydreams; I Still Can't Say Goodbye; and four others. COLUMBIA FC 44323, © FCT 44323, © CK 44323 (46 min).

Performance: Masterly Recording: Very good

Since signing with Columbia in 1983, Chet Atkins, the former head of RCA's country division, has turned his attention to jazz fusion; his records are now played on New Age, progressive, and adult-contemporary stations. This, his fourth such album, sets particularly well on the turntable. Atkins and his co-producer, keyboardist Darryl Dybka, deftly move through arresting and airy originals and recast such classics as Daydream and Imagine (in which Dire Straits' Mark Knopfler contributes a melancholy guitar accompaniment) in welcome new shapes. Atkins, who humbly calls himself a Certified Guitar Player (hence the title of this album), picks in a style so clean and elegant as to be deceptively simple, but he also paints complex musical images in startlingly vivid colors—bright red for Latin and country sounds, muted blue for the coolest of jazz. The one odd resonance is in the closer, a shaky and sentimental vocal performance of I Still Can't Say Goodbye. Atkins, who says he sees his father every time he looks in the mirror, conjures up the old man's spirit, still trying after all these years to be just like him. It is a poignant finish to an album that otherwise avoids overt emotion, aiming more for the head than the heart, but finally reaching both. A.N.

EDIE BRICKELL AND NEW BOHEMIANS: Shooting Rubberbands at the Stars. Edie Brickell (vocals); New Bohemians (vocals and instrumentalists), other musicians. What I Am; Air of December; The Wheel; Circle; She; Nothing; and six others. GEFENN GHS 24192, © M5G 24192, © 24192-2 (49 min).

Performance: Smart Recording: Good

We remember the Sixties, and yet we seem doomed to repeat them. At least we can listen to Edie Brickell and New Bohemians while it happens, and that's not too bad. Considering that this Texas band has ridden surprisingly high on the charts, we may not have any choice but to pay attention. Singer-songwriter Edie Brickell, of course, is the focus of attention. Her off-center perceptions often hit the mark, but she's a maturing rather than mature writer and usually picks easy targets. The band's big hit, What I Am, works best, including these two epigrammatic lines: "Philosophy is the talk on a cereal box/Religion is the smile on a dog." The band sounds loose-jointed yet spry, and that encourages Brickell's mild eccentricities without exaggerating them. R.G.

RAY CHARLES: Just Between Us. Ray Charles (vocals, keyboards); vocal and instrumental accompaniment. Nothing Like a Hundred Miles; I Wish I'd Never Loved You At All; Too Hard to Love You; Now I Don't Believe That Anymore; Let's Call the Whole Thing Off; and five others. Columbia FC 40703, © FCT 40703, © CK 40703 (35 min).

Performance: Still the greatest Recording: Very good

The consistent excellence that has marked the work of Ray Charles over the years is nothing short of remarkable. Somehow he has managed to sustain the profound expressiveness and blues-based authenticity that inform every note of his music. Whether he is performing pop, country, r & b, or jazz, it all comes out as genuine soul music, a genre he all but created. What's more, he's sounding just as good today as he did thirty years ago.

The bonus in "Just Between Us" is a series of guest appearances by some superartists. The venerable B. B. King lets his guitar Lucille do the singing for him as he joins Charles in the effective opener, Nothing Like a Hundred Miles, and the wonderful Gladys Knight lends her shimmering vocals to I Wish I'd Never Loved You At All. Most of the time, though, Charles wends his way through a set of classy, easy-listening numbers ideally suited to his style, with Now I Don't Believe That Anymore and Stranger in My Own Hometown being particular standouts. He rounds it all out with the perennially amusing Save the Bones for Henry Jones, in which he's joined by Chicago soul brother Lou Rawls and Milt Jackson on vibes. This album affirms that soul music will always be alive and well as long as Ray Charles is around. P.G.

ELVIS COSTELLO: Spike (see Best of the Month, page 103)

BOB DYLAN AND THE GRATEFUL DEAD: Dylan & the Dead. Bob Dylan (vocals, guitar); the Grateful Dead (vocals and instrumentalists). Slow Train; I Want You; Gotta Serve Somebody; Queen Jane Approximately; and three others. COLUMBIA OC 45056, © OCT 45056, © CK 45056 (44 min).

Performance: Not their best Recording: Okay

On paper, this would seem a marriage made in hell: Bob Dylan, the most, er, spontaneous of major rock figures, and the Grateful Dead, a band of hippie stumblebums not often celebrated for their precision. Sad to say, the resultant album is about as awful as you'd expect, a stunning example of artists bringing out the worst in each other. Dylan's singing here is all nasal buzz, like some folk-rock version of Jeff Goldblum in The Fly, and the Dead, seemingly frustrated by having to play genuine songs with structured arrangements, sound limp even by their own stoned standards. Of course, all that begs the larger questions, such as, do we really need another version of Dylan's ode to mad-gangster Joey Gallo? And why doesn't Columbia just release Dylan's justifiably legendary (and often bootlegged) 1966 Albert Hall concert with the Band and be done with it? Dispensable stuff for anyone but Deadheads and Dylan completists. S.S.

LYLE LOVETT: And His Large Band (see Best of the Month, page 104)

NEW ORDER: Technique. New Order (vocals and instrumentalists). Fine Time; All the Way; Love Less; Round & Round; Guilty Partner; and four others. QWEST 25845-1, © 25845-4, © 25845-2 (40 min).

