

Stereo Review

MAY 1985 \$1.75

SPECIAL REPORT: CAR STEREO

HOW TO EVALUATE
YOUR CAR SYSTEM

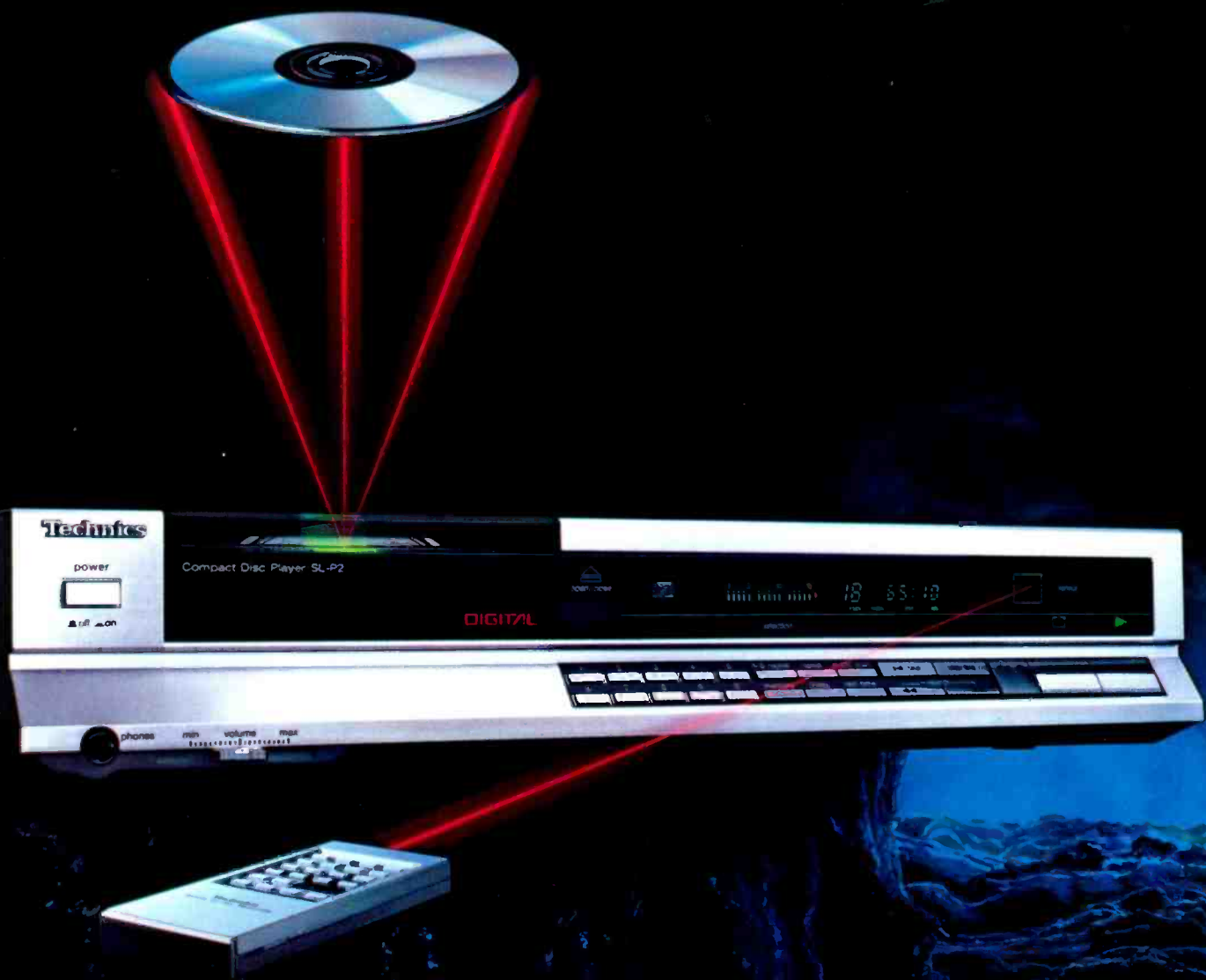
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TAPE DECKS,
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AND MORE...

EMMYLOU HARRIS

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The digital revolution continues at Technics. Perfectly.

Technics
The science of sound

CIRCLE NO. 1 ON READER SERVICE CARD

by Gordon Sell and Christie Barter

GRAMMIES WON

Media coverage of the 1985 Grammy Awards focused on such top winners as Tina Turner, Lionel Richie, and Bruce Springsteen, but less was said of the first Grammys won by two other veterans – Merle Haggard for his rendition of *That's the Way Love Goes* and David Bowie for his video *David Bowie*. John Williams got his fifteenth Grammy and Quincy Jones his sixteenth for the music they wrote and arranged for the Olympic Games. The soundtrack of the film *Amadeus* was voted best classical album, and Prokofiev's Fifth Symphony with Leonard Slatkin and the St. Louis Symphony was chosen as the year's best orchestral recording. The track for the movie version of Bizet's *Carmen* with Julia Migenes-Johnson and Placido Domingo was voted the best recording of an opera.

FLAT-SCREEN VIDEO

The old dream of a TV set that can be hung on a wall like a painting is getting closer to reality. Engineers at Matsushita (parent company of Technics, Panasonic, and Quasar) have built a 10-inch diagonal display screen that is less than four inches thick. It uses 3,000 picture cells, each with its own scanning electron beam. The company says that the technology can be scaled up to allow large-size picture tubes.

BOWIE ON CD

In addition to his first Grammy, David Bowie can lay claim to another honor – the honor of being the pop performer with the greatest number of CD titles. RCA's recent release of eight new titles from the Bowie catalog brings his CD listings to a record nineteen, seventeen of them on RCA.

NPR GOES DIGITAL

National Public Radio's new series by the St. Louis Symphony, which began in April, derives from concerts recorded digitally during the orchestra's 1984-85 season. According to NPR, these are the first concert broadcasts to use digital technology for an entire run of twenty-six weekly programs. The quality of the sound is expected to improve markedly.

MUSICAL FASHIONS

Five pop stars – Michael Jackson, Grace Jones, Prince, Tina Turner, and Madonna – shared top honors on this year's International Best Dressed List with President Reagan and Princess Diana.

TECH NOTES

On the way: a double-drive Compact Disc player that permits loading two discs at a time and playing them sequentially or alternately with a single laser pickup....

The EIA has formed a committee to investigate development of standard formats for infrared, wired, and power-line remote controls. It is hoped that this will make possible remote-control transmitters to operate multiple components from different manufacturers... Madrigal Audio Labs has bought the physical assets of Mark Levinson Audio Systems and will make the same products under the same name.

... If your singing in the shower leaves something to be desired, Sun Hill Industries is offering a watertight Radio-on-a-Rope that can be hung from the shower head.

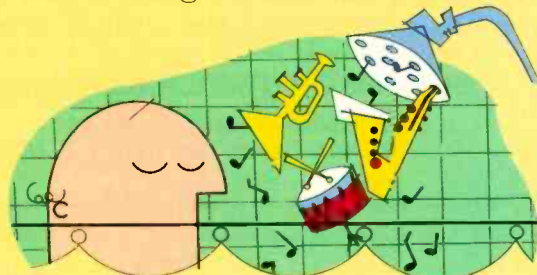
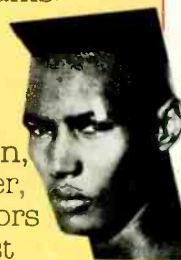


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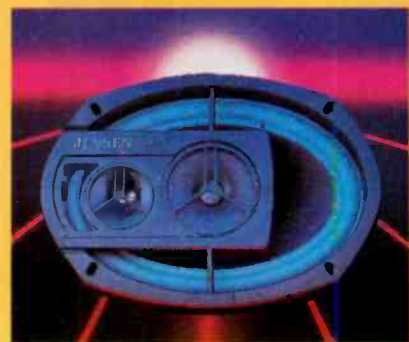
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by William Livingstone



Seated one day at the Grotrian

Value

THE habit of bargain hunting dies hard. Everybody likes to get value for the money he spends, but I sometimes think we Americans overdo it. Most of us are trained not to waste anything—Use it up/Wear it out/Make it do/Do without. I don't know whether parents are drumming such tiresome maxims into their children's heads today, but a lot of people of my generation had childhoods so blighted by parental efforts to turn them into good puritans that we grew up inhibited about spending money on ourselves.

The issue of self-indulgence is much discussed these days in articles deploring the alleged selfishness and materialism of the Yuppies. The parents of most of today's Young Urban Professionals were people who lived through the Great Depression of the 1930's. Apparently, many of those parents did not raise their children to be frugal, but encouraged them to enjoy to the fullest the material things that were unavailable during the Thirties.

I have lived long enough to learn that there is truth in the tiresome old maxim that material things do not bring happiness. But I don't think being young, urban, professional, and successful and wanting to keep fit, eat good food, and surround oneself with beautiful things necessarily means that one is devoid of spiritual values. Some of my best friends are Yuppies.

A lot of them work so hard that they have little time for shopping, and when they play, they want to do so only with the best toys. Those who are buying telescopes this year, for example, are getting expensive ones. They want to be sure to see all they can of Halley's Comet when it arrives next winter.

I've worked hard to overcome my inhibitions about spending money on luxuries. In the September 1984 issue of *Art & Auction* it helped to read art dealer David Tunick's advice to beginning print collectors: "I always advise people to buy the best they can afford, and then some."

