Looking at them, you'd never suspect that graphite, kapton, polypropylene and neodymium are all that musical.

But polypropylene, when its injection-molded and reinforced with radially-aligned graphite fibers in our IMG woofer, becomes Stanley Clarke's battering ram bass.

Graphite, in the form of thousands of tiny, hollow spheres in our Polyspherite™ dome midrange, sounds exactly like Kenny G's alto sax on fire.

And kapton, stretched into a micro-thin diaphragm and suspended between powerful neodymium magnets in our EMIT k tweeter, is the steam rising from Jeff Hamilton's cymbals.

All these disparate materials, in the hands of our speaker designers, are transformed into the most positive proof that the State of the Art has taken a significant step forward.

Introducing the new RS Series.

These six speakers embody everything we know about the physics of transforming exotic plastics and rare-earth metals into music.

Their drivers are unlike any you've seen or heard before. Drivers we had to invent because there were none this musically accurate before.

Their very cabinet profiles are shaped by our understanding of the behavior of soundwaves.

And their grilles display the mobius emblem that has adorned the most critically acclaimed speakers in the world.

For the audiophile in all of us.

Yet, for all its state-of-the-art engineering, exotic, space-age speaker materials, and extreme sonic accuracy, the RS Series wasn't created for the money-is-no-object audiophile.

Its price range of only $85 to $530 per speaker puts the RS Series well within the reach of most people who,
ew technology.

frankly, don't even care about our use of photo-etched aluminum voice coils and Monster Cable® internal wiring. Because it's only the music that really matters.

For all these reasons—musical, technical and economic—we invite you to bring a favorite record or CD to your Infinity dealer and hear it as you've never heard it. Through the new Infinity RS speakers.

We promise you all the passion and excitement you can handle.

Which, since you're as hooked on music as we are, is exactly what you deserve.

Infinity

We get you back to what it's all about. Music.
Even as the prices of luxury cars go sky-high, Sony brings luxury car stereo down to earth. Introducing the CDX-R77, Sony's most affordable car compact disc player ever. At this price, your CDs at home needn't be home-bound any more. Now you can enjoy their rich, dynamic sound wherever you drive. Sony's stirring CD performance gives the automobile a new type of mobility. Upward mobility.

The CDX-R77 just had to be from Sony. After all, Sony invented the compact disc and we've been making car CD players longer than anyone. Which means we've had more time to refine our technology. More experience making our players rugged to withstand the tortures of the road. And more opportunity to build in valuable features like our SSIR AM/FM tuner, switchable amber or green illumination to match your dashboard, and the ability to handle the new, smaller CD-3s directly.

The CDX-R77 is so attractive, we even made the CDX-R79—a slide-out version you can keep in your hands and out of the hands of others.

With Sony car CD players at prices like these, it's easier than ever to travel first class. So before you buy your next car stereo, audition the Sony CDX-R77 and CDX-R79. Your ears will convince you: anything less is just pedestrian.

THANKS TO SONY, THE PRICE OF LUXURY TRANSPORTATION JUST WENT DOWN.
Cover: The Philips improved-definition TV monitor/receiver and Shure's HTS subwoofer are components in the home theater system evaluated in the article beginning on page 62.
Design by Sue Llewellyn, photo by Roberta Brossan.

STEREO REVIEW BUYER POLL, SEE PAGE 93
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EQUIPMENT

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SHOW STOPPERS
Outstanding new products from the Consumer Electronics Show

THE BEST SEAT IN THE HOUSE
A home theater system with surround sound and improved-definition television

GET THE PICTURE!
A guide to high-technology TV

HI-FI VCR’S: A BUYING GUIDE
Features, specs, and prices of video recorders for audiophiles

MUSIC

WHERE’S THE ROT?
A special report on CD longevity

BEST RECORDINGS OF THE MONTH
Emmylou Harris, Schumann Symphonies Nos. 1 and 2, Lou Reed, and Rachmaninoff Piano Concerto No. 1

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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.
**TV'S GOLDEN ANNIVERSARY**

The Electronic Industries Association is sponsoring an exhibit that begins this month at the Smithsonian Institution's National Museum of American History in Washington, commemorating the first fifty years of television broadcasting. The exhibit, entitled "American Television from the Fair to the Family, 1939-1989," will run until next April and will include artifacts, souvenirs, antique TV receivers, and video segments from the early days of television.

**A COMPACT HI-FI CAMCORDER**

JVC has introduced the first compact Super VHS camcorder to incorporate hi-fi stereo recording. Priced at approximately $2,500, the GR-S707U is designed for professionally oriented consumers. Features include audio dubbing, time-lapse recording, an animation function, built-in self-timer, 8-lux low-light sensitivity, and a two-speed 8-to-1 macro-power zoom lens.

**RELIEF AND RECORDS TO THE USSR**

Mobile Fidelity Sound Lab of Petaluma, California, which has held an exclusive licensing agreement with the state-owned Russian recording company Melodiya for several years, is donating all profits from 1989 sales of Melodiya recordings to the Armenian Relief Society. Columbia Records is reportedly the first Western pop label to ship recordings in bulk to the Soviet Union for retail distribution there. Included in the shipment of 20,000 albums were two of the record industry's all-time best sellers, Michael Jackson's "Thriller" and George Michael's "Faith," as well as recordings by Bruce Springsteen, Cyndi Lauper, the Rolling Stones, the Bangles, Journey, and Billy Joel.

**VICTIM OF THE YEN**

Kyocera is no longer marketing audio products in the United States, citing economic reasons. The company said financial pressures brought on by the stronger yen forced it to look for sources other than Japan for manufacturing, but it could not get the quality it needed to differentiate its products from others on the market. Servicing and warranties for Kyocera brand products will be handled by the parent company's U.S. headquarters in Somerset, New Jersey, and by a network of independent service centers.

**CELEBRATIONS**

Blue Note Records, the jazz label reactivated in 1985 and distributed now by Capitol, is currently observing its fiftieth anniversary with an artist roster that includes Stanley Jordan, Lou Rawls, Michel Petrucciani, and Dianne Reeves. Highlighting the year-long celebration will be a number of special compilations and a Blue Note 50th Anniversary Concert Tour.

The French classical label Harmonia Mundi is observing its thirtieth year with the release of a special boxed set of six CD's offered for the price of two.

The Stockholm Philharmonic is currently celebrating its seventy-fifth year and has produced, on the BIS label, a special package of eight CD's featuring its music directors and prominent guest conductors over the last three quarters of a century.

**STEREO TV SPREADING**

About 520 TV stations in the U.S. are equipped to broadcast in stereo, according to a survey done by the newsletter *Television Digest*. The survey found that 146 NBC affiliates are equipped for stereo, more than the ABC (64) and CBS (72) affiliates combined. The PBS network has 82 stereo-equipped affiliates, and there are 154 independent stations with stereo capability. The survey also found that an estimated 99 percent of U.S. homes are within range of at least one TV station broadcasting in stereo.

**POP SUPPORTS POP**

Pepsi-Cola has joined Philips, the Dutch electronics firm, in backing the 1989 World Music Video Awards scheduled for April 14. The two-hour telecast from London will be picked up from the satellite feed to the U.S. by Fox Broadcasting. The title track from Madonna's new album, "Like a Prayer," released by Sire on March 15, was introduced earlier in the month as a two-minute prime-time-television Pepsi commercial. The recent American Music Awards telecast on ABC (January 30) served to introduce George Michael's current Diet Coke commercial.

**KEITH IN A CAN**

In a move aimed at hard-core fans, Virgin Records has temporarily retitled the new Keith Richards album, "Talk Is Cheap," and repackaged it—in a tin can. Premium priced at $24.98, as befits a collectors' item, "Keith in a Can" consists of an embossed metal container, designed by Timothy Eames, containing three 3-inch compact discs and a twelve-page booklet with art work and notes. The three CD's hold all eleven tracks of the original Rolling Stone's first solo effort, but the edition in this format is limited. Get it while you can!
The Polk Revolution Continues!

"Polk reinvents the loudspeaker"
High Fidelity Magazine

Nearly six years ago the audio world was stunned by Matthew Polk's introduction of revolutionary SDA technology. While other designers had been concentrating on small refinements to existing loudspeaker technology, Matthew Polk opened the door to new frontiers of exciting realism in sound.

True Stereo SDA technology maintains stereo separation all the way to your ears, something which no conventional speaker can achieve. Conventional speakers make it sound like the musicians are trapped in the speaker boxes or in the small space between them. Polk's patented SDA speakers fill the entire width of your listening room with sonic images so breathtakingly real that its just like having the musicians in the room with you. They must be experienced to be believed!

Introducing the SDA SRS 2.3

Introduced two years ago, the flagship SDA Signature Reference System (SDA SRS) is the ultimate expression of loudspeaker technology. A two-time winner of the prestigious Audio Video Grand Prix Award, the SDA SRS was recently chosen by the editors of Stereo Review magazine for their ultimate dream system.

Now being introduced, the SDA SRS 2.3 offers all of the benefits of third generation SDA technology in a slightly more modest package. It is the perfect speaker for those listeners who demand the best and most exciting listening experience but who cannot accommodate the larger SDA SRS.

Words can never fully express the thrilling experience of listening to the new SDA SRS 2.3. Effortless reproduction at live concert levels, distortion free, body-tingling bass and room-filling stereo imaging are executed so flawlessly that when you close your eyes you'll forget that you are listening to speakers at all. Visit your local Polk dealer and experience them for yourself.

polkaudio
The Speaker Specialists®
5601 Metro Drive, Baltimore, Md 21215

Where to buy Polk Speakers? For your nearest dealer, see page 103.

CIRCLE NO. 90 ON READER SERVICE CARD
IS YOUR CLASSICAL MUSIC SUFFERING FROM POOR HOUSING CONDITIONS?

High resonance housing will put any tape in a nasty mood. Especially when pests, such as modulation noise, gnaw on the purity of digitally sourced music.

At TDK, we believe the formula for perfect reproduction includes not only technologically superior tape, but housing that enhances its performance.

Our incredible new SA-X, for example, features an ultra low resonance SP-ARI mechanism. By utilizing our unique co-molding technique, the unified two-layer shell realizes maximum total rigidity to improve reliability. Which drastically reduces modulation noise—an enemy of clear, pure sound that even noise reduction systems are powerless against.

This undesired "noise" is also attacked by SA-X's revolutionary magnetic characteristics and smooth, flat tape surface. First, there are the densely packed and uniformly distributed ultra fine Super Avilyn magnetic particles. Then, there is the advanced dual coating technology.

Together, the result is an unbelievably quiet tape with an exceptionally low bias noise of -61.0 dB. Plus, low and high frequency MOLS of +5.0 dB and -6.5 dB respectively.

And SA-X, which provides transparent reproduction of the most powerful digital sources, is available in convenient lengths of 46, 60 and 90 minutes.
Introducing the new Silver Edition Amazing Loudspeaker with Sonic Holography® Generator and Electronic Control System.

By looks alone you know this is no ordinary speaker. The Silver Edition trades a bulky, boxy cabinet for unfettered musical freedom. Its full-range ribbon transducer is open to the room, projecting seamless 25 Hz to 40,000 Hz sound both forward and back, creating near-photographic imaging and realistic spatial ambience. Its three enclosureless, twelve-inch subwoofers deliver bass that's tactilely tight and deep.

And each fifty-four-inch, piano-lacquered panel looks as good as it sounds. While occupying less than two square feet of floor space.

Up to this point we've described a brilliant, unconventional and yet proven dipole speaker design. One which offers openness, detail and sonic impact 'ar in excess of its modest price. And which solves inherent problems plaguing far more expensive ribbon transducer designs.

But in order to fully earn the title "Amazing Loudspeaker," Bob Carver has endowed the new Silver Edition with even more technology.

At its heart is an Electronic Control System. Not an "equalizer" to compensate for shortcomings, but three dramatic sound enhancement circuits, plus bass “Q” and high frequency trim adjustments in a single compact component.

Select Sonic Holography® for the spectacular, 3-dimensional imaging high fidelity described as seeming to "open a curtain and reveal ... musical forces extending behind, between and beyond the speakers." With any CD, record, tape or video sound source.

Add ultra-low fundamentals below 20 Hz with a Sub Bass generator that detects and enhances existing low level information. On bass-shy recordings, it takes advantage of the Silver Edition's long-throw free-air subwoofer system to restore bone-shaking musical reality.

There's even a unique circuit that psychoacoustically "zooms" you back from the speakers. Called the Gundry Perspective, this effect creates the illusion of concert hall depth ahead of you without disturbing overall frequency balance. Combine it with Sonic Holography®, Sub Bass generation and the Silver Edition's own innate ability to create a vast, open listening space, and you have a truly amazing aural phenomenon.

More than just a reproducer of music, the Amazing Loudspeaker Silver Edition becomes a restorer of sonic reality. In its most minute, organic detail.

Finally, there is one more very realistic thing about this new Amazing Loudspeaker model. Its price. Far less than you might pay for conventional loudspeaker designs which can't begin to match the Silver Edition's warmth, vitality and spaciousness.

Reawaken your sense of amazement with an audition at your nearest Carver dealer soon.
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. Teammed 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 CO10 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 CO10'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 or 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 1-800-555-7000 Ext. 101 or write 240 Crossways Park West, Box 9101, Woodbury, New York 11797.
In-Home Performance In-Dash. Inevitably Harman Kardon.
Why all Boston Acoustics speakers sound alike. (More or less, that is.)

Andy Petite, chief designer, Boston Acoustics.

"At Boston Acoustics, live music is our basic reference standard. And since we design each of our speakers to sound musically accurate, all of our systems have a remarkable sonic resemblance.

"Any full-range speaker system, whatever its size, should have good octave-to-octave tonal balance and wide dispersion. We provide these qualities in all of our speaker systems—from the A40 bookshelf to the T1000 tower. (From our long experience in listening to many competitive speaker lines, the same can be said of only a few.)

"In larger rooms and at higher listening levels, the differences—and the superiority—of our more expensive systems begin to emerge. They can play louder without strain, and reproduce deeper bass. But this doesn't detract from the musicality, accuracy and tonal balance of our smaller speakers.

"How much sound a speaker produces in your listening room also depends on the room's size, the music you listen to, and how loud you play it. Because all Boston Acoustic speaker systems—bookshelf, floor-standing and tower—meet all our standards, there's at least one that should meet your special requirements and conditions.*

"So when you visit a Boston Acoustics dealer, ask to hear a Boston speaker. Any Boston. We can't promise you perfection, but we will bring you as close to the music as the state of the art allows."

"It certainly helps that we design and build our own speakers—all with the same high quality materials. Further, we manufacture all our speakers to such tight tolerances that any two samples of a given model are virtually identical. And to insure this, we test each completed system—every single one—before it leaves the factory.

"Finally, sonic similarity is especially important with surround-sound systems. An all-Boston system assures the greatest sonic impact."

The A40 Series II.
Our most popular bookshelf system.
...attains an aura of spaciousness surpassed only by some of the far more expensive multi-directional speakers." The New York Times.
Suggested retail: $170 a pair.

Introducing the T930 Tower System.
Combines our finest midrange and tweeter with a new 10-inch long-throw woofer.
Suggested retail: $800 a pair in walnut veneer, $650 a pair in black woodgrain laminate.

Boston Acoustics
70 Broadway, Lynnfield, MA 01940 (617) 592-9000
**Carver**

The Silver Edition of Carver’s Amazing Loudspeaker system combines a full-range ribbon driver with three 12-inch, very-long-throw subwoofers that have a bipolar dispersion pattern. Frequency response is rated as 23 to 40,000 Hz -3 dB, impedance as 8 ohms, and sensitivity as 88.5 dB. Recommended power range is 60 to 1,200 watts per channel. The system includes an outboard electronic controller with a Sonic Holography generator, a sub-bass synthesizer, and a “gundyry perspective” circuit that can modify upper-midrange output to make the sound source appear to be further back than it is. The speaker panels are 54 inches high, 27 1/2 inches wide at bottom, and 10 inches deep. Finish is ebony lacquer with silver highlights. Price: $2,195 a pair. Carver Corp., Dept. SR, P.O. Box 1237, Lynnwood, WA 98036.

**Bang & Olufsen**

Bang & Olufsen’s Beosystem 4500 is a wall-mountable system consisting of a matching receiver, CD player, cassette deck, and turntable. All the components can be controlled with a single handheld Beolink remote unit. The system can feed remote speakers in other rooms through optional B&O Master Control Links.

The Beomaster 4500 AM/FM receiver is rated for 100 watts per channel into 8 ohms and has twenty presets. The Beogram CD4500 compact disc player uses quadruple oversampling and has a motorized lid. A special disc clamp holds CD’s firmly when the player is vertically wall mounted. The Beocord 4500 is an autoreverse cassette deck with Dolby B, Dolby HX Pro, and automatic head demagnetization. The radial-tracking Beogram 4500 turntable includes a built-in phono preamplifier. Prices: receiver, $1,098; CD player and cassette deck, $800 each; turntable, $499; remote control, $175. Bang & Olufsen of America, Dept. SR, 1150 Feehanville Dr., Mount Prospect, IL 60056. Circle 121 on reader service card.

**Case Logic**

Case Logic’s CD-60 carrying case can hold sixty CD’s. The soft-sided case has a nylon outer shell, padded with foam rubber, and plastic trays inside. There is a detachable shoulder pad and strap. Colors are black, gray, or blue. Price: $39.95. Case Logic, Dept. SR, 6930 Winchester Circle, Boulder, CO 80301. Circle 120 on reader service card.

**Teac**

Teac’s AG-75 AM/FM receiver is rated for 75 watts per channel. It features a discrete output stage, matrix-surround circuitry, connections for two tape decks with dubbing in both directions, a CD input with a CD direct switch, and a twenty-eight-key remote control with a motorized volume control. The quartz-PLL, frequency-synthesis tuner section has sixteen presets and auto-scan tuning. Capture ratio in FM is rated as 2 dB, alternate-channel selectivity as 50 dB, AM suppression as 55 dB. Price: $399. Teac, Dept. SR, 7733 Telegraph Rd., Montebello, CA 90640. Circle 122 on reader service card.
NEW PRODUCTS

**Coustic**

The Coustic RX-728 car cassette receiver features the company’s Auto-Aligned Azimuth system, said to eliminate high-frequency losses associated with azimuth misalignment. Rated to deliver 25 watts per channel, it has quartz-PLL, frequency-synthesis tuning, twelve AM/FM presets, ignition-off pinch-roller release, Dolby B and Dolby C noise reduction, and metal-tape equalization. Price: $315. Coustic, Dept. SR, 4260 Charter St., Vernon, CA 90058-2596.  

**Altec Lansing**

Altec Lansing’s Model 511 four-way tower loudspeaker is designed to give listeners control over the tonal balance of the system. Its crossover system has four level controls: The first, for the two 10-inch long-throw woofers, provides a choice of three rolloff curves. Other controls allow ±3-db level adjustments for the upper bass, midrange, and treble. Frequency response is rated as 20 to 22,000 Hz ± 3 db. Users can select either normal amplification or bi-, tri-, or quad amplification by connecting the gold-plated jumper on the back of the speaker. Input terminals are made of heavy-duty gold-plated copper. Cabinet dimensions are 57 x 13 x 13½ inches. Price: $3,000 per pair. Altec Lansing, Dept. SR, Milford, PA 18337.  

**Memorex**

To make it easier to record typical compact disc albums on cassette tape, Memtek has added three new lengths to its high-bias Memorex HBS II line: 46, 76, and 100 minutes. The 60- and 90-minute Memorex HBS II cassettes will continue to be available. Prices for the new lengths: C-46, $1.59; C-76, $1.99; C-100, $2.59. Memtek Products, Dept. SR, P.O. Box 901021, 1600 Two Tandy Center, Fort Worth, TX 76101.  

**Pioneer**

The Elite C-91 is Pioneer’s top preamplifier. It can control up to five video sources and two audio tape decks along with inputs from a CD player, tuner, and MM or MC phone cartridge. The dual-mono construction isolates the left and right audio channels to reduce crosstalk, noise, and distortion. There are separate power supplies for each channel and a third for the video circuits, displays, relays, microprocessors, and electronic switches. The circuit boards are said to be isolated from vibration and other external disturbances. Included is a “smart” remote control that can learn the infrared codes for virtually any other remote-controlled component regardless of manufacturer. Price: $1,400. Pioneer Electronics, Dept. SR, 2265 E. 220th St., Long Beach, CA 90801-1720.
NEW PRODUCTS

Onkyo

Onkyo’s TA-R300 cassette deck has Dolby HX Pro in addition to Dolby B and Dolby C noise reduction. It features quick-autoreverse using an optical sensor rather than mechanical devices to reverse tape travel. Its Accubias circuit automatically sets the deck for the tape type being used. A remote control is included. Price: $360. Onkyo, 200 Williams Dr., Ramsey, NJ 07446.

Panasonic

The Panasonic SL-NP11 portable compact disc player can operate on two AA-size NiCad rechargeable batteries for up to 2 hours. The batteries are said to recharge in 3 hours using the supplied AC adaptor. The supplied one-button, four-function remote control plugs into any headphone cord. An auto-power-off function operates if the player is left in the stop or pause mode for more than 5 minutes. The SL-NP11 uses quadruple oversampling. Weight is about 14 ounces with batteries. Price: $349.95. Panasonic, Dept. SR, One Panasonic Way, Secaucus, NJ 07094.

Phoenix Gold

The Phoenix Gold Optical Fiber System, OFS-1, is designed specifically for car audio and transmits four signals through one fiber-optic cable 1/16 inch in diameter. Claimed advantages of the OFS-1 system include its small cable size, immunity to radio-frequency and electromagnetic interference, elimination of capacitance and resistance problems, and elimination of ground loops. The transmitter unit (left in photo) can be mounted in the dash next to a cassette receiver or CD player. The receiver unit (right) is designed to be mounted near the system amplifiers and crossover, connected by short RCA cables. Price (including 20-foot cable): $225. Phoenix Gold, Dept. SR, 8 Jackson Rd., Marblehead, MA 01945.

Velodyne

Velodyne’s SA-7 forward-firing tower subwoofer incorporates the company’s High Gain Servo technology. An accelerometer-based correction loop is said virtually to eliminate harmonic distortion at any frequency or output level. Distortion is rated as no more than 2 percent at 25 Hz. The 12-inch driver has a stiff, low-mass cellulose cone, a 56-ounce magnet, and a copper voice coil said to be capable of more than 1 inch of peak-to-peak excursion. The built-in amplifier is rated at 100 watts rms, 400 watts peak. Speaker-level crossovers allow integration with an audio or video system, and a mono line-level input can be used with external crossovers or surround-sound processors. The cabinet measures 33 1/2 x 13 3/4 x 15 3/4 inches. Price: $995. Velodyne Acoustics, Dept. SR, 1746 Junction Ave., San Jose, CA 95112.
Introducing the first tuner/preamplifier that includes Carver's remarkable sonic enhancements.

We didn't invent the preamplifier/tuner combination. We just gave it what it's always needed:

Fresh air — A remarkable FM tuning system that virtually eliminates station noise and multipath interference.

Wide open spaces — The ability to recreate 3-dimensional sonic reality with your existing speakers.

Asymmetrical Charge-Coupled FM Detector. At the touch of a button on the CT-Seven's burnished face plate, multipath distortion, interference, and distant station noise are dramatically reduced. Yet stereo separation, space, depth, and ambience are not only retained, but seemingly enhanced by the lack of background noise. Choose 6 FM and 6 AM presets by remote control or scan the broadcast band in auto or manual mode. You may even discover "new" stations which were previously unlistenable!

Sonic Holography® Generator. The CT-Seven is capable of redefining your perception of music by recreating the multi-dimensional sound stage 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 sound source. With your existing speakers.

Useful features and remote control. The CT-Seven includes an ultra-low noise phono stage pre-preamplifier for both moving magnet and moving coil cartridges plus dual tape monitors, CD input and AUX for video sound. Instead of distortion-inducing electronics, the CT-Seven's remote volume control is motorized for smooth control and smoother sound quality.

The CT-Seven's powerful partners. Only Carver gives you four perfectly matched power amplifier choices each using 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.

Fresh air, wide open spaces and serious power at your Carver dealer. Switch between the CT-Seven and the most expensive tuner in the room to hear Asymmetrical Charge-Coupled FM Detection work its magic. Turn up the volume to live performance sound levels and discover the impact of true dynamic headroom. And then get ready for another pleasant experience when you discover just how affordable performance like this can be.
Live in Concert. Forget the tickets. Put away the tux. Just hook up a pair of Pioneer's new ST Series speakers and let the performance begin.

Now there's a new line of advanced speakers designed to bring out the full dynamic range and emotion of today's digital recordings.

Developed by the same team that makes Pioneer's renowned TAD speakers for major recording studios, these speakers feature ceramic carbon dome tweeters for flawlessy brilliant highs and integrated twin woofers for natural, powerful bass. Even the cabinets are superbly crafted to enhance imaging and minimize vibration for smooth true-to-life sound.

So if it's great live performances you're looking for, catch the debut of our new ST Series at your Pioneer dealer today.
Cataloging Tip

In the letter from W. S. Hubbard in the January issue, "Cataloging a Collection," Mr. Hubbard suggests that the computer program dBase III+ is the best choice for this purpose. But dBase III+ is an elaborate relational database program, not easy to use and quite expensive. The type of reports that Mr. Hubbard describes, as well as much more elaborate reports, could easily be produced by a program of the "file manager" (or "flat file") type, in which only one data-base file is open at a time. This kind of program is much cheaper to buy and much easier to learn. I am using PC-File Version 1.04 for exactly the same application as Mr. Hubbard.

JOSEPH RICHARD
Yorktown Heights, NY

Longer CD's

With the hope that you have not set off a Guinness Records type of search for the longest-playing CD with "CD Stretch" in February's "Letters," let me report that I purchased a Pilz compact disc that exceeds the seventy-nine-minute length of the Angel CD of Strauss's Eine Nacht in Venedig. The Pilz disc is Dvořák's Stabat Mater in a recording by the Radio Symphony Orchestra of Ljubljana. Its length is seventy-nine minutes and thirty-eight seconds, and at a retail price of $6.98, it must be the most "generous" CD yet produced.