Performance: Moods for moderns Recording: Good

There's something schizophrenic about New Order. It has roots in the moody, expressionist new wave of Joy Division (the group New Order used to be) yet seems disposed to churning out percolating, urban-contemporary dance-floor grooves, with all the submerging
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of identity that implies. On the one hand, you get the feeling the band is really baring their souls, but at the same time the distance they put between themselves and the listener when the sequencers go on automatic pilot makes New Order no more knoawable or interesting than, say, Exposé. It doesn't help that despite the dozen or so years they've been at it, the band members haven't developed a great deal of proficiency on their instruments. The synths all sound as if they were played using the one-finger method and the guitars are similarly elementary. That's what comes from relying on machines and not performing in front of an audience often enough.

Cut by cut, "Technique" vacillates between roistering, heavily synthesized tracks and more pensive, guitar-laden ones. The slower cuts provide the most interesting moments, being marinated in a tuneful melancholy that recalls the Velvet Underground Underworld of Sunday Morning and Femme Fatale. Such songs as All the Way, Love Less, and Run all zero in on that warm, reflective, introspective feeling, as shimmering twelve-string guitars are shadowed by meandering bass lines and the singer employs an affectingly poppish delivery.

Most of the rest of "Technique" is an extroverted romp, with honking synths and busy drum programs burrying the songs along like an ambulance in traffic. Some of it can be pretty infectious—Fine Time and Dream Attack, especially—but overall the album lacks the killer hooks to set it apart from the pack. And after a while the programmatic mode becomes a dead end.


Performance: Folky Recording: Okay

Who'd have thought there was a folk singer at the heart of Graham Parker's music all this time? Until last year's "The Mona Lisa's Sister." Parker cloaked himself in various musical arrangements. Now, with "Live! Alone in America," he's walked into the spotlight by himself. In this album he reworks songs from the entire span of his career, including Hotel Chambermaid from "Heat Treatment" and Don't Let It Bring You Down from "Mona Lisa." Of the three new numbers, two are acidic socio-political condemnations (Soul Corruption and Durban Poison), and one is a light socio-political condemnation (The 3 Martini Lunch). He also does a cover of the Sam Cooke hit A Change Is Gonna Come. The guitar work is simple and effective but unremarkable (it's too bad Parker's guitaris-
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LIVING IN DREAMS

In his heyday, Roy Orbison's great rock music reverberated from the tiny speakers of teens' car radios, the impassioned growl of Oh, Pretty Woman fueling lustful gropings in the back seats of Chevys everywhere. But his ballads... ah, his ballads! This was music of a different kind, a music of nighttime mystery, a music that hung its hat on Lonely Street, lingered beneath dingy streetcorner lights, and frequented the back parlors of David Lynch's Blue Velvet.

Yet, aside from his sad, soaring tenor—an instrument that appeared to have its origins in the netherworld, not the unlikely flat hamlet of Wink, Texas—in real life Orbison, one of rock's true shining originals, dispelled any notion of mystery with a kind of startling insouciance. Years ago, when the late Don Gant went to pick him up for his first BMI award ceremony, the publisher looked down to see the nerdiest of white socks reaching for the cuffs of Orbison's rented tuxedo.

In 1983, when Orbison was between record deals and his glory days were seemingly behind him, I traveled to one of his dates to talk with him about a magazine interview. Four years after his open-heart surgery, he was jowly and out of shape, and when he walked on stage in his costume, his physique sagged into something resembling a black-leather pear. None of that mattered when he started to sing, of course. The years had diminished none of his majestic range and power, and he still sang for "lonelies" everywhere, his glorious voice throbbing with emotional pain and abandonment, his shuddering crescendo weeping for anyone who ever sought solitude and self-pity in the dark.

Afterward, in his hotel room, his eyes still hidden behind sunglasses, his pasty skin framed by crow-black, fright-wig hair, he talked about exercising, getting in shape for a comeback. He was sweet and gentle, polite to a fault, eternally self-effacing, and, in a way, almost beautiful. He struck me as someone who spent too much time in dreams.

But dreams were, of course, the stuff of Roy Orbison's art. He often said that certain songs came to him in dreams, although songs such as Running Scared and It's Over sounded more like dreams themselves, dreams that teetered on the edge of nightmare. The irony is that after years of tragedy and career disappointments, dreams were starting to come true again for Orbison at the time of his death last December at the age of fifty-two. George Harrison, Bob Dylan, Jeff Lynne, and Tom Petty were thrilled when he agreed to climb aboard the Traveling Wilburys caravan. Cable TV gave him his own stylish special. And Virgin Records asked for his first album of all-new material in a decade.

"Mystery Girl," as the album was eventually titled, is as dignified a send-off as anyone could want. Written and produced by Orbison, his wife Barbara, and an all-star group of acolytes—including fellow Traveling Wilbury Jeff Lynne, T Bone Burnett, and U2's Bono—the album wed the dramatic immediacy and grand flourishes of the old Monument hits with the good-natured simplicity of the Wilburys.

Although "Mystery Girl" is destined to become a classic, it's fair to say that the album also has its share of filler. Most notably California Blue and Windsurfer, both of which Orbison had a hand in writing. But this is not a showcase for Orbison the writer, but for Orbison "The Voice." The most affecting material comes from the supporting cast, which grew up playing his music over and over in the safety of their bedrooms at night—Bono, Lynne, Elvis Costello, Billy Burnette, and Will Jennings. Not surprisingly, they too found the passageway to Lonely Street, and most of their offerings here are dignified expressions of pain and longing, shrouded in ethereal dreams, shaped around the Orbison aura.

At times, however, the dreamer finds himself in dangerous company. In Burnette's (All I Can Do Is) Dream You, he drifts away on growly, romantic fantasy. But Costello's bizarre The Comedians, about a man left stranded at the top of a Ferris wheel by his lover, tops even Orbison's bleakest songs for paranoia. And Bono's She's a Mystery to Me presents the dream lover as murdering seductress—and the pop song as both complex psychological study and dark concerto.