I got similar reinforcement from pianist Curt Swidler last winter when he opened an elegant showroom in New York. Swidler is selling an extensive line of imported pianos, ranging in price from \$3,250 to \$46,500 for the company's flagship instrument, the Grotrian. "People tend to buy a piano that is just good enough for their current level of playing," Swidler says. "Those who follow my advice to buy a better one always come back to tell me that their playing has improved dramatically as a result of having a better piano."

People who consume music via hi-fi equipment often report similar improvement in their listening pleasure as a result of trading up to better equipment. In the way that pianists play better on good instruments, record collectors listen with greater acuteness if they have speakers of high quality. So, like Tunick and Swidler, I advise people to buy the best equipment they can afford and then some.

You may have read that the Compact Disc player is the favorite current toy of the Yuppies. Don't let the word "toy" mislead you. Yuppies and other innovators adopted the Compact Disc early because it provides the best potential sound quality for home and car.

And when you evaluate the stereo equipment in a car, don't hesitate to go for the best you can afford. A corollary of the modern maxim that you get what you pay for is that the top of the line may offer the best value for the money. So buying the best musical equipment may not be self-indulgence, but really bargain hunting after all. □

Stereo Review

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A few words for those who haven't experienced Sony's new Compact Disc Player.

Listen to it.



CIRCLE NO. 52 ON READER SERVICE CARD



Boy George

The March "Record Makers" kind of threw me for a loop. I can see it now: "Boy George Clones Invade the Earth." I'm still trying to put Prince's looks together with his music. As they say, "to each his own," but Boy George . . . ain't my own.

JOHN WOLNER
Minneapolis, Ind.

Art of Tape Recording

Ian Masters's "The Art of Tape Recording" in March was the most useful and well-presented article on the subject I can remember reading. Over the years I have learned the hard way most of what he explains so well. I wish I had had Masters as a teacher years ago.

JON B. OAKLEAF
Moline, Ill.

Reading "The Art of Tape Recording" was like reading my autobiography. I learned most of the techniques that Mr. Masters explains by the at times frustrating experimental method. But I also discovered an association of creative tape-recording enthusiasts with members in every part of the world. Readers who would like to pursue Mr. Masters's suggestion that there is joy in creative tape recording should request a free information packet from Worldwide Tapetalk, c/o Charles L. Towers, Secretary, 35 The Gardens, West Harrow, Middlesex, HA1 4HE, England.

BILL BAUCUM
Independence, Calif.

Zapping Peel

Mark Peel made a small error in his March review of Frank Zappa's "The Perfect Stranger" and "Them or Us" by referring, in a comment on Zappa's guitar work, to "the late Jimmy Page." If we are thinking of the same Jimmy Page (from Led Zeppelin), he is far from deceased. At present, Page and Paul Rogers from Bad Company have

teamed together to form a new band called the Firm, which has released an album and is planning a U.S. tour.

SCOTT LAMBIASE
Fairfax, Va.

Perhaps Mark Peel could acquire a degree of musical taste, which he so obviously lacks, by taking his tongue out of his cheek and licking Frank Zappa's *Sinister Footwear*. Those of us who have been Zappa fans since "Freak Out" recognize "Them or Us" as Frank's finest album in several years.

Please let Mr. Peel confine his reviews to bands like Culture Club, which he describes as "among the most pleasant, endearing pop-culture sensations . . ." and leave Frank Zappa to those who know, appreciate, and love him.

KENNETH C. KNIGHT
Powell, Tenn.

Yoko Ono

I found Mark Peel's January review of Yoko Ono's "Every Man Has a Woman" blatantly biased and irresponsible. Instead of reviewing this collection of interpretations of Ono's music, Mr. Peel wrote a personal assault on her. This "inadequate" artist, as he put it, has worked in the forefront of creative music since the early Sixties, whether with John Cage, Ornette Coleman, or John Lennon. Mr. Peel's bias is so obvious that he seems to have written the review before breaking the shrink wrap on the album. A critic is entitled to give a negative review, but a personal attack on an artist demonstrates a locker-room, towel-snapping mentality that STEREO REVIEW should avoid.

BOB BURNETT
Arlington, Va.

U2 M.P.

I have read STEREO REVIEW for five years, and I have found the best review yet in the February 1985 issue. My compliments to Mark Peel. His "Best of the Month" review of U2's "The Unforgettable Fire" has given me a better understanding of the group as well as giving them the recognition they deserve. Finally someone has paid attention to good music.

JIM BARKER
Ada, Ohio

Bouquet and Brickbat

Julian Hirsch is a patient, yet fascinating educator, and David Ranada's contribution to the February review of the Pioneer LaserDisc/CD player was masterly, with both lucid explanation and a sense of the luck-and-coincidence side of technology.

Your continuing saga of CD's vs. analog recordings is always lively; please keep it up, for it both teaches and amuses. While I'm not one of the golden-eared who can hear the difference between brown and black speaker wire, I can certainly hear the difference between Compact Discs and even "digital" or direct-to-disc analog LP's.

One complaint: *please* stop publishing features about multi-million-dollar stereo/video/bar/waterbed "systems." The "money green" system of a few issues ago is not what STEREO REVIEW ought to be about. What interests me is high-quality equipment housed cleverly, functionally, and beautifully.

DAVID W. SIGETICH
Markham, Ont.

Gallic Van Gogh

Since when is the Dutch painter Vincent van Gogh a Frenchman (March "Video V.I.P.'s")? Is Christie Barter next going to tell us that Rembrandt was an Italian?

CASE M. MANDERSLOOT
Covina, Calif.

Maybe an honorary Frenchman?

Discordant Awards

Somewhere there's a disconnect. How is it possible for both "Born in the USA" and "Purple Rain" to be given 1984 Record of the Year Awards (February issue) by STEREO REVIEW? It's incomprehensible. Might as well have Mother Theresa and Larry Flynt share an award. It really makes your judgment suspect.

STEVE KOHN
APO San Francisco, Calif.

CD Sidelights

Have you noticed the typographical error on Deutsche Grammophon's Compact Disc (400 067-2) of Mozart's Great Mass in C Minor? The trilingual disc label identifies the work as the "Grosse Messe c-moll," the "Grande Messe en ut mineur," and the "Grand Mess in c-minor." Doesn't sound that bad to me.

JIM SULLIVAN
Santa Ana, Calif.

The best thing about Compact Discs is that you can comb your hair in them.

RONALD KONOPKA
Potsdam, N.Y.

Digital Converts

Hi-fi history does indeed repeat itself. A couple of decades ago I switched from a good tube amplifier to the new Dyna-

A few words for those who have.

INTRODUCING THE THIRD GENERATION CD PLAYER THAT'S LIGHT YEARS AHEAD OF THE COMPETITION.

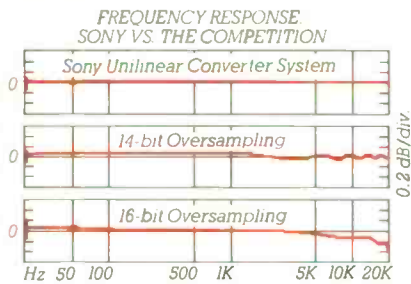
After listening to one of Sony's new third generation component CD players, you begin to realize you're hearing something not possible in any first, or even second generation player.

It's a whole new level of technological achievement not merely designed for those who appreciate great specs, but those who appreciate great music, as well.

A RESPONSE CURVE THAT ISN'T A CURVE.

All CD players are endowed with a much flatter response curve than any turntable or tape deck is capable of reproducing. Unfortunately most are also endowed with a conventional converter/filter system. Which tends to cause high frequency irregularities.

However, take the response curve of Sony's new CDP-302 (the one that's flat as a board).



As you can see, it's far more uniform than the one found in conventional models. What this should tell you is that when you listen to even the most intricate piece of music, you'll be hearing precisely what the musicians recorded. Nothing more. And nothing less.

YOU CAN'T BEAT OUR CLOCK.

Perhaps the most interesting "little" feat of engineering is Sony's new Unilinear Converter System. Its high-speed, digital-to-analog converter works by virtue of a "master clock." Using this single clock dramatically

reduces intermodulation distortion common to "multiclock" converter systems.

When you combine all this with our new, high-resolution digital filter, it results in something even the most ardent audiophile will find no fault with: incredibly flat response, remarkable phase linearity and the conspicuous absence of spurious noise caused by conventional oversampling.

Of course, you'll need a master's degree in engineering to fully understand all the intricacies of our new Unilinear Converter. But you certainly don't need one to appreciate it.

A NEW CHIP OFF THE OLD BLOCK.

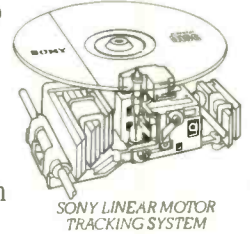
The heart of our new CD player is a thing of beauty. This award-winning microchip governs nine different functions usually requiring multiple chips in conventional players. But more importantly, it simplifies the signal path and improves reliability.

CHANGE TRACKS AT THE SPEED OF LIGHT.

Sony has done away with the lumbering gear-driven tracking mechanism, and instead, created a whole new Linear Motor Tracking System. It uses a compact laser optic assembly that's one-third the size of typical units. And its linear, noncogging motor allows the laser to move

faster and more precisely.