WILLIAM G. MILLER
Lancaster, PA

Rykodisc's "Mission of Burma" CD by the group of the same name is eighty minutes and eight seconds long.

SEAN MCGOLDRICK
Brooklyn, NY

Thanks to the other readers who also cited "Mission of Burma."

High-Definition Television

In a reply to a letter in the January issue, Technical Editor William Wolfe said, "...fortunately, the FCC has ruled that it will consider only those HDTV [high-definition television] designs that are compatible with the current NTSC system." STEREO REVIEW should be leading the charge against that decision, not applauding it.

For twenty-five years, Americans have put up with color TV images of significantly lower quality than those available in Japan and Western Europe because the FCC insisted on making our color TV compatible with 1940's technology black-and-white receivers. Now, astonishingly, the Commission wants to cripple 1990's HDTV by tying it to the same obsolete technology, now half a century old. Sort of like saying the new Stealth bomber must be made with parts interchangeable with a B-25!

Clearly, the search should be for the best available picture.

STEPHEN D. LEONARD
Mesa, AZ

William Wolfe replies: While some HDTV prototypes based on non-NTSC-compatible systems do outperform their NTSC counterparts in some areas, the differences are often subtle and may not be discernible at all under real-world viewing conditions. Because the FCC is a governmental body, political and economic considerations are unavoidable part of its decision making. It's ruling in this case is still "fortunate" because it means that every American will still be able to watch TV, whether he can afford a new HDTV set or not.

Shocking Tactics

As a retail salesperson, I enjoyed Ken C. Pohiman's "How to Buy a CD Player" (October) up to the point where he said, "Hit the player a few times on the top and the sides to ascertain the pickup's ability to track." Why does everyone feel it is necessary to beat, poke, and pound on equipment? If you test drive a Mercedes, do you drive it into a wall to ascertain the buyer's ability to withstand the shock? I think you might encounter some difficulties when you return it to the dealer.

I don't want a customer to bang, hit, or otherwise abuse any piece of equipment on my sales floor. This merchandise will someday be owned by a valued customer. Even though there may be no cosmetic damage, who is to say what the life expectancy might now be? Until you can convince manufacturers to give stores free floor samples to be beat on, please refrain from advising people to test equipment in this fashion.

BRENT THULL
Columbia, MO

 Corrections

An incorrect address was given in the March test report on the Wharfedale Diamond III speaker. Wharfedale's U.S. address is 1230 Calle Suerte, Camarillo, CA 93010.

In the photo on page 142 of the November 1988 issue, the singer shown with Luciano Pavarotti is not Edita Gruberova but the Chilean mezzo-soprano Victoria Vergara.
I've been a studio drummer for eight years. So, I'm very critical about speakers, mostly because I know what drums are supposed to sound like. Most speakers make a kick drum sound like someone's playing a bowl of oatmeal. I don't even like the way oatmeal tastes, let alone how it sounds.

One day, a friend and I stopped at a hi-fi store to pick up some cassette tapes. Off in one of the listening rooms, I heard some music that sounded live. It was the drums I noticed first. Forget oatmeal, what I heard was a really tight, clean, punchy sound.

We strolled into the room halfway expecting to find a jam going on. But it was a recording. I looked at one of the speakers. It was a KLIPSCH® CHORUS®.

This was a new KLIPSCH speaker. A speaker with professional drivers in a real dressy cabinet. A speaker with a surprisingly good price. A speaker good enough to qualify for the home of a most critical musician. Good enough for me. And that's very, very good.

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WHERE'S THE ROT?
A SPECIAL REPORT ON CD LONGEVITY BY REBECCA DAY

The headlines in British newspapers last summer undoubtedly sent chills down every CD owner's spine: "Compact discs 'fade out after eight years' use,'" the Manchester Guardian said. "The CD Controversy—Music Giants on the Warpath as Manufacturer Claims Those 'Everlasting' Albums Fade Away. Warning: The Years Can Leave Your Discs in Dire Straits," the Daily Mail trumpeted. The headlines accompanied highly publicized articles on the alleged deterioration of compact discs, or, as it came to be known, "CD rot."

A few weeks earlier, the British magazine New Scientist had reported on CD tests conducted by the Japanese pressing plant Ultech for Mobile Fidelity Sound Lab, which was experimenting with metals other than aluminum for the reflecting layer of CD'S. The company was looking for a metal more durable than aluminum.

The Guardian picked up the story and asked the U.K. disc manufacturer Nimbus Records for more information on the longevity of co's. It then quoted Nimbus officials as saying that certain CD'S would begin to self-destruct within eight to ten years because inks used for labeling had "begun to eat into the protective lacquer coating, oxidizing the aluminum layer and making the CD's unplayable.

Amid the uproar that followed, subsidiaries of Philips and Sony, co-developers of the compact disc, issued statements to the press. The Philips response was issued by Philips and DuPont Optical Company (PDO), which is the world's largest manufacturer of compact discs: "We have produced nearly 200 million CD'S throughout Europe and America," PDO said, "and no one has ever complained of 'fade-out' effects. We have over fifteen years' experience in manufacturing optical discs. During this time we have conducted continual testing, including artificial aging, under severe environmental conditions, and our original discs, now fifteen years old, are still not showing signs of quality loss.

In another statement, Leon Vogels, worldwide managing director of consumer media at PDO, said: "We foresaw the potential danger of corrosive inks and other noncompatible materials destroying the aluminum layer by oxidation. So we got our chemistry and materials right, and obviated that problem from the word go. It simply doesn't happen to PDO discs."

Sony Corporation of America said: "This is not a CD format problem. Theoretically speaking, it is true that materials used for CD production, including ink for the printed label, may show some kind of chemical change over time. Such change could damage a compact disc if the materials are not chosen carefully. . . . Before launching compact discs to the market, Sony conducted accelerated aging tests which show no change of the product even after more than ten years' time. Sony has continued to conduct such tests on a permanent basis ever since."

Even Nimbus, which started the whole flap, pulled in the reins a bit, issuing a news release that called the Guardian story an "oversimplification." The company, which itself had encountered problems with labeling ink eating through the lacquer coating and oxidizing the aluminum layer, had its own reasons for questioning the reliability of CD's produced by other manufacturers. It had just come up with a new CD manufacturing process that it claimed cleared up previous problems, and it was now guaranteeing its discs for a hundred years.

In the release, Nimbus maintained that "There is certainly no cause for any CD customer to doubt the durability and quality of any disc manufactured to appropriate high standards, but in those cases where the delicate information layer has been badly protected, a lifetime guarantee must be considered speculation. In the end, you get what you pay for."

Meanwhile, Mobile Fidelity's reasons for wanting to come up with a superior CD were clear. It had built its reputation on a two-tiered record catalog that offered a "better/best" choice for consumers. To bring the story up to date, I spoke with Mobile Fidelity's president, Herb Belkin. He compared the company's Ultradisc, a compact disc that uses..."
24-karat gold for the reflective layer, to its UHQR LP’s, which are pressed on pure vinyl and command a higher price than its standard LP’s.

Belkin told me that the test conducted for Mobile Fidelity by Ultech indicated that “There are deleterious effects on aluminum CD’s when they’re subjected to a variety of environmental circumstances. The degradation has to do with the type of aluminum and the type of polycarbonate [substrate] used and the steps used in a variety of processes which allow air and moisture to get between the aluminum layer and the polycarbonate.”

In the tests, Ultech compared discs made using 24-karat gold with aluminum discs pressed by a number of other plants. All of the discs were subjected to the same life-cycle test: 2 hours at 65°C and 95 percent humidity, 12 hours at 40°C and 95 percent humidity, and 2 hours at -30°C. After thirty cycles, more than half of the aluminum discs exhibited error rates that made them unplayable, but the gold discs were relatively unchanged.

Does this mean you should junk all your aluminum CD’s in favor of gold? Absolutely not. Mobile Fidelity guarantees its aluminum CD’s as well as its gold discs, and a Sony official told me that a properly manufactured aluminum disc will last “indefinitely.” Other factors—such as the thickness of the substrate, the type of polycarbonate used, or the kind of labeling inks—may have contributed to the results of the Ultech tests. Also, the quality control for the gold discs may have been much more stringent than for the aluminum discs. Finally, your discs are not likely to encounter the same extreme conditions as the Ultech test discs.

The next question, then, is how reliable are extreme, simulated-aging tests in determining real-life durability? “What our research points to,” Mobile Fidelity’s Belkin told me, “is that in a laboratory environment you can create oxidation in an aluminum CD to the point where the CD loses reflectivity.” He added, however, “I don’t think anybody has come out and said what the life cycle of a CD is under normal conditions.”

Even Nimbus conceded in a press release that aging tests are speculative: “Our accelerated-aging tests are intended to simulate in a short space of time (hundreds of hours) what might be expected to happen over many decades, but we make no indication of a quantitative conversion factor. . . . We cannot say how many years of real use correspond to an hour of accelerated aging.”

Cambridge Audio, which had been studying CD error rates for corrective purposes, also released to the press test results for aluminum discs. Its findings were that “well under 5 percent” of the sample discs showed significant signs of long-term failure. In the worst case, the number of dropouts increased by more than two hundred times in three years, which, the company said, “gives direct evidence of serious deterioration in an eighteen-month period.” But Cambridge Audio also said that “Discs made by certain companies have proven to be worse than others, but not consistently so, giving evidence that the problems are primarily of a batch-to-batch [quality-control] nature.”

When I spoke with Dr. Harald Ahrens, director of development and consumer media at PDO in Hanover, West Germany, he told me that it’s difficult to transfer the results of forced laboratory tests to real-life situations. Moreover, he said, comparison tests to determine sonic and reliability differences among various types of metals have yielded “no remarkable differences.” As PDO’s Vogels told the press, PDO produces gold- or silver-metalized discs when customers want them, “but they have no performance or longevity advantage over aluminum.”

Ahrens explained that manufacturers use “blurb values,” representing the number of errors per second, to determine a disc’s susceptibility to deterioration. Blurb values of up to 220 are allowed by “Red Book” CD format standards developed by Sony and Philips. “Today’s discs,” he said, have blurb values “in the range of 50.” Philips and Sony receive royalties of 3¢ for every disc pressed, and license to press is granted on condition that discs meet Red Book standards.

How can you tell if your discs have been manufactured to standard? A good policy would be to stick with major labels or reputable specialty labels that you’re familiar with, which is probably what you do when you buy LP’s and cassettes. “The problem with offbeat labels is that you’re not sure of the manufacturing source,” I was told by Ron Petty, director of corporate communications for Sony of America. “The well-known labels are going to be quality-controlled.”

Keep in mind that manufacturers’ longevity claims for CD’s are based on the discs’ being handled under proper conditions. Contrary to what some salesperson might have told you, you can’t eat pizza off a disc or throw one like a Frisbee without risking damage. Also, exposure to extremes of heat, humidity, or cold could increase the number of errors in a disc. Storing CD’s in your car is asking for trouble. Here are PDO’s suggestions for CD care:

1. Don’t leave oily finger deposits on CD’s. Handle them on the outer edges only, holding them between your thumb and fingers.

2. Don’t bend a disc when removing it from the jewel box.

3. Be sure that the blank side is dustfree before you put the disc in the player.

4. Remove dust with a soft, lint-free cloth, wiping the disc in a radial direction, from the center to the outer edge.

5. Breathe onto a disc before wiping off impurities or fingerprints.

6. Don’t use solvents such as gasoline or alcohol that might damage the protective coating or the label.

7. Don’t use markers or gummed stickers to label CD’s. They could eat through the protective coating and destroy the aluminum layer.

There will probably always be some people who believe CD’s are doomed to failure. But, realistically, all we have to go on regarding the longevity of CD’s after their seven short years on the market is what the two largest disc pressers told me: They have had no discs returned because of so-called “CD rot.” The same goes for the Tower Records chain, whose president, Russ Solomon, told me that Tower’s return rate on CD’s is “very, very small.” And of those that have been returned, Solomon said, none can be attributed to deteriorating discs.

Right now, there’s no definitive way to predict the life span of a CD. The original Philips promotional motto for the CD—“Perfect Sound Forever”—was a pretty weighty statement that almost invited intense scrutiny. The word today from PDO is that as long as discs are handled and stored properly, they should last at least as long as the people who own them. And that should be long enough.
We've built it in a wide range of choices. You can select from a wide variety of current hits and classical favorites. Our great introductory offer lets you choose 6 CDs listed in this ad for $19.98. Fill in and mail the application—we'll send your CDs and bill you the penny, plus shipping and handling. In exchange, you simply agree to buy as few as 6 more CDs (at regular Club prices) within the next three years—or you may cancel your membership anytime after doing so.

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by Ian G. Masters

Wet Playing

Q I have heard of playing vinyl records with water or isopropyl alcohol sprayed onto the surface. Can this degrade the sound quality or damage the record?

TOM SEVERS
Slidell, LA

Some years ago, wet playing enjoyed a brief popularity, and at least one company produced an accessory that tracked along with the tonearm, dampening the grooves as it went. Dampening was supposed to help the stylus negotiate the groove smoothly by lubricating the surface, to reduce static charges that could collect dust as the record played, and to reduce the surface noise caused by contaminants on the disc. The practice did do all this to some extent, but its benefits were heavily outweighed by its drawbacks.

For one thing, the liquid alters the chemical composition of the vinyl surface, with the result that once a record has been played wet, it always has to be played that way. Also, the fluid has a tendency to mix with whatever dust is in the groove; when this dries on the stylus it has the consistency of cement. Finally, because it takes a record some time to dry, you have to wait several minutes before playing the second side or returning the disc to its sleeve.

Still, there are situations where these drawbacks might be tolerated. For instance, many people are willing to put up with all the hassles to tape one good copy of an irreplaceable old favorite. Wet playing should definitely be a last resort, and the improvement is likely to be small, but if you choose to try it make sure that you use only distilled water, that you clean your stylus after each record (while the stylus is still wet), and that the record is thoroughly dry before you put it away.

Efficiency and Subwoofers

Q I'm confused about the use of subwoofers with high-efficiency main speakers. Is it correct to assume that a highly sensitive speaker would nullify the effect a subwoofer is supposed to produce?

KENNETH J. HARRIS
Washington, DC

A No. The sensitivity of a speaker determines how much acoustic output is achieved for a given electrical input, not the frequencies at which the output occurs. If your high-sensitivity speakers roll off sharply in the bass—some do, some don't—then a subwoofer might be a worthwhile addition, as it is designed to reproduce the lowest octave or two, where many full-range speakers are relatively weak.

Matching sensitivities of subwoofers and primary speakers is only a concern when they are to be driven by the same amplifier, as the two together should produce a balanced sound, and that is difficult to achieve if the bass unit is much less sensitive than the full-range speakers. Separately amplified subwoofers can be independently adjusted to take care of this, so they are probably the best bet for use with very efficient main speakers.

70-Volt Speaker System

Q My son is building a new home, and he plans to install ceiling speakers in each of six rooms. We have heard of using a 70-volt system to feed these speakers from a common source. Would that be a practical solution?

AL ERBES
Piqua, OH

A Only if he plans to listen at fairly low levels. Sound contractors use 70-volt systems where they wish to drive a large number of speakers from one amplifier, such as in public-address or background-music applications. A transformer is used at the amplifier's outputs to step the maximum voltage up to 70 volts, and a similar transformer is placed in the circuit at each speaker location to drop the voltage to an appropriate level for that speaker. As long as the total power requirement of the speakers does not exceed the amplifier's capacity, speakers can be added or subtracted (or turned on and off) at will, without regard to impedance considerations.

That might seem to make a 70-volt setup ideal for your son's purposes. But most of the transformers available are not designed for high-quality use; they're typically very small, and their cores are easily saturated if too much power is applied. At anything higher than elevator-music levels, therefore, most of the bass will be lost.
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- AMP 120
- AMP 300
- AMP 130
- AMP 380
- AMP 120

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- MIDRANGE
- SUPER TWEETERS
- WOOFERS
- CROSSOVER

connections

- RCA CONNECTORS
- Fuse

powers

- Battery
- Remote Control
- Ignition
- Memory

channels

- Left Channel
- Right Channel
- Subwoofer Output

CIRCLE NO. 68 ON READER SERVICE CARD
Once upon a time, noise was noise and that was that. If an interfering signal got in the way of your recording, there was little you could do about it. If your tape deck superimposed tape hiss on a recording, it was there to stay. If a bad microphone cable introduced clicks and pops into a recording, they became part of the performance.

Over the years, technicians have fought valiantly against noise and interference. For example, the hiss on a tape recording could be reduced by rolling off the high frequencies, and clicks and pops could be edited out with a razor blade. Such methods, however, destroyed the audio signal along with the noise. More enlightened methods, such as those devised by a young engineer named Ray Dolby, used dynamic, double-ended processing systems to reduce noise yet compensate for the effect of the processing.

With the advent of digital signal processing, the tools in the battle against noise took a giant step forward. For the first time, it was possible to pinpoint a noise artifact precisely and to minimize its effect without affecting the audio signal. Thomas Stockham, Jr. was a pioneer in this field. In 1971 he restored some early Caruso recordings (circa 1906) using a digital method known as blind deconvolution (so called because the nature of the signals being operated on cannot be precisely defined). The noise and other recording artifacts, such as the resonances of the horn used to make the acoustic recordings, were identified and removed, leaving a restored audio signal. The drawback was the amount of computation that was required.

Today, the idea of digital noise reduction is being implemented with modern signal-processing methods and applied to numerous commercial releases. Case in point is Sonic Solutions, a San Francisco company founded by former employees of The Droid Works, a defunct subsidiary of Lucasfilm (a pioneering group in its own right). The Sonic Solutions NoNoise system can reduce or remove clicks, pops, hum, tape hiss, and surface noise from a master recording without tampering with the music. In addition, using methods borrowed from the field of artificial intelligence, signal content that was lost because of tape drop-outs can be synthesized with great accuracy.

The all-digital NoNoise process starts by dividing the audio spectrum into frequency bands, then performs an analysis of the recording using digital signal-processing techniques. The spectral composition of surface noise and hiss is determined, and this fingerprint is used to develop an inverse function to remove the noise. Ideally, the fingerprint data are taken from a silent portion of the recording, such as during a pause. Because there is no music signal, the noise can be more accurately analyzed. Alternatively, samples can be taken from an area of low-amplitude music and a noise template applied.

For removal of steady-state artifacts, such as hiss, the audio signal is considered in small sections. The energy in each frequency band is compared with that of the noise fingerprint, and the system determines what action to take in each frequency band. For example, at a particular point in the program, the music may dominate in a lower spectrum and the system will pass the signal in that band unprocessed, while hiss dominating at a higher frequency may trigger processing in that band. In most cases, some original noise is retained, because the result is generally more natural sounding.

Interactive graphic displays are used to locate isolated defects, and a “de-clicking” program removes the offending sound, analyzes the frequency and amplitude of the music around it, and synthesizes a music signal for the section that was removed.

Hiss from a noisy analog recorder, wind noise in an outdoor recording, hum from a studio’s air conditioner, even the ambient noise obliterating information in a downed aircraft’s flight recorder can all be reduced by the NoNoise system. In short, NoNoise can make a processed recording more faithful to the live sound than the original master recording.

That, of course, is a radical idea. It goes against intuition and will certainly stir some audio skeptics. It seems like faulty logic—you’d expect that a processed recording would contain subtle changes in the music. But within the constraints of the process, only artifacts, and not the music signal, are affected.

On the other hand, as with most technology, NoNoise requires expertise in its application, and improper use could degrade a recording. The crux of the issue is the degree to which processing is applied. Perhaps the removal of 10 to 15 percent of the noise level is enough to make the difference between an acceptable recording and one that’s unpleasantly noisy. Additional noise removal may pose problems, if only because of psychoacoustic phenomena that make us think it is the audio signal that is being affected. Remember that one criticism of early CD releases was their “unnatural silence,” that is, lack of background noise.

The proof of course, lies in your own listening evaluation. Fortunately, many examples of NoNoise-processed recordings are already on the market. Over the past eighteen months, more than two hundred CD reissues have been produced with NoNoise. For example, it was NoNoise processing that made the 1943 original-cast album of Oklahoma! (the first musical ever recorded) suitable for reissue.

Of course, even a system as powerful as NoNoise is just the beginning. Because the original NoNoise system was too costly for record companies to buy for in-house use. Sonic Solutions has gone on to develop the Sonic System, a second-generation product offering noise removal and a whole lot more. It is a Macintosh II-based Desktop Audio system capable of editing, equalizing, mixing, dynamics processing, and, of course, NoNoise processing—everything you need to prepare a CD’s master tape. Clearly, digital signal processing will increasingly influence tomorrow’s recordings as well as yesterday’s.
Deceptive Engineering

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You'll probably notice our 50-watt RX-533 offers obvious features such as Digital 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!

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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.

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by Julian Hirsch

FMX NOISE

THREE years ago, in the March 1986 issue of STEREO REVIEW, I discussed a new and promising technique for improving the quality of stereo FM reception. FMX, as it was called, was developed at the CBS Technology Center, and it was designed to reduce noise in weak-signal stereo reception to levels close to those of mono broadcasting with little or no effect on the stereo qualities of the program. Although a specially modified receiver was needed to reap the benefits of the system, FMX-encoded broadcasts could be received with standard FM tuners, though without any reduction in noise level.

Shortly before writing that column, I had heard a demonstration of FMX, using internally generated transmissions and a modified tuner, at the CBS Technology Center. As far as I could tell, the system performed exactly as claimed, even under conditions of simulated "picket-fence" effects such as those often encountered in mobile FM reception. Experimental transmissions from a Connecticut FM station indicated that the reception area for stereo FM broadcasts could be doubled by the FMX system. Other broadcasters were about to install FMX, and NAD was developing an FMX-equipped receiver. It looked as though a major breakthrough had been made in improving the quality of FM broadcasting.

Not long afterward, CBS closed the Technology Center. A company called Broadcast Technology Partners, or BTP, was formed to continue the development and introduction of FMX. BTP holds the patents relative to FMX and is headed by FMX's co-inventor, Emil Torick. Currently, a number of FM stations are transmitting FMX-encoded programs, and both Alpine and JVC recently announced FMX-equipped car receivers. Seemingly, FMX was finally coming into its own, roughly three years after its introduction.

But wait: A well-attended technical session held at the Massachusetts Institute of Technology in late January of this year cast serious doubt on the viability of FMX. The session featured a dramatic presentation by Dr. Amar Bose and Dr. William Short of Bose Corporation (Dr. Bose is also a professor of electrical engineering and computer science at M.I.T.). Although the Bose Corporation has little direct involvement in FM broadcasting or receiver design, the research team undertook a detailed analysis of the effects of multipath on FM reception.

Multipath, which is the arrival of one or more reflected (and thus delayed) signals at the receiver, is actually the normal condition of FM reception in most locations, although it can vary widely in its severity. In general, mobile operation is most affected, but few FM receiv-

Currently, a number of FM stations are transmitting FMX-encoded programs, and Alpine and JVC recently announced FMX-equipped car receivers. Seemingly, FMX was finally coming into its own. But wait...

ing locations are free of it. Typical effects include harsh distortion, loss of stereo separation (or even of the entire audio program), and a severe increase in noise.

In general, the degree of signal degradation from multipath is a function of the frequencies and levels of the ultrasonic components in the transmitted signal, such as the 19-kHz stereo pilot carrier and the difference-signal (L-R) sub-band from 23 to 53 kHz. A standard mono transmission (rare these days, but not entirely extinct) is inherently quieter and cleaner than any stereo transmission.

On top of all the other portions of a standard stereo program, FMX adds a second difference signal in the same frequency band as the normal one but in quadrature with it (shifted in phase by 90 degrees). This second difference band is compressed (compressed in transmission and expanded in reception) to reduce the noise it adds during the demodulation process in the receiver. At low modulation levels the quadrature difference signal replaces the noisy conventional difference signal, yielding an overall noise reduction of up to 14 dB, compared with 20 dB for fully blended or mono reception. As the modulation level increases, the normal stereo difference signal comes into use automatically.

At M.I.T., Dr. Bose claimed that while FMX is an ingenious approach to improving FM stereo reception quality, the system renders
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1 Crutchfield Park, Dept. SR, Charlottesville, VA 22906

A recent paper by BTP's Emil Torick in the Journal of the Audio Engineering Society discussed many of these problems and, not surprisingly, came to diametrically opposite conclusions. According to BTP, there have been virtually no listener complaints to any FMX-equipped station regarding signal quality as received on standard receivers (no FMX receivers have yet been sold to the public).

Clearly, this is a potentially explosive situation. Both parties to the controversy boast impressive technical qualifications, yet they disagree strongly on the audible problems, if any, of FMX. There is apparently little or no controversy about the theoretical validity of Dr. Bose's analysis, however, and the demonstration presented at the M.I.T. meeting of the effects of multipath on standard and FMX receivers was devastating. It may have been a "worst case" demonstration, however.

The outcome of this question is obviously uncertain at this time, but we can look forward to some newsworthy developments in the near future. Stay tuned.
What has prism effect, a refractive phenomenon, to do with audio equipment? Nothing, except that it is the simplest analogy to describe what our sophisticated XM-3* Mobile Electronic Crossover does to audio signals.

When an ordinary ray of white light passes through a prism, it is systematically separated into the primary colors of the spectrum—optically much more aesthetic than the original light.

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History Repeats Itself.

History shows that in 1973 the Nakamichi 1000 forever changed the destiny of the audio cassette. Against all odds the world's first true three-head cassette deck had transformed a medium designed for convenience into a serious audiophile's dream-come-true.

And over the years the Nakamichi 1000 has come to represent a product philosophy—an example of what can be accomplished when a group of single-minded people throw out the rules and eliminate the word "compromise" from their vocabulary.

If, therefore, you're inclined to expect achievements of historical proportions in the new Nakamichi 1000 Digital Audio Recording System, you won't be alone, and you won't be disappointed.