There are beguiling pop anthems here—the bouncy You Got It and A Love So Beautiful, a rhapsodic ballad that characterizes what Sun Records founder Sam Phillips saw as Orbison's baroque, classical contribution to the genre. (Sun was Orbison's first label.) But it is the murky fantasy underworld to which Orbison always returns, sometimes with eerie results. In the album's most plaintive cry, In the Real World, he asks with weary anguish why we can't always live in dreams, where everything will always be all right. "In the real world," he laments, "We must say real goodbyes... And endings come to us/in ways that we can't rearrange."

Sweet dreams to you, Roy.

Alanna Nash

ROY ORBISON: Mystery Girl. Roy Orbison (vocals, acoustic guitar); George Harrison, T Bone Burnett, Bono (guitar); Benmont Tench (piano, organ); Jeff Lynne, Tom Petty, Billy Burnette (background vocals and instrumentals); other musicians. You Got It; In the Real World; (All I Can Do Is) Dream You; A Love So Beautiful; California Blue; She's a Mystery to Me; The Comedians; The Only One; Windsurfer. Careless Heart. VIRGIN 91058-1, © 91058-4, © 91058-5 (38 min).
Jazz

GARRY DIAL AND DICK OATTS:
Dial and Oatts. Garry Dial (piano); Dick Oatts (flute, soprano, alto and tenor saxophones); string orchestra, Carlos Franzetti cond. Between Us; Kept Woman; The Perfect Pill; Harmonic; I Can't Forget; Anita; I Dig Your Do; No Option; and seven others. DMP © CD-465 (62 min).

Performance: Ambitious
Recording: Excellent

Just when you thought the sight of jazz musicians surrounded by an army of string players was a scene out of the past, here come a couple of upstarts who arrange just that. In an age when one player can call on electronic gear to emulate just about any sound—including that of a full symphony orchestra—it is refreshing to find someone doing it the old-fashioned, expensive way.

Fortunately, "Dial and Oatts" is not just an album noteworthy for the way in which it was recorded; it also contains a wealth of worthwhile music. Both leaders have a solid background in acoustic jazz: Saxophonist Dick Oatts has been heard regularly with the Mel Lewis Jazz Orchestra, and pianist Garry Dial has played with groups led by James Moody and Gerry Mulligan. They have also worked together in the Red Rodney Quintet and in various other contexts for the past eleven years. This is their first venture as co-leaders, though.

The fifteen selections are meant to be listened to as a whole, according to Dial, but I find them quite pleasant taken separately. (DMP's press release calls the album "a classically structured jazz suite."). Aside from the unfortunate echo the engineers have placed on the soloists, the music often seems to be a throwback to the pretty ballads that Charlie Parker, Coleman Hawkins, and Stan Getz used to lay down ever so gently on a bed of strings. Fifties purists felt that anything so pretty and accessible couldn't possibly be jazz. How wrong they were. The Dial and Oatts material (just who wrote what is not made clear in the notes) is new and fairly original; it runs the gamut of moods and is a pleasant combination of the beautiful and the biting. Recommended.

C.A.

JACKIE AND ROY:
Full Circle. Jackie Cain and Roy Kral (vocals and instrumentals); instrumental accompaniment. Cherokee; In the Dark; Line for Lyons; Sleigh Ride in July; Our Love Rolls On; and three others. CONTEMPORARY C-14046.

Performance: Enduring
Recording: Very good

I was just getting my first taste of jazz forty years ago when Jackie Cain and Roy Kral, aided and abetted by Charlie Ventura's band, gave jazz vocals some new boppish twists and turns. Their latest album, "Full Circle," recorded last year, belies the fact that they have been around almost as long as bop itself; there is no sign of age in their voices, and the style holds up remarkably well. Their influence can be heard in the work of such current groups as Manhattan Transfer and the Ritz, and it clearly helped shape Lambert, Hendricks, and Ross. The Jackie and Roy approach to jazz vocals is somewhat meatless, but it borrowed much of its form from the cool instrumental sounds of the late Forties, and it has a certain enduring charm.

In the new album, the vocal duo receives wonderful instrumental support from some of the West Coast's finest, including trumpeter Conte Candoli, saxophonists Bob Cooper and Bill Perkins, and bassist Monty Budwig. As in the past, Kral is the session pianist and arranger.

C.A.
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Performance: Convincing
Recording: Fine

Although Bach’s Goldberg Variations are, perhaps, more idiomatically written for a double-manual harpsichord than any of his other keyboard music, they work beautifully on the organ. But this should come as no surprise—Bach’s music is indestructible no matter what it is transcribed for, as Bach himself well knew. The canonic variations, in fact, are more clearly heard on the organ, as each of the two canonic voices is performed on a different stop, with a third stop for the accompanying voice. The same is true of the cross-keyboard variations and those for a single manual. Ironically, it is the theme itself that sounds weakest on the organ.

Jean Guillou brings clarity, rhythmic vitality, and imaginative registrations to the music in his splendid transcription for this recording. He plays the Kleuker organ of Notre-Dame des Neiges, Alpe d’Huez, France (at an altitude of some 6,000 feet), and its sonorities have been beautifully caught by the Dorian engineers.

S.L.

BARTÔK: Concerto for Orchestra. JANÁČEK: Sinfonietta. Los Angeles Philharmonic Orchestra, André Previn cond. TELARC @ CD-80174 (62 min).

Performance: Very good
Recording: Splendid

André Previn’s performance here of the Bartók Concerto for Orchestra may not have quite the hard-edged brilliance of those by Dutoit and Boulez. What it does have going for it, however, is warmth without sentimentality. The “couples” in the second movement parade across the sonic stage with great elegance and color. And whatever the “Interrupted Intermezzo” lacks in satire and sass is made up for by Previn’s fine handling of contrasts in color and standing of these instruments, and you have only to hear their subtle interweaving in the introduction of the Countess’s “Porgi amor” to realize that no modern orchestra can produce such ravishing sounds. Conductor Arnold Ostman’s tempos are brisk but by no means skittish. At all times the reflective is crisp and intelligible.