If you're wondering what speed has to do with these mechanisms, we'd like to remind you of the fact that it takes some CD players up to 15 seconds to go from the first to the last track on a disc. But with ours, you can go from track 1 to 99 in less than a second.



FEATURES WORTH HEARING MORE ABOUT.

Not all of these advances are audible to the naked ear.

Both of our new CD players come complete with Sony's Remote Commander[®] unit which provides direct access to up to 99 tracks or subcoded selections. In addition, both have Automatic Music Sensor[™], high-speed search and three-way repeat. (The CDP-302 shown here also allows for programmability of up to 16 of your favorite songs.)

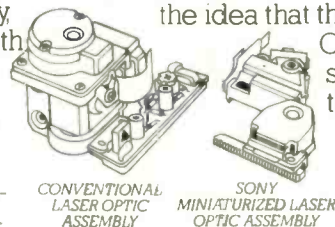
We'd also be remiss in not telling you about our built-in subcode port. Which in the not-too-distant future you can make good use of when CDs are integrated with graphic information.

By now, you're beginning to get the idea that the new line of Sony CD players not only sound remarkable, they are.

So having heard and read just about all there is to hear and read about

them, we suggest there's only one thing left to do. Go to your Sony hi-fi dealer and purchase one.

Of course, there's no rush. It will take our competition at least one or two generations to catch up.



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SONY
THE LEADER
IN DIGITAL AUDIO.™

co 120 solid-state amp. The improvements and advantages were both dramatic and impressive. Yet the doubters criticized the new "transistorized sound" at length. Of course, time has settled that dispute.

Recently I purchased a Sony D-5 Compact Disc player. Words cannot adequately describe the revolutionary advance this medium has brought to sound reproduction. I can only read with amusement the negative letters about digital audio that STEREO REVIEW publishes. Once again the critics complain of "impure" sound, this time because it's been "digitalized." It will take time to show them the way. Meanwhile, I and many others will just continue to enjoy the spectacular sound of our Compact Discs.

MARK PATTERSON
Virginia Beach, Va.

In January's "Technical Talk," Julian Hirsch, for whom I have the greatest respect, concluded that the cartridge "won" in an A/B comparison between digital and analog discs. From an engineering standpoint that may be so, but what the comparison means to audio-

philes is that for less than \$500 we can have sound from a CD player that is equal to, if not better than, that provided by high-end analog record players and cartridges together costing three to six times as much. What we'll miss with CD's is the never-ending battle to keep records clean, the nagging suspicion that our cartridge adjustments are not correct, and the inevitable hiss and rumble, no matter how soft.

I have purchased more than one hundred CD's in the three months I have owned my player. Less than 5 percent of them have been disappointing, which is a far better experience than I've had with analog records. Also, thanks to the handling convenience of CD's, my wife and I listen to our favorites four or five times as often as we do our favorite LP's. And, finally, to restate Mr. Hirsch's last point, our CD's "should go on forever."

JUDD BARBER
Augusta, Ga.

Perfect Records

Just a note to let everyone out there know that flat, quiet, on-center LP's *can*

be made. It is disgustingly easy. As a matter of fact, it's my job. I run the quality-control department at a custom pressing plant in California.

Julian Hirsch's January "Technical Talk," about a comparison between Compact Discs and Sheffield LP's, came as no surprise to me. The Sheffield LP's are pressed at my plant, and I make certain that they will give CD's a run for the money. So to all you disgruntled record buyers who are fed up with noisy, warped pressings, I say that records *can* be perfect, but they will only be as good as the company that makes them.

MARK WILLIAMS
Camarillo, Calif.

Crystal Cathedral Pipes

In the March issue there is a letter from James Edwards of Electro-Voice, who states that the E-V 30W is "still substituted for the 32-foot organ pipes at Robert Schuller's Crystal Cathedral in Garden Grove, California . . ." While it is true that the 30W is incorporated in the Cathedral's organ (the world's sixth largest), it is not a "substi-

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Pyle Industries	x856
Sansui Electronics	x857
Studer Revox	x858

Stereo Review

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LETTERS

tute" for the 32-foot pipes. There are four sets of real 32-foot pipes. In addition, there is one very soft 32-foot stop that is electronically produced. It is this stop that uses the 30W speaker, and does so very effectively.

FREDERICK SWANN
Director of Music and Organist
The Crystal Cathedral
Garden Grove, Calif.

Too Old to Write

The person that is writing "Popular Music" is obviously too ancient to even be allowed to express an opinion on modern music. Just look at Billy Squier and the legendary Twisted Sister ruthlessly cut down in the December issue! The jerk that writes these reviews is obviously hypercritical and prejudiced against modern music, especially heavy-metal rock-'n'-roll.

MATTHEW HAGNY
Gettysburg, S.D.

Our reviews in the Popular Music section are written by various critics whose names are listed at the beginning of the section. Their ages vary. The December

review of Twisted Sister's "Stay Hungry" was written by Steve Simels, and Mark Peel reviewed "Signs of Life" by Billy Squier. Both writers are known to be cranky on occasion, but neither is anywhere close to qualifying for Medicare or Social Security.

Errata

Carlo Maria Giulini's recording of Verdi's *Falstaff*, referred to in Robert Ackart's March review of Giulini's new recording of *Il Trovatore*, derived from a co-production by several opera companies, but it was not, as stated, recorded at Covent Garden. The live recording was made by the Los Angeles Philharmonic in the Dorothy Chandler Music Pavilion in Los Angeles.

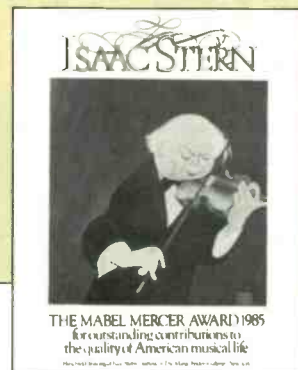
Our March test report on the JBL 250Ti speaker system incorrectly gave the price as \$3,000 per pair. The correct price is \$3,396 per pair.

In Louis Meredith's February review of the video "Asia in Asia," it was erroneously stated that John Wetton appears in the video rather than Greg Lake. It was, in fact, Lake who performed.

ISAAC STERN POSTER

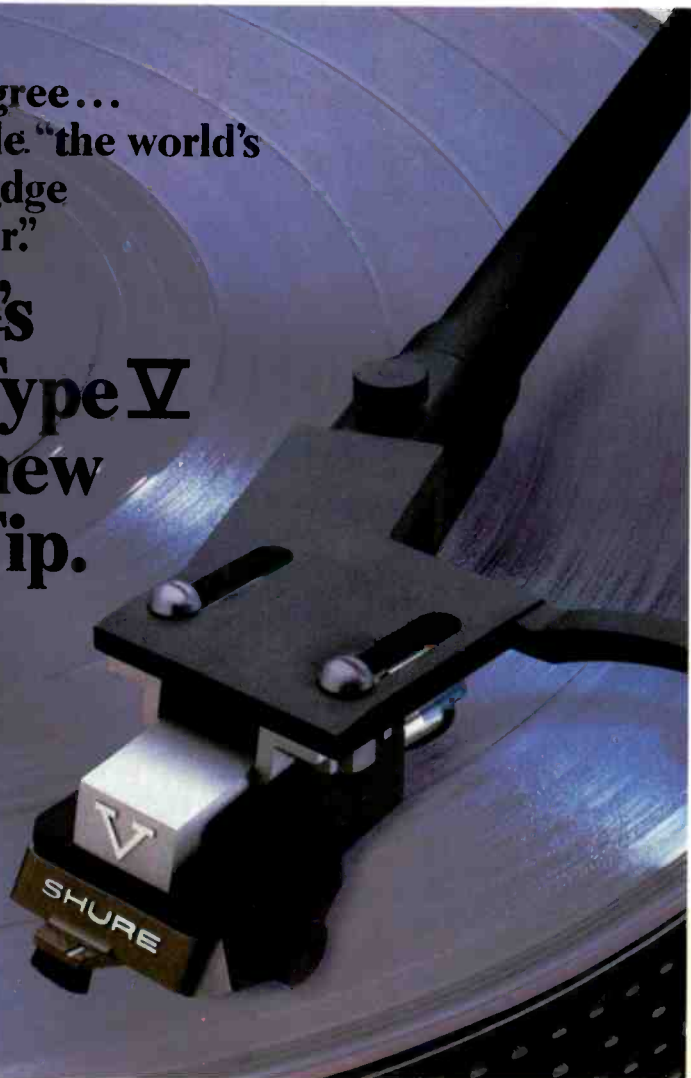
A limited-edition, full-color poster version of Al Hirschfeld's drawing of Isaac Stern on our February cover is available, while the supply lasts, to STEREO REVIEW readers for just \$4 to cover postage and handling costs.

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NEW PRODUCTS



Yamaha

The Yamaha CD-X2 Compact Disc player can be programmed to play up to nine tracks in random order. The drawer-loading player has a three-beam laser said to improve tracking, and a resampling frequency of 88.2 kHz is used to increase resolution and clarity. The higher sampling rate enables low-pass digital filters to be used instead of sharp-cutoff analog filters, and phase distortion is said to be reduced accordingly. Controls allow skipping to the next track or back to the start of the current track as well as searching in fast forward or reverse. The player can repeat either an entire disc or selected tracks. The front-panel headphone output is adjusted by a level control located above the jack. The display shows track number, elapsed time, or total time. Price: \$399. Yamaha Electronics Corp., Dept. SR, 6660 Orangethorpe Ave., Buena Park, Calif. 90620.