You'll notice a profound difference the very first time you use the Nakamichi 1000 Digital Audio Recorder. Unlike other DAT recorders, the Nakamichi 1000 neither bobs nor feels like a VCR. The smooth, rapid, and quiet operation of the transport will rather remind you of the acclaimed Silent Mechanism found in Nakamichi's analog cassette decks.

That's because the unique F.A.S.T. (Fast Access Stationary Tape Guide Transport) mechanism was designed from the ground up as a digital audio tape transport. Its exclusive, patented stationary tape guides assure more precise and stable tape alignment, so digital error caused by mistracking is dramatically reduced. And articulated link arms gently bring the tape into playing position within 1.9 seconds after a cassette is inserted—two to three times faster than VCR-derived DAT mechanisms.

The four-head drum has separate record and play heads, so you can monitor off the tape while you record. And a unique 'half-load position' fast-winds the tape at 400-times normal play speed—twice that of conventional fast wind—with less wear and tear on tape and heads.

Included with each Nakamichi 1000 recorder is the 1000r infrared wireless remote controller, which gives you full access to the deck's expansive array of advanced operating features.

The Nakamichi 1000 Digital Audio Processor establishes a new reference standard for sonic accuracy. 8-times oversampling digital filters and fully calibrated 24-bit digital-to-analog converters deliver unprecedented resolution, linearity, and dynamic range.
Each stationary tape guide block actually consists of four separate guide surfaces—two slanted, one vertical, and one horizontal—that work together to more reliably maintain critical tape alignment.

Simply increasing the number of bits is meaningless unless they are implemented with a high degree of precision. So, the Nakamichi 1000p 20-bit D/A converter employs a novel ROM (read-only memory) calibration system. Each D/A converter IC has a corresponding ROM chip programmed at the factory with individual bit error compensation data. Together with a newly developed glitch cancellation circuit, this sophisticated calibration system brings the D/A converter to the theoretical limits of 20-bit performance.

The equally advanced analog-to-digital converter employs an ingenious charge comparison principle that assures accurate encoding without conventional, distortion-causing sample-and-hold circuits. And an extraordinary auto-calibration system precisely trims the quantization increments for all bits within 1.4 seconds every time the 1000p is turned on. That means, unlike typical designs, the 1000p's A/D converter maintains its high level of precision forever.

Finally, to eliminate the adverse effects of any jitter at the digital inputs, the Nakamichi 1000p incorporates a sophisticated two-speed phase-locked-loop interface that more effectively handles a wide range of time-axis fluctuations.

Perhaps most significant is the basic design of the Nakamichi 1000 Digital Audio Recording System. Not content to capture a mere, fleeting moment in audio history, Nakamichi engineers have made the system easily upgradable. The essential circuitry of both recorder and processor resides on plug-in boards, all readily accessed from the rear panels. The system thus delivers the very best performance available today... whenever "today" happens to be.
"McIntosh . . . no other transistor amplifier is capable of reproducing as well."

"All the sounds, even those different one from another, remain separated and distinctive. There results a sensation of contrast, precision, and uncommon clarity.

... A close analysis of different frequencies reveals an extremely deep bass, very rich in spatial detail . . . The upper bass region is very linear testifying to an extraordinary richness of information. The very structured mid-range contributes enormously to listening pleasure.

The feeling of power is never refuted and instead of stunning the listener, the 7270 recreates an audio environment of a majesty that no other transistor amplifier is capable of reproducing as well." Need we say more?

—REVUE DU SON, foremost French stereo magazine.

For a copy of the REVUE DU SON and information on the McIntosh MC 7270 Amplifier and other McIntosh products write:

MCINTOSH LABORATORY INC.
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BINGHAMTON, NY 13904-0096
ONKYO DX-7500
COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

The Onkyo DX-7500 is a full-featured CD player incorporating the latest digital technology, but it is priced just above a typical midrange player. It features dual 18-bit digital-to-analog (D/A) converters with eight-times oversampling (at 352.8 kHz). The player also makes extensive use of optical signal transmission and isolation techniques.

Onkyo’s Opto-Drive system is claimed to completely eliminate any electromagnetic interference from the outputs of the D/A converters by using phototransistors instead of diodes to regulate the power-supply voltage to the converters. Optical coupling between the digital and analog circuitry of the DX-7500 eliminates the possibility that digital signals could leak into the analog sections and degrade the output quality. The analog audio outputs are supplemented by two digital outputs (electrical and optical) for use with an external D/A converter.

In addition to its internal sophistication, the DX-7500 offers almost every feature one could hope to find in a CD player. Besides the usual operating functions, including repeat of a track, disc, or any selected portion, it has a Time Editing feature that determines how many tracks can be accommodated on each side of a tape cassette. When you’re copying a CD, this feature automatically puts the player into pause mode at the end of the tape’s first side to allow the cassette to be turned over.

The memory system can be programmed to play up to twenty tracks of a CD in any order, and a Memory Edit feature allows the program to be modified at any time. The player has a shuffle-play mode, in which all the tracks on a disc are played back in a random order. It also provides direct keypad access to any numbered track.

The rear of the DX-7500 has three pairs of analog output jacks, identified as fixed, variable, and direct. The direct output bypasses the...
player's analog filtering, minimizing the circuitry between its D/A converters and the system amplifier. The manual warns that recording on a cassette deck from the direct outputs may result in "beat" sounds on the tape similar to those sometimes experienced when recording from an FM tuner with inadequate ultrasonic filtering.

Unlike most CD players, the DX-7500 has a front-panel volume control for its variable analog outputs as well as the headphone jack. The volume knob is motor-driven so that it can be operated from the supplied wireless remote control. Besides the analog and digital outputs (optical and coaxial), the rear apron has two small phone jacks for linking the DX-7500 to other Onkyo audio and video components for unified system control.

The easily read white front-panel display of the DX-7500 shows track and index numbers and elapsed or remaining times on the track and disc. The LAP/REM button toggles the time display, and there is an index button for cueing. The lower part of the display shows the status of the program memories, including the remaining tracks on the disc or in the program and the order in which they will be played.

The Onkyo DX-7500 is a heavy, solidly constructed player. Its disc transport mechanism is made of metal, unlike the light, plastic construction used in low-cost players. It can play 3-inch discs without an adapter ring.

The supplied remote control duplicates virtually every front-panel function, including opening and closing the disc drawer. In addition, it has a CD/TAPE switch, enabling it to operate an Onkyo cassette deck as well, an intro-scan button to play the first 7 seconds of each track on a disc, and an auto-space button to insert a 4-second pause between tracks during taping. The DX-7500 measures 17½ inches wide, 14½ inches deep, and 5½ inches high, and it weighs about 19½ pounds. Price: $700. Onkyo Corporation, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.

**Lab Tests**

The output of the Onkyo DX-7500 was almost exactly 2 volts, as rated. Its frequency response was flat within ±0.1 dB from 20 to 20,000 Hz, with a channel imbalances of 0.04 dB. The interchannel phase shift was less than 0.4 degree from 20 to 20,000 Hz.

The linearity of the D/A converters was virtually perfect down to a -70-dB level. At -80 dB the output was low by 0.5 and 1.5 dB for the left and right channels, respectively. At -90 dB, the left-channel output was exactly -90 dB, while the right channel was 2 dB low. The error at -100 dB was +2.5 dB for the left channel and +1.3 dB for the right channel.

Channel separation was greater than 120 dB at 100 Hz, a very high 111 dB at 1,000 Hz, and 80 dB at 20,000 Hz. The total harmonic distortion (THD) plus noise at a 0-dB level was between 0.003 and 0.006 percent from 20 to 20,000 Hz. At 1,000 Hz, the distortion was less than 0.003 percent for recorded levels from -10 to -80 dB.

The A-weighted noise level measured during the "infinity zero" track of a test disc, when the D/A converters were essentially not operating, was -100 dB in the left channel and -109 dB in the right channel. In effect these figures represent the noise level of the player's analog section. The quantization noise (with the converters active) was about -90 dB. The dynamic range was 92 to 94 dB. The frequency error of the player's output was less than 0.02 percent.

The DX-7500 had no difficulty tracking the highest-level defects (900 micrometers) on the Philips TSSA test disc. Since this disc is no longer adequate to test the error-correction capabilities of a late-generation CD player, however, we have begun to use the new "Digital Test"...
CD on the French Pierre Verany label, which contains calibrated "defects" in a range that is almost certain to outtax the capabilities of any CD player at some point. The Onkyo DX-7500 was able to track the 1,000-micrometer levels on this disc, although a 1,250-micrometer defect produced crackling noises in playback.

The slew time from Track 1 to Track 15 of the Philips TS4 disc was 1.8 seconds, which is very rapid, though not quite the fastest we have seen. The cueing accuracy was excellent. The only respect in which the DX-7500 did not more than live up to our expectations was in its impact resistance. It was able to absorb a fairly solid slap on a side without mistracking, but even light finger taps on the top cover would interrupt playback for a moment, after which it almost always returned to the point where it had stopped. Fortunately, it appeared that the player's physical isolation through its mounting feet was considerably more effective.

Comments

The measured performance of the Onkyo DX-7500 ranks with the best we have seen from any CD player, including some selling at considerably higher prices. It is difficult to assess the audible benefits of the measurable qualities of a CD player. Personally, I do not find significant differences in sound quality between most CD players. That does not mean they all sound alike, of course, merely that the differences, for me at least, do not warrant a conclusion that one is better than another.

I can say that the Onkyo DX-7500 sounded at least as good as any other CD player I have heard, and it also has just about every useful feature that can be found in any other player. Its front-panel volume control (remotely controllable as well) makes it possible to drive a power amplifier directly from it, and that is the way I operated the player for listening purposes. Whether you're looking for the latest refinements in CD player technology or just want a full-featured, high-performance machine at a reasonable price, the DX-7500 would be hard to beat.

OHM CAM 16 SPEAKER

Julian Hirsch, Hirsch-Houck Laboratories

The Coherent Audio Moni-
tor (CAM) speaker systems from Ohm Acoustics were designed to provide op-
timum sound and stereo imaging under a variety of difficult installa-
tion conditions that may make these qualities unattainable with conventional speakers. All three CAM speakers—we tested the smallest model, the CAM 16—are two-way systems that enclose the woofer (plus a passive radiator in the two larger models) in a rigid, vented cabinet with a frameless, acoustically transparent, removable plastic grille. The tweeter is housed in a separate enclosure that plugs into the top of the main cabinet and can be rotated freely through 360 degrees in the horizontal plane. By aiming the tweeters correctly, it is possible to create a stereo image (sound stage) that remains fixed as the listener moves about the room, even outside the area bounded by the speakers themselves.

An additional degree of placement flexibility is provided by the tweeter's rotating capability. The speakers need not be along the same wall but can be on adjacent walls or even opposite walls. Even if it is not possible to achieve an optimum stereo effect, aiming the tweeters properly will enable maximum stereo performance to be obtained from any speaker locations. Ohm also suggests that a modification of the high-frequency balance of the system is possible by turning one or both tweeters away from the listening position.

The tweeter's position relative to the woofer was selected to provide correct time and phase alignment between the high and low frequencies for good stereo imaging. The egg-shaped tweeter housing minimizes diffraction around its front, and the beveled edges of the woofer cabinet perform a similar function for the middle and low frequencies. The cabinet is internally braced, and the inside of the woofer frame is lined with sound-absorbent material to damp surface reflections. The tweeter has a 3/4-inch polycarbonate dome, with ferrofluid cooling, and a large (2-inch) magnet.

A Thermo Guard protective de-
vice minimizes the possibility of damaging the drivers by prolonged high-level listening. It is a bistable resistor whose value increases sud-
denly when the temperature rises to
a critical value, greatly reducing the speaker's output. After the excessive drive is removed or reduced, the resistor returns to normal temperature (and a negligible resistance) in about 2 minutes, and normal operation is restored automatically.

The CAM 16 has a 6 1/2-inch woofer, with a polypropylene cone, in a 16-liter enclosure (the model number corresponds to the cabinet volume). The cabinet, finished in black, is 17 1/4 inches high, 9 inches wide, and 11 inches deep. Each speaker weighs 19 pounds. The manufacturer's specifications include a sensitivity of 89 db sound-pressure level (SPL) and a frequency response of 46 to 20,000 Hz ± 4 dB. Price: $300 a pair. Ohm Acoustics, Dept. SR, 241 Taaffe Place, Brooklyn, NY 11205.

**Lab Tests**

The room-response curve was very smooth and free of the large variations that are often found in live-room measurements. The only significant irregularity was a 7-db hole at 400 Hz, caused by the reflected signal from the floor (the speakers were on 26-inch stands). The close-miked bass response, combining separate measurements made at the cone and the port, was flat within about ± 1 db from 30 to 250 Hz and decreased smoothly by another 5 db at 2,000 Hz. Although Ohm does not specify the crossover frequency of the system, our measurements suggested that it was about 2,000 Hz.

The composite frequency response was flat within ± 4 db from 20 to 20,000 Hz. It could be viewed as consisting of two relatively flat sections about 5 db apart in level, extending respectively from 25 to 1,000 Hz and from 1,000 to 20,000 Hz—except for a narrow tweeter resonance of about 5 db amplitude at 14,000 Hz. Along with a smaller peak at 16,000 Hz, the 14,000-Hz one was also present in all our FFT response measurements, appearing as a ringing of about 2 milliseconds duration in the time/frequency/amplitude plots created by the IQS FFT analysis system. Up to 10,000 Hz, there was a slight frequency-independent directivity, with about 3 db level difference between the response curves on-axis and 45 degrees off-axis. Above 10,000 Hz, the normal tweeter directivity was apparent.

The minimum impedance of the CAM 16 was about 5 ohms, at 200 and 7,000 Hz, and the maximum value of 20 ohms occurred at 82 Hz. The system's sensitivity was 90 db SPL at 1 meter with a 2.83-volt drive signal (corresponding to 1 watt). With the same input signal, the bass distortion rose smoothly from under 1.5 percent at 100 Hz to 4.5 percent at 50 Hz and 14 percent at 25 Hz. In pulse testing, the woofer cone bottomed audibly at a 100-Hz input of 175 watts, but at 1,000 and 10,000 Hz the amplifier clipped, at 720 and 1,400 watts, before the speaker overloaded.

**Comments**

Ohm states that the optimum spacing between the CAM 16 speakers is about 5 feet. Not only is it a full stereo effect obtainable with this spacing, but the mutual coupling between the woofers provides some enhancement of output at low-bass frequencies. For our listening tests we installed the speakers on stands 5 feet apart and about 2 feet in front of a wall.

When we aimed the tweeters inward at about 30 or 40 degrees, the sound stage developed between the speakers (and extending somewhat beyond them to the sides) remained essentially fixed as we walked across the room from side to side. It was effectively anchored midway between the speakers, and we heard the left, right, and center portions of the sound with little change as we moved about the room.

Controlling the position of the sound stage by shaping a speaker system's directivity is neither new nor exclusive to Ohm. The company's CAM speakers are unusual, however, in having rotatable tweeters, which provide greater flexibility in one's choice of speaker and listener locations than do speakers whose directive characteristics are fixed in their design. The system works, and works well. It was interesting to hear what a broad stereo sound stage could be developed by a pair of small speakers only 5 feet apart without resorting to electronic or other spatial-enhancement techniques.

In addition to its spatial qualities, the CAM 16 was a very comfortable, smooth-sounding speaker. Of course, a small bass driver cannot generate room-shaking levels at low bass frequencies, and the bass distortion was somewhat greater than we would prefer (though not unreasonable for the speaker's price class). Nevertheless, the CAM 16 managed to sound larger (and considerably higher-priced) than it is. We suspect that few, if any, speakers of comparable size and price can match it, let alone outperform it.

*Circle 140 on reader service card*
“It is so clearly superior to past amplifiers in the low- to mid-priced range—not to mention most amplifiers two to three times its price—that I can unhesitatingly recommend it for even the most demanding high end system.”

Anthony Cordesman
stereophile
vol. 8, no. 4
ORTOFON MODEL 540
PHONO CARTRIDGE

Julian Hirsch, Hirsch-Houch Laboratories

ORTOFON’s Series 500 moving-magnet phono cartridges were designed to compete with digital sound sources by emulating their response uniformity and low distortion while retaining the musical qualities often associated with analog music reproduction.

All six Series 500 models are fundamentally the same. Three are of conventional construction, compatible with the 1/2-inch-spaced mounting holes of universal tonearms. The other three are P-mount cartridges that plug directly into the end of a T4P standard tonearm and require no adjustment, balancing, or tracking-force setting. Each group shares the same body and internal design, differing only in the shape of the stylus tip. Since all of the user-replaceable styli (which have integral pivoting stylus guards) fit any of the cartridges, the purchaser of one of the lower-price models can easily upgrade it without replacing the entire cartridge.

We tested the top of the line, the Model 540, a universal-mount cartridge fitted with a fine-line Fritz Gyger II nude stylus. The stylus’s contact area with the groove wall closely resembles that of a cutting stylus, which gives it an extended high-frequency response, rated to 27,000 Hz, and lower distortion when playing high-level passages.

The performance differences among the three universal cartridge models in the line are principally in their lateral tracking ability at 315 Hz. The least expensive, the Model 520, with an elliptical stylus, is rated at 70 micrometers (µm) in this test. Its 1,000-Hz channel separation is also rated as 23 dB, compared with the 25-dB rating of the other two models. The middle cartridge, the Model 530, has a fine-line stylus with a tracking-ability rating of 80 µm, and the Model 540 carries a 90-µm rating.

All of these ratings are based on a nominal 1.5-gram tracking force. Other characteristics the cartridges have in common are an equivalent stylus tip mass of 0.3 milligram, output of 3 millivolts, and channel balance of 1.5 dB at 1,000 Hz. All of the styli have a nominal vertical tracking angle of 20 degrees.

According to Ortofon, the frequency response of the cartridges has been flattened by using slit pole pins in their magnetic systems, thereby reducing eddy currents and eliminating the sagging high-frequency response characteristic of solid pole pins.

The Ortofon Model 540 is furnished with a small screwdriver, mounting hardware, and a stylus gauge. The black, plastic-encapsulated cartridge body weighs 5 grams, well within the balancing range of almost any tonearm. Price: $300. Ortofon, Dept. SR, 122 Dupont St., Plainview, NY 11803.

Lab Tests

We installed the Ortofon Model 540 in the medium-mass tonearm (about 18 grams) of a good, popular-priced turntable. We used the rated tracking force of 1.5 grams and a load of 47,000 ohms and 140 picofarads for our measurements.

The cartridge’s output was 3.7 millivolts at a recorded velocity of 3.54 cm/s, with a channel imbalance of only 0.35 dB. The vertical tracking angle was 22 degrees. Frequency-response and crosstalk measurements with two test records (the CBS CTC 300 and the older STR 100) yielded similar results. Cartridge response was very flat, within about 1 dB, well beyond 10,000 Hz and rose by 1 to 3 dB at 20,000 Hz. The channel separation (crosstalk) was rather asymmetrical, which is not uncommon among cartridges, with readings of 15 to 25 dB over the full frequency range.

The true mettle of the Ortofon Model 540 was revealed in its tracking ability. It easily handled the very high-level 32-Hz tones of the Cook 60 test record, and the 30-cm/s 1,000-Hz tones of the Fairchild 101 record were reproduced with only the moderate peak-flattening typical of this record (but with no sign of mistracking). Playing the DIN 45549 test record, the Model 540 tracked the 110-micrometer level at 315 Hz, the first cartridge in our experience to do so, far surpassing its 90-µm rating. Other tracking
We don't show people smoking in our ads.

Because we figure smokers already know how. Heck, we're not talking rocket science here. So, we'll get right to the point: flavor. In a nationwide taste test, a majority of smokers said Merit tasted as good as or better than cigarettes that have up to 38% more tar. Enriched Flavor™ is the reason why. And only Merit has it. So the next time you do what you already know how to do, do it with Merit.

Enriched Flavor™ low tar. A solution with Merit.
TEST REPORTS

Tests with the CBS CTC 300 test record (which we have not used previously for this measurement) indicated that the cartridge could track the 100-μm lateral section and the maximum-level 63-μm vertical section.

Comments

Our measurements indicate that the Ortofon Model 540 is one of the top-performing cartridges of today, and possibly of all time. It seems unlikely that any recording will exceed its tracking abilities. Its frequency response was also very uniform (we have seen a few others with comparable flatness, but they are rare). The channel separation, though falling a little short of the cartridge's ratings, was nevertheless adequate for a full stereo effect. The output was higher than that of most other cartridges of comparable quality, though not enough to make a significant difference.

Our measurements indicate that the Ortofon Model 540 is one of the top-performing cartridges of today, and possibly of all time. It seems unlikely that any recording will exceed its tracking abilities.

The only sour note in our experience with the Ortofon 540 was the omission from the instruction sheet of information on how to remove the stylus. Even though the instructions advised removing the stylus before mounting the cartridge, we had to mount it with the stylus installed. Later, we found in a brochure on the Ortofon 500 Series that the stylus assembly is locked in place when the stylus guard is in either storage or playing position: only midway between the two is it possible to remove the stylus. Another surprising omission in the cartridge's documentation was any mention of the recommended load or of the inductance and resistance of the coil windings.

We found no surprises in listening to the Model 540, however. Its sound quality and clarity are certainly close to those of a CD player (some might say better, but we won't get involved in that!). Only an occasional tick or pop gave away the analog nature of the source. One can hardly expect more of an analog playback system.

Ortofon has demonstrated quite effectively that the LP is not yet dead and that first-rate playing quality is possible from a reasonably priced cartridge.

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Signet has created two series of Maximum Transfer PCOCC interconnects using this new wire. Each features premium-quality gold-plated terminations and high-density braided shields to minimize RF and magnetic interference. And each is jacketed by extra-flexible, heavy-duty polyvinyl.

New Signet Music Line PCOCC speaker cable extends the value of pure copper to your entire system. Thick dual-gauge strands are jacketed individually, then enclosed in extra-flexible opaque insulation for unvarying quality and appearance.

Your Signet dealer will gladly demonstrate the superiority of Signet PCOCC cables and interconnects for your system. Enjoy the Pure Copper connection from Signet today!
The first CD changer worth listening to for 10 hours straight.

There are surprisingly few activities the human body can endure for 10 hours straight.

Listening to the CD player you see before you, the CDC-610U, is a delightful exception to the norm.

The first 10-disc CD changer capable of capturing both the attention and the imagination of even the most demanding audiophiles.

For hours on end. Boasting specs and features that are nothing less than sensational.

Like Yamaha's Hi-Bit Technology with advanced 18-bit 4x oversampling digital filters and high-speed D/A conversion.

Direct Track Access, which lets you enjoy virtually instant access to any track on any disc.

Random Programming, which permits programming of an entire evening of music — up to 36 selections — in any order you like.

"Plus One" Memory — a unique little feature that allows you to momentarily interrupt your program to hear another selection.

And as you might expect, quite a bit more.

Stop by your nearest Yamaha Audio Specialist and experience the impressive CDC-610U for yourself. But be forewarned. One listen and you could be hearing about it for a long, long time.

Yamaha

*1989 Yamaha Electronics Corporation, USA. P.O. Box 6660, Buena Park, CA 90622. For the dealer nearest you, call 1-800-662-6800.
"They Were Designed To Play Music
This They Do Very Well, In
At A Bargain Price... It's Hard To

It has always been true that placement in the listening room has a profound effect on the sound of any loudspeaker, regardless of its inherent qualities. Cambridge SoundWorks has confronted this fact and created Ensemble, a speaker system that can provide in your home, the superb sound once reserved for the best conventional speakers under laboratory conditions. And because we market it directly, Ensemble costs far less than previous all-out designs. Perhaps best of all, it virtually disappears in your listening room.

The best sound comes in four small packages.

Ensemble consists of four speaker units. Two compact low-frequency speakers reproduce the deep bass, while two small satellite units reproduce the rest of the music. Separating the low bass on both channels from the rest of the range makes it possible to reproduce just the right energy in each part of the musical spectrum without turning your listening room into a stereo showroom. With clumsy conventional systems, you can either strive for that balance by letting loudspeakers dominate your room, or sacrifice it for less conspicuous speaker placement.

Your listening room works with Ensemble, not against it.

Room acoustics emphasize and de-emphasize various parts of the musical range, depending upon where the speaker is placed in the room. If you put a conventional speaker where the room can help the low bass, it may hinder the upper ranges, or vice-versa.

Ensemble, on the other hand, takes advantage of your room's acoustics. You put the low-frequency units where they provide the best bass, whether or not that location is good for the high frequencies (and it usually
-And Make It Sound Like Music. A Most Unobtrusive Way, going Wrong With Ensemble."

isn't for any speaker. Then you put the satellites where they provide a well-defined stereo "stage."
The ear can't tell where bass sounds come from, which is why Ensemble's bass units can be tucked out of the way—on the
in gunmetal gray Nextel, a suede-like finish highly resistant to scratching. We even gold-plated all connectors to prevent corrosion.
But perhaps an even bigger difference between Ensemble and other speakers is how we sell it...

Placement for most bass reinforcement from walls.

Placement for more bass reinforcement from corners.

Placement for even more bass reinforcement from corners.

Placement for least bass reinforcement.

The best showroom of all: your living room.

Choosing a loudspeaker after a brief listen at a dealer's showroom is like deciding on a car after one quick trip around the block. Therefore we make it possible to audition Ensemble right in your own home. In fact, Ensemble is sold only by Cambridge SoundWorks directly from the factory. That only makes sense. You get to match Ensemble specifically to your listening room in a way no other system permits. You get to listen for hours without a salesman hovering nearby. And if after 30 days of all that you're not happy, you can return Ensemble for a full refund (we'll even reimburse the original UPS shipping charges in the continental U.S.). You also get to save. At only $499—complete with all hardware, 100' of speaker cable, and free ongoing assistance—Ensemble costs hundreds of dollars less than it would in a retail store.