One fascinating feature of this recording is the inclusion of material not usually heard in performances of Figaro, such asrias as Marcellina’s striking “Tutto ancor non ho perso” and Susanna’s charming “Uno m’o’sto di giaia,” as well as variants of the Countess’s “Dove sono” and Almaviva’s “Hai già vinta la causa.” The first recording of Mozart’s comic masterpiece on period instruments, this is also one of the finest of the half-dozen or so available today on compact discs.

STODDAR LINCOLN

MOZART: Le nozze di Figaro. Hakan Hagegard (baritone), Count Almaviva; Arleen Auger (soprano), Countess; Barbara Bonney (soprano), Susanna; Petteri Salomaa (bass), Figaro; Alicia Nafe (mezzo-soprano), Cherubino, Della Jones (mezzo-soprano), Marcellina, Carlos Feller (bass), Bartolo; others. Drottningholm Court Theatre Chorus and Orchestra, Arnold Ostman cond. L’OISEAU-LYRE @ 421 333-2 three CD’s (186 min).

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de Schwarzkopf and Fischer-Dieskau is on a conductor of Brahms's German Requiem, the most persuasive (74 min). Or-Deutsche Grammophon 423 574-2. Deutscher Philharmonic Orchestra, Carlo Maria Giulini cond. Schmidt (baritone); Vienna State Opera, Andreas Bonney (soprano); Andreas Swedish conductors in view of the beautifully balanced and full-bodied Telarc sound. 

BIZET: Symphony in C Major (see Best of the Month, page 104)

BRAHMS: A German Requiem, Op. 45. Barbara Bonney (soprano); Andreas Schmidt (baritone); Vienna State Opera Concert Chorus; Vienna Philharmonic Orchestra. Carlo Maria Giulini cond. Deutsche Grammophon 423 574-2 (74 min).

Performance: Touching Recording: Good live take

Otto Klemperer, the most persuasive conductor of Brahms's German Requiem on records (his Angel recording with Schwarzkopf and Fischer-Dieskau is on CD now), steered clear of the temptations to make the work either a grandiose public ceremony or a theater piece, probed down to muscle and bone, and allowed a natural momentum to carry it forward. Carlo Maria Giulini doesn't share Klemperer's craggy view of the work, but he too avoids the big ceremonial gesture, in this case in favor of an expansive yet intimate approach. The result is consolatory rather than dramatic, but not without fervor, and sometimes touched by radiance.

The radiance is most engagingly apparent in the singing of the two soloists, both of them young and fresh sounding, free of self-consciousness or affectation. On its own terms, the performance is unfailingly cogent, and the grand moments come through with exceptional conviction because the scale is maintained. This is a live performance, and the recording does have the feel of an occasion: I don't think it is overstate- noun to suggest that you can sense the difference between artists who are singing to people seated before them and those who are singing only to microphones. Both chorus and orchestra, in any event, are in splendid shape. The sound tends towardubbiness at times but is generally quite good. R.F.

BRITTEN: Simple Symphony (see Best of the Month, page 104)

COPLAND: Connotations for Orches-stra (see SCHUMAN)


Performance: Poetic Recording: Mixed

Dvořák's Piano Concerto has never enjoyed the popularity of his other big works. It has been criticized for the "clumsiness" of the piano writing, and most of the infrequent performances heard in our century have used the revised version of the solo part prepared by Vílem Kurz. Kurz's pupil, Rudolf Firkusný, who virtually alone kept the work in the international repertoire for decades, added emendations of his own, but lately he and several other pianists have taken up the original version, regarding it, in Firkusný's words, as "far purer than any subsequent revision, and more truly characteristic of the young Dvořák."

András Schiff apparently sees it that way, too. His performance here of the original version has everything one could ask in the way of both power and poetry, and he has a very sympathetic collaborator in Christoph von Dohnányi. The recording itself is a bit of a letdown, first for its flawed balance, in which the orchestral sound is conspicuously less well defined than the piano's, and also for the obtrusive reminders that it was made live.

The Schumann work, also beautifully played, was taped under studio conditions; it is more agreeably balanced than the Dvořák and free of audience noise, but still a bit below London/Decca's current standard. The piece itself is agreeable, too, but little more. The record might have been more of an enticement had it included Schumann's similarly titled later work (Op. 134), and there certainly would have been room for it. R.F.

GLASS: 1000 Airplanes on the Roof.

Miles Green (synthesizer sound design, sound effects); Martin Goldray (keyboards); Jack Kripl, Jon Gibson (saxophone, flute, wind synthesizer); Richard Peck (saxophones); Linda Ronstadt (vocals); other musicians, Michael Rieman cond. Virgin © 91065-1, © 91065-4, © 91065-2 (54 min).

Performance: Vigorous Recording: Excellent

Though somewhat less impressive on record than in the theater, 1000 Airplanes on the Roof is one of the better scores that Philip Glass has written in the past few years. It was created to accompany a monodrama by David Henry Hwang that concerns a man's terror of being kidnapped by space aliens, which prompted Glass to return to a style that has much in common with his early opera Einstein on the Beach. The function of the music is to color the theatrical environment and to
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suggest the changing emotions of the protagonist. A sense of unity is given by the music's dominant leitmotifs, which are never very far away in any passage. In MAHLER's Das Lied von der Erde, occasions sounds like a series of variations on a theme. Too often, though, Glass is content to restate a given theme in a different sonic context rather than truly transform it, which can at times make the writing sound musically thin and reductive. While one of Glass's strengths is that he never allows an idea to outstay its welcome, the drawback is that the music has a stunted quality. Just when you think it could begin to soar, it stops.