Circle 120 on reader service card



Cramolin

A fast-acting anti-oxidation solution, Cramolin aerosol spray is said to clean, lubricate, and preserve all metal surfaces, including gold. It is designed to form a protective molecular layer on the metal, removing the oxides from the contact surface and holding them in suspension. When two treated contact surfaces meet, the Cramolin layer is pushed aside, removing the oxides with it. When the contact is broken, Cramolin is claimed to re-cover the area, protecting it from reoxidation and reducing the contact resistance. Cramolin is recommended by the manufacturer for use on all switches, phono-cartridge pins, tone-arm connectors, plugs, jacks, and connecting cables. The R-2 Tech Kit includes 6 ounces of the spray, lint-free cloths, foam swabs, and cleaning brushes. Price: \$9.95. Replacement spray cans are \$7.25. Caig Laboratories, Dept. SR, P.O. Box J, Escondido, Calif. 92925-0051.

Circle 121 on reader service card

Infinity

The Infinity MRA-150 car stereo power amplifier is rated to deliver 75 watts per channel into 4 ohms with less



than 1 percent distortion. It uses a quasi-complementary output stage, with a pair of virtually identical transistors, that is said to give it an especially well-balanced output. The amplifier is direct-coupled throughout and uses moderate amounts of negative feedback. There are no fuses. A protection circuit that operates independently of the audio circuitry shuts the amplifier down during extreme overload conditions; since it does not limit current during normal operation, it causes no sonic degradation.

The MRA-150 has a remote turn-on feature that works with an automatic-muting circuit. The input levels are adjustable, and the speaker connections are push-type. Frequency response is given as 1.4 to 125,000 Hz +0, -3 dB, rise time 3 microseconds. Price: \$319. Infinity Systems, Dept. SR, 9409 Owensmouth Ave., Chatsworth, Calif. 91311.

Circle 122 on reader service card



Tandberg

The Tandberg TPA-3009A 200-watt mono power amplifier is designed to perform under almost any load condition, which is said to make it suitable for driving high-performance speakers and multiple pairs of speakers that present difficult impedances. The amplifier has eight high-current MOSFET output devices and does not use any negative feedback, voltage limiting, or current limiting. The audio stages use selected high-spec polypropylene capacitors and metal-film resistors in a totally discrete configuration. The constant-impedance high-current driver stage is specifically designed to realize the capabilities of the MOSFET's. A voltage-comparator circuit is used to make the output

devices linear without any feedback.

The amplifier is rated to deliver a continuous output of 200 watts into 8 ohms, 330 watts into 4 ohms, or 456 watts into 2 ohms, all from 20 to 20,000 Hz with less than 0.05 percent total harmonic and intermodulation distortion. It can also deliver a short-term dynamic output of 1,512 watts into a 0.5-ohm impedance and has a peak current capacity of 55 amperes. Slew rate is 250 volts per microsecond. The A-weighted signal-to-noise ratio is 94 dB. The TPA-3009A measures 1 7/8 x 3 1/4 x 13 3/4 inches without the optional rosewood end panels shown and weighs 25 pounds. Two units can be stacked for stereo operation. Price: \$995 each. Tandberg of America, Dept. SR, Labriola Court, Armonk, N.Y. 10504.

Circle 123 on reader service card



Phoenix

The P-522 noise-reduction unit from Phoenix Systems can add 30 dB of dynamic range to recordings made on cassette and open-reel tape decks that lack Dolby C or dbx noise reduction. The processing reduces tape hiss and increases headroom. The encode/decode companding system compresses the signal during recording at a ratio of 2:1 and expands it during playback at a ratio of 1:2. Simultaneous encode/decode permits real-time monitoring from decks with three heads. A proprietary gain-modulation suppression circuit is said to eliminate distortion caused by incomplete cancellation of modulation. Switchable hard-wire bypass and return-level trims are included. Price: \$135, or \$79 in kit form. Phoenix Systems, Dept. SR, P.O. Box 338-B, Stone Mountain, Ga. 30086.

Circle 124 on reader service card

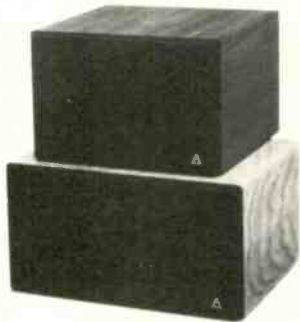


B&W

Two laser-optimized drivers are vertically aligned in the B&W DM100 loudspeaker. Their claimed near-perfect

transient behavior and extended linear dispersion are said to result from the use of laser interferometry in the development process. The horizontal dispersion is given as ± 2.5 dB of the on-axis response from 20 to 15,000 Hz over 120 degrees of arc. The woofer has a 6-inch nominal piston diameter with a 1-inch high-temperature voice coil. The cone is made of composite fiber. The tweeter is 1 inch in diameter with a polyamide dome/coil. The crossover, at 3,000 Hz, is a fourth-order-Butterworth design. With an input of 1 watt, the DM100 is rated to produce a sound-pressure level of 89 dB at a distance of 1 meter. Frequency response is given as 80 to 20,000 Hz ± 3 dB. The speaker is said to be suitable for use with amplifiers rated from 10 to 75 watts. The cabinet, finished in simulated walnut or black-ash veneer, measures $8\frac{3}{4}$ x $14\frac{1}{2}$ x $8\frac{1}{4}$ inches. Price: \$218 per pair. Anglo American Audio, Dept. SR, P.O. Box 653, Buffalo, N.Y. 14240.

Circle 125 on reader service card



Acoustic Design Group

A series of three bookshelf-sized subwoofers from the Acoustic Design Group, called High Speed Woofers, are intended to complement small bookshelf systems having poor low-bass performance. The HSW units can be shelf-mounted either vertically or horizontally and range in size from 12 x 8 x 11 inches (the HSW-100, top in photo) to 15 x 8 x 11 inches (the HSW-200, bottom in photo). Each speaker has a built-in 70-watt amplifier and a crossover network that rolls off its response at 12 dB per octave above 110 Hz. The HSW series is said to be able to reproduce bass frequencies down to 24 Hz; the larger and more expensive models are capable of higher output levels.

The HSW-100 has a single 6½-inch driver, the HSW-150 (not shown) an 8-inch driver. Prices: \$229.95 and \$269.95, respectively. The HSW-200 has two 6½-inch drivers and costs \$299.95. Cabinets are medium-density fiberboard with walnut or oak veneers and solid wood corners. Acoustic Design Group, Inc., Dept. SR, 620 E. Bleeker St., Aspen, Colo. 81612.

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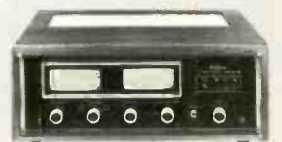
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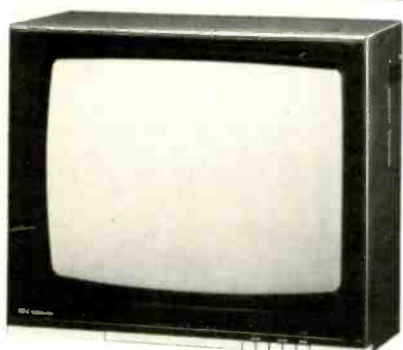
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AUDIO/VIDEO NEW PRODUCTS

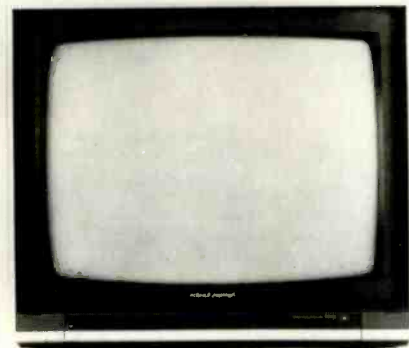


NEC

Built-in stereo decoders enable two new NEC receiver/monitors to reproduce full stereo sound from stereo TV broadcasts. The CT-2505A (shown) has a 25-inch screen, the CT-2020A a 20-inch screen. The CT-2505A is a 134-channel cable-ready monitor/receiver with wireless remote control. It has dual r.f. inputs, dual video inputs, a comb filter, and a built-in timer. A stereo amplifier and a pair of side-firing speakers are included. Price: \$950.

The smaller CT-2020A has all the same features as the CT-2505A, but it uses a flat 20-inch-square picture tube for increased viewing area (compared to a standard 20-inch tube) and less distortion. Its front-firing speakers are correspondingly smaller. The PLL-synthesizer tuner can bring in 142 channels and is cable ready. An on-screen display shows the time. Price: \$799. NEC, Dept. SR, 1401 Estes Ave., Elk Grove Village, Ill. 60007.

Circle 127 on reader service card



Harman Kardon

The 25-inch VM 100 video monitor from Harman Kardon contains special circuits said to ensure a high-quality picture. The shadow detail is continually adjusted for optimum contrast, and dynamic geometric distortion is re-

duced by three means: a transformer to compensate for distortion in the video signal, a modified deflection-circuit power supply to limit scanning inaccuracies, and a regulated power supply to maintain constant brightness. A transient-reshaping circuit speeds up the rise and fall times of the video signal to restore transient response. Other refinements include a comb filter and automatic color temperature control. Horizontal resolution is 400 lines, and there are three video inputs. Price: \$1,095. Harman Kardon, Dept. SR, 240 Crossways Pk. W., Woodbury, N.Y. 11797.