What Henry Kloss tells his friends:

Every time I came out with a new speaker at AR, KLH, or Advent, my friends would ask me, "Henry, is it worth the extra money for me to trade up?" And every time I would answer, "No, what you've already got is still good enough."

But today, with the introduction of Ensemble, I tell them, "Perhaps now is the time to give your old speakers to the children."

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TEST REPORTS

HAFLER XL-600
POWER AMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

The XL-600 is the newest and most powerful amplifier to bear the Hafler name. This formidable unit, which is rated to deliver 305 watts per channel into 8 ohms from 20 to 20,000 Hz with no more than 0.05 percent total harmonic distortion (THD), is not current-limited. Its rated output at the clipping point is 360 watts per channel into 8 ohms, 500 watts into 4 ohms, 750 watts into 2 ohms, and 900 watts into 1 ohm! It also has a bridged mono mode in which it can deliver 1,000 watts into 8 ohms or 1,500 watts into 4 ohms (at the clipping point).

The XL-600 was designed to use some 30 dB less overall negative feedback than previous Hafler amplifiers, which contributes to its low transient intermodulation distortion (TIM) and high stability. In accord with Hafler’s “Excelinear” concept, phase shift in each channel has been kept to a minimum. Each output stage has eight power MOS-FET’s (metal-oxide-semiconductor field-effect transistors) capable of driving the most difficult speaker loads. Except for the single large power transformer, the two channels are completely separate, and the total filter capacitance of 72,000 microfarads gives the amplifier a powerful low-end capability. A small, separate power supply operates the low-level stages.

The output stages are constructed about a square, chimney-like heat-sink structure through which a fan blows cooling air. The air enters the cabinet through openings on the sides and exhausts through the rear apron. The fan’s speed is variable and responds automatically to the cooling requirements of the amplifier. The outputs are protected by a heavy-duty relay that connects them after a 3-second turn-on delay to prevent transients from reaching the speakers. If any significant DC component appears at the speaker outputs or if the heat-sink temperature becomes excessive, the relay also disconnects the speakers while allowing the fan to continue cooling the amplifier.

The rear apron of the XL-600 contains the gold-plated input jacks, four multiway binding-post speaker terminals (with a speaker-fuse holder for each channel), and a slide switch that converts the amplifier to bridged mono operation. The front panel, fitted with heavy-duty handles, has a rocker-type power switch and a clearly visible red pilot light. The XL-600 weighs 51 pounds and measures 19 inches wide, 13 inches deep (plus 2 inches for the handles), and 7 inches high (plus half an inch for the feet). Price: $1,195. David Hafler Co., Dept. SR, 5910 Crescent Blvd., Pennsauken, NJ 08105.

Lab Tests

The cooling fan of the XL-600 turned slowly and inaudibly in normal operation, although during the 1-hour preconditioning period and other high-power operation it sped up and could be heard clearly. It was never as noisy as most other amplifier cooling fans we have heard, however, and it should not be audible in a home environment.

Our clipping-level power measurements clearly established the credentials of the XL-600. Driving two-channel loads of 8 and 4 ohms
LITES: 9 mg. "tar", 0.6 mg. nicotine, BOX: 14 mg. "tar", 1.0 mg nicotine, av. per cigarette by FTC method.

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at 1,000 Hz, the amplifier clipped at outputs of 372 and 680 watts, respectively. For the 2-ohm measurement, we loaded only one channel with 2 ohms, leaving the other to drive 4 ohms. The 2-ohm clipping power measured an impressive 900 watts. The dynamic power, as expected, was even greater, with readings of 478, 900, and 1,300 watts into respective loads of 8, 4, and 2 ohms.

The amplifier's distortion was typically about 0.01 percent at most power outputs and frequencies, but it increased to about 0.03 or 0.04 percent at the upper audio frequencies. The amplifier required an input of 0.14 volt for a reference 1-watt output, and its A-weighted noise level was −89 dB referred to 1 watt. The frequency response varied only ±0.02 dB from 10 to 30,000 Hz. Phase shift was truly negligible, varying ±0.1 degree from 20 to 7,000 Hz and reaching 0.8 degree at 20,000 Hz.

Comments
The Hailer XL-600 lived up to the claims made for it in full measure. Not only did our bench measurements confirm its specifications, but it proved itself to be as "bulletproof" an amplifier as one could wish.

Testing a large, powerful amplifier such as the XL-600 often produces unwelcome surprises such as blown-out power transistors or even damage to one's speakers. When we blew out a 10-ampere speaker fuse at one point, we continued the test with the only available substitute, a 15-ampere fuse (these fuses protect only the speakers; the amplifier is separately fused in its DC power circuits). Although this inadvisable procedure enabled us (barely) to make our 2-ohm clipping-level power measurement, that channel of the amplifier shut down, having blown one of its power-supply fuses. After a fuse replacement, however, the amplifier appeared to be as good as new.

Otherwise, there were no surprises in our use of the XL-600. Its fan was quite inaudible in normal use, and its exterior never became more than faintly warm. As claimed, it came on (and shut off) with not a trace of a thump. The speakers we used had reasonable impedance characteristics and probably would not tax the abilities of any good amplifier, but we have no doubt that the XL-600 would be able to drive any speaker to its limits without approaching its own limits in any respect.

Circle 142 on reader service card

FEATURES

- Dual-mono construction (sharing only the power transformer between channels)
- Eight power MOSFET's for each channel
- Double-differential J-FET cascode input stage
- Current-mirroring driver stage
- Low overall negative feedback

- No current limiting; able to drive low-impedance loads
- Rear-apron switch for bridged mono operation
- Gold-plated input connectors
- Speaker outputs protected by relay against DC output level or turn-on transients

LABORATORY MEASUREMENTS

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000-Hz power output at clipping:</td>
<td>372 watts into 8 ohms, 680 watts into 4 ohms, 900 watts into 2 ohms</td>
</tr>
<tr>
<td>Clipping headroom (relative to rated output)</td>
<td>0.86 dB into 8 ohms</td>
</tr>
<tr>
<td>Dynamic power output</td>
<td>478 watts into 8 ohms, 900 watts into 4 ohms, 1,300 watts into 2 ohms</td>
</tr>
<tr>
<td>Dynamic headroom</td>
<td>1.95 dB into 8 ohms</td>
</tr>
<tr>
<td>Harmonic distortion (THD + noise) at 1,000 Hz into 8 ohms:</td>
<td>watt, 0.028%; 10 watts, 0.01%; 305 watts, 0.0058%</td>
</tr>
<tr>
<td>Maximum distortion (20 to 20,000 Hz into 8 ohms):</td>
<td>0.095% at 30 watts (20,000 Hz)</td>
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<tr>
<td>Sensitivity (1-watt output into 8 ohms)</td>
<td>140 mV</td>
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<tr>
<td>A-weighted noise (referred to a 1-watt output):</td>
<td>−89 dB</td>
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<tr>
<td>Slew factor: 2</td>
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Art meets art.

If you would like to have your own copy of this striking 18 x 38 full-color poster, drop by your Alpine dealer with this ad and $2.00. Then roll home with your very own Lamborghini. While there are still a few left.
If there was any concern that audio/video equipment was nearing its technological limits, the 1989 Winter Consumer Electronics Show did its best to prove otherwise. As in years past, STEREO REVIEW editors joined manufacturers, retailers, distributors, and other journalists converging on the Las Vegas Convention Center to show and see the latest and greatest equipment, and few came away from the show unimpressed. The following pages preview some of the hottest products we saw. They should be showing up at your local stores in the next few months.

Loudspeakers made a lot of news at the show, and not just those from U.S. and European manufacturers. Japanese electronics firms showed renewed interest in the American speaker market, with Pioneer, Yamaha, Sony, and Sansui introducing new lines. The introductions of smaller, bookshelf-size speakers from Celestion, Allison Acoustics, JBL, and Ohm Acoustics, to name a few, and in-wall speakers from Sonance and Boston Acoustics, among others, gave evidence of continuing efforts to offer space-saving or “invisible” speakers with improved sound quality.

Show attendees got a peek at the home of the future, which may use the new data-transmission standard called CEBus to combine all audio/video, appliance, heating and cooling, and security functions in one automated system. The demonstration was sponsored by the Electronic Industries Association, and the participating companies included Marantz, Mitsubishi, Panasonic, Sony, Tandy, and Thomson Consumer Electronics (RCA and GE).

As audio technology advances, so, of course, does video, and on hand at the show were some indications of video’s future: high-definition TV (HDTV). Although it will be a few years before HDTV becomes a mainstream household product in the United States, Philips, Boffi Vidikon, Fisher, and Barco Electronics gave showgoers a preview of what’s to come. If the impressive Barco/Fosgate surround-sound demonstration was an example of the next decade’s audio/video offerings, you can look forward to a television image rivaling 35mm photography in clarity and multichannel surround sound to go along with it.

It was a show of futures and a show of firsts. While Nakamichi is not the first manufacturer to announce marketing plans for digital audio tape (DAT) recorders in the U.S., it may be the first to execute those plans. Delivery of its $10,000 Model 1000 recorders, which can make digital copies of CD’s, was promised for early spring. Taiyo Yuden became the first manufacturer to demonstrate recordable compact discs in the United States when it showed a prototype in a private suite during the show, but the company said it will not introduce the product on the consumer level until copyright issues are resolved. NEC introduced its first CD player with sixteen-times oversampling, and Sansui took the CD bit race in an unusual direction, demonstrating a player with the first 1-bit digital-to-analog converter.

On the mobile-audio side, Toshiba entered the field with a line of cassette and CD receivers, speakers, equalizers, and amplifiers. Polk showed its first subwoofer for the car, and Pioneer introduced the first system in its Nautica line, designed for boats. Alpine’s CD Shuttle is the first CD changer that can be controlled by either an in-dash CD player or a cassette receiver. The CD Shuttle can also operate with Alpine’s Model 1390 tuner, which is one of the first tuners, along with JVC’s KS-RX5500 cassette receiver, to incorporate FMX decoding circuitry. Hafler introduced its first line of car speakers, and Blaupunkt and HiFonics brought out their first multi-channel amplifiers. Precision Power showed the first digitally controlled active electronic crossover for the car and the first digital remote-control module for signal processing in the car.

All in all, the future looks very bright in consumer electronics, and audio/video enthusiasts have a lot to look forward to in the coming months and for years ahead.
Sony demonstrated one of its new digital signal processing (DSP) components, the TA-V925E preamp, which can do all of its audio processing—input to output—in the digital domain, thus avoiding many of the phase, distortion, and imaging problems associated with analog circuitry. The preamp is currently available in Japan; an American model is to be introduced some time this summer.

The Denon AVC-2000 integrated amplifier ($1,000) offers Dolby Pro-Logic decoding, fourteen audio inputs and nine outputs, seven composite video inputs and four outputs, and two S-VHS inputs with three outputs. It can provide on-screen display of its operating status.

The Allison Acoustics AL Series loudspeakers feature Convex Diaphragm tweeters and Power Guard thermal protection. The 16-inch-high AL 110, $349 a pair, and 24-inch-high AL 120, $600 a pair, are in the middle of the six-speaker line. The speakers are available in black, oak, or walnut finishes.

The Celestion Model 3 (below) is a two-way bookshelf speaker with a rated frequency response of 75 to 20,000 Hz ± 3 dB and an operating range of 10 to 60 watts. At $250 a pair, it is significantly less expensive than other Celestion speakers, yet it claims close to the same spatial imagery and dynamics.
The floor-standing TZ-9 (above, $4,000 a pair) is the top model in Pioneer's Elite TZ speaker series. It has ceramic-graphite midrange and tweeter domes made of 99.9 percent pure carbon and a twin-bass drive system with two opposing woofers, one firing out of the front of the cabinet, the other firing out of the rear.

Yamaha's new Active Servo Technology (AST) speakers are designed to provide accurate very low bass from small enclosures. The AST-S1, with a 7½ x 11½ x 9-inch cabinet, is capable of producing a usable frequency response down to 28 Hz. The system has a matching amplifier and two impedance-modifying cartridges that plug into its front panel. Price: $1,200 complete.

Sumo's new Aria speaker ($3,000 a pair) uses a single stretched-polyester membrane. The system applies drive to a small area at the center of the diaphragm and controls the traveling waves to create a spherical waveform. The Aria measures 60 x 30 x 9 inches and has a rated frequency response of 40 to 20,000 Hz ± 3 dB.
Barco Electronics and Fosgate joined forces for a home A/V theater that featured HDTV and surround sound. The audio system used Fosgate's 3610 Pro Plus surround processor (top right, $1,429) and 100 Series amps, including the T-100 ($599). Barco's 600C projector (above) provided a state-of-the-art picture, and the 1001 Data Projector gave a glimpse of the HDTV future.

The Proton VT-331 stereo monitor/receiver has a 31-inch flat, square screen, a 1-watt-per-channel amplifier, a pair of 4 x 6-inch internal loudspeakers, an MTS/SAP decoder, and the Aphex Systems Aural Exciter circuitry, which enhances harmonics. The $2,499 set is rated for more than 600 lines of horizontal resolution and is S-VHS compatible.

Beyer Dynamic's IRS 690 wireless headphones have an FM infrared transmission system. The transmitter and the charging device use a single power supply. A 9-volt storage battery built into the headpiece is charged via the transmitter. Price: $399.
The Ahec Lansing two-piece Ambiographic control system for cars combines an in-trunk electronic crossover/equalizer (above) and an under-dash remote control module (not shown) with its own voltage-controlled amp. Price: $875.

The Koss JCK/300 Kordless Stereophones are said to have a coverage area of more than 500 square feet. The transmitter consists of a modulator and an emitter panel that can be remotely installed up to ten feet from the base. Additional panels can be added to expand coverage. Price: $275.

The Alpine Model 1390 AM/FM tuner module, designed to be used in a car system with the Model 5953 controller (not shown), has no controls or displays, only a DIN input and output, so it can be mounted anywhere in a car. The 1390 is one of the first tuners to include FMX decoding circuitry. Price: $200.

Sony's CDX-2001 DiscJockey CD changer ($1,400) is the first car player to use eight-times oversampling. Its ten-disc magazine is interchangeable with those of other Sony home and car magazine-type changers. The accompanying in-dash Remote Commander uses a precision logic attenuator that is said to achieve precise linearity and channel balance.
THE BEST SEAT IN THE HOUSE

A home theater combines a remarkable surround-sound system and improved-definition television.

BY WILLIAM LIVINGSTONE

AFTER haunting surround-sound demonstrations for years, last fall I decided the time had come for me to stop using my living room for storing the boxes my audio equipment came in and turn the space into an up-to-date media room. When I started looking for the units necessary for a home wedding of audio and video at my house, Editor in Chief Louise Boudas asked me to do some in-home user evaluations of new equipment before making my final choices, and I jumped at the chance.

The setup we decided on was a top-of-the-line array with strong emphasis on sound. For audio we chose the Shure HTS Theater Reference System, which includes speakers, amplifiers, and a Dolby Surround decoder. For video we selected the brand-new 27-inch Philips improved-definition TV monitor/receiver, and for sources we added JVC's Model HR-S5000U Super VHS VCR and Sony's Model MDP-700 combi-player for videodiscs and CD's.

Working with so much topflight equipment was enlightening, and I can't think when I've enjoyed a project more, but when it was delivered to my apartment in fifteen cartons I was taken aback. The Shure audio system costs $9,600. The Philips IDTV set lists for $1,500, the JVC S-VHS VCR for $1,299, and the Sony combi-player for $1,450. It all adds up to $13,849, and the prospect of making a mistake with that much expensive equipment that didn't belong to me was a little intimidating.

To start me off, Executive Editor Michael Smolen, an experienced installer, came to my apartment to hook the system up. It took him just under two hours from the time he opened the first carton until the last connection was made. He picked up the first CD that came to hand, \textit{Lisztromique}, a performance of Liszt's music by synthesizer artist Jeffrey Baker (Newport Classic NC 60022), and we got sound on the first try. Standing in the center of the room, I was flooded by extraordinarily clean sound from deep bass to crystal-
As daunting as a pile of fifteen boxes may seem, installing the Shure system was not extremely difficult. Armed with Shure's excellent documentation, wirestrippers, a spool of good speaker cable, and a modicum of patience, we had the Shure system up and running in just under two hours.

We would recommend that you fully map out where you intend to place each piece of the system before you start tearing open boxes. This will prevent confusion later. And because of the possibly extensive runs of speaker cable, you may want to consider having an electrician pre-wire your listening room for you, particularly if you have little experience in hooking up complicated hi-fi systems. That way you will avoid unsightly coils of thick speaker cable lying exposed on the listening-room floor.

We placed the three Shure HTS50SPA amplifiers in a stack on a shelf, with the HTS5300 Acra-Vector Logic Decoder on the shelf below and nearer to eye level for ease of use. On a separate shelf above the amps we placed the Sony MDP-700 combi-player, one of the system's sources. Off to the left on another shelf, unseen in the room photograph, we placed our other source, JVC's HR-SS000U S-VHS video deck.

Wiring the system was simple because of Shure's easily followed wiring diagrams, which offer many options. One installation trick is to place your components in their stacks on the shelves, but rotate them a quarter turn so you have access to the back of each unit for wiring. Once you've made all your connections and run a system check, simply turn the stack around facing forward and you're all set.

We used a low-profile tv cart made by Sony, placing the Philips IDTV on a swivel tray on top. By removing the cart's inner shelves, we had a perfect fit for the HTS50CF center-channel speaker. The HTS50SW subwoofer, the least placement-specific speaker in the system, was placed on the floor off to the right. The two HTS50LSRs speakers used for the front channels were placed roughly 10 feet apart on either side of the television set, while the two used for rear-channel information were placed further apart against the room's rear wall.

If you feel comfortable wiring hi-fi systems and do the proper pre-installation planning, the Shure system should go together with little difficulty. But remember, if you're a novice at this kind of thing, you should turn to your dealer for help. The Shure HTS components are part of an extremely sophisticated audio system, and unless you wire everything properly you defeat the purpose of your investment.

—Michael Smolen

**The Equipment**

The Shure HTS Theater Reference System consists of six loudspeakers, three signal-processing amplifiers, and a surround-sound decoder plus a wireless remote control. Designed entirely by Shure HTS engineers in Evanston, Illinois, all the units are manufactured in the United States (using some imported parts). They are available separately for those who wish to combine some of them with audio equipment they already own, but to get the maximum benefit from compatibility of design, we chose to evaluate the components together as a system.

Developed for movies, Dolby Surround technology encodes four channels of sound into two. When this is decoded in a home installation, three signals (left, right, and center) are fed to the front speakers, and a fourth (embodying ambience or surround information) goes to the rear pair. A large amount of information is handled by the center front speaker, including almost all of the dialogue. Movie soundtracks contain more low-frequency energy than music does, and in the Shure HTS system this is handled by a subwoofer.

In cabinets of 1-inch particle-board covered with walnut veneer, all six of the Shure HTS speakers are fairly compact. Designed for the
center front channel, the HTS50CF speaker measures 13½ inches wide, 20 inches high, and 8¼ inches deep, and it weighs 37 pounds. It has two 6½-inch woofers and a 1-inch soft-dome tweeter. The subwoofer, containing one 12-inch driver, measures 23 x 18 x 14 inches and weighs 65 pounds.

Left, right, and surround information is handled by four identical HTS50LRS speaker systems, each measuring 10 x 13½ x 8 inches and weighing 24½ pounds. Each contains a 6½-inch woofer and a 1-inch soft-dome tweeter.

The Shure HTS Theater Reference System includes three HTS50SPA power amplifiers, each measuring 16¾ x 4 x 14 inches and weighing 27 pounds. Front-panel controls include level controls for each channel and five different operational modes. In most mode settings frequency response and sensitivity are tailored to the characteristics of the Shure HTS speakers. A CFx mode setting for the center channel extends the frequency response of the HTS50CF down to 55 Hz for an installation that does not include a subwoofer. A FLAT setting makes the amplifier suitable for use with any loudspeaker.

The heart of the Shure HTS Theater Reference System is the HTS 5300 Acra Vector Logic Decoder, which measures 16¾ x 2½ x 15 inches. On its front panel are controls for master and surround volume, input level and balance, delay range, Dolby Surround, and stereo and mono surround synthesis with defeat, as well as a tape-monitor switch. A graphic display indicates the strength of signal to the various channels in the system.

The wireless remote-control unit permits changing the settings of the volume controls, and it also has a MUTE switch. Holding that down activates a generator in the decoder, sending a pink-noise signal to each of the speakers in turn for the purpose of balancing.

The JVC Model HR-S5000U Super VHS Hi-Fi stereo videocassette recorder is rated for an improved picture quality with horizontal resolution of more than 400 lines. On-screen menu selection permits remote-control channel presetting, timer setting, and so forth. The many other features include automatic on-screen mode display (with manual recall capability) and a flying erase head for smooth insert edits. The unit measures 17¼ x 4½ by 15 inches and weighs about 18 pounds.

The Sony MDP-700 Multi-Disc Player can be used to play 8- and 12-inch videodiscs, 5-inch CDV's, standard-size compact discs, and the newer 3-inch CD's. It claims 425 lines of horizontal resolution. Both the front panel and the remote control have a combination jog dial and shuttle ring for fast forward and reverse and for scanning. In addition to the usual open, close, pause, and still functions, the unit has a memory stop, which makes it possible to resume playback at a specified point even after the player has been turned off and back on. It has a headphone jack with separate volume control.

The Philips 27J245SB improved-definition television set is a 27-inch table model with Philips's patented noninterlaced scanning system, which creates a new line of information to go into the visible space between each pair of scanning lines. According to Philips, the number of scan lines on the IDTV is doubled, resulting in a 40-percent improvement in vertical resolution. A digital comb filter delivers 480 lines of horizontal resolution to insure maximum performance for such wideband video sources as videodiscs and Super VHS videotapes.
**MANUFACTURERS’ SPECIFICATIONS**

- **Shure HTSS50SPA Power Amplifier (flat mode)**
  - Frequency response: 20 to 20,000 Hz ± 0.5 dB
  - Power output: 100 watts per channel into 8 ohms with less than 0.1% total harmonic distortion
  - Input impedance: 100 kilohms
  - Input sensitivity at full power: 0 dBV (1.0 V)
  - Dynamic range: > 100 dB (300 to 20,000 Hz)

- **Shure HTSS5300 Acra Vector Logic Decoder (outputs loaded with 50 kilohms)**
  - Frequency response: front left and right channels, center channel, 20 to 20,000 Hz ± 0.5 dB; subwoofer channel, -3 dB at 80 Hz, 12 dB/octave low-pass rolloff; left and right surround channels, 50 to 7,000 Hz, -3 dB
  - Input sensitivity: 0.25 V (input control maximum), 2.5 V (input control minimum)
  - Input clipping: 4.0 V
  - Input impedance: 75 kilohms
  - Output clipping: 4.0 V
  - Output impedance: 5.5 kilohms
  - Total harmonic distortion (1 kHz, 1 V output): front left and right channels, center channel, <0.1% with volume at maximum; left and right surround channels, <0.3% with master volume at minimum and surround volume centered
  - Output noise (A-weighted): -90 dBV with master and surround volumes centered, -80 dBV with master volume at maximum and surround volume centered
  - Delay range: 16 to 36 ms

- **Shure HTSS5LRS Two-Way Speaker**
  - Frequency response: 60 to 18,000 Hz with amp in LRS extended mode, 80 to 18,000 Hz with amp in LRS mode
  - Sensitivity: 85 dB SPL at 1 meter with 2.83 V input
  - Power handling: 100 watts into 8 ohms
  - Impedance: 5.6 ohms nominal, 200 to 18,000 Hz

- **Shure HTSS50CF Center-Channel Speaker**
  - Frequency response: 55 to 18,000 Hz with amp in CF extended mode, 80 to 18,000 Hz with amp in CF mode

- **Sensitivity:** 88 dB SPL at 1 meter with 2.83 V input
- **Power handling:** 100 watts into 8 ohms
- **Impedance:** 5.6 ohms nominal, 200 to 18,000 Hz

- **Shure HTSS50SW Subwoofer**
  - Frequency response: 33 to 80 Hz
  - Sensitivity: 91 dB SPL at 1 meter with 2.83 V input
  - Power handling: 100 watts into 8 ohms
  - Impedance: 8 ohms nominal

- **Sony MDP-700 Multi-Disc Player**
  - Audio Section
    - Frequency response: 4 to 20,000 Hz ± 0.3 dB
    - Signal-to-noise ratio: > 105 dB
    - Dynamic range: > 96 dB
    - Total harmonic distortion: 0.003%
    - Channel separation: 92 dB
    - Wow-and-flutter: unmeasurable
  - Video Section
    - Horizontal resolution: 425 lines
    - Signal-to-noise ratio: > 47 dB

- **JVC HR-S5000U S-VHS Hi-Fi VCR**
  - Video Section
    - Horizontal resolution: > 400 lines
    - Signal-to-noise ratio: > 47 dB
  - Audio Section
    - Frequency response: 20 to 20,000 Hz in hi-fi mode, 70 to 10,000 Hz in normal mode
    - Signal-to-noise ratio: > 40 dB in normal mode
    - Dynamic range: 90 dB in hi-fi mode
    - Wow-and-flutter: < 0.005% w rms

- **Philips 27J2455B IDTV Monitor/Receiver**
  - Video Section
    - Screen size: 27 inches
    - Deflection angle: 100 degrees
    - Tuning capability: 178 channels
    - Horizontal resolution: 480 lines
    - Noise reduction: digital, up to 12 dB
  - Audio Section
    - Power output: 10 watts per channel
    - Speakers: two two-way systems, each with a 5-inch woofer and two piezo tweeters

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**Using the System**

The kind of help I had in installing this audio/video system is available not only to writers and editors of major magazines. According to Shure, the HTS Theater Reference System is sold exclusively through retailers who are trained in setting it up and operating it, and installation and some in-home orientation are typically included in the purchase price.

The manuals for all this equipment are informative, clear, and easy to understand, and I found the equipment itself user-friendly and comparatively simple to operate. I used to regard remote controls with the scorn audiophiles reserved for LP changers, and I thought on-screen menus were only for computer nerds. But anyone who can get cash out of an automated teller machine can operate these devices effectively, and menu operation can ease you over one of the great technological barriers in modern life: setting up a VCR for time-shift recording.