SCHRÖTER's Das Lied may be reckoned, spect to the conducting and orchestral strengths is that he never allows an idea to outstay its welcome, the drawback is that the music has a stunted quality. Just when you think it could begin to soar, it stops.

Most critical sections. It's especially frustrating when everything else about this release is so splendid. R.F.

MAHLER: Symphony No. 9; Symphony No. 10, Adagio (see Best of the Month, page 106)

MOZART: Horn Concertos Nos. 1-4; Rondo in E-flat Major (K. 371); Rondo in D Major (K. 514). Lowell Greer (natural horn), Philharmonia Baroque Orchestra, Nicholas McGegan cond. HARMONIA MUNDI ® HMU 907012 (61 min).

Performance: Lusty
Recording: Splendid

Of all the conductors on the early-music scene today, Nicholas McGegan seems to bring the most joy and vitality to his performances. Horn player Lowell Greer has the same qualities, making him the perfect collaborator. The natural horn, too, is a luscious, joyous instrument with its throaty sonorities and remarkable changes in timbre when hand-stopping is employed for chromatics. These fine performances of Mozart's four horn concertos are full of the sounds of the forest—its rustling leaves and mysterious shadows serve as a background for the composer's spirited hunt.

The Rondo in E-flat Major is a reconstruction by Greer, and the D Major Rondo was completed by Herman Janssen. Both are extremely effective and make welcome additions to the repertoire.

Performance: Suave
Recording: Very good

Playing an anonymous Italian harpsichord dating from the first half of the eighteenth century, an instrument of "rich, darkly flamboyant colors ideally suited to the passion, theatricality, and adventurousness of Scarlatti's keyboard writing" (according to the annotation), Colin Tilney here presents a fine selection of both popular and rarely heard sonatas. The beauty of his playing is in its rhythmic flexibility. He truly understands the essence of temporal expression and is not afraid to pull back, press forward, linger on a dissonance, or impart elegance to a pause. Unlike many a performer of Scarlatti, Tilney directs his performance toward musical expression rather than brilliance and virtuosity for its own sake. The result is most satisfying. S.L.

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What a pleasure it is to hear a well-balanced program of selections by a single composer! You come away from this one with a feeling of genuine musical satisfaction. None of these Schubert songs are what you would call unfamil iar. The majority of them, in fact, are very well known; even the Ave Maria is included. Soprano Felicity Lott approaches each of them, however, with a winning freshness and sincerity. She uses her lovely and expressive voice to communicate the full emotional power of both words and music, while pianist Graham Johnson provides ever-appropriate accompaniment—now lyrical, now dramatic as the individual songs require. Like Lott's singing, his sensitive playing is always intelligent and tasteful. Highly recommended.  
R.A.

SCHUMAN: In Praise of Shahn. COPLAND: Connotations for Orchestra. 
SESSIONS: The Black Maskers, Suite. Juilliard Orchestra, Otto-Werner Mueller, Sixten Ehrling, Paul Zukofsky cond. New World NW 368-1, @ 368-2 (60 min). 
Performance: First-rate
Recording: Very good

This record is one of the first fruits of the Juilliard American Music Recording Institute, an entity created in November 1987 to work something like the long-running program of recording American music at the University of Rochester's Eastman School of Music. All the Juilliard recordings are to be made by that school's superb student orchestra, under several conductors, and will be devoted entirely to "twentieth-century concert music by American composers." The initial release is an impressive sampler, not only for the quality of the performances but for the seriousness it indicates with respect to repertoire.

As is his wont, Copland reshapes material from an earlier composition for large orchestra, and after their respective premieres in 1962 and 1970, both recordings have been somewhat hasty prepared Viennese sessions of the early Fifties, and few have ventured to challenge Bernstein in the works he introduced. There is no hyperbole, though, in suggesting that all three of the performances on this New World disc stand up to the earlier ones in terms of interpretation and execution, and they benefit pointedly from the smooth, up-to-date digital recording. The labeling could have been tidier: the Copland title is not simply Connotations, as given in all the labeling with the disc, but, as Eric Salzman tells us in his fine notes, Connotations for Orchestra; and surely it would have been appropriate to mention somewhere that Schuman designated his memorial to the American artist Ben Shahn a "Can ticle for Orchestra." But this appealing package is musically first-rate. exciting the highest expectations for the new series.

R.F.

SCHUMANN: Introduction and Allegro Appassionato in G Major (see DVORAK) 
SESSIONS: The Black Maskers, Suite (see SCHUMAN) 
Performance: Good
Recording: A shade brittle

Those who consider Strauss's Alpine Symphony one of the summits of his orchestral output will find the Josephs Legende ballet score very much to their taste. Composed for Diaghilev's Ballet Russe and first performed under the composer's direction at the Paris Opera on May 14, 1914, the music represents Strauss at his most decadently extravagant. The orchestra calls for not two but three full violin sections, a heckle phone, a piano, four celstas, an organ, and a vast array of percussion. The story line is essentially that of Joseph and Potiphar's wife as told in Genesis, but with a few psychological overtones added that suggest the Jokanaan-Salome confrontation in Strauss's early and celebrated opera. Indeed, you might sum up the music as a blend of Salome and the Alpine Symphony. It has the sensuality of the former and the inflated grandiosity of the latter.

It's surprising to find a Japanese conductor and orchestra tackling this ultraStraussian work—but then it's not so surprising when we read that Hiroshi Wakasugi spent most of the early Eighties conducting in Germany and Switzerland. The performance he conducts here is thoroughly creditable in terms of both interpretation and orchestral execution, but the acoustic surround is not quite right for the work's all-out scoring. The details of line and color emerge with ample clarity, but the huge climaxes seem confined and lack richness at the lower end of the spectrum. Nevertheless, the likelihood that this new recording of Josephs Legende will have a successor in the immediately foreseeable future is rather slim, so dedicated Strauss lovers will do well to add it to their collections.