Circle 128 on reader service card



Pioneer

A mid-priced LaserDisc player from Pioneer Video, the PR8210 handles both 8- and 12-inch laser-read video discs. The speed of play can be increased to three times normal in both forward and reverse. The scan control allows rapid movement to the beginning of either the next or the previous chapter. Playback can be slowed to a single frame every few seconds in forward or reverse. Entering the desired chapter or frame number gives rapid access to any point on the disc.

The two audio channels of the PR8210 permit a choice of either stereo sound or a separate audio program (such as a foreign language) if one is recorded on the disc. CX noise-reduction decoding is built in. The audio signal-to-noise ratio is rated at greater than 70 dB. Total harmonic distortion is rated as less than 0.3 percent, frequency response from 40 to 20,000 Hz. A wireless remote control is included. Price: \$499. Pioneer Video, Dept. SR, 200 West Grand Ave., Montvale, N.J. 07645.

Circle 129 on reader service card

JNEL

The CableMaster cable/VCR programmer from JNEL Corp. automatically switches cable-TV channels to allow unattended recording of video programs on different channels. The pro-

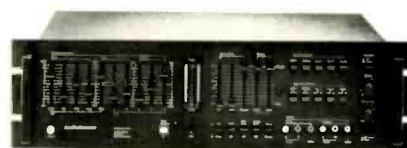
grammer turns the cable-TV converter to the selected channels at the times that have been programmed into the VCR,



enabling the VCR to record up to eight programs on eight different channels over two weeks. The unit also turns the cable converter on and off between recordings. Because it sends switching commands to the cable converter with an infrared beam, like a remote control, the CableMaster will work only with converter boxes that have provisions for infrared remote control.

Different plug-in "personality" modules make the programmer usable with any type of infrared-controlled cable-TV converter. Personality modules are available for use with satellite receivers having infrared remote control. The CableMaster can also be used to control VCR's that lack timing ability. Since all switching commands are sent by infrared beams, no cables or wire connections to the VCR or the cable-TV converter are required. The CableMaster comes with one personality module. Price: \$169.95. Additional modules are \$24.95 each. JNEL Corp., Dept. SR, 792 South Main St., Suite 23, Mansfield, Mass. 02048.

Circle 130 on reader service card



AudioSource

The AudioSource AV One is an audio-video selector and signal processor designed to control the picture and sound of an audio-video system. Front-panel switches control monitoring and dubbing. A set of input and output jacks for one VCR are on the front panel, and a second VCR can be connected to the rear panel. There are jacks on the rear for three more high-output sources, which can be dubbed onto either VCR. Knobs control detail and sharpness of the picture.

Audio controls include a ten-band graphic equalizer, DNR (Dynamic Noise Reduction), stereo synthesizer, hiss filter, and mono switch. The equalizer frequencies are centered at 31.5, 63, 125, 250, 500, 1,000, 2,000, 4,000,

8,000, and 16,000 Hz. Maximum gain or attenuation is 12 dB. Sliders are also used to mix and fade audio and video signals. The unit is 19 inches wide and can be rack mounted. Price: \$579. AudioSource, Dept. SR, 1185 Chess Dr., Foster City, Calif. 94404.

Circle 131 on reader service card



Sharp

The Sharp VC-487U VHS Hi-Fi video-cassette recorder will play mono, stereo, and VHS Hi-Fi video cassettes. In addition to its hi-fi recording and playback capability, its linear two-channel audio recording system has Dolby noise reduction. The recorder has three speeds and can record up to eight hours of programming. The timer allows one-touch recording. The headphone jack on the front panel has a level control. A fourteen-function infrared remote control is included. Price: \$1,099.95. Sharp, Dept. SR, 10 Sharp Plaza, Paramus, N.J. 07652.

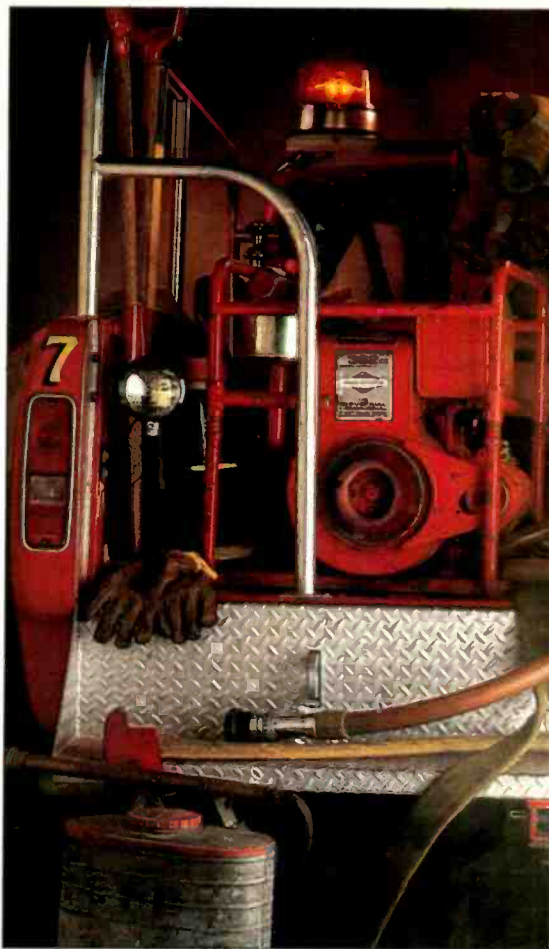
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CommTek

A booklet titled "Tuning In to Home Satellite TV" explains the technology and programming of satellite TV. It describes the equipment needed to receive TV signals broadcast directly from satellites and includes a question-and-answer section and a glossary. A thirty-two-page section lists a typical month's programming on the 123 satellite channels available for viewing. The booklet was prepared by the editors of *Satellite Orbit* magazine, which serves owners of home satellite-TV systems. Price: \$1 to cover postage and handling. *Satellite Orbit*, CommTek Publishing Company, P.O. Box 1700, Dept. SR02-DLR, Hailey, Ind. 83333.

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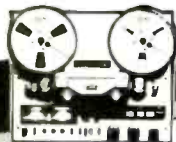


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by David Ranada



Evaluating Resolution

IN-STORE examination of the resolution of a video monitor or TV set is not easy. You shouldn't just glance at the images and say, "That one is sharper." More critical viewing is necessary, and that involves more than just getting the same image on a couple of screens.

The ability to judge monitor resolution without the use of special test patterns or signals is intimately connected to your visual acuity and to the distance from which you view the screen. On average, the human eye can resolve details separated by 1 minute of arc ($1/60$ of a degree) in the field of vision. Taking this figure together with the maximum resolution available using the NTSC video standard (about 330 lines, both vertically and horizontally), the viewing distance beyond which the structure of the scanning pattern, or *raster*, should become invisible works out to 20.8 times the picture height: about 26 feet for a 25-inch screen or 20 feet for a 19-inch.

Most viewers, however, sit closer to their screens than that and should, in theory, be annoyed by a highly visible raster. But, on the whole, viewers have been satisfied with NTSC picture quality despite their close viewing distances. Even

the Society of Motion Picture and Television Engineers (SMPTE) recommends viewing distances of only four to six times the screen height in several of its standards. In general, the raster does not become easily visible until the viewing distance is reduced to less than four times the picture height. There are several reasons for this, all of which bear on the evaluation of video monitor resolution.

The 1-minute-of-arc visual-acuity figure applies only to the kind of sharply defined, stationary images found in test patterns. One of the principal reasons a TV picture looks as good as it does is that the image is usually in motion. The eye's resolving powers fall off tremendously if the image moves, to as little as one-fifth of its fixed-image acuity.

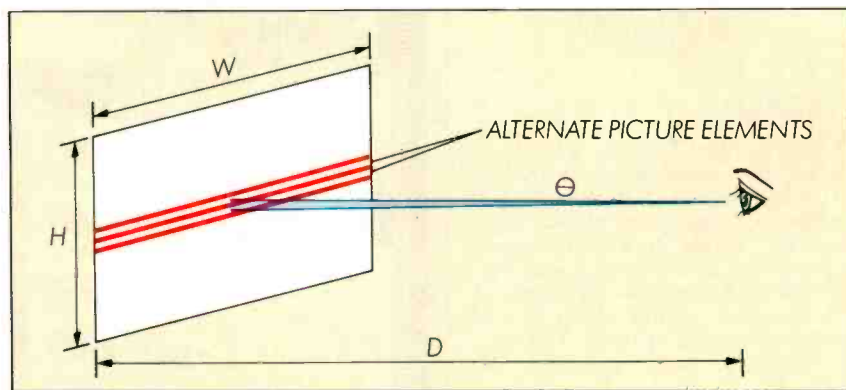
Moreover, a typical image cannot be resolved with infinite detail. Because a video camera or picture tube requires time to sense or reproduce a change in image intensity, transitions between light and dark areas on the screen can never be instantaneous or perfectly sharp. Even the raster is imperfect in all picture-tube based designs (certain flat-screen technologies have more nearly ideal raster characteristics). A picture-tube scan line is not uniform in brightness over its height. Rather, it fades in from the top, peaks in brightness along the center of the line, and fades out at the bottom. Add to this any vibrations of the raster due to "time-base insta-

bility" in the monitor or the video-signal source, and the result is a much smoother picture texture than if the picture elements were sharp and stationary.