Some of the features on the video units, such as PIP and digital special effects, held little interest for me. I did not get around to some others, such as audio-only recording on the VCR, that would be practical. The JVC S-VHS VCR made recordings from videodiscs that were excellent in sound and picture. The difference between these and the old prerecorded cassettes in the standard VHS format with mono soundtracks is greater than the difference between compact discs and LP’s. It’s more like the difference between CD’s and 78’s!

In addition to decoding Dolby Surround soundtracks, the Shure audio system enhances mono soundtracks effectively by providing stereo and surround synthesis. It also provides surround synthesis for two-channel stereo sources. If you want to, however, you can cancel the surround sound through the DEFEAT button and hear a mono source only from the center front speaker or two-channel stereo only from the left and right front speakers, with the subwoofer providing the lowest bass. I found that I liked at least a little of the concert-hall ambience the synthesized surround gave to my favorite CD’s.

According to Shure, the intention
of the HTS engineers was to re-create as faithfully as possible the sonic environment in which the music (or whatever) was originally recorded. The philosophy behind the Theater Reference System is, therefore, quite different from the one embodied in signal processors that seek to create a variety of sonic environments so that the user can move the music from a cabaret to a cathedral to a concert hall.

Once the Shure system is balanced and adjusted for an individual room and an owner's tastes, it is possible to use it indefinitely without additional tweaking. More technically oriented owners will want to try various settings described in the instruction booklet to give more visceral kick to the low bass for movies about volcanic eruptions, tank attacks, or intergalactic battles.

I experimented a bit with speaker placement and found that I prefer the center front speaker above the monitor instead of below it as Michael Smolen installed it (and as it is shown in the photograph on page 62). In my living room, which measures approximately 20 x 20 feet, the rear speakers were about 18 feet apart and aimed at the central listening area.

Having this installation at my disposal at home for a couple of months made me understand better the phenomenon that marketing experts refer to as "cocooning." This term describes the process of shutting out unpleasantness to enjoy a privately created environment in which one is surrounded by luxurious products that are useful or beautiful.

For me the principal benefits of all this equipment were the high-quality picture and the superb sound, which greatly enhanced my pleasure in watching network television as well as videodiscs and tapes. The system is most impressive with an adventure film, such as Raiders of the Lost Ark or Back to the Future, with a well-recorded Dolby Surround soundtrack, and my opinions are based entirely on subjective reactions. As you must have gathered by now, I liked this equipment and have reasons to give high marks to all units in the system.

Since attending a laboratory demonstration of the Philips IDTV technology last year, I have been aching to get my hands on one of the sets. Having the Model 27J245SB to evaluate has confirmed my high opinion of it where it counts, at home. Using only a very simple antenna I had around the house, it received VHF and UHF broadcasts well, and the sound from its built-in speakers was superior to that of the majority of other sets. For obvious reasons I did not try out its built-in surround-sound capability.

What was most remarkable about Philips's IDTV was its picture quality. Color and sharpness were excellent, and control was easy with the versatile remote. For comparison I substituted a couple of other monitors in the installation, and the Philips won hands down. The noninterlaced scanning system really worked in eliminating visible scan lines, an important step toward high-definition TV. I consider this a great product and a bargain at its price.

The shelves were stacked with the Sony MDP-700 combi-player, the Shure power amplifiers, and, at eye level, the Shure Acra Vector Logic Decoder. Another shelf held the JVC HR-SS000 S-VHS VCR.
The heart of the surround-sound system is Shure’s HTS5300 Acra Vector Logic Decoder, which can be operated by remote control.

good opinion of videodisc technology, which I have always considered superior to videotape. Used with the Shure amps and speakers, it produced sparkling sound from digital recordings, and even the analog sound with CX noise reduction from older videodiscs was quite good. The picture on IDTV was excellent.

At first it seemed a little awkward to open the large videodisc drawer to play the much smaller and lighter compact discs and CD-3’s, but I got used to it, and it is convenient to have one player for those discs of varying sizes.

I got good results from the JVC S-VHS VCR in both recording and playback. It is compatible with earlier VHS units in that it will play tapes made on them, and you can record with a Super VHS machine in the standard VHS mode to make tapes for your less up-to-date friends. But a tape recorded in the S-VHS mode can be played only on an S-VHS deck. To check for uniformity from one S-VHS model to another, I made recordings with the JVC unit and with a similar one, the Mitsubishi HS-U70. Each played the other’s tapes perfectly.

The improvement offered by S-VHS is a brighter picture. Since there are very few prerecorded tapes available in this format, the only way to take advantage of the increased brightness is to record from a high-resolution source (videodisc) or make live recordings with an S-VHS camcorder. Whether the increase in quality is worth the higher price of the equipment and blank tape is something you will have to decide for yourself. At present the S-VHS VCR is still a high-end videophile product.

When I asked Robert Schulein why the Shure home theater system is so expensive, he answered in high-end terms. “With this system Shure wanted to make a statement about what surround-sound technology is capable of,” he said, “and as any consumer of high-end audio equipment will tell you, such a product always costs money. But when you consider that with three amplifiers and six speakers, it is the equivalent of three stereo systems, you realize it’s not so expensive after all.”

The quality of the Shure HTS components was suggested by their heft and feel as Michael Smolen unpacked them. It was verified for me by their performance every time I used the audio/video system.

When the sound of a home theater system is this good, you can consider video a further dimension of audio. I am impressed by the design of the Shure system, by its flexibility, by its ease of operation, but most of all by its sound. I give it five stars.

The A/V Experience

With a home theater system you never have to stand in line to see a movie, and the picture always starts when you want it to. Home systems are meant primarily for the “picture-dominated experience,” for which you tend to sit down, and the seats are more comfortable at my house than at the movies because my first step in setting up was to buy new chairs.

That’s about as far as I got in decorating my new media room, however. Once the equipment was delivered, I became too involved in using it to attend to new carpets and painting the walls. Consequently, we photographed the components a few blocks away in the home of Music Editor Christie Barter, whose cocoon was already complete.

Our rock critic Steve Simels (also a movie fan and videophile) was helpful in steering me to movies with exceptional soundtracks. They included some old-time wide-screen epics—Spartacus (1960) and El Cid (1961)—which had multichannel soundtracks that are quite effective in home systems. Steve lent me that shameless tearjerker E.T.—The Extra-Terrestrial (which still works its magic despite those repulsively smug child actors) and Sid and Nancy, a depressing but well-crafted film about the lethal combination of sex, drugs, and rock-and-roll. Winners for me were The Empire Strikes Back and La Bamba.

Audiophiles have traditionally looked down on television for its wretched sound, but this year’s Super Bowl game was broadcast in surround sound, and more sonic improvements can probably be expected from the networks. Those who prefer classical music have been especially critical of TV despite the many hours of fine-arts programs with which the Public Broadcasting Service stimulates and delights the cultivated mind.

What now appears on your home screen is up to you. Many of those PBS programs are available on videotape or disc. Bon Jovi, Fleetwood Mac, and Michael Jackson all have current videos with Dolby Surround tracks. Will it be Horowitz, Pavarotti, Diane Schuur, or Barbra Streisand? Classic films currently available in carefully reconstructed versions include Lost Horizon, Citizen Kane, and A Star Is Born. Films recorded in Ultra Stereo (a compatible multitrack system) include Rented Lips and Attack of the Killer Bimbos.

The range of choice is staggering, but if you watch sports on TV, like movies, or love music, there is probably a surround system of some kind in your future. If you enjoy the process of choosing, owning, and operating the equipment, you will probably be shopping sooner rather than later. I intend to continue decorating and furnishing my media room, but I already have some other audio/video equipment to evaluate. It had better be good. My experience with these components from JVC, Philips, Shure, and Sony has made me hard to please.
BEFORE we do anything else, let’s get one thing straight: There’s no such thing as “high-density television,” despite what you may have read in the newspaper. The general media are often just as confused by new technology as the general public is, and there are quite a few misnomers resulting from that confusion. Actually, HDTV stands for high-definition television, and it’s just one spoonful of the new television technology’s alphabet soup. Others include IDTV, or improved-definition television, and the high-resolution monitor/receiver. These two categories of products are available to consumers now; HDTV sets won’t be available in this country for a few more years.

Consumer electronics technology really is grand. Just when you feel on top of the game, marketers, manufacturers, and research labs spring something new on you, completely unnerving folks who thought they had just installed the ultimate home video setup. The technology is driven, for the most part, by economic concerns. The introduction of Super VHS, for example, was spurred by the declining profits of Japanese manufacturers when cheaper Korean VCR’s flooded the market (which explains why JVC is in no hurry to license the S-VHS format to any Korean manufacturers). Like S-VHS, IDTV and high-resolution TV are genuine breakthroughs, providing consumers with higher quality at a premium price. But HDTV is a much bigger deal, with much wider economic ramifications. Many billions of dollars are at stake, and the Japanese are way ahead of the U.S. in terms of development. Congress, after reading about HDTV in the Sunday supplements, has sat up and taken notice. The eventual outcome of the growing controversy will decide how soon HDTV arrives in this country, and just how good it will be once it gets here.

But what is HDTV anyway? And, while...
we’re at it, what are IDTV and high-resolution TV? Although the three sound similar, they are not even close to being the same thing. Let’s start with the one that’s most widely available right now: the high-resolution monitor/receiver.

**High-Resolution TV**

Basically, a high-resolution TV set has what it takes to handle high-resolution video sources like S-VHS, ED Beta (ED stands for extended definition), and videodiscs. Now, broadcast TV signals come into your home with a horizontal resolution of about 330 lines. Conventional VHS VCR’s record and play back with a horizontal resolution of 240 lines. The more resolution a TV picture has, the more detail it conveys, and if you think numbers like 240 and 330 aren’t that hot, you’re right. Low resolution is why you can’t read the license-plate numbers during car-chase or traffic-jam scenes. Admittedly, that’s a frivolous example; the fact is, though, more detail means more realism, and more realism means more involvement in whatever you’re watching.

The S-VHS format records and plays back with 400 lines of resolution, the playback-only videodisc has a slight edge over that, and the ED Beta tape format goes up to 500 lines. Even though resolution isn’t the be-all and end-all of a television picture, and broadcast formats using 1-inch videotape recording still have an edge in parameters such as color reproduction, there’s no disputing the impressive capabilities of the new consumer formats. And home videographers, too, have access to this greater resolution through S-VHS and ED Beta camcorders.

In any case, these advanced VCR’s and camcorders need TV sets that match their capabilities. That’s where the high-resolution monitor/receiver comes in. To achieve higher resolution, ED Beta and S-VHS components record at a higher frequency than conventional components, and many high-resolution monitor/receivers employ wide-band video amplifiers to match the video output of these formats. In fact, current monitor technology has gotten a bit ahead of even ED Beta and S-VHS; many sets are capable of a horizontal resolution of 600 lines, more than any video source available to consumers can
Currently use. Better more than enough, however, than too little.

The other hallmark of such sets (aside from their direct video inputs and outputs, which provide better signal quality than you get from an antenna hook-up) is the S-connector. Both ED Beta and S-VHS decks contain an S-video output—and many of the latest videodisc players boast this feature as well. Developed by renowned video engineer Yves Faroudja, the five-pin S-video output separates luminance (brightness) and chrominance (color) signals so they can be sent to a monitor/receiver with a corresponding input. Separating the two parts of the signal results in fewer picture "artifacts" like color bleeding and dot patterns. This has nothing to do with resolution per se—hooking an S-VHS deck to a high-resolution monitor/receiver by way of its direct video jacks will yield you the same level of picture detail. But the more detailed a picture, the more noticeable its other flaws become, and the S-video system does a good job of filtering out those flaws.

Since the introduction of S-VHS in 1987, the popularity of high-resolution monitor/receivers with S-connectors has grown considerably. Super sets—large-screen TV's loaded with features, including wideband amplifiers and S-connectors as well as MTS decoders for receiving stereo broadcasts, stereo speakers, and digital effects like picture-in-picture (PIP)—are practically commonplace. And these features are now beginning to show up on sets with smaller screen sizes. Panasonic, for instance, recently introduced a 20-inch model with everything but the digital effects. Wider acceptance doesn't make the high-resolution monitor/receiver old news. It just means that more middle-of-the-road consumers are beginning to appreciate the benefits of the new technologies, which spurs manufacturers to make further refinements—and that's where IDTV comes in.

**Improved-Definition TV**

An understanding of IDTV requires a little bit of background. A close look at the picture on your TV set will reveal that it's made up of horizontal lines. These scan lines (which are not to be confused with the lines used to measure resolution) are created by an electron gun at the rear of the TV tube as its beam of electrons hits the color phosphors on the inner screen surface. Video, like film, is made up of frames, and in our NTSC broadcast system (established in the Forties and Fifties by the National Television System Committee), the 525-scan-line picture changes at a rate of 30 frames per second. But that's not what you're actually seeing on your set. Each frame comes up on screen in the form of two sequential meshing fields of 262.5 scan lines each. The electron gun shoots these fields every sixtieth of a second, and two of them have to come together to make a one-frame picture on your screen. The meshing of fields is known as interlace, and how good the interlace on your set is determines how solid your video picture will appear on the screen.

Perfect interlace is described as 50/50, but even with perfect interlace, experienced eyes can notice the scan lines. And just as better resolution equals more realism, visible scan lines equals less realism. On a set with 60/40 interlace, for example, scan lines look like Venetian blinds to some viewers—disturbing, to say the least.

The IDTV sets attempt to eliminate this distraction by eliminating interlace. What's made this possible is the substantial boom in digital technology we've seen over the past few years, particularly the ability to digitize and store video signal information. The first applications of digital memory in video were for snazzy effects like picture-in-picture or digital freeze frames. The IDTV application is an attempt to use digital memory for real picture improvement. Noninterlace scanning stores the video information of an incoming field and combines it with the video information from the next field—so that instead of two successive 262.5-line fields, each frame contains 525 scan lines shown all at once. With no interlace, scan lines are almost impossible to perceive. Flicker and jitter practically disappear, and, perhaps most important, perceived resolution increases dramatically.

Noninterlace scanning is not strictly a new development. Toshiba introduced a noninterlace set a couple of years ago, but while the principle behind it was sound, digital technology was not as highly refined as it is today. Although the Toshiba set got rid of interlace-related artifacts, it introduced an element of lag into the picture, particularly when fast-moving objects were on screen.

It was Philips Consumer Electronics that brought the technology to its current state, however, and Philips also coined the term IDTV. The new generation of sets gets the job done, and not just through the noninterlace scanning method. Like most high-end sets, the Philips IDTV system also uses a three-dimensional comb filter, which improves the separation of the color and brightness signals to take care of artifacts like "dot crawl"—if you've ever seen a woman in a red dress on TV, but the red was extending outside the boundaries of the dress, you know what that is. Finally, the Philips system adds digital video noise reduction, which uses digital field memory to clean up a grainy picture or boost the quality of weak broadcast signals.

This year IDTV is going to be a buzzword in high-end monitor/receivers. The two outstanding Philips models are the 27-inch 27J245, which features eight direct video inputs, and the 31-inch 31J460. Sony plans to introduce an IDTV set this spring, and a host of other manufacturers will be following suit. The IDTV system is particularly welcome for large-screen rear-projection sets, which almost never achieve 50/50 interlace and whose screen size makes such imperfections very noticeable. But the benefits of IDTV are visible on any screen 20 inches or larger. Pundits are saying that the IDTV system is the last major technological refinement in TV that the U.S. will see until HDVT gets here.

**High-Definition Television**

Ah, HDVT. NBC News recently reported that it made our current NTSC pictures look "crude." Movie buffs are all excited over the fact that HDVT uses a wide-screen aspect ratio similar to the ones used in movie theaters. No longer will they have to put up with watching Clint...
Eastwood's nose glaring at Eli Wallach's nose when they view a video-cassette of *The Good, the Bad, and the Ugly*. Audiophiles are thrilled that HDTV sound is digital; CD-quality audio will add tons of drama to The Morton Downey Jr. Show. Wisecracks aside, what HDTV has going for it is genuinely impressive. But the questions it raises and the controversy it's created put something of a damper on celebratory expectations. The political and economic concerns fueling today's HDTV debate are grabbing the headlines. The outcome of the debate will determine both when we get HDTV and what form it will take. The stakes are high because HDTV is not just a record/playback system, like S-VHS, and it's not just an improvement of an already existing system, like IDTV. Rather, HDTV is an entire broadcast system that will substantially change the way TV signals are transmitted and how we receive them.

Another sticking point for the Muse system—the one developed for use in Japan, at least—is that it requires too much spectrum space for its transmission. Broadcasts travel through the airwaves at different assigned frequencies, and spectrum space is dear. Everyone wants some, from two-way radio operators to satellite transmitters. The Federal Communications Commission currently allows a U.S. TV channel to take up 6 MHz of the broadcast spectrum. Because a wider, better picture and digital sound translate into a bigger broadcast signal, the Muse system used in Japan needs 9 MHz of spectrum space. To receive such a Muse signal here, you'd have to tune in to the equivalent of two separate TV channels. If you ever got a look at an FCC chart of allotted bandwidths, you'd be shocked to see how little blank space it contains. (Those extraterrestrials who receive all the transmissions traveling out into space are probably very confused by now.)

American TV engineers are faced, then, with a multifaceted challenge. Compatibility is something every consumer wants—many are frightened at the least suggestion that one piece of equipment won't work properly with another. For instance, because 8mm tapes can't be played back on a VHS deck, many videocassette buyers assumed that VHS-C, which offers VHS playback with the help of an adaptor, was a more desirable format than 8mm. It took the public a little while to realize that playing back an 8mm camcorder tape was as easy as plugging the camcorder into a TV set, and now 8mm is making some impressive gains in popularity. But real and complete incompatibility does not make consumers happy. Last year the FCC handed down the final word: Any HDTV system proposed for United States use has to be compatible with our current NTSC system—that is, any HDTV broadcasts would have to be receivable on non-HDTV sets. And that means so long Muse. It's very likely that the NHK system will be used for production purposes here in the States, but not for broadcast and transmission.

In the meantime, a number of manufacturers and engineers have been working on NTSC-compatible HDTV systems, hoping the FCC will award them the brass ring by adopting their proposed system as a standard. Essentially, HDTV is in the process of being reinvented for America, and different companies have different ideas about what the ideal HDTV configuration is. One of the big issues is the aspect ratio of the HDTV screen, the screen's proportion of width to height. Any HDTV picture will be wide-screen, but to what extent? The Muse system specifies a 5:3 aspect ratio; some proposed American systems vary from that a bit. Moreover, a number of proposals contain improvements over the Muse system—almost all of them employ noninterface digital scanning as part of the standard. And all of them offer some form of compatibility with our current NTSC system.

One of the earliest proposals for America was Advanced Compatible Television I, introduced in 1987 as a joint venture of NBC, RCA, and the David Sarnoff Research Center. Described as an interim system, it uses time compression to squeeze an enhanced signal into the standard NTSC bandwidth of 6 MHz. Viewers with regular NTSC sets would receive only the center part of the wide-screen picture (aspect ratio 5:3); information for the sides of the picture and enhanced detail would be contained within the time-compressed portion of the signal, which could only be received with special ACTV sets. As the second stage of its proposal, the ACTV team has unveiled ACTV II, an NTSC-compatible HDTV system using two broadcast channels.

Philips first showed its High-Definition System for North America (HDS-NA) to the press late last year at its research laboratories in Briarcliff, New York, and demonstrated it again at the Winter Consumer Electronics Show in January. It employs a satellite feed that sends a dual-component HDTV signal containing a picture with a 16:9 aspect ratio and four-channel digital audio. The first part of the signal contains the standard NTSC signal; the second part is an augmentation signal that provides the information for the HDTV picture and the enhanced audio. What kind of picture and sound a viewer would get would depend on the receiver he had.
NEC's KX2792S 27-inch monitor/receiver has matrix, hall, and Dolby surround-sound settings, an S-VHS input, MTS/SAP stereo decoder, and more than 500 lines of horizontal resolution. It has four built-in speakers and a built-in amplifier that delivers 10 watts per channel into four channels. The price is $1,399.

The Zenith ZB2777H stereo monitor/receiver ($1,900) has a Zenith/Bose sound system. Features include on-screen display, picture-in-picture, and S-VHS input. The 27-inch set has 560-line resolution, and it provides a variable audio output switchable for direct connection to an amplifier or a speaker system.

The Glenn system, developed by New York Institute of Technology director William E. Glenn, also employs an augmentation signal. The Del Rey system uses subsampling and slices off the bottom and top lines of the picture in order to squeeze the HDTV signal into a standard broadcast channel. Zenith's Spectrum Compatible system would simulcast a full HDTV signal on an otherwise unused adjacent channel, partly digitizing it to reduce power requirements and prevent interference. In terms of their approaches to the problem, the engineering community is reveling in diversity, but in terms of real progress, we seem to be playing catch-up with the Japanese.

In Japan, players from every part of the consumer electronics business are gearing up for HDTV. Matsushita is making TV sets and VCR's for Muse HDTV, anticipating NHK's experimental broadcasts beginning this spring. Maxell has shown a 1-hour-length HDTV videocassette called Hi-Vision. And so on. Things aren't quite up to that speed here in the U.S. One thing is for sure, though: The HDTV equipment, once it arrives, will be more expensive than the television gear we have now. But not too much more expensive. A study prepared for the Electronic Industries Association predicts that if there is a timely adoption of standards we could have HDTV in the U.S. by 1993, and that the first sets, which will be large-screen models, will be sold for an average price of $2,500. But prices are expected to decline rapidly as larger volume permits production economies, and by the turn of the century, the study estimates, 25 percent of all American homes will be HDTV equipped. That's a big number for such a short time frame, and prohibitive pricing won't help make it happen.

Until the FCC adopts an HDTV broadcast standard—which could be this year or sometime in the early 1990's—we have little to go on but debate and speculation. The FCC's order for an NTSC-compatible system cleared the fog a bit, but there's still a way to go before those wide-screen pictures get to you. In the meantime, however, high-resolution and HDTV sets offer dramatic improvements over conventional TV equipment, and they are well worth investigating while you are waiting for HDTV.
INDUSTRY pundits like to point out that the VCR boom that has altered the TV viewing habits of millions of Americans is losing its gusto. After all, they reason, three out of every five U.S. households now own at least one VCR.

But the truth is, for all those who have not yet experienced the added dimension that real hi-fi sound brings to video, the boom hasn't even begun. Whether you are buying your first VCR or an upgrade, now is a good time to purchase a hi-fi deck—special features are more plentiful and prices lower than ever before. In fact, a no-frills hi-fi VCR can be had for $400 or less today.

As always, the information in this guide was provided by the manufacturers and does not represent the results of tests by STEREO REVIEW. All prices are list prices; actual selling prices may vary. A directory of manufacturers appears on page 79.