D.H.

Performance: Satisfying
Recording: Superior

Performance: Opulent
Recording: Rich

Recorded live during the filming of the recent television documentary Karajan in Salzburg, the Deutsche Grammophon program of Wagner is sonically radiants but presents an odd, rather meaningless combination of instrumental and vocal excerpts. The brightest moment is Jessye Norman's tenderly expressive Liebestod, which, under Herbert von Karajan, becomes an intensely personal and meaningful utterance. Norman sings the Liebestod beautifully on the Angel disc as well, though without the same intimacy of feeling. The glorious, full richness of her voice is heard to exceptional advantage, however, in the other selections on Angel, making it an altogether fascinating Wagner concert than the one on Deutsche Grammophon, and Angel's Klaus Tennstedt conducts the finely honed London Philharmonic with exemplary style.

R.A.
THE "AUTHENTIC" BEETHOVEN

The old-music business sometimes reminds me of the medieval traffic in saints' relics. Every era has its holy men, and we all need some of their powerful spirituality to rub off on us. Most of the stories about saints' relics and lives weren't true, but they ought to have been.

The Romantics replaced saints with artists like Leonardo and Beethoven and embellished a few tales on their behalf. This eventually led to psycho-biography, pop media, and *People* magazine.

Getting close to the great masters today means authenticity: old instruments, original sources, the one true score. Beethoven as he would have heard it (if he hadn't been deaf). Beethoven as he would have wanted it (as he wrote it).

The early-instrument movement has gotten to Beethoven. With a hang and a tootle. There are "authentic" Beethoven symphonies on compact discs from Roger Norrington, Christopher Hogwood, and Frans Bruggen. And now there's a complete set from the Hanover Band (on a very reasonable five CDs) that claims to represent these works as they would have sounded in Beethoven's day.

The Hanover Band was founded in 1980 as an original-instrument ensemble devoted to reconstructing the Classical orchestra. Its path led, inexorably, to The Nine.

This amazing set—not without its problems, as we will see—was very carefully prepared over seven or eight years. The Hanover Band plays from editions—score and parts—that have been newly revised and edited with the proverbial fine-tooth comb. Everything is played according to Beethoven's own manuscripts, copyists' scores corrected by the composer. Original sets of parts used at the first performances, and so forth. The metronome marks are, we are told, Beethoven's own. The pitch, which has crept steadily upward over the years, has been lowered. The windband sound as well as the articulation, dynamics, and phrasing are pre-Romantic.

Does it make a difference? You bet it does. The result is a distinctive orchestral sound that flavors and colors the music everywhere. Although most of the editorial revisions and restorations are not noticeable, some things, particularly the brass writing, jump right out.

But other significant decisions were made that have a great impact on the results and yet are hardly mentioned in the annotation. One is the size of the orchestra—that is, the number of strings employed in each work. Other choices have to do with the seating arrangements of the orchestra and the recording locales. One other important issue is how the pieces are led. Three of the symphonies were directed by Monica Huggett from the concertmaster's chair, the others by Roy Goodman from either the concertmaster's chair or the podium.

The conducting issue is serious. Rigid observance of Beethoven's metronome marks—i.e., in fact, that is what we have here—is not enough. The impression of fast, featureless pacing is particularly strong in the slow movements. Slow or fast; steady, unyielding tempos are the rule; the starting gun is fired, and away we go. There are traditions—in folk, jazz, Baroque, and early Classical music—in which performers embellish a rock-steady tempo through syncopations, by playing in front of or in back of the beat, by expanding or contracting the measures, and so forth. But none of that happens here; and the effect of the steady, relentless tempos is simply numbing.

It has been argued that Classical music and Beethoven were intended to be performed this way. Maybe. Contemporary accounts describing Beethoven leading his own music make him sound like Leonard Bernstein at his most agitated, jumping up and down, waving his arms, and leaping like a madman. But then Beethoven was already deaf and reportedly out of sync with the musicians most of the time anyway.

The Hanover Band claims to use a chamber-music approach to the symphonies, but these performances sound anything but chamber-like, partly because the power of the brass section, partly because of the recording locales.

Of all the instruments in the orchestra, the brass have changed the most—and so has brass writing. Beethoven knew only the natural instruments before they got wrapped up in elaborate valve-and-key mechanisms. They were primitive, but he knew how to write for them.

And what a sound! Early critics complained that Beethoven had brought the outdoor marching band indoors, and often enough in these recordings you hear the logic of that complaint. As amplified by the reverberations of London Gothic churches, it is a spectacular sound, certainly not a chamber sound.

The strings, on the other hand, make a sound that is equally different but in another direction. The string section here has a beautiful and vivid color— listen to the opening of the famous Seventh Symphony andante—but its sound is considerably less brilliant than that of a modern string section.

The Hanover Band also appears to use fewer strings than usual, and, in this acoustic, the wind and brass sections tend to overwhelm the strings in the big tutti's and important themes played in the lower strings tend to be lost.

My assumption was that the First and all the even-numbered symphonies would benefit most from the "authentic" treatment, but, quite the contrary, it is Nos. 3, 5, and 7 that work best. The Ninth, above all, eludes the Hanover Band. The pacing of the scherzo—for once, too slow—with all the repeats, makes it seem endless; similar problems plague the big instrumental fugue in the finale. Even so, there are moments that come to life in an amazing way. In the slow movement the tempo, the lower pitch, and the orchestral sound can combine to make an extraordinarily vivid impression, and the last "Alle Menschen" in the finale, just before the dash to the finish line, which you usually hear with a strained and exhausted chorus, is absolutely breathtaking.