We have, then, an ironic situation in which "less is more." As Donald G. Fink pointed out in his 1940 *Principles of Television Engineering* (from which much of the preceding has been derived), "The television image is satisfactory at . . . short distances only because it is imperfect."

The foregoing analysis, among other considerations, suggests several guidelines for evaluating and comparing video resolution. The guidelines apply equally well to picture-tube and projection video systems:

1. Either compare only equivalent screen sizes or else adjust the viewing distances for different-sized screens so that they appear to be equally large.
2. View the screens from no farther than four times the picture height.
3. Adjust the sharpness controls, if any, to their center, detented positions. This avoids giving an unfair advantage to an artificially boosted video high-frequency response.
4. Use a stationary picture containing many small details, preferably a test pattern. If that is not available, use a still-frame from a laser video-disc player. As a last resort, use a *live* off-the-air broadcast. Do *not* use a picture from a 1/2-inch



The viewing distance beyond which the structure of a video image is invisible depends on the eye's resolving power, here shown as an angle (θ). To find the critical distance (D), multiply the height of the screen (H) by 6,876, then divide that result by the figure you get when you multiply the number of active scan lines (483 in the NTSC system) by 0.7, the "Kell factor," which converts the number of scan lines into a count of visible picture elements. $D = (6,876 \times H) \div (483 \times 0.7)$

NINA WALLACE

VCR system (Beta or VHS), because both are inferior in potential resolution to a live or a video-disc image.

5. Use exactly the same video signal from the same source for the comparisons (you might have to juggle some connections to do this).

6. Adjust the images for equal contrast and brightness, the brighter the better (within reason). Visual acuity is greatly influenced by the brightness of an image. For this same reason it is also advisable to have the same degree of illumination of the room areas surrounding the screens. It's best to have the screens side by side.

7. Look for sharp transitions between light and dark, and compare the blurring of sharp edges or thin lines. Animated features may be suitable program material for such viewing.

8. You may safely turn the color down or off because the color resolution of the eye is comparatively poor. In fact, the best color resolution provided for in the NTSC system is less than fifty lines! And color can be a distraction when evaluating monitor resolution, which is a monochrome attribute.

9. Turn the color back on when viewing small grid-like patterns (striped or plaid clothing, for example), and look for undesirable spurious colors caused by the interference between the resolution-carrying luminance signal and the color-bearing chrominance signal.

10. Wear your glasses or contact lenses if you need them.

Tip for moviegoers: Tomlinson Holman, technical director for Lucasfilm, tells me that the company's audio and film facilities are oriented toward a subtended Cinemascope/Panavision picture angle of about ± 21 degrees. Therefore, when you go to see a widescreen multichannel projection of *Indiana Jones* or the like, try to sit in the center of the theater at approximately 3 times the screen height from the screen to get the full intended auditory and visual effect. If you're bad at estimating screen height, a piece of paper $8\frac{1}{2}$ inches wide subtends about ± 21 degrees when held 11 inches in front of the eyes, so take along a sheet of typing paper.



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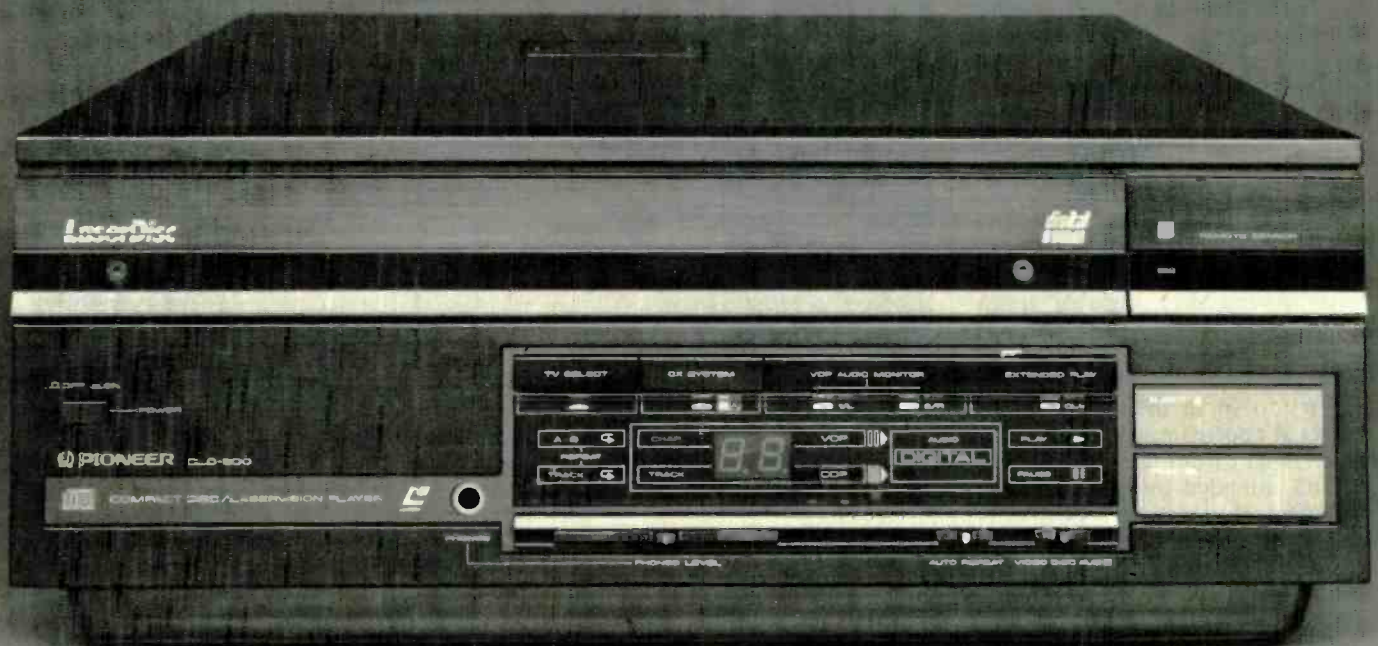
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YOU EVER HEARD.**

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**IT'S THE BEST
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YOU EVER SAW.**



PIONEER INTRODUCES THE FIRST COMBINATION COMPACT DISC AND LASERVISION PLAYER.

The new Pioneer® CLD-900 will play CD discs digitally. It will play conventional laser videodiscs with analog sound. And it'll play the new-generation laser videodiscs with digital sound. It is clearly the most versatile audio/video system yet devised.

Given all this versatility, it's easy to assume we've made some kind of compromise. How could one player possibly be the best at all these things? Better, in fact, than if it did one thing alone?

Believe it or not, the new Pioneer CLD-900 LaserDisc™ brand videodisc player is better at everything. Without any question. And for a very simple reason.

The precision and sensitivity required to make a great LaserDisc player is far greater than what's required to make a CD player. (The laser beam itself must focus 20-25% more accurately on an LV disc than on a CD disc.)

Because of this precision, the CD portion of our new combo player offers superb specs: a frequency response of 5 Hz-20 KHz, an S/N ratio and dynamic range of 96 dB, and a separation of 94 dB.

And it comes as no surprise that, by adding digital sound to the laser picture, LV sound is, as *Video Magazine* reports, "the best available in a home video-plus audio system."

As everyone knows, a CD disc is physically very different from an LV disc. So how do you create a player that reads both so well? That wasn't easy.

First, we gave our new CLD-900 two distinct motors: one for CD, another higher-torque motor for LV. (We could have made a player with one motor and a lot of gears, but that would have been a compromise.) And we mounted these motors in an aluminum frame

independent from the cabinet.

Next, we gave our combo player 6 separate servos. (CD players have at best 3 or 4.) We even added a separate servo to compensate for warped discs, something that no CD player has ever had.

Since stability is of such consequence in a laser system, we gave our player the largest, most stable clamping system yet devised. Substantially larger than the clamping system on any CD.

And to ensure that none of this quality is lost, we built our player with unprecedented quality. As an example, we employ oxygen-free copper cables in the circuitry itself. As well as gold-plated connectors.

For all its technical advances, the CLD-900 is childishly simple to use. One remote control controls both CD and LV functions. And sensors in the system automatically set the player for either LV or CD discs. All you do is put the disc on the tray, slide it in, and press "Play." As *Video Magazine* put it, "It could become simpler only by accepting voice commands..."

The Pioneer CLD-900 costs more than CD players. It costs more than conventional laser-videodisc players. But since it's clearly the best at everything, shouldn't it?



The 12" Standard Videodisc.



The 8" Music Videodisc.



The Compact Audiodisc.



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by Julian Hirsch



Ford Fights Back

CAR radios have been available for more than half a century, but only in recent years have most of them achieved a quality level much beyond mere intelligibility. Understandably, automobile manufacturers were not at the forefront of autostereo improvements. Their primary goal was to sell cars, and the general public, largely ignorant of audio, could hardly be blamed for not demanding that the automobile industry provide them with expensive options to get improved sound.

This task fell to the "aftermarket" car stereo industry, which grew up to fill the gap. Instead of settling for the mediocre sound of a typical factory-installed car radio, you could buy "aftermarket" components that resembled miniature versions of home audio components: tuners, preamplifiers, equalizers, power amplifiers, and speakers.