Robert Ankosko
**Hitachi**

VT-3800A Digital Super VHS VCR

Super VHS Hi-Fi deck with multistereo and mosaic/digital painting digital video effects. Features MTS/SAP: flying-erase video head with double-azimuth; PIP: 12-screen picture; slow motion and freeze frame; remote control; high-speed search; auto repeat/frame advance; index search; 8-event/1-year timer; auto play/rewind; 85-channel, cable-compatible tuner; $1,400

VT-2600A Digital VHS VCR

VHS Hi-Fi recorder with stereo, mosaic/art freeze and store digital effects. Features MTS/SAP: still frame; variable-speed slow motion; frame advance; visual search; remote control with TV or remote control; 4-hour timer/107-channel, cable-compatible PLL frequency-synthesis tuner; HQ; still frame, and frame advance; $999

VT-3400A VHS VCR

VHS Hi-Fi VCR featuring MTS: 4-event/1-year timer; clock, calendar, and program review; on-screen display; 30-second program skip; 120-channel frequency-synthesis tuner; HQ; soft-touch operation; fine edit; Fi display; 5-segment recording level indicator; 5-minute timer back-up; $649

**JVC**

HR-S5000U Digital S-VHS VCR

Super VHS Hi-Fi recorder with 4 video and 2 audio heads; HQ: flying-erase head; real-time tape counter; special effects; multi-function VCR/TV remote control; 8-event/2-week timer; 155-channel frequency-synthesis tuner with MTS: index search; intro search; tape stabilization head drum; on-screen menu and auto channel-set; skip search; zero-frame editing system; audio dubbing facility; edit switch; headphone jack with adjustable output; shutter search with latch function; 1-button instant recording; maximum recording time 8 hours; Video: S/N >45 dB, resolution >400 lines; Audio: S/N >40 dB; FR 70-10,000 Hz; Hi-Fi audio: FR 20-20,000 Hz, WAF <0.005% wms.; 17 x 33 x 13 in.; $2,999

HR-S5000U Editing S-VHS VCR

Super VHS Hi-Fi VCR featuring 4 video and 2 audio heads; HQ: flying-erase head; real-time tape counter; special effects; multi-function VCR/TV remote control; 8-event/2-week timer; 155-channel frequency-synthesis tuner with MTS: index search; intro search; tape stabilization head drum; on-screen menu and auto channel-set; skip search; zero-frame editing system; audio dubbing facility; edit switch; headphone jack with adjustable output; shutter search with latch function; 1-button instant recording; maximum recording time 8 hours; Video: S/N >45 dB, resolution >400 lines; Audio: S/N >40 dB; FR 70-10,000 Hz; Hi-Fi audio: FR 20-20,000 Hz, WAF <0.005% wms.; 17 x 33 x 13 in.; $2,999

**Magnavox VR9770AT**

VHS Hi-Fi VCR with HQ: 4 double-azimuth heads, on-screen menu system; real-time counter; special effects; multi-function VCR/TV remote control; 4-event/2-week timer; 155-channel frequency-synthesis tuner with MTS: index search; intro search; skip search; zero-frame editing system; headphone jack with adjustable output; shuttle search with latch function; 1-button instant recording; maximum recording time 8 hours; Video: S/N >45 dB, resolution >400 lines; Audio: S/N >40 dB; FR 70-10,000 Hz; Hi-Fi audio: FR 20-20,000 Hz, WAF <0.005% wms.; 17 x 33 x 13 in.; $2,999

**Magnavox VR9770AT Digital S-VHS VCR**

Super VHS Hi-Fi VCR with 4 video and 2 audio heads; MTS/SAP: index search; remote on-screen programming; 8-event/1-month timer; 155-channel quanz-controlled, random-access tuner; 45-function remote; time stamp; auto tracking; HQ: 4 video and 2 audio heads: digital direct-drive video head servo system: digital direct-drive capstan servo system: maximum recording time 8 hours, auto scan tuning; on-screen function display; real-time counter with memory; soft-touch controls; edit switch; Record/playback resolution >400 lines; 17 x 33 x 13 in.; $1,399

**Kenwood KV-D5075S Digital S-VHS VCR**

Super VHS Hi-Fi deck with digital effects, including slow motion, freeze frame, and frame advance; 8-event/3-week timer; 140-channel tuner; MTS/SAP: on-screen display, manual/remote control programming. Maximum recording time 8 hours. Video: S/N >43 dB, resolution >240 lines, Hi-Fi audio: FR 20-20,000 Hz, dynamic range >90 dB, channel separation >60 dB, 17 x 33 x 13 1/4 in.; 19.2 lb.; $950
**HI-FI VIDEOCASSETTE RECORDER**

**MINOLTA**

**MV-160S Digital S-VHS VCR**
Super VHS Hi-Fi VCR with numerous digital video effects, including strobe, frame memory, mosaic and posterization; frame-by-frame advance, and adjustable slow motion. Features more than 400 lines of resolution: 167-channel, cable-compatible tuner with MTS; multi-channel search; 12-channel still picture; multi-index search; multi-sampling play; PIP, 2-speed visual search; double-speed playback; index search. 8-event/1-year timer: 43-function remote; on-screen menu display; auto operation functions; search lock/skip search; auto front loading with rapid start transport; 181-channel, digital quartz-controlled, random-access tuner; 44-function remote; on-screen function displays, linear-time counter with memory, HQ: digital-direct servo video head system; digital direct-drive capstan servo system; 1-touch record with standby; audio mute; maximum recording time 8 hours; 3-speed record/playback; multi-function display with auto dim; soft-touch controls: auto TV/VCR switching; auto fine-tuning; transition editing. 15.4 x 31/4 x 11/2 in. $699

**N958U VHS VCR**
Super VHS Hi-Fi VCR featuring 110-channel, cable-compatible, easy-to-use, multi-function display; on-screen menu display; multi-function remote; multi-function delay display. Maximum play time 8 hours. Video: S/N >43 dB. Audio: FR 100-10,000 Hz, S/N >40 dB. Hi-fi audio: FR 20-20,000 Hz, dynamic range >90 dB, channel separation >60 dB. 17 x 4 x 14/4 in. 16 lb. $699

**NEC DS8000U Digital S-VHS VCR**
Super VHS Hi-Fi VCR with digital video effects, including strobe, still, slow motion, and picture memory. Features >400 lines of resolution; on-screen programmable tuner and display; 8-event/3-week timer; multi-speed shuttle play with picture and jet search; index search; index search; 155-channel, digital quartz tuner with auto set; multi-speed recording; digital direct-drive capstan servo system; 1-touch recording; MTS; CCD NR; direct-drive cylinder and capstan motors. Audio: dynamic range >90 dB, FR 20-20,000 Hz, W&F <0.005% wms. 17 x 31/4 x 13/8 in. 11 lb. $1,350

**PV-54864 S-VHS VCR**
Super VHS Hi-Fi VCR featuring 4 heads; MTS/SAP, bar code; on-screen display programming, 155-channel digital quartz tuner with auto set; 44-function wireless remote control; index search, real-time counter, A/V noise muting; standby, 1-touch recording; multi-function display; automatic operation functions; search lock/skip search; HQ: CCD NR; direct-drive cylinder and capstan motors. Audio: dynamic range >90 dB, FR 20-20,000 Hz, W&F <0.005% wms. 17 x 31/4 x 13/8 in. 10.4 lb. $950

**PV-4860**
Same as above except without bar code programming; S-VHS. 9.9 lb. $630

**PHILIPS VR6885 Digital S-VHS VCR**
Super VHS Hi-Fi VCR with digital video effects, including stereo, twin-screen multi-speed, and still TV-picture memory. Features 4 video heads; PIP, TV in TV allows an external TV to be displayed on the screen; 16-screen channel display; digital auto mode; MTS/SAP, bar code; on-screen digital programming; 155-channel, digital quartz tuner with auto set; index/address search, auto tracking search, channel-separation search, still TV picture memory. Features >400 lines of resolution, on-screen programmable tuner and display; 8-event/3-week timer; multi-speed shuttle play with picture and jet search; index search; 155-channel, digital quartz tuner with auto set; digital direct-drive cylinder and capstan. Audio: dynamic range >90 dB, FR 20-20,000 Hz, W&F <0.005% wms. 17 x 4 x 14/4 in. 12 lb. $1,499

**NEC DS8000U**

Minolta MV-160S

**MITSUBISHI**

**HS-U80 Digital S-VHS VCR**
Super VHS Hi-Fi VCR with freeze frame, slow motion, still frame, variable slow motion, and frame advance digital video effects. Features 4 video heads; HQ: CCD NR; twin digital tracking, still frame, variable slow motion and frame advance: 3-speed visual search with lock; search-by-time and skip search; auto front loading with rapid start transport; 155-channel, channel memory scan-tuning; channel memory scan tuning; channel programming; channel digital quartz-controlled, random-access tuner; 181-channel, cable-compatible, frequency-synthesis tuner, auto-cancelling of programmed recording, on-screen remote programming; 8-event/1-month timer; on-screen display: resolution >400 lines, edit switch, video mute, dubbing output, high-speed address/index search; insert edit and fine edit; auto programmable channel-memory scan tuning; on-screen menus: 1-touch recording, MTS; manual/auto recording level control; transient recovery; circuit; gold output jacks. 43/4 x 16/4 x 15 in. 17 lb. $999

**NEC**

**DS8000U**

Minolta MV-160S

**PHILIPS**

**VR6885 Digital S-VHS VCR**
Super VHS Hi-Fi VCR with digital video effects, including stereo, twin-screen multi-speed, and still TV-picture memory. Features 4 video heads; PIP, TV in TV allows an external TV to be displayed on the screen; 16-screen channel display; digital auto mode; MTS/SAP, bar code; on-screen digital programming; 155-channel, digital quartz tuner with auto set; index/address search, auto tracking search, channel-separation search, still TV picture memory. Features >400 lines of resolution, on-screen programmable tuner and display; 8-event/3-week timer; multi-speed shuttle play with picture and jet search; index search; 155-channel, digital quartz tuner with auto set; digital direct-drive cylinder and capstan. Audio: dynamic range >90 dB, FR 20-20,000 Hz, W&F <0.005% wms. 17 x 31/4 x 13/8 in. 11 lb. $1,499
VHS Hi-Fi VCR featuring HQ, 4 double-azimuth heads; direct-drive head drum and capstan; still, slow, frame advance; 2x play, digital slow tracking; transition editing; on-screen function displays: line-input selection; index search; real-time counter; MTS; audio dubbing, 152-channel quartz frequency-synthesis tuner with auto program scan; 8-event/1-month timer; 1-touch record with standby; 35-function remote.

Audio: S/N >70 dB, FR 20-20,000 Hz, dynamic range >90 dB. 0.47% THD. 15% x 344 x 14 in; 11.9 lb $1,050

Model 44 VHS VCR
VHS Hi-Fi VCR featuring 4 double-azimuth video heads; HQ; more than 400 lines of horizontal resolution; multi-channel search; 8-event/3-week timer; on-screen programming; index search; real-time counter; picture search; jet search; MTS; 140-channel, cable-compatible, frequency-synthesis tuner; 59-function remote (may be used with any Pioneer SR audio or video products); manual record level control with audio level meter. $1,500

VHS Hi-Fi VCR featuring MTS/SAP, 4 double-azimuth heads; HQ; dynamic range >80 dB, 0.4% THD. 3% x 14 x 14 in; 16.3 lb $1,299

VR640HF S-VHS VCR
Super VHS Hi-Fi VCR with jitter-free field-still effects, including 2-speed picture search, stop action, frame advance, and variable-speed slow motion. Features 4 double-azimuth video heads; resolution >400 lines, MTS/SAP decoder; index search; remote programming with on-screen display; wireless remote; 120-channel, quartz-controlled tuner with auto programming; maximum recording time 8 hours. Audio: FR 20-20,000 Hz, dynamic range >80 dB, 0.4% THD. 3% x 14 x 14 in; 15.6 lb $999

VR695HF Digital S-VHS VCR
Super VHS Hi-Fi VCR featuring MTS/SAP; 4 double-azimuth heads, direct-drive cylinder and capstan motors. Audio: dynamic range >80 dB, 0.4% THD. 3% x 14 x 14 in; 13.6 lb $699

VR45485 VHS VCR
VHS Hi-Fi VCR featuring MTS/SAP, 4 double-azimuth heads; 155-channel, quartz-controlled tuner with auto program; high dynamic memory, on-screen programming; 4-event/1-month calendar/timer; 43-function remote; A/V noise muting; stand-by one-touch recording, high-speed picture search with lock; digital playback; ECD digital filter; HQ circuitry, direct-drive cylinder and capstan motors. 12% x 34 x 11 in; 8.8 lb $540

VR45655 VHS VCR
VHS Hi-Fi VCR featuring HQ, 4 double-azimuth heads; direct-drive head drum and capstan; still, slow, frame advance; 2x play, digital slow tracking; transition editing; on-screen function displays: line-input selection; index search; real-time counter; MTS; audio dubbing, 152-channel quartz frequency-synthesis tuner with auto program scan; 8-event/1-month timer; 1-touch record with standby; 35-function remote.

Audio: S/N >70 dB, FR 20-20,000 Hz, dynamic range >90 dB. 0.47% THD. 15% x 344 x 14 in $1,050

Pioneer VH-930SD Digital S-VHS VCR
Super VHS Hi-Fi VCR with digital video effects, including PIP, multi-pix, freeze with recall, mosaic and post-effect. Jitter-free still effects: 2-speed picture search, stop action, frame advance, variable-speed slow motion. Features 4 double-azimuth video heads; resolution >400 lines; MTS/SAP decoder; index search; remote programming with on-screen display; on-screen tape timer, wireless remote; master tracking, 167-channel, quartz-controlled tuner with auto programming; A/V dub; maximum recording time 8 hours; 8-event/1-year timer with remote programming. Audio: FR 20-20,000 Hz, dynamic range >80 dB, 0.4% THD. 3% x 14 x 14 in; 16.3 lb $1,299

RCA VR695HF Digital S-VHS VCR
Super VHS Hi-Fi VCR with digital video effects, including PIP, multi-pix, freeze with recall, mosaic and post-effect. Jitter-free still effects: 2-speed picture search, stop action, frame advance, variable-speed slow motion. Features 4 double-azimuth video heads; resolution >400 lines; MTS/SAP decoder; index search; remote programming with on-screen display; wireless remote; 120-channel, quartz-controlled tuner with auto programming; maximum recording time 8 hours. Audio: FR 20-20,000 Hz, dynamic range >80 dB, 0.4% THD. 3% x 14 x 14 in; 16.3 lb $1,299

VR8310 VHS VCR
VHS Hi-Fi VCR featuring MTS; 122-channel tuner, HQ, 6-event/1-year timer; on-screen display: quick-touch record; 4 video heads; still; slow motion playback, quick play mode; cue and review picture search in SP and SLP; memory rewind $1,500

VR7500F VHS VCR
VHS Hi-Fi VCR featuring HQ, 4 double-azimuth heads; HQ; 6-event/1-year timer; on-screen display: quick-touch record; 4 video heads; still; slow motion playback, quick play mode; cue and review picture search in SP and SLP; memory rewind $1,500

VHR9500 Digital VHS VCR
VHS Hi-Fi VCR with HQ, 4 double-azimuth video heads; pause, still, frame advance, variable speed motion. Features remote control, 4 video heads; HQ; 6-event/1-year timer; on-screen display; quick-touch record; 4 video heads; still; slow motion playback, quick play mode; cue and review picture search in SP and SLP; memory rewind $1,500

Sanyo VHR9500
VHS Hi-Fi VCR featuring HQ; MTS/SAP decoder; 4-event/2-week timer; on-screen display; quick-touch record; 4 video heads; still; slow motion playback, quick play mode; cue and review picture search in SP and SLP; memory rewind $1,500

VHS Hi-Fi VCR featuring 4 double-azimuth video heads: pause, still, frame advance, variable slow motion and quick-play modes; 6-event/3-week timer; 122-channel, frequency-synthesis tuner; 29-function remote, on-screen programming; auto channel programming; quick timer recording; direct-access tuning with remote; channel scan function; MTS/dbs decoder; CCD dropout compensation and noise cancellation circuitry; 2-speed cue and review; linear time counter; auto operation. SV 48 dB (video), 80 dB (audio) $500

Sharp VC-HS975U VHS VCR
VHS Hi-Fi VCR featuring 4 double-azimuth video heads: multi-function on-screen display, including PIP, mosaic, solarization, multi-still, multi-strobe. Slow motion, freeze frame, and frame advance. Features remote control, 4 video heads; HQ; 6-event/1-year timer; on-screen display; quick-touch record; 4 video heads; still; slow motion playback, quick play mode; cue and review picture search in SP and SLP; memory rewind $1,500

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**Sharp VC-1H857U**

**SONY**

**EDV-9500 ED Beta PCM VCR**
ED Beta Hi-Fi VCR with 500 lines of resolution and PCM digital audio processor. Features metal tape compatibility, Tilted Sendust Sputtered (TSS) video heads; tape stabilizer; 12-segment peak level meter; freeze-frame, 1/4x slow motion; flash motion with 6-step speed control; stop motion; scan frame; frame-by-frame advance, dual flying erase heads; 5-second pre-roll capability with sync adjustment control; 8-segment assemble editing; auto insert editing, linear time counter and frame counter; audio dubbing: jog, shuffle dial; remote allows operation of 8mm and Betamax, tab marker indexing, 18-channel, quartz-PLL cable-compatible tuner; 45-function remote; 155-channel digital quartz tuner; 45-function display; maximum recording time 8 hours. Video resolution 60 dB. Video: S/N 45 dB. Audio: Dynamic range >80 dB, FR 20-20,000 Hz, W/F <0.005% wrms. $1,950

**EDV-7500 ED Beta PCM VCR**
ED Beta Hi-Fi VCR with 500 lines of resolution and PCM digital audio processor. Features metal tape compatibility, tape stabilizer; 12-segment peak level meter; freeze-frame, 1/4x slow motion; flash motion with 6-step speed control; stop motion; scan frame; recall; flying-erase head, shuffle edit, synchro edit; remote with 10-key direct access, channel selection; 149-channel, quartz-locked, frequency-synthesis, compatible tuner; 6-event/1-week timer; FL multi-display, full auto operation. Beta Hi-Fi Dynamic range >90 dB, FR 20-20,000 Hz, W/F <0.005% wrms. Beta Hi-Fi off, S/N >40 dB, FR 50-10,000 Hz. $1,590

**EV-8500 8mm PCM VCR**
Tascam 8mm VCR with PCM digital audio dubbing. Features 4-hour video recording; flying-erase head; index search with 99 program access. MTS decoder; compatible-camera tuner; 6-event/3-week timer. $599

**SL-VHF360 Super Beta VCR**
Super Beta Hi-Fi VCR with Betascan high-speed search. Features B-1 playback speed; pause; freeze-frame, color and sharpness switch; 149-channel compatible-Express Tuning system: 1-event/1-week timer; linear time counter; counter/lock button; auto rewind, play, power-on/play, eject; stereo headphone jack with adjustable level: RMT-156 Remote Commander. Video: s/n >45 dB, Hi-fi audio: Dynamic range >80 dB, FR 20-20,000 Hz, W/F <0.005%. $1,590

**Sylvania VC4070AT**
Sylvania Hi-Fi VCR featuring 4 video heads. Remote on-screen programming; 8-event/1-month timer; 135-channel digital quartz tuner; 45-function remote; index search; on-screen function displays; MTS/SAP decoder; skip search; real-time counter; auto scan tuning; 1-touch recording with standby; time stamp; auto track. $1,195

**Sylvania VC4074AT VHS VCR**
VHS Hi-Fi VCR featuring 4 video heads; MTS/SAP decoder; on-screen display; 5-function remote; 2-track, 2-event/1-month timer; 135-channel, cable-compatible tuner; power-on/play, rewind, eject; 2-step search. $1,000

**TEAC MV-550 VHS VCR**
VHS Hi-Fi VCR featuring 4 heads, MTS/SAP decoder; on-screen display; 32-function remote; 4-digit electronic tape counter with memory function; auto power-on/off, auto playback/rewind; auto eject; 2-step search. $1,100

**Toshiba**
**SV-970 Digital S-VHS VCR**
Super VHS Hi-Fi VCR with digital special effects, including PIP, freeze frame, multi still, variable speed search, channel search, strobe, mosaic, color art, and zoom. Features 4 double-azimuth heads; HQ circuitry; MTS decoder; 138-channel, frequency-synthesis tuner; 8-event/2-week timer; color on-screen programming; resolution 400 lines; index search; 50-function remote. Audio: Dynamic range 90 dB, FR 20-20,000 Hz, W/F <0.005% wrms. $1,300
Hi-Fi Videocassette Recorders

**YAMAHA**

**YV-1110S Digital S-VHS VCR**

Super VHS Hi-Fi VCR with digital special effects, including PIP, 2-picture display. TV in TV (reverse and shift), picture and jetcue, still picture, and frame advance. Features 4 video and 2 audio heads; manual record-level control; 140-channel, PLL frequency-synthesis tuner; MTS decoder with dbx; 3-speed slow motion.

**YV-1110S**

HQ: editing control; program timer; 8-event/3-week timer; on-screen display and programming; segment recording; delayed segment recording; real-time counter; counter search; index search. 10-key remote control with Yamaha TV's; headphone jack with volume. 17 x 33/4 x 141/4 in; 22.7 lb. $1,099

**M-HF845 VHS VCR with Graphic EQ**

VHS Hi-Fi VCR featuring 4-band graphic equalizer with FI display; spectrum analyzer. 10-key random access tuning; HQ color on-screen programming; MTS/SAP decoder; 4 double-azimuth video heads; 155-channel, cable-compatible frequency-synthesis tuner; 8-event/2-week timer; flying-erase head; synchro edit; full-load/quick access; linear time counter; index search. $1,000

**M-9485 VHS VCR**

VHS Hi-Fi VCR featuring 4 double-azimuth video heads; 122-channel, cable-compatible frequency-synthesis tuner; MTS/SAP decoder; full-load system; tape-remaining counter; color on-screen programming; 8-event/2-week timer; HQ linear time counter; 10-key random access tuning. $649

**M-P200 VHS Videocassette Player**

VHS Hi-Fi player that does not record. Features 9-function remote; audio level meter; HQ with edit mode; 2-speed picture search; 2-speed slow motion; headphone jack with adjustable level; auto power-on; rewind, and play; picture sharpness control. $399

**VECTOR RESEARCH**

V-6040 Digital VHS VCR

VHS Hi-Fi VCR with digital special effects, including freeze frame and jitter-free slow motion. Features MTS decoder with dbx; 124-channel PLL frequency-synthesis tuner; color on-screen programming; index search; linear time counter; direct-access transport; HQ circuitry. Maximum recording time 8 hours. Audio: FR 100-20,000 Hz. Dynamic range >90 dB, W&F <0.008% wrms, channel separation >60 dB, THD <0.8% at 1 kHz. Maximum recording time 8 hours. 17x x 33/4 x 13 in. $1,149

**ZENITH**

**VRE550HF S-VHS VCR**

Super VHS Hi-Fi VCR featuring 157-channel cable compatible quartz tuner; resolution >720 lines; 4 double-azimuth video heads and 2 audio heads; still, slow motion, and speed search; MTS decoder; HQ with luminance and chrominance NR; comb filter, 8-event/2-week timer; on-screen programming, index search; real-time counter; intro search; dual-function remote compatible with many Zenith TV's; 5-speed slow motion; double-speed play with muted sound; auto programming; silent blue screen on non-broadcast channels; forward and reverse picture search lock; flying-erase head, insert edit, audio dubbing, mic input, edit switch, and camera pause. Video: S/N >43 dB. Audio: S/N >40 dB. FR 10-14,000 Hz. Hi-fi audio: FR 20-10,000 Hz. Dynamic range >90 dB, WAF <0.008% wrms, channel separation >60 dB, THD <0.8% at 1 kHz. Maximum recording time 8 hours. 17x x 33/4 x 13 in. $1,000

Toshiba DX-900

**YAMAHA**

**TV-6019HF VHS VCR**

VHS Hi-Fi VCR featuring 157-channel, cable compatible quartz tuner; HQ with luminance and chrominance NR; MTS decoder; 5-speed slow motion; dual-function remote compatible with many Zenith TV's; 4-event/2-week on-screen programming; auto hi-fi linear switching during playback; real-time counter; index search, instant record; blue screen replacement of non-broadcast channels; next function memory, double speed play with muted sound, forward and reverse picture speed search; comb filter, 4 double-azimuth video heads and 2 audio heads. Video: S/N >43 dB. Audio: S/N >45 dB. FR 100-10,000 Hz. Hi-fi audio: FR 20-20,000 Hz. Dynamic range >80 dB, WAF <0.008% wrms, channel separation >60 dB, THD <0.8% at 1kHz. Maximum recording time 8 hours. 17x x 33/4 x 13 in. $649

**DIRECTORY OF MANUFACTURERS**

<table>
<thead>
<tr>
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<td>1150 Feehanville Dr., Mt. Prospect, IL 60056</td>
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<td>Canon</td>
<td>1 Canon Plaza, Lake Success, NY 11042-1113</td>
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**BEST RECORDINGS OF THE MONTH**

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

**THE POWER OF EMMYLOU HARRIS**

**EMMYLOU HARRIS**, the godmother of the New Traditionalists, has had a spotty time of it on the record charts ever since divorcing her longtime producer, Brian Ahern, and moving to Nashville several years ago. "The Ballad of Sally Rose," her concept album about a country singer, and "Trio," her collaboration with Dolly Parton and Linda Ronstadt, were critically and commercially successful. But her last solo album, "Angel Band," a collection of acoustic gospel songs, was a tough sell, and the one before that, "Thirteen," lived up to her usual high standards without plowing new ground.

The word Harris uses to characterize her new album, "Bluebird," is "experimental." And while she has difficulty calling it a straightforward country record, she doesn't see it as being far off from a lot of other things she's done, either. All in all, she's right.

Produced by Harris and Richard Bennett, who picked the thick-as-steel-cables six-string on Steve Earle's "Guitar Town," the album differs from Harris's other efforts mainly in its deft manipulation of sound and texture. Largely an acoustic work, with Bennett's distinctive electric lead standing above the instrumental bed like big, shivery goosebumps, the backing often resembles a tapestry of woven sound. In No Regrets, the Tom Rush song Harris has carted around since her hardscrabble folk days, she and Bennett meld the soft jangle of a twelve-string acoustic guitar, the resounding thump of an upright electric bass, an electric slide guitar, and the heavenly background vocals of Pam Rose and Mary Ann Kennedy. The otherworldly Kate and Anna McGarrigle come on board for a wash of background sound in a couple of songs, the soulful Bonnie Raitt joins in on another, and If You Were a Bluebird, the Butch Hancock song that rounds out the album, features a four-piece mandolin orchestra, producing a tremolo effect that lovingly underscores the shimmering, ethereal quality inherent in the song.

From presentations such as these it is clear that Harris is as concerned with the beauty and power of the instrumentals as she is with the punch of the lyrics. She is also in exceptional voice here, which is most apparent in John Hiatt's remarkable Icy Blue Heart, where she easily moves from one end of her register to another in a dynamic explosion of romantic tension and conflict. She is nearly as good in A River for Him, one of her rare flirtations with solo songwriting.

If other songs in the album seem like odd choices (Johnny Cash's I Still Miss Someone, the old country chestnut Lonely Street), it may be that Harris picked the songs in this hodgepodge of country, bluegrass, and ballad as much for what they say about a woman's existence as for their musical merit. As always, she is concerned with the spiritual side of love, and the ten selections find her wrestling with the full cycle of love: a woman hopeful, a woman consumed, a woman betrayed, wounded, and finally resolved and hopeful again, stronger for her ordeal. In a way, "Bluebird" is a metaphor for Emmylou Harris's life and career—a career that continues to be surprising, thrilling, and ultimately rewarding. **Alanna Nash**

DOHNÁNYI CONDUCTS SCHUMANN

Schumann’s orchestrations have sometimes been criticized for being opaque, but you’d never know it from the new London recordings of his First and Second Symphonies made in the clear and brilliant ambience of Cleveland’s Masonic Auditorium with the Cleveland Orchestra conducted by Christoph von Dohnányi. The opening of the Spring Symphony sounds forth with splendid urGENCY, and the main body of the first movement is full of rhythmic vitality as well as a lyricism that Dohnányi never allows to become self-indulgent. Tenderness and a natural flow characterize his treatment of the slow movement, the scherzo has a fine solidity, and there’s a jaunty feel to the finale. Exposition repeats are observed in the outer movements.

While the performance of the Second Symphony is a fine one, it could stand a shade more warmth and body in the bass line, especially in the slow introduction and in the scherzo. Nonetheless, the first-movement allegro (with repeat) fully conveys the curiously manic quality inherent in its rhythmic drive. The scherzo finds the Cleveland players at their alert and brilliant best; the purity of the melodic line is admirably preserved throughout, and the little fugato interlude is made to sound more vital than usual. The finale has enormous tension, but also a passionate singing quality that keeps the music from lapsing into hysteria. The recorded sound is superb in both performances. Highly recommended.