*Eric Salzman*

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ONE of the Soviet Union's leading rockers, Boris Grebenshikov, will be releasing an American album this spring. His "Radio Silence" was produced for Columbia Records by Dave Stewart of Eurythmics and features guest appearances by Annie Lennox (also of Eurythmics), Chrissie Hynde (of the Pretenders), and Siobhan Stewart (formerly of Bananarama). Grebenshikov sings in English for most of the album, although some of the songs are in Russian. Recording sessions took place in two unhappy marriages—one has been in turmoil. Through personal and professional troubles, he's put her problems behind her. She's happily married, she says, and her health is "wonderful now."

The latest American-born Broadway musical hit (as opposed to British imports, that is) is Jerome Robbins' Broadway, which opened at the Imperial Theater on Sunday evening, February 26. It's a sort of "Best of" compilation of memorable dance sequences staged by the veteran choreographer for musicals spanning a twenty-year period, from 1944's On the Town to 1964's Fiddler on the Roof. The show had been in rehearsal for several months and, unlike any other in living memory, was deemed ready to record on a Sunday two weeks before its opening. The result of those sessions, a two-record original-cast album containing familiar songs and dance music by Leonard Bernstein, Morton Gould, Jule Styne, and Stephen Sondheim, was set for release by RCA in April.

Brazilian music is making a remarkable comeback. Not since the days of the bossa-nova craze and Astrud Gilberto's record of The Girl from Ipanema has there been such a wealth of this music available. Now a major Brazilian label, Som Da Gente (Sound of Our People), is getting U.S. distribution. Started in 1982, it was the first label in Brazil devoted strictly to instrumentals. The best-known artist on the Som Da Gente roster is multi-instrumentalist Hermeto Pascoal, who's played with Miles Davis, Chick Corea, and Flora Purim. The groups on the label feature members who've played with such varied American musicians as Pat Metheny and Chet Baker and such well-known Brazilians as Gilberto Gil and Egberto Gismonti. Most Som Da Gente artists are generally unknown outside their country, but that may not be true for long.

American soprano Barbara Hendricks, who's recorded for every other major classical label, has recently been strengthening her ties with EMI—and has signed exclusively with the company for recital albums. Her first recording under that contract is a collection of songs by Ravel and Duparc, with the Orchestra of the Opéra de Lyon under John Eliot Gardiner. It was released by Angel in April. Coming up are recitals of songs by Faure, with piano accompaniment by Michel Dalberto, and Mozart, with pianist Maria-João Pires.

For most of her career, Tammy Wynette's personal and professional life has been in turmoil. Through two abdominal operations and a dependence on painkillers, Wynette has managed to turn out records that have sold more than thirty million copies altogether. Now, with her fifty-first album, "Next to You" on Epic Records, she seems to have put her problems behind her. She's happily married, she says, and her health is "wonderful now."

Hendricks is also featured in several large-scale works scheduled for EMI/Angel release in the months ahead. They include Orff's Carmina burana, the Poulenc Gloria, an album of Haydn masses, and Richard Strauss's Der Rosenkavalier with Lorin Maazel conducting.

The forthcoming album by John Cougar Mellencamp, "Big Daddy," may surprise his fans. His seventh Riva/PolyGram release, it apparently takes an intense, almost spooky turn from the lighter, folk-based musical textures of his last one, "The Lonesome Jubilee." Mellencamp wrote all eleven songs in the album, and produced it as well. Although "Big Daddy" uses the same band as "Lonesome Jubilee," Mellencamp has written edgier, more personal tunes and given them somewhat rough-sounding interpretations. Re-
REPORTEDLY there are no upbeat songs in the album. Mellencamp has also been working on a screenplay with Larry McMurtry, author of the novels Lonesome Dove and Terms of Endearment, among others, but no arrangements have been made for shooting it yet.

THE St. Louis Symphony Orchestra and its music director, Leonard Slatkin, have each signed exclusive five-year, multidisc recording contracts with BMG Classics, the international company that includes RCA Victor Red Seal. According to BMG, these are the longest exclusive recording agreements signed in the last decade.

Slatkin and the orchestra will make some thirty recordings together over the next five years, including all of the Tchaikovsky symphonies; Shostakovich's Nos. 1, 6, 8, 9, and 11; Mahler's Nos. 3, 4, and 5; Orff's Carmina burana; and Samuel Barber's Piano Concerto, with John Browning as soloist. The agreements call for a number of recordings of other works by American composers as well, including Aaron Copland, Elliott Carter, and John Corigliano.

Slatkin's new contract with BMG also calls for several world premieres: on a roll

Dr. John's saucy piano with straightforward pop arrangements, including lots of strings. Among the immortal songs in the album are Makin' Whoopee, Accentuate the Positive, My Buddy, More Than You Know, and Love for Sale. Rickie Lee Jones joins Dr. John for a duet in one number.

FORMED ten summers ago by its artistic director, Michael Feldman, for performances at the Caramoor Festival in Katonah, New York, the Orchestra of St. Luke's is today one of the busiest orchestras in New York City's concert halls and recording studios. It has just concluded its fourth consecutive season of concerts at Carnegie Hall; in the last concert, Roger Norrington, making his New York debut, conducted "authentic" performances of Beethoven's Eighth and Ninth Symphonies. The orchestra also shared in the glory of John Adams's recent Grammy award for the Non-such recording of his opera Nixon in China, in which Edo de Waart conducted. The recording was made at RCA's New York studios during the seventy-performance run at the Brooklyn Academy of Music.