The interior of an automobile is far from an ideal listening environment because of its dimensions and the acoustic properties of its contents, size, and shape. As anyone who has tried to put in or take out a

car radio knows, the installation of good audio components in an automobile is no job for an amateur. Snaking wires through the car frame and doors or cutting holes in panels and parcel shelves is difficult, risky, and expensive work.

But a truly integrated, factory-installed music system, equalized to compensate for the known properties of a specific car, would seem to offer the possibility of hi-fi quality without the uncertainty of a specific installer's talent—or lack of it.

The first such system emerged several years ago from a joint effort of General Motors, Delco Electronics (GM's electronics division), and Bose Corporation, and the Delco-GM/Bose Music System has since earned a justified reputation for the caliber of its sound. Originally available only in a few top-priced GM cars, since equalization and speaker placement are different for each model, the system is now available as an option in a broader range of car models.

I recently had the opportunity to visit the Electrical and Electronic Division of Ford Motor Company in Dearborn, Michigan, where I saw (and heard) some of Ford's work in integrated audio-system development. Even Ford's currently available car tuner/cassette deck, which will be used in modified form in the forthcoming Equalized Sound Power (ESP) systems, offers a degree of ergonomic refinement that is lacking in most aftermarket radios I have seen. A large, uncluttered panel with a minimum of pushbuttons and separate clearly indexed and marked knobs for most functions, with no concentric or "push-pull" controls, simplifies using the radio while driving. Ford's approach is in

marked contrast to the more common design practice of fitting the maximum possible number of pushbuttons into the limited panel space. (Try to push those buttons while wearing gloves!)

To me, the development of the ESP speaker systems was the most interesting aspect of Ford's efforts. The problem of achieving good tonal balance and stereo imaging is universal in car audio systems. As Bose showed, it can best be solved through a highly sophisticated computer analysis of the sound fields in a car and the actual frequency response at specific listening positions resulting from specific speaker drivers and locations. The resulting response measurement is far from "flat" even compared with the irregular room response of a typical home listening room. Practical improvement of the sound in a car virtually requires the use of parametric equalizers, which can be adjusted to accentuate or reduce the outputs in a specific (usually narrow) range.

In the Ford ESP system, each speaker unit is driven by its own amplifier, which contains four parametric equalizers that are adjusted for that particular speaker and its location in the car. Unlike Bose, which builds an amplifier and equalizer into each speaker enclosure, Ford combines all the satellite-speaker amplifiers (usually four) and their equalizers in a single separate module. Another difference between the approaches used by the two companies is that Bose uses small full-range speakers (similar to those in its home systems) while Ford has opted for more conventional two-way biamplified systems with electronic crossovers. The large amount of low-frequency ambient noise in a moving vehicle requires considerable bass boost to produce a low-frequency balance that will overcome the noise. Ford engineers decided that this requirement could best be satisfied by using large-volume-displacement bass drivers.

At the current stage of the ESP system's development (it's still subject to change), the single "subwoofer" is driven by its own 50-watt amplifier, which has a crossover frequency that is adjustable from 150 to 300 Hz. One or two parametric

Tested This Month

*Allison CD 8 Speakers
Ultrax R100 AM/FM
Receiver*

*Sennheiser HD 414 SL
Headphones*

*Radio Shack Archer
Video Sound Processor*



Ford's experimental Mark VII Comtech has audio controls inside the steering wheel.

equalizers can be included in the bass amplifier (each car model has its own specific equalization requirements). The high-frequency satellite speakers (usually four, though some car models have six) are driven by individual 12-watt amplifiers, each of which has four parametric equalizers to smooth out the middle- and upper-frequency response in the car.

A common amplifier circuit board is used for the ESP system in all car lines since the equalizers plug in and can be installed as required. The satellite speakers are located approximately in the corners of the car (at the ends of the dashboard or in the front doors, and on the rear package shelf), and the woofer is usually mounted on the rear deck. In one experimental system, the subwoofer was under the front passenger seat.

A convincing demonstration of the success of Ford's design approach is the system's measured frequency-response data published in a technical paper by Ford engineers. The response measured in one-third-octave bands was flat within ± 3 dB from 400 to 20,000 Hz, rising smoothly in the bass to +12 dB in the 30- to 60-Hz range (this is the bass boost intended to overcome ambient noise). The single 7-inch long-throw woofer produced a 25-Hz output at the level of the middle and high frequencies.

Ford makes intensive use of computers for calculating the frequency response of a speaker operating in a car. Some of the design programs

involve an enormous number of calculations, which can take a powerful mainframe computer several minutes to perform. For cases where standard computers are too slow, Ford's Dearborn facility has a Cray super-computer available to the engineering department as a back-up. This could be likened to keeping the Boston Symphony Orchestra on hand for those critical A/B listening comparisons!

I was also impressed by Ford's extensive use of Computer Aided Design (CAD) for developing new car radios, both electrically and mechanically. One tends to expect a giant company to have a slow reaction time to new developments, but Ford has the facilities to pursue new electronic investigations and make product-design changes, as often as needed, in a fraction of the time required by older methods.

The Ford Electrical and Electronic Division's laboratories were the first I have seen that were designed so that automobiles can be driven right in, letting the engineers use them as easily as they would a test bench. The talented and enthusiastic engineers I met there have an eye-opening array of test equipment at their fingertips, even including some rather good home hi-fi component music systems (among the familiar audio brand names represented were Sequerra, Crown, JBL, Audio Research, Nakamichi, and Magneplanar). These are not for the entertainment of the staff but rather to permit some degree of side-by-side comparison between the sound

of an automobile system and a good home music system.

The practical fruits of these endeavors should be appearing in Ford's 1986 cars, from the Lincoln Continental down to smaller and more affordable models. I rode in a couple of them, and even a limited exposure to their sound systems left no doubt that they delivered real hi-fi sound quality. In one lab I sat in an experimental car equipped with a rather unconventional sound system (in respect to its speaker placement) that included a Compact Disc player. It sounded just great (though the motor was not running). My visit to Ford convinces me that real automobile hi-fi is here to stay and that Ford will soon be a powerful factor in that field.

Of course, automotive electronics goes far beyond audio systems. Today's cars, to say nothing of the cars of the immediate future that I saw at Ford, contain an huge number of electronic components. Some current models have more than ten microprocessors and over three hundred other IC's and transistors.

The dashboard information displays are probably the most visible signs of the heavily electronic innards of some cars, and the most impressive example I saw of this was in a car that will be available to the public later this year. The Mark VII Comtech (presumably derived from "Computer Technology") has among its many unique features a cathode-ray-tube (CRT) display of practically every aspect of its internal and external operation. To change many of the displayed conditions, such as internal temperature or fan speed, you merely touch the appropriate part of the CRT screen (a grid of infrared beams covering the front of the screen senses your finger position).

Other aspects of the Mark VII's "cockpit" are more suggestive of a jet plane than of a car. To my surprise, however, the human engineering of the many controls and indicators was so good that even when I drove the car for the first time, on snowy and unfamiliar roads, I had little difficulty in controlling it and avoiding accidents. If only some of the more cluttered stereo receiver panels were as legibly and logically designed! □

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The quality never fades.

ALLISON CD 8 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories



RED AXON

Allison Acoustics' latest speaker takes after its predecessors: smooth, uncolored response, wide dispersion, and clean bass.

ALLISON ACOUSTICS' CD 8, the newest speaker in the company's line, is a compact, floor-standing, three-way system that closely resembles the three-way Allison:Seven. Like all Allison speakers, the CD 8 is designed to couple bass energy to the listening room without the upper-bass or lower-midrange power-

response variations that affect most speaker installations. After extensive investigation designer Roy Allison concluded that in conventional speaker installations, reflections from room boundaries (walls, floor, ceiling) produce a dip in a typical speaker's actual acoustic power output (not to be confused with room-resonance effects) at frequencies

usually on the order of a few hundred hertz. His solution, used in every Allison speaker, is to locate the woofer(s) as close as possible to any adjacent room boundary (floor or wall). When this is done, in combination with a proper choice of the woofer crossover frequency, interference from boundary reflections occurs at a frequency above the woofer's operating range and thus has no effect on the system output.

In the Allison CD 8, the 8-inch acoustic-suspension woofer is on the top, facing upward. It is recommended that the speakers be placed within 1 inch of the wall behind them for best results, but Allison claims that in any location, the CD 8's mid-bass acoustic output will be less influenced by room boundaries

Allison found that conventional speaker setups produce dips in the actual acoustic power output around a few hundred hertz.

than will that of any conventional speaker placed in the same location. The unique Allison convex diaphragm tweeter and midrange drivers, near the top of the CD 8's columnar cabinet, face forward. The woofer crosses over at 450 Hz to the 3½-inch midrange driver, with the second crossover, to the 1-inch tweeter, at 3,750 Hz.

The Allison convex diaphragm is a modified dome driver design whose unusual shape is said to give it excellent dispersion qualities. The midrange and high-frequency drivers use magnetic fluid for damping and cooling. Both crossovers have 12-dB-per-octave slopes, and air-core inductors and computer-grade non-polarized capacitors are used. Nominal system impedance of the CD 8 is rated at 4 ohms, and sensitivity is given as a 90-dB sound-pressure level measured at 1 meter with a 2.83-volt input.