David Hall


LOU REED’S ANGRY “NEW YORK”

A

NOTHER year, another good Lou Reed album. Ho-hum, right? Well, not really. Reed’s latest effort, “New York,” is actually rather different from anything he’s ever done. It’s a protest album, a cry in the wilderness, and one of the angriest blasts of rock-and-roll memory. It is also the best-sounding Lou Reed record ever.

The instrumentation in “New York,” co-produced by Reed and drummer Fred Maher, is straight ahead—two guitars, bass, and drums—and the sound is big, bassy, and right in your face, as if the band were jamming at top volume in your living room. This is, of course, Lou Reed as nature intended, and while it’s the kind of thing that fans have been clamoring for for years, the explicitly topical, political cast of most of the songs is probably going to throw people for a loop, especially when you consider how much of Reed’s music has always seemed to be autobiographical or confessional.

On the other hand, the personal is ultimately political, as Reed doubtless realizes, and the odd thing is that “New York,” in its blunt, outspoken way, is one of the most overtly “poetic” pieces of writing the man has ever done. Still, you probably won’t notice the felicitous literary touches (Last Great American Whale, for example, is one of the best extended metaphors that ever masqueraded as a rock-and-roll song) as much as you’ll notice the bravado with which Reed spits out the bitter lines of Dirty Blvd. or the way Reed and Mike Rathe’s guitars careen through There Is No Time, an ironic salute to the end of the Age of Reagan.

Of course, not everything is bile and vitriol. Halloween Parade, for example, Reed’s meditation on what the AIDS epidemic has done to his friends, tempers its justifiable anger with characteristic humor and tenderness. And Beginning of a Great Adventure, a warped fantasy about becoming a parent that’s set to an amusing beatnik-jazzbo background, is fairly sneaky about its politics: “I’d be as progressive as I could possibly be,” Reed sings, “as long as I didn’t have to try too much.”

Still, at heart “New York” is a jeremiad, a howl of outrage at a society that the artist sees as indifferent at best and cruelly venal at worst, backed with music that strikes a carefully considered balance between tunefulness and white noise. It is also Lou Reed operating somewhere near the peak of his post-Velvet Underground form, as abrasive and (sometimes) scary as the city he backhandedly celebrates. Don’t miss it.

Steve Simels

LOU REED: New York. Lou Reed (vocals, guitar); Dion DiMucci (vocals); Mike Rathe (guitar); Rob Wasserman (bass), Fred Maher, Maureen Tucker (drums). Romeo Had Juliette; Halloween Parade; Dirty Blvd.; Endless Cycle; There Is No Time; Last Great American Whale; Beginning of a Great Adventure; Busload of Faith; Sick of You; Hold On; Good Evening Mr. Waldheim; Xmas in February; Strawman; Dime Store Mystery. SIRE 25829-1, ©25829-4, ©25829-2 (56 min).

Lou Reed: political
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EVGENY KISSIN’S DEBUT

THE first release in RCA Victor’s new program of recording Soviet musicians introduces the young pianist Evgeny Kissin in the Rachmaninoff Piano Concerto No. 2, with the London Symphony Orchestra under Valery Gergiev, and six of the Études-tableaux from the same composer’s Op. 39. No need to hedge about this, or to exaggerate, or to make allowances: Kissin, who was all of sixteen when he recorded these performances last May, is not only the most exciting teenage virtuoso to appear since Anne-Sophie Mutter started recording violin concerts with Karajan, but one of the most impressive pianists of any age to come along in decades. If this recording is truly representative, he is a master musician of astounding maturity and depth.

While Kissin looks even younger than sixteen in the cover photograph, it is not youthful exuberance that characterizes his playing but the most profound and assured response to what Rachmaninoff created. He is not demonstrating technique, he is making music. It’s as simple as that, and as wonderful. It’s the kind of playing that endeared Artur Rubinstein to us—unfussily communicative, unvaryingly tasteful, with both power and poetry in abundance and in ideal balance—and Kissin perhaps already has a keener sense of unobtrusive discipline. Every note is beautifully shaped, every phrase individually weighted, yet never in a way that calls undue attention to the process itself or impedes momentum. At every point the music goes forward with the sweep and spontaneity that insure the most vibrant “live” quality, but with the subtle control that keeps it from running away from itself. Kissin is not content to skate on a lovely surface; he seems to be guided by an instinctive judgment in avoiding both understatement and excess in responding to the emotional qualities in Rachmaninoff’s music, so that there is not the slightest hint of caricature. Forget about his youth, and forget about “pianism.” This is music making of ageless quality, with enough conviction, compassion, and eloquence to inspire new respect for the sometimes battered old Concerto No. 2 and remind us that it can be an elegant work, after all, as well as a colorful one.

The orchestral contribution is adequate, though not on the same level. Gergiev seems to be a considerate partner but a rather pedestrian conductor, and the orchestra is less vividly recorded than the piano, too. In the Études-tableaux, of course, Kissin has the stage entirely to himself, and he relishes every one of them with the same unselfconscious mixture of seriousness, authority, and delighted discovery that is so compelling in the concerto performance. Can Kissin play Mozart, Beethoven, Chopin, Debussy, and Schumann this convincingly? It is intriguing to think about where his other sympathies may lie, and whether he will have the courage, the confidence, and the plain good luck to maintain and extend the phenomenal qualities so abundantly evident here. In the meantime, this is quite a debut. Even with the less than stunning orchestral playing, it strikes me as one of the three or four most persuasive accounts of the well-loved concerto to be recorded since Rachmaninoff’s own with Stokowski.

Richard Freed

RACHMANINOFF: Piano Concerto No. 2, in C Minor, Op. 18. Études-tableaux, Op. 39: No. 1, in C Minor; No. 2, in A Minor; No. 4, in B Minor; No. 5, in E-flat Minor; No. 6, in A Minor; No. 9, in D Major. Evgeny Kissin (piano); London Symphony Orchestra, Valery Gergiev, cond. RCA © 7982-4-RC, © 7982-2-RC (60 min).

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Discs and tapes reviewed by Robert Ackart, Richard Freed, David Hall, Stoddard Lincoln, Eric Salzman, and David Patrick Stearns

BEETHOVEN: Symphony No. 3, in E-flat Major ("Eroica"). Orchestra of the 18th Century, Frans Brüggen cond. PHILIPS © 422 052-4, © 422 052-2 (49 min).

Performance: Often insightful
Recording: Anemic

Today an "authentic-instrument" performance of Beethoven's Eroica is no longer a rarity. There are at least four such recordings available, and this one would have my top recommendation had it come out a little earlier. Frans Brüggen leads a fleet, spirited performance in which Beethoven's dissonances seem as shocking as they must have seemed to early-nineteenth-century ears. Next to the Hanover Band's Eroica conducted by Roy Goodman on Nimbus, however, this one really sounds a bit thin.

Brüggen's interpretation is marginally more daring than Goodman's. His tempos are surprisingly slow considering the quick decay time of the early instruments, and he sometimes tends to pull the tempo back a bit to make a rhetorical point. I also like the collage effects he obtains with a clear juxtaposition of the different sections of the orchestra. But the Hanover Band has a much fuller, more interesting sound even though it has only three more players than Brüggen's group. The Philips recording is really a concert recording, and there is no chance that it might flatter the orchestra, and the playing time, at just over forty-nine minutes, is rather stingy for a CD. D.P.S.

BRUCKNER: Symphony No. 4, in E-flat Major ("Romantic"). Staatskapelle Dresden, Giuseppe Sinopoli cond. DEUTSCHE GRAMMOPHON © 423 677-4, © 423 677-2 (67 min).

Performance: Colorful
Recording: Very spacious

What Giuseppe Sinopoli and the great Dresden orchestra give Bruckner's Romantic Symphony here is not your basic dyed-in-the-wool Austro-Germanic treatment. Using the Nowak edition, Sinopoli evokes a fascination with the fantasy world Villa-Lobos created just for this music, or the music written in anticipation of it.

The sound quality itself, aside from the unflawed well-judged balance, tends perhaps more toward mellowness than brilliance (the recordings are from analog originals of unspecified date), but it seems just right for this material—as pointedly so in the intimate realizations of No. 6, for flute and bassoon alone, as in the pieces for full orchestra. An extraordinary set. Richard Freed

VILLA-LOBOS: Bachianas brasileiras, Nos. 1-9. Nelson Freire (piano); Leila Guimaraes (soprano); Norton Morozowicz (flute); Noël L. Devos (bassoon); Symphony Orchestra of Brazil, Isaac Karabtchevsky cond. SIGLA/QUALITON IMPORTS © VG 662 600 208 three CD's (175 min).

LISTENERS certainly don't have to be Finnish to love Sibelius's music, or Czech to love Dvořák's, but there are instances in which national identity on a performer's part can be invaluable. The new Sigla CD set of Heitor Villa-Lobos's nine Bachianas brasileiras, with the Symphony Orchestra of Brazil under its conductor of many years, Isaac Karabtchevsky, makes a powerful argument for the notion of ingrained authority and commitment on the part of performers who have the music in their blood—or, if you prefer, in their bones. These Brazilian musicians would seem to have the Bachianas in their blood, bones, lungs, fingertips—and most certainly in their hearts.

Since Karabtchevsky and his orchestra had recorded the Bachianas No. 4 for a series of records issued by the Organization of American States, I had some grounds for high expectations, but I could not have imagined how thoroughly persuasive they would be in the entire cycle. In every phrase of every movement of every one of the Bachianas there is an effortless and irresistible evocation of the fantasy world Villa-Lobos created by commingling native sources and Bachian forms. I went through the set from one work to the next expecting the inevitable drop in intensity and fluency—but it didn't happen; the remarkable level is maintained for nearly three hours of music.

You have to do some digging to find the names of the soloists, which turn up only with the recording credits on the back of the insert booklet. The pianist in the concerto-like Bachianas No. 3 turns out to be Nelson Freire, who is very much attuned to the music's essence. In No. 5, the best known of the Bachianas and very likely the best loved of all Villa-Lobos's works, the wonderful Brazilian soprano Leila Guimaraes is so deep inside the piece that there is no point in making comparisons with other performances. It's not just a matter of her singing in her native language and a familiar idiom; it's as if that delicious voice—rich and creamy and incredibly luminous—had been created just for this music, or the music written in anticipation of it.

Soprano Leila Guimaraes

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Hans Fantel

Handel's ever-popular masque Acis and Galatea has never really sounded like much on record until now. Sir Adrian Boult's recording, reissued on London, is a stylistic nightmare despite its attractive cast, and John Eliot Gardiner's authentic-instrument recording on Deutsche Grammophon sounds anemic and precious. But within the first few minutes of this performance, it's clear that Acis has finally received a worthy recording.

Johannes Somary contends that the choruses should be sung by soloists, one to a part. Whatever the musicalological merits of this contention, the results in this case make perfect sense to the ear in a way that previous Baroque recordings using this approach have not. There's an unaffected airiness about the performance, with its woody-sounding recorders in place of the usual flutes, and other, more transparent touches from the authentic instruments. All of the singers are winning, too, especially Julianne Baird as Acis, whose stylistic scrupulousness sometimes robs her of the music. But his interaction with the orchestra is assuredly enjoyable as well as a grow-

...tion. Sinopoli takes a more volatile and colorful view than usual of the opening movement. For me, it works just fine as an alternative approach. He imbues the slow movement with a high degree of atmosphere so that it emerges as a sort of nocturnal procession, and he exploits the resplendent Dresden horns and Wagner tubas to produce a sure-fire scherzo. The finale, which can seem overly long for its substance, gets a highly charged reading, with huge dynamic contrasts and some magnificent outbursts from the full string body. This may not be an interpretation for the ultrapurist, but dramatically effective it surely is, and the acoustics of the Lucas-kirche contribute brilliant, spacious sound to match.

D.H.


Performance: Atty

Recording: Radiant

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PISTON: Piano Sonata; Piano Quintet; Improvisation; Passacaglia. Leonard Hokanson (piano); Portland String Quartet. NORTHEASTERN @ NR 232-CD (47 min).

Performance: Committed

Recording: Excellent

The Incredible Flutist has been Walter Piston's Sorcerer's Apprentice: We hardly ever get to hear anything else of his, even the symphonies or the highly regarded Concertino for Piano and Orchestra. The Piano Sonata, Improvisation, and Passacaglia on this disc constitute his entire output for solo piano.

The sonata, composed in Paris in 1926, was withheld from publication. Perhaps Piston felt it owed too obvious a debt to the music of both Debussy and Ravel. As an ensemble, the vocalists are occasionally too labored and heavy for such delicate music, and their approaches to ornamentation are not consistent. Somary sometimes seems content to let style carry the piece rather than find memorable insights into the music, but that should not deflect one from a new Newport Classic recording. It may be some time before we get another Acis and Galatea as charming as this one is.

D.P.S.

PART: Passio. Michael George (bass), Jesus; John Potter (baritone), Pilate; solo quartet; Western Wind Chamber Choir, Hilliard Ensemble. Paul Hillier cond. ECM @ 837 109-1, @ 837 109-2 (71 min).

Performance: Divine boredom

Recording: Very good

Estonian-born composer Arvo Pärt is a kind of closet minimalist who has enjoyed an underground following in this country as well as a growing reputation in Europe. His work is very static, mystical, and sorrowful in an Eastern European sort of way. Passio, a setting of the Passion According to St. John, is clearly a deeply felt work, composed in an almost continuous sort of vocal keening that is medieval in sound. The writing is exquisitely beautiful and unbearably sad, and nothing ever happens. It makes for a long, intense, blank seventy minutes.

E.S.
RACHMANINOFF: Piano Concerto No. 2; Etudes-tableaux (see Best of the Month, page 84)

ROSSINI: Les Soirées musicales. June Anderson (soprano); Raul Gimenez (tenor); Kathryn Bouleyn (soprano); Alessandro Corbelli (baritone); Nina Walker (piano). NIMBUS OD 5132 (48 min).

Performance: Delightful
Recording: Fine

This record really belongs to June Anderson, who turns in splendid performances of five of the songs and is joined by Kathryn Bouleyn for two duets and Raul Gimenez for one. Anderson’s voice is a sharply focused, silvery, and wonderfully expressive instrument. Her feeling for Rossini’s vocal idiom is dead on, with a clarity of line and a sense of portamento that so well becomes these florid melodies. Her interpretation of La partenza is moving in its simplicity, and the sparkle of her coloratura in La pasarella dell’Alp is a sheer delight. Gimenez is appropriately swaggering in L’orgia and turns in a rousing performance of the ever-popular La danza. Bouleyn and Alessandro Corbelli make important contributions as partners in the various duets, in which the ensemble is precise and nicely balanced. Nina Walker, the pianist for these festivities, deserves special recognition for her stylish introductions and sensitive accompaniments. All in all, this is charming music, delightfully sung.

D. SCARLATTI: Sonatas: E Major, K. 495; E Major, K. 381; E Major, K. 20; E Minor, K. 394; G Major, K. 454; G Major, K. 425; D Major, K. 491; D Minor, K. 32; A Major, K. 342; A Minor, K. 109; A Major, K. 39; G Major, K. 125; G Major, K. 470; G Major, K. 124; G Major, K. 79; G Major, K. 547; B-flat Major, K. 551; B-flat Major, K. 128. Maria Tipo (piano). EMI/ANGEL CDC-49078-2 (75 min).

Performance: Excellent
Recording: Excellent

Many of us first discovered Maria Tipo in her earlier recordings of Scarlatti sonatas, on imported Italian 10”s, about twenty years ago. Her playing of this music seemed so persuasive as to transcend any questions regarding the type of instrument, and so it does in this new collection. While now and then, as in K. 394, she achieves a secco quality that reminds us that these sonatas were written for the harpsichord, she most often demonstrates how gracefully the music adapts to the full-blooded possibilities of the modern piano. It is all enlivening in the very best sense, music making of subtlety and depth as well as considerable charm, in a sequence artfully chosen for its effective contrasts. Nobody does this better than Tipo, or indeed as well, and the recording is just about ideal in its presence and warmth.


Performance: Intense
Recording: Very good

This installment of Riccardo Muti’s Vienna Philharmonic Schubert-symphony cycle is a decided improvement interpretively over his earlier reading of the Great C Major. He gives the opening of the Tragic Symphony considerable emotional weight, but it can take it. The main allegro is deliberate in pace but not heavy-handed, and though the slow movement is on the brisk side and the chromatically convoluted minuet a mite foursquare, the finale is effectively fevered. Exposition repeats are observed in both the first and last movements.

The real prize on this disc is the so-called “little” C Major. Muti imparts to

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<td>Sennheiser HD540 Open ear design for big boss sound</td>
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<tr>
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- **CLOSEOUT**

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the first movement an engaging drive and makes the most of the amusing Rossinian coda. In the scherzo he exploits every opportunity for dynamic contrast with razor-sharp attacks. The finale is a swift affair, sparkling all the way. First-rate sound and superb orchestral execution throughout. D.H.

SCHUMANN: Symphony No. 1, in B-Flat Major; Symphony No. 2, in C Minor (see Best of the Month, page 82)


Performance: Refined
Recording: First-rate

Joshua Bell plays both of these well-worn concertos with a good deal of refinement as well as technical assurance. He and Vladimir Ashkenazy are in thorough accord in their approach, which is expansive enough to let the music breathe, controlled enough to make any meandering or indulgence out of the question. The splendid Cleveland Orchestra is in fine shape, and the sound is first-rate, with the soloist and orchestra really well balanced for once. There may be other recordings of the Tchaikovsky with more flair and excitement, but none of either work. I think, that is more musically sound. If this particular juxtaposition of titles appeals to you, you will find this a very satisfying package. R.F.

TCHAIKOVSKY: Eugene Onegin. Thomas Allen (baritone), Onegin; Mirella Freni (soprano), Tatyana; Neil Shicoff (tenor), Lensky; Anne Sofie von Otter (mezzo-soprano), Olga; Paata Burchuladze (bass), Prince Gremin; Michel Senechal (tenor), Triquet; others. Rundfunkchor Leipzig; Staatskapelle Dresden, James Levine cond. DEUTSCHE GRAMMOPHON © 423 959-2 2WO CDs (149 min).

Performance: Beautiful
Recording: Exceptionally fine

No composer created more subjectively than Tchaikovsky did, and no single work from his canon is more personal than Eugene Onegin. Like the composer himself, each important figure in the opera seeks and fails to attain personal serenity and fulfillment. The libretto tells of recognizable people with whom we can readily empathize, and once we understand that the honor code of the time not only permitted but obliged dueling, the action of the opera becomes totally comprehensible and, almost like that of Greek tragedy, inevitable and devastating.

In the splendid new Deutsche Grammophon recording, Mirella Freni fully captures the tremulous courage, loneliness, and need of Tatyana and conveys the girl's vulnerability in limpid, effortless singing, beautifully phrased and inflected. She is surely the most affecting Tatyana before the public today. The outgoing, fun-loving, and thoughtless Olga of Anne Sofie von Otter provides a telling contrast to her sister's introspective character.

Thomas Allen's full, vibrant baritone suits the role of Onegin admirably, he reminds one of the late George London in this part. one of the American baritone's finest creations. Allen evokes the spoiled cynicism of the protagonist with unusual effectiveness (you want to throttle him after his put-down of Tatyana in Act 1, Scene 3), and he moves through the arrogance of the party scene and the tragic waste of the duel to emerge, in Act 3, wiser, disillusioned, and utterly alone. This is a total conception of the role, and Allen projects it admirably.

As Lensky, Neil Shicoff employs his expressive lyric tenor to good advantage. There is a quality of sincerity and believability in every performance by this fine artist; here, he conveys the full extent of Lensky's idealistic love for Olga, together with his possessiveness and jealousy, as well as his strong devotion to Onegin. As Prince Gremin, Paata Burchuladze imparts the warmth and reverence felt by the older man for Tatyana, his much younger wife.

Another Onegin is currently available, conducted by Georg Solti on London Records with Teresa Kubik and Bernd Weikl. The London set, too, offers an exceptional performance, but I find Freni's voice more beautiful and more expressive than Kubik's, Allen's more cutting and therefore more characteristic than Weikl's.

So integrated is the new recording that it is impossible to select a "star," but certainly James Levine merits high commendation. His molding of the score is such that many nuances are heard afresh, and his exciting sense of orchestral coloration greatly enhances the performance throughout. R.A.

VAUGHAN WILLIAMS: Fantasia on a Theme by Thomas Tallis; Fantasia on Greensleeves; The Lark Ascending: Five Variants of "Dives and Lazarus." José-Luis Garcia (violin), William Bennett (flute), English Chamber Orchestra, Yehudi Menuhin cond. ARABESQUE © ABQ6568, © Z6568 (46 min).

Performance: Conscientious
Recording: Bright and clear

This beguiling Vaughan Williams collection features a fine solo performance by flutist William Bennett in a tender reading of the familiar Greensleeves and exquisite solo violin work by José-Luis Garcia in the ethereal The Lark Ascending. And in the Five Variants of "Dives and Lazarus," Yehudi Menuhin and the ECO flawlessly capture the music's ruminative, inward-directed character. The only disappointment is the noble Tallis Fantasia. I have always reacted negatively to inflated, overly passionate interpretations of this work, but Menuhin seems to have gone too far in the other direction—his reading seems a bit chilly. The recording that best captures the essence of the music, as well as the multiple perspectives of the two string bodies and solo quartet, is the one by the English String Orchestra under William Boughton on Nimbus. The Arabesque sonics are clean and bright throughout, but also just a bit on the cool side. D.H.

COLLECTION

Performance: Literal
Recording: Fine

Viktoria Mullova is unquestionably a first-class violinist. (Anyone who even thinks about recording a program as varied and challenging as this one would have to be either a technical whiz or utterly crazy.) She is also a scrupulous musician, as is shown by her carefully terraced dynamics in the Bach partita. Unfortunately, she isn't a particularly interesting musician. As an artist, Mullova isn't exactly prosaic: Her performances have too much heat for that. But even that heat cools off a bit in the Bartók sonata. One hears a violinist coming to terms with a lot of notes but not with Bartók's musical ideas, particularly compared with Nigel Kennedy's more sweeping, dramatic performance on Angel. I like the plainspoken sense of searching Mullova captures in this third movement, but her harmonies are a bit raspy, and the final movement lacks the exotic Hungarian tang of Yehudi Menuhin's authoritative EMI recording. Mullova seems most at home in the Paganini, where she shows a playfulness that's rather engaging. But it's too little, too late. D.P.S.
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COWBOY JUNKIES: The Trinity Session. Cowboy Junkies (vocals and instruments); instrumental accompaniment. Mining for Gold, Misguided Angel, Blue Moon Revisited (Song for Elvis); I’m So Lonesome I Could Cry; and eight others. RCA 8568-1-R, © 8568-1-R, © 8568-2-R (53 min).

Performance: Eccentric
Recording: Substandard to good

On my first spin through this offbeat collection, when I listened attentively, the hour seemed to stretch into weeks, the weeks into months. The second time, when I played it as background music, things went down quite nicely. Cowboy Junkies is a Canadian quartet consisting of lead singer Margo Timmons, her brothers Michael on guitar and Peter on drums, and Alan Anton on bass, and they recorded this highly subdued collection in a Toronto church, hence the album’s title. As for the name of the band, I don’t know about their personal habits, but cowboys they are not, despite their description of the album as “an exploration of country music.”

Margo’s voice, soft and whispery but still intense as a laser, floats above and beneath the melody of such standards as Hank Williams’s I’m So Lonesome I Could Cry, Waylon Jennings’s Dreaming My Dreams with You, and Patsy Cline’s Walking after Midnight. This effect—with no one supplying the true melody, I might add—is either mad-dening and eventually coma-inducing, or intriguing and even mesmerizing, depending on whether you listen full-tilt or have it on mainly to dull the noise of something else. The second half of the album is particularly beautiful, with some serious instrumental moments, and it seems to be the most consistent work, but on a song-for-song basis it is their finest. Along the way, the Dublin-based group’s Scottish leader, Mike Scott, appears to have found a companionable muse in Irish folk music.

For the most part, the first half of the program is a series of instrumental numbers that build over droning guitar chords as Scott unburdens himself of some troubling thoughts about individual concerns (When Will We Be Lovers) or the plight of the world at large (Strange Boat). A barnstorming number with Dylan-esque imagery, World Party (not to be confused with the band of the same name formed by ex-Waterboy Karl Wallinger) carries Scott’s kitchen-sink approach toward arrangements to a breathless climax with horns, congas, and a choir.

But then the album shifts into a Celtic trance as Scott and company fearlessly tackle a Van Morrison number, Sweet Thing. Scott scats his way into dream-time with the same driven passion as the song’s title (Celtic Soul Brother No. 1), a song linked to the same drive. It is a song built over droning guitar chords as Scott unburdens himself of some troubling thoughts about individual concerns (We Will Not Be Lovers) or the plight of the world at large (Strange Boat). A barnstorming number with Dylan-esque imagery, World Party (not to be confused with the band of the same name formed by ex-Waterboy Karl Wallinger) carries Scott’s kitchen-sink approach toward arrangements to a breathless climax with horns, congas, and a choir.

The Waterboys (vocals and instruments); folk-acoustic, string-oriented sound. Their first album since 1985’s This Is the Sea, it was drawn from three years’ worth of sessions. It may not be their most consistent work, but on a song-for-song basis it is their finest. Along the way, the Dublin-based group’s Scottish leader, Mike Scott, appears to have found a companionable muse in Irish folk music.

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THE WATERBOYS: Fisherman’s Blues. The Waterboys (vocals and instrumentals); vocal and instrumental accompaniment. Fisherman’s Blues; We Will Not Be Lovers; Strange Boat; World Party; Sweet Thing; And a Bang on the Ear; Has Anybody Here Seen Hank?, is a honky-tonk weeper sung with a Scottish burr—talk about cultural cross-pollination!