Musicmasters has signed the Orchestra of St. Luke's to a three-year contract, which will yield over twenty recordings of music from Bach to Copland. The latest is an album containing Kurt Weill's Violin Concerto, with Naoko Tanaka (a member of the orchestra) as soloist, and the suite from Weill's Threepenny Opera; Julius Rudel conducts. Forthcoming recordings on other labels include an all-Bach program, with soprano Kathleen Battle and violinist Itzhak Perlman, for Deutsche Grammophon; a collection of middle Haydn symphonies conducted by Charles Mackerras for Telarc; all of the Bach keyboard concertos, with Vladimir Feltsman as soloist, for CBS; and Adams's Fearful Symmetries (a St. Luke's commission) and Shaker Loops, conducted by the composer for Nonesuch.

THE singer, songwriter, and pianist Ray Charles, along with his Original Ray Charles Orchestra and the Raelets, will join dancers of the New York City Ballet on the New York State Theater stage for a PBS telecast May 12 in the Live from Lincoln Center series. The program will feature a performance of Peter Martins's ballet A Fool for You, which is set to ten of Charles's classics, including the title song.

On the preceding Sunday, May 7, PBS will carry the twentieth-anniversary concert of the Chamber Music Society of Lincoln Center. Violinist Pinchas Zukerman and the organization's retiring artistic director, pianist Charles Wadsworth, will be featured in works by Ravel, Poulenc, and Schubert.

RACENOTES. Chrysalis is releasing "Once More into the Bleach," a collection of Blondie dance tracks, including some twelve-inch remixes. Debut Debut McClinton's new Alligator album was recorded live on the TV show Austin City Limits .... Mavis Staples has a new album, produced by Prince for his Paisley Park label. CBS Music Video has just released a two-hour highlight video of the Nelson Mandela 70th Birthday Tribute staged at London's Wembley Stadium last June.

Slatkin: on a roll

Dr. John

FOR his first major-label album in more than ten years, Dr. John has taken a stroll through the world of classic pop tunes. "In a Sentimental Mood," produced by Tommy LiPuma, surrounds...
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Mr. Wizard obligingly explained that I was experiencing the effects of subtractive acoustical interference, compliments of my newly installed rear speakers. Since these were essentially in opposite phase relative to the front pair, they were combating some of the long-wavelength room modes I had suffered, and noticeably smoothing out the extreme low-end response. Undoubtedly they were also adding some response irregularities at shorter wavelengths, but the overall effect was pleasing, and it became more so with further adjustment.

Powerful stuff, Mr. Wizard, and very useful. I have since employed the same technique, in one way or another, in many sound systems I've designed for domestic listening rooms.

Now there has appeared a commercial product for this bass-purification function: the Phantom Acoustics Shadow, $1,790 the pair, which buys two 7-foot columns with 8-inch woofers in top and bottom, 25-watt amplifiers for each woofer, and microphones and servo circuitry to tell the woofers what to do. They are not surround-sound speakers in any sense, being hand-limited to about 200 Hz and below. and originator Nelson Pass, of Threshold amplifier fame, is not especially keen to have them become surround-sound speakers. "As amplifier manufacturers, we have made many good friends among speaker manufacturers," Pass told me. "We don't want to compete with them."

So why has he come so close to it? "The whole idea for this product was outlined comprehensively by Harry Olson [famed RCA audio engineer] in 1953." he remarked, "and even turned up in a science-fiction story by Arthur C. Clarke. Decades later, nothing had appeared. We decided to climb the concept because it wasn't there."

In essence, the Phantom system doesn't make sound—it unmakes it by acoustically canceling the sound-pressure conditions that lead to the creation of standing waves and other listening-room resonances. It is an active acoustical diffuser rather than a passive one, and for the frequencies it addresses, it attempts to act like a black hole that unwanted bass can enter, but from which it will never escape.

According to Pass, "The structure of these tubes attempts to put a canceling transducer within 6 inches of all four rear corners—that is, wall and floor junctions and wall and ceiling junctions—of the room. The corners are where you'll find the greatest pressure buildup, typically around +10 dB, that leads to troublesome room resonances. In effect, the system eliminates these corners, as if they were hacked off by a chain saw. The microphone senses the incoming pressure and informs the servo circuitry, then the amplifier gets the message to drive the speaker for 10 dB of cancellation. We believe this is the right figure. Too much more with a feedback system like this and you risk instability and oscillation."

Naturally, the cancellation takes place only for problem frequencies. The rest of the sound is left intact. Pass describes the overall effect as a tightening of the deep bass and a pleasant clarification of the middle and upper bass, both of which are reasonable expectations given the theory of operation.

Pass admits that the benefits of the Phantom are not easy to demonstrate. For a true A/B comparison, the tall towers have to be removed from the room completely, since even when the electronics are turned off the foam-filled structures exhibit considerable acoustic absorption. "I would not say the product has gotten to the point of taking the consumer by storm," Pass said. "Probably our most enthusiastic customers to date are dealers, who are using the system to clean up their demo rooms. They know these rooms and their problems."

By Pass's estimate, the cancellation effect of the system is operative within a sphere whose radius extends about a quarter wavelength out from each driver. At greater distances, the influence on the sound is negligible. By inference, this would mean that the longest wavelengths get the most processing, which is appropriate. It would also mean that the system does much less in very large rooms, which is fine, because very large rooms with reasonable acoustics develop far fewer modes within the audio range.

While the intended function of the Phantom is subtractive, taking away bass where it exists in excess, Pass has discovered an application in which it can be profitably additive. When the towers are placed a bit behind and to the sides of true dipole radiators (full-range electrostats and the like), they will eliminate some of the rear radiation that would otherwise result in back-to-front bass cancellation. Pass says he has gotten as much as 3 dB of low-frequency gain from the Martin-Logan CLS by this stratagem.

So, here is an audio product that truly breaks new ground. To experience it you'll have to find a Threshold or Forté dealer, but that shouldn't hold you back.
MAGNA

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