In the past Scott has reached to make grand statements, and there’s some of that in “Fisherman’s Blues,” too. But it strikes me that When Ye Go Away, the finest song he’s ever written, is also one of the simplest. The reverberations are quietly haunting, much like Joni Mitchell’s timeless Urge for Going. All in all, there’s a lot of fine music in “Fisherman’s Blues,” but the most fascinating aspect of the album is witnessing a good artist evolving into a great one.

Parke Puterbaugh
Til Tuesday: Everything's Different Now. Aimee Mann (vocals, guitars); Michael Hausman (drums); vocal and instrumental accompaniment. Everything's Different Now; Rip in Heaven; Why Must I; J for Jules; (Believed You Were) Lucky; Limits to Love; Long Gone (Buddy); The Other End (Of the Telescope); Crash and Burn; How Can You Give Up. Epic OE 44041, © OET 44041, © EK 44041 (39 min).

Recording: Very good

Performance: A class act

It hardly seems like twenty years since Roberta Flack defined the mood of a war-weary generation with her debut album, "First Take," released regularly during the Seventies, including her unforgettable duet with the late Donny Hathaway in Where Is the Love in 1972. Her rare combination of passion and restraint, her dreamy, transfixed quality with a touch of gospel vitality, said something special to us. But as the Eighties progressed, she seemed to fade away. We haven't heard from her since 1983, when the album she made with Peabo Bryson yielded the hit "Tonight, I Celebrate My Love." But "Oasis," her new solo album, marks a triumphant return and reflects Flack's decision to speak to a new generation in its own language. That means there's a lot of production here, compared to the lean, sparse quality that distinguished her best earlier work. At times, this seems to obscure one of her strengths, the ability to convey a sense of intimacy, but in spite of all the clutter, her voice shines through with genuine ebullience and reaffirming joy.

Although the title song has caught on, there's rather less to it. I think, than the lean, spare quality that distinguished her best earlier work. At times, this seems to obscure one of her strengths, the ability to convey a sense of intimacy, but in spite of all the clutter, her voice shines through with genuine ebullience and reaffirming joy.

The songs never truly deliver, although several, including a quirky cover of Lou Reed's "Sweet Jane," make vague promises before they quietly tiptoe away. Still, there's something going on beneath this mountain of subtlety.

Crosby, Stills, Nash, and Young: American Dream. Crosby, Stills, Nash and Young (vocals and instrumentals); instrumental accompaniment. American Dream; Got It Made; Name of Love; Don't Say Goodbye; This Old House; Nighttime for the Generals; Shadowland; and seven others. Atlantic 81888-1, © 81888-4, © 81888-2 (56 min).

Recording: Pretty dull

Performance: Good

Well, it's not slick. Inoffensive, bland, and forgettable, yes. But slick? Naah. Which means that this latest effort from the newly reformed CSNY is at least consistent, because if you go back and listen to their earliest efforts you might be surprised at how roughhewn they actually sound.

Of course, you might also be surprised at how much they sound like actual human beings with honest-to-God feelings, which in "American Dream" they don't, particularly. They sound here like a bunch of competent professionals without much of interest to say or a compelling reason to say it (including Neil Young, who we can only hope is saving his good stuff for a future solo album). To be fair, there are occasional moments of minor interest. The title song, for example, sets the Jim and Tammy Bakker story to a modified Motown groove, and "Name of Love," with its signature guitar solo from Neil Young, does indeed sound—superficially—like vintage CSNY. The rest of the album, sadly, just sort of wafts by you, and only the deepening of David Crosby's tenor is likely to distract anybody who's doing the dishes and listening to this set at the same time. Like I said, at least it isn't slick.

ROBERTA FLACK: Oasis. Roberta Flack (vocals); vocal and instrumental accompaniment. Oasis; All Caught Up in Love; Uh-Uh Ooh-Ooh Look Out (Here It Comes); Shock to My System; You Who Brought Me Love; Something Magic; and five others. Atlantic 81916-1, © 81916-4, © 81916-2 (49 min).

Recording: Very good

It's a class act.

His words have a sadly ironic ring now, especially as sung by Mann in this context. Despite the highly charged emotional content, the songs are not lachrymose. Mann is a terrific songwriter, marrying incisive lyrics to brisk, mint-fresh melodies. On the subject of love and disappointment, "Everything's Different Now" is as eloquent as it is frank.

Parke Puterbaugh

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Parke Puterbaugh
EMMYLOU HARRIS: sings with an edge of longing in her lisch and Siedah Garrett, which Flack the sweet side there's the shimmering Ooh -Ooh Look Out (Here It Comes). Best of the Month, page 81)

AL JARREAU: Heart's Horizon. Al Jarreau (vocals); vocal and instrumental accompaniment. All or Nothing at All, So Good; All of My Love; Pleasure over Pain; Yo' Jeans; Way to Your Heart; and six others. REPRISE 25778-1, © 25778-4, © 25778-2 (50 min).

Performance: Dazzling Recording: Excellent

With this album, Al Jarreau comes full circle, working once again with George Duke, the composer-keyboardist-producer with whom he performed during his formative years in West Coast jazz clubs. Since then, both have moved decidedly into pop, but this collaboration shows how they have adapted their sophisticated sense of harmony and musical texture to popular tastes. The result is a dazzling album of brilliantly produced songs.

Jarreau is assertive and sure-footed as he makes his way through a wide-ranging set. He's funky in All or Nothing at All, rakish in the driving 10K Hi. He brings gospel to Killer Love, complete with a rousing back-up chorus. He shifts to a Michael Jackson groove in Way to Your Heart, and by setting out the lyrics to a frenetic beat, but eases into tropical mellowness on the Brazilian-flavored One Way. Jarreau is also a superb balladeer, as heard here in the sweetly intimate More Love, the haunting Pleasure over Pain, and the sensitive Heart's Horizon. One track of special interest is his playful but brief a cappella duet with Bobby McFerrin, Yo' Jeans. But everything Jarreau attempts in "Heart's Horizon" is so fully realized that it should leave both old and new fans smiling with satisfaction.

R.H.

MIKE AND THE MECHANICS: The Living Years. Mike and the Mechanics (vocals and instrumentals). Nobody's Perfect; The Living Years; Seeing Is Believing; Nobody Knows; Poor Boy Down; and five others. ATLANTIC 81923-1, © 81923-4, © 81923-2 (47 min).

Performance: Enervating Recording: Fair

Mike and the Mechanics has become a bassman's holiday for guitarist Mike Rutherford whenever Genesis goes on vacation. For a second job it hasn't worked out too badly; the group's previous album launched a pair of hits in All I Need Is a Miracle and Silent Running. Though he's not a flashy or assertive personality, Rutherford is a smooth professional who can line up all the elements—strong vocals, assured production, solid material—in a way that virtually guarantees some measure of success. (Multiply such punch-the-clock cunning by three, and you've got a supergroup called Genesis.)

Some intangible ingredient, however, is lacking in "The Living Years," resulting in a tedious stew of keyboard-dominated progressive rock. Paul Carrack and Paul Young do their best to breathe some soul into the vocals, but the whole generation (for Cats in Vienna, Cabaret in Paris, two Kurt Weill concerts in New York, and more). This new recording gives an exciting taste of what all the shouting is about, even if it doesn't exactly live up to the liner's hype about Leper spurning "the popular throaty, declamatory 'Brechtian way' of singing Weill's songs in favor of "something new and fresh" and "destined to reach a new generation of listeners."

Riveting Performance: No. With both old and new fans smiling with satisfaction.

R.H.

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force of their personality, their enviable
grace and intonation, and the familial
hand-in-glove authority of their vocal
blend. The duo scores points, also,
by somehow avoiding the slightly incestu-
ous vapors that billow up when other
male-female family members get to-
gether to sing about love and lust.

Producer Steve Roberts, who discov-
ered the Sanders a decade ago when
they were playing the forty-ninth state's
rough-and-tumble bars, provides crisp,
uncluttered backing and achieves ex-
ceptional separation of the instruments.
Best of all, he keeps the album country,
yet modern, and he shows his good taste
in selecting David Schnauffer and Herb
McCullough's lovely Starry Lullaby,
which gets my vote as the theme song of
A.N.

SIMPLY RED: A New Flame. Simply
Red (vocals and instrumentalists); vocal
and instrumental accompaniment. It's
Only Love: You've Got it; To Be with
You; More; Turn It Up; and five others.
ELEKTRA 60828-1, ©60828-4, © 60828-
2 (41 min).

Performance: Soul par excellence
Recording: Fine

Vocalist Mick Hucknall of the British
group Simply Red knows that when it
comes to soul, what you leave out is as
important as what you put in. There's
not one superfluous note in this lean,
cleanly produced album of love songs.
The way Hucknall contains his voice is
a considerable part of his talent: You
never doubt that there's plenty of power
in reserve, and when he chooses to let it
loose, the results are therefore all the
more thrilling.

Vocal arrangements are the focus of
"A New Flame." Hucknall and his
back-up singers exploit the dynamics
range of their voices in stirring ways.
In More they rise from a whisper to a full-
throated fortissimo, pouring on the in-
tensity to illustrate a mounting desire
for physical closeness. All the way
through "A New Flame" Hucknall
courts eroticism, though in a much less
ribald way than, say, Prince. In other
words, he doesn't talk dirty, although
he does spell out his agenda: "I want to be
with you/Talk to you/Sleep with you/
Make love to you," he implores in To
Be with You.

The musicians in Simply Red are self-
less and unobtrusive, staying out of the
limelight for the sake of the song. Gen-
erally, keyboards block out the chords
and drums tap out a pulse, with the
remaining instruments providing sup-
port and coloration. The group's lack of
ego and abundance of emotion indicate
that they have both an intellectual and
an intuitive grasp of what soul is all about.
"A New Flame" doesn't deliver any knockout punches, but it will gradu-
ally grow on you until you can't get it
out of your head—and believe me, you
won't want to.

JAZZ

JAZZ, '84—HIGHLIGHTS FROM
THE NINTH MOSCOW JAZZ FES-
TIVAL. Novosibirsk Jazz Orchestra;
M. Yuldybayev's Stardust Ensemble;
Leonid Vintskevich, others. Stardust;
Manteca; 1 Got Rhythm; Embraceable
You; Free Jazz Dialogue; Festival Blues;
and seven others. MOBILE FIDELITY ©
MFCD 894 (68 min).

Performance: Western
Recording: Fine remote

We all know that Russia is changing.
These days, the nightly network news
broadcasts are fond of showing us pis-
zas in Red Square and rock in Riga.
They have also done jazz-invades-Rus-
sia bits, one of which featured a visit by
saxophonist Grover Washington, Jr.—a
bad choice, especially when you hear
what the Russians themselves are capa-
bale of producing. And if you think all
the changes have occurred in the past
couple of years, listen to this recording
from the 1984 Moscow Jazz Festival,
the ninth such event.

Licensed from Melodiya, this CD fea-
tures some of the U.S.S.R.'s most ac-
complished jazz musicians and com-
poser/arrangers, and it reflects a diversi-
ity of styles ranging from Dixieland to
fusion. There is also an impressive dose
of originality in this nearly seventy-
minute offering. Pianist Leonid Vints-
kevich's Fragment from an Improvisa-
tion on a Song from Russia's Central
Region, for instance, is not only a
mouthful but also an earful, with a high
NPM (notes per minute) count. Then there is The Bells Were Pealing in Nov-
gorod by the V. Konovaltsev Chamber
Jazz Orchestra, a Russian folk song giv-
en a Cannonball Adderley touch. These
are clearly not the expressions of artists
who have been sheltered from jazz.
We send Grover Washington to Russia and,
so far, the Russians have paid us back
in kind by sending us inferior groups,
but let's hope some of the truly talented
artists heard in this album will also be
heard in the U.S. in person.

STANLEY JORDAN: Flying Home.
Stanley Jordan (guitar); instrumental
accompaniment. Street Talk; Tropical
Storm; The Music's Gonna Change;
Can't Sit Down; and five others. EMI
MANHATTAN E4-48682, © E4-48682.
E2-48682 (47 min).

Performance: Boring
Recording: Good

Sad to say, it looks as if jazz fans can
chuck up yet another loss to pop, at least
judging by this latest Stanley Jordan
album. Jordan can make his guitar sing,
but in "Flying Home" he falls back on
easy-listening clichés that slip in one ear
and out the other. I think it's a terrible
waste of talent—there has to be a better
way for Jordan to make money in the
music business.

MEL LEWIS: Naturally! Mel Lewis
Jazz Orchestra (instrumentalists). Cherry
Juice: My Centennial; Easy Living;
and three others. TELARC © CD-83301
(46 min).

Performance: Promise
Recording: Very good

MEL LEWIS: Soft Lights and Hot
Music. Mel Lewis Jazz Orchestra (in-
strumentalis). Compensation; Off the
Cuff; The Touch of Your Lips; Lester
Left Town; It Could Happen to You;
and four others. MUSICMASTERS ©
CJJD 60172F (65 min).

Performance: Fulfillment
Recording: Very good

A mainstay at New York's Village Van-
guard for twenty-two years, the Mel
Lewis Jazz Orchestra continues to keep
the big-band spirit alive. Formerly
known as the Thad Jones–Mel Lewis
Orchestra, the band draws on New
York session men for manpower and on
its remaining leader for sheer drive.
"Naturally," was the 1979 recording de-
but of a new edition of the band. It's a
fine but, as running time on CD's goes
these days, fairly skimpy set devoted to
compositions and arrangements by the
late co-leader, Thad Jones, who had left
to pursue a separate career. "Soft Lights
and Hot Music" features more familiar
material recorded nine years later, by
which time Lewis's sole leadership was
firmly established and the band had an
identity of its own. Both recordings are
all-digital, both reflect the precision and
team spirit that has always marked this
band, and both contain a wealth of fine
solos. My preference, however, is for
"Soft Lights and Hot Music," a more
ecclectic set that offers riper solos and
sensibly avoids lingering spotlights on
the leader's drums. Best to acquire both
sets.

Mel Lewis: team spirit

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The image contains a classified section of a newspaper or magazine. It includes various ads and listings, some of which are highlighted in red text. The content is too detailed to transcribe completely, but it appears to include listings for audio equipment, records, and other items for sale or wanted. The listings are organized by category, such as needles and cartridges, compact discs, and general classifieds. There are also advertisements for companies and services, such as audio repair and installation services. The text is too small and crowded to transcribe accurately. The overall layout is typical of classified sections found in newspapers or magazines, with items listed in a tabular format and details provided for each listing.
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by Christie Barter & Ron Givens

Outstanding among the sizable crop of Soviet musicians recently signed by RCA Victor is Vladimir Spivakov, who is music director of the highly regarded chamber ensemble that calls itself the Moscow Virtuosi, and who is himself an internationally acclaimed virtuoso violinist. The exclusive, long-term contract Spivakov and the group signed with RCA calls for a total of eighteen recordings, which, according to RCA, represents "the most extensive collaboration of Soviet musicians with a Western recording company to date."

The first two recordings will be released this summer and fall. One is an all-Shostakovich album containing the composer's First Piano Concerto, the Chamber Symphony, and six of the twenty-four piano preludes in orchestral transcriptions. The other disc is an all-Haydn one, with the C Major Violin Concerto, the D Major Piano Concerto, and the B-flat Major Sinfonia Concertante. The piano soloist on both discs is young Evgeny Kissin, whose first record under the new RCA contract is among the Best of the Month for April.

Spivakov is in this country right now, appearing as soloist with the Dallas Symphony and in a recital with Paul Ostronsky in St. Paul, Minnesota. He returns for a solo engagement in New York's Mostly Mozart Festival this summer and will lead the Moscow Virtuosi on a country-wide tour this fall.

Etta James is definitely on a roll. She performs Jimmy Reed's Baby What You Want Me To Do in the Columbia Records album derived from the new film Tap, and she's featured in the just-released Capitol soundtrack of Roofops, singing Avenue D with Dave Stewart of the Eurythmics. There's also an Avenue D video in which they both appear (Stewart wrote the song). James's latest album of flat-out blues and rau-cous soul, "Seven-Year Itch," was released by Island last fall, her first in seven years, and Chess has recently reissued a two-record set of material she recorded in the Sixties and early Seventies. And, for those who consider the re-recorded Etta too tame, she's been belting it out live in concerts around the country.

It's been eleven years since Dion DiMucci last rocked out, and that's why the release of his new Arista album, "Yo Frankie," is a special occasion. Dion recorded a gospel record two years ago, but his last secular LP, "The Return of the Wanderer," came out in 1978. The new release, produced by Dave Edmunds, includes new songs by Dion, such as King of the New York Streets and Loving You Is Killing Me, as well as a cover version of a Tom Waits tune, Serenade. Dion and Edmunds share guitar duty, and there are background vocals by Lou Reed, who early this year inducted Dion into the Rock and Roll Hall of Fame in ceremonies at New York's Waldorf-Astoria Hotel.

Dion: rocking out

IKE Evita and, more recently, Chess, Maury Yeston's new musical Goya—A Life in Song, starring Placido Domingo, will be marketed as a record album well ahead of its Broadway run in 1990. It's just been released on Columbia Records, as well as CBS Masterworks, CBS Discos, and the new Sony Records label in Japan. It was preceded, too, by three versions, released as singles, of the show's love theme, Til I Loved You—one by Barbra Streisand and Don Johnson, another by Domingo and Dionne Warwick, and yet another, in Spanish, by Domingo and Gloria Estefan.

Yeston, you may remember, was the composer of a Tony Award winner, the musical Nine, also recorded by CBS. His new show, he'd want you to remember, is related only in subject matter—the Spanish painter Francisco Goya (1746-1828)—to the Gian Carlo Menotti opera Goya, produced by the Washington (D.C.) Opera in 1986, also starring Placido Domingo. The opera was never recorded.

Evver since embarking on a solo career in the early Eighties, Robyn Hitchcock has been an alternative-rock favorite. The British singer-guitarist has won a devoted following on the college scene with his eccentric style, but now, with his ninth solo album (his second for A&M), "Queen Elvis," he seems poised to break through to a larger audience. His regular band, the Egyptians, plays on the record, as does R.E.M.'s guitarist Peter Buck. Not so coincidentally, Hitchcock will soon be an opening act for R.E.M. on a U.S. concert tour.

Hitchock: breaking through

When Soviet pianist Vladimir Viardo returns to this country in April, he should be pleased to see first copies of the recording of Rachmaninoff's Third Piano Concerto he made last fall.
with Eduardo Mata and the Dallas Symphony for Pro Arte. This trip the 1973 Van Cliburn Competition winner is back for recitals in Texas and at Carnegie Hall in New York.

A LTHOUGH winds of political change recently removed Daniel Barenboim from his position as artistic director of the new, yet-to-open Bastille Opera in Paris, it appears that his future in the world of opera is anything but bleak. Erato, the independent label based in the French capital, has taken him on to record the three Mozart operas with librettos by Lorenzo Da Ponte. The recording sessions, which will involve the services of the Berlin Philharmonic and RIAS Chamber Chorus, are scheduled to take place over a three-year period beginning with Così fan tutte in November. The Marriage of Figaro will be recorded in May 1990 and Don Giovanni in April 1991, the Mozart Year (the two hundredth anniversary of the composer’s death).

Barenboim has conducted these works many times over the past six years, notably in Paris, Tel Aviv, and Washington, D.C., but these will be his and the Berlin Philharmonic’s first recordings of them.

Barenboim’s influence on the cultural life of Paris will be further diminished at the end of the current season when he (voluntarily) steps down as music director of the Orchestre de Paris, which he brought to the U.S. in February on a valedictory tour. But he’s covered on that score too. He is set to succeed Sir Georg Solti in 1991 as music director of the Chicago Symphony, and there is talk that he might just conduct the Mozart–Da Ponte cycle with that orchestra as well.

W HEN Nickolas Ashford and Valerie Simpson put out an album, they can always rely on the help of two top songwriters: themselves. They’re the authors of such hits as Ray Charles’s “Let’s Go Get Stoned,” Marvin Gaye and Tammi Terrell’s “ Ain’t No Love” and at Carnegie Hall in New York.

M ANY of today’s techniques of filming and telecasting classical music events were developed under the guidance of the Media Department of the Lincoln Center for the Performing Arts in New York. A prominent showcase of its work has been the Live from Lincoln Center series on PBS, programs from which are being released, for the first time on videocassette, by Paramount Home Video. The first three, due in stores by mid-April, are The Barber of Seville performed by the New York City Opera with Beverley Sills, making her home-video debut; “An Evening with Danny Kaye and the New York Philharmonic”; and American Ballet Theatre’s Giselle, with Natalia Makarova and Mikhail Baryshnikov. Available in stores in Beta and VHS formats at $29.95 each, they can also be ordered by phone, toll free: (800) 445-3800, operator 863.

T HE new album by German singer Ute Lemper, “Ute Lemper Sings Kurt Weill,” inaugurates an ambitious project being undertaken by London/Decca to record all of Weill’s major stage works over the next few years.

Lemper comes to this project, at age twenty-five, with some impressive theatrical credits. She made her stage debut in a Viennese production of Cats, she was subsequently hailed in Berlin for her performances as Peter Pan, and she won a Molière Award (the French equivalent of Broadway’s Tony) for her portrayal of Sally Bowles in a Parisian production of Cabaret. Her current commitment to London/Decca includes leading roles in recordings of Weill’s The Threepenny Opera, which she taped last year, Happy End and Marie Galante, scheduled for later this year; and The Seven Deadly Sins in 1990. The conductor in all three is John Mauceri.

G RACENOTES Saxophonist David Murray’s “Ming’s Samba” on Portrait is his first solo album for a major U.S. label... Nearly all of the albums recorded by the singer-songwriter Tim Buckley, who died in 1975, will be reissued by either Enigma or Elektra in the next few months... Pink Floyd’s latest album, “Delicate Sound of Thunder,” was requested by cosmonaut A. A. Serebrov to accompany him on the Soyuz 7 during the first French-Soviet joint space mission this winter... Andrew Lloyd Webber’s new musical, Aspects of Love, will have its London premiere on April 12.
THE OHM/WALSH DRIVER

YEARS ago, a visionary named Lincoln Walsh took a look at loudspeakers and perceived the obvious: that an impulse originating at the center of a speaker cone (the voice-coil region) is not going to influence the outlying areas of the cone immediately. There will be a brief delay before they get involved in the process of pushing and pulling air, and that delay, inevitable with a cone that is not infinitely stiff, makes for complex acoustical interference. Even though the center and the suburbs may ultimately say the same thing, their doing it at significantly different times creates a garbage that, at its worst, is referred to as cone breakup.

One mark of engineering genius is being able to take a liability and turn it into an advantage. Walsh thought that if a cone was deliberately designed to break up in a tightly controlled fashion, some good things might result. Specifically, he thought of impulses that traveled from voice coil to surround in concentric ripples. The rate at which they traveled would be controlled by the cone material they were passing through, and if the slope of the cone (its included angle) was properly coordinated with the rest of the design, a wavefront that was perfectly coherent (without interference) would emerge.

The first commercial realization of Walsh's concept was the Ohm A, a very large box with a megaphone (the driver) placed mouth-down upon it. The cone of the driver, as implemented by Martin Gersten after Walsh died, was composed of successive rings of titanium, aluminum, and a paper-like material. It had to be hand-tuned, and much of that tuning was necessarily done by ear. At its best, a well-tuned Ohm A fulfilled Walsh's expectations, producing a vertically cylindrical wavefront that expanded into the listening space like an exploding beer can. It was not at all omnidirectional, but it was utterly nondirectional in the lateral plane. It was also grossly inefficient and at the same time quite limited in power-handling capability.

Enter John Strohbeen, a founder of the Tech Hi-Fi chain (now defunct) and obsessed devotee of audio technology. Strohbeen had direct experience at the retail level with the Ohm speakers' shortcomings, and when he took over the company from Gersten, he made improved system efficiency the priority. As Strohbeen tells the story, Gersten had been laboring to reduce the moving mass of the large diaphragm/voice-coil assembly. As he did so, he was, not surprisingly, losing bass response as well.

Strohbeen decided to turn things upside down. Let the Walsh driver be massive enough to maintain low-end response, and let what turned out to be a consequent loss in high-end sensitivity be supplemented by a tweeter. This was a daring step, because said tweeter was going to impose something on the system that Walsh had deliberately tried to avoid: lateral directivity. Yet Strohbeen elected to go ahead anyway. He was not fond of the reflected sonic images that laterally omnidirectional sound sources produce in most domestic rooms, and his wish was to make the entire system more directional. He did this by installing acoustical absorption within the grille hood surrounding the two drivers and arranging it so that the dispersion patterns of the Walsh radiator and the tweeter matched at the crossover point. Of course, he threw away some acoustical output in the bargain, but apparently not enough at critical frequencies to make a serious difference.

The cone material of the new Walsh driver employed for this application became thicker, but it didn't really become more massive in the aggregate because the Walsh principle dictated a shallower cone. The transit time of impulses from center to surround was prolonged, so that the lateral distance from center to surround had to be increased or the vertical distance between center and surround had to be decreased. As it happened, a vertical decrease, making for a smaller and less expensive package, fit into Strohbeen's marketing plans perfectly. Everything was playing right into his hands.

Thus came about the present generation of Ohm/Walsh loudspeaker systems (not to be confused with the other current Ohm products, which are rather conventional in comparison). Strohbeen makes a claim for them that is now almost a cliché, that the stereo image remains stable and satisfactory no matter what the listening position. In my experience, the Ohm/Walsh systems come at least as close to this objective as any of their competition. Unfortunately, the theory of stereo seems to preclude the full realization of such image stability. Strohbeen believes there is something in the nature of coherent sound emanation that causes the ear/brain mechanism to ignore arrival-time and amplitude cues and instead compose a sonic spatial image based on waveform integrity. It is perhaps possible that some ears and brains will do this, but it's never been shown that all are capable of it.

Neither has it really been shown that Ohm's new Walsh driver configuration, which is radically altered from previous versions, truly behaves like a Walsh device. It clearly doesn't when the tweeter takes over. I don't think there's much doubt, however, that the Ohm/Walsh system is an uncommonly fine-sounding loudspeaker.
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