Recessed into the rear of the enclosure, together with the binding-post terminals, are two toggle switches that can be used to adjust the midrange and tweeter outputs slightly. With both switches up, the



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response is essentially flat; in their down position, they produce a gently downward-sloping frequency response. The CD 8's oak-finished cabinet measures 28 $\frac{3}{8}$ x 10 $\frac{1}{2}$ x 10 $\frac{1}{2}$ inches, and the speaker weighs about 35 pounds. Price: \$395 each (slightly higher on the West Coast). Allison Acoustics, Inc., Dept. SR, 7 Tech Circle, Natick, Mass. 01760.

Lab Tests

In our listening room, we had to place the Allison CD 8 speakers on a narrow ledge some 28 inches above the floor in order to get them the recommended 1 inch or less from the rear wall. Actually, since this placement put the higher-frequency drivers at approximately the ear height of a seated listener, it was for us a nearly ideal placement. We also listened to them briefly using a conventional floor placement that put the speakers about 15 inches from the wall. Although the sound was virtually the same, we chose the first position for our testing and listening. We used the flat setting of the two response-adjustment switches throughout, since this gave what we considered to be the best overall sound balance.

In spite of the frequency-response irregularities inherent in every live-room measurement, the CD 8's curve was very smooth over the whole range, sloping downward gently but remaining within 5 dB of flat response from 200 to 20,000 Hz. The woofer response, measured with a close microphone spacing, was excellent, flat within 2 dB overall from 52 to 500 Hz and sloping downward steeply at higher frequencies. The output dropped at 12 dB per octave below 50 Hz. When we spliced the bass curve to the room curve, smoothing out the sharp irregularities that were obviously functions of the microphone position, the resulting composite frequency response was an impressively flat +2, -4.5 dB from 40 to 20,000 Hz. The dispersion of the Allison convex diaphragm drivers was excellent, with no more than 6 or 7 dB difference between the on-axis and 45-degree off-axis response curves at any frequency up to 20,000 Hz.

Quasi-anechoic response meas-

urements made with our IQS FFT analyzer showed an unexpected ± 5 -dB response variation from 3,000 to 5,000 Hz that was not present in the room measurements (which are more indicative of overall acoustic output power). But we found that this effect occurred only on the speaker's front axis; even at 30 degrees off axis the overall response was fairly similar to the excellent composite room measurements. In any case, the effect was not audible as such. Close measurements of the midrange driver's output produced one of the flattest speaker responses we have measured, within 1 dB overall (!) over virtually the full operating range of the driver.

Near-field measurements of the CD 8's midrange driver produced one of the flattest speaker responses we have seen—within 1 dB overall.

The phase linearity of the Allison CD 8 was as good as its frequency response, with an overall group-delay variation of less than 0.4 millisecond between 1,000 and 20,000 Hz, except for an additional 0.2-millisecond "jog" at approximately the 3,750-Hz tweeter-crossover frequency. The impedance curve was at its maximum of 15 ohms at 49 Hz, and the minimum of 3.5 ohms was in the 90- to 150-Hz range, justifying the speaker's 4-ohm rating. The settings of the response-adjustment switches had only a minor effect on the speaker's high-frequency impedance.

Speaker sensitivity measured 89 dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts of random noise in an octave band centered at 1,000 Hz. Our reference SPL of 90 dB required a 3.18-volt drive level, which we used for measuring low-frequency distortion. Distortion was just over 1 percent at 100 Hz and increased smoothly and gradually to 5.3 per cent at 25 Hz.

The power-handling ability of the Allison CD 8 was determined by observing the onset of acoustic-waveform distortion when the speaker was driven by a short tone

burst (one or two cycles on, then an interval of 64 or 128 cycles off) at frequencies of 100, 1,000, and 10,000 Hz, each of which falls in the operating range of one of the three drivers. The woofer emitted a rasping sound, showing that the linear limits of its suspension had been exceeded, at an input of 78 watts. At 1,000 Hz the waveform clipped at 200 watts, and at 10,000 Hz it clipped at 20 watts. These results are consistent with the speaker's amplifier power rating of 30 to 200 watts per channel and with the spectral power distribution of typical music programs. We drove the speakers with amplifiers rated as high as 350 watts per channel, and at any level which we found comfortable the speakers sounded unstrained and were not damaged.

Comments

Like other Allison speakers, the CD 8 does not produce a "flashy" sound. There is no particular emphasis on any part of the frequency range (even in the 100- to 200-Hz range where so many speakers have response irregularities that unnaturally color male voices). These are "easy sounding" speakers that one tends to forget about after a short period of listening since the music comes through with uncolored clarity. In our view, this "forgettable" quality is one of the most desirable characteristics of any piece of audio equipment, and it is typical of all the Allison speakers we have tested and used.

The virtues of smooth, uncolored middle- and high-frequency response, wide polar dispersion, clean and undistorted bass, and independence from room boundary effects have been a hallmark of Allison speakers from the beginning. If you are looking for "fire and sizzle" in your sound, the Allison speakers are probably not for you—nor is most live music likely to be sonically satisfying! However, if you want to enjoy sound that suggests "the real thing" and your budget won't stand for a pair of Allison:One speakers (\$1,020 per pair), you would do well to listen to the Allison CD 8. It is about as close to its senior siblings as you are likely to get.

Circle 140 on reader service card

ULTRX R100 AM/FM RECEIVER

Julian Hirsch, Hirsch-Houck Laboratories



FEATURES

- Rated to deliver 100 watts per channel into 8-ohm loads between 20 and 20,000 Hz with no more than 0.009 percent total harmonic distortion
- Digital-synthesis AM/FM tuner with twenty-station memory system (ten preset buttons, each assignable to two frequencies, one AM and one FM)
- Automatic and manual tuner scanning
- Switchable tuner i.f. bandwidth
- dbx noise-reduction circuits for encoding and decoding tapes with external tape deck
- Separate inputs for a CD player and TV/VCR audio output
- DNR and pseudo-stereo matrix circuits for processing TV/VCR audio signals
- Extensive fluorescent display shows signal strength, tuned frequency, preset number, i.f. bandwidth, selected source, tape-monitoring status, volume, tone and balance-control settings, special circuits activated
- Twenty-segment output-level display
- Pushbutton selection of all functions
- Supplied infrared remote control switches power, varies tuning and volume, and selects preset stations
- Phono input switchable for moving-magnet or moving-coil cartridges
- Connections and switching for two tape decks and two pairs of speakers
- Two a.c. outlets, one switched
- Screwdriver adjustments for dbx levels
- Headphone output, "subsonic" filter, mono and loudness switches

THE R100 is the flagship receiver of the Ultrax line, a comprehensive series of stereo receivers and cassette decks manufactured by Sanyo. One of the most versatile and full-featured digital-synthesis receivers on the market, it is one of the few that have the necessary sensors and circuitry for infrared remote-control

operation. The R100's remote control (supplied) switches the receiver on and off, varies the volume and tuning, and selects among the twenty preset radio channels.

The Ultrax R100 is also the first receiver we have seen to incorporate the very effective dbx noise-reduction circuitry for the recording and playback of tapes and the de-

coding of dbx-encoded discs. The R100 will add dbx capability, with its more than 80-dB dynamic range, to any tape deck not having it already. Unfortunately, dbx has discontinued releasing dbx-encoded records and tapes, thereby restricting the availability of encoded LP's and prerecorded tapes.

A second noise-reduction system, DNR, is also included in the R100 for use with its TV/VCR audio input (also a fairly unusual feature)

One of the most versatile and full-featured digital-synthesis receivers on the market, the Ultrax R100 is also among the few that come with an infrared remote-control unit.

to reduce the typical high audio noise from these sources. A MATRIX control usable with a mono TV or VCR signal generates a pseudo-stereo effect by applying different frequency contouring to the two output channels.

All the R100's controls are light-pressure pushbuttons. Half of the front panel is devoted to some forty-seven of these controls, with the upper half given over to a window containing one of the more elaborate fluorescent displays we have seen. This display panel is the user's only source of information on the receiver's operating status (volume, tone-control settings, station selection, etc.) since most of the pushbutton controls give no indication of their settings.

The R100's top and sides are gray aluminum with a satin-finish front panel and pushbuttons and a black background in the display window. It measures 16½ x 15 x 5¾ inches and weighs 27¼ pounds. The unusually compact remote control unit is only 1½ x ¾ x 5¾ inches. Price: \$600. Ultrax, Dept. SR, 1200 W. Artesia Blvd., Compton, Calif. 90220.

Lab Tests

Our one-hour preconditioning period at one-third rated power, followed by a number of high-power

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TEST REPORTS

measurements, made the top of the R100's cabinet hot to the touch, though not hot enough to pose a danger to the user. This may be a result of the R100's design, which aims for high power with low distortion, as evidenced by the high clipping-power measurements into 8 and 4 ohms—though the receiver would not tolerate a 2-ohm load, which tripped the protective relay at about 7 or 8 watts output. The dynamic headroom was excellent into 8- and 4-ohm loads, but the unit shut down at 14 watts of pulsed output during the dynamic-headroom test into a 2-ohm load.

Both the high-level and phono-preamplifier overload limits were sufficiently above the maximum output level of any normal audio component or phono cartridge to pose no problems. The frequency responses of the R100's amplifier, phono stages, filters, and tone controls were all good. As is sometimes the case, the "subsonic" filter had a considerable effect on the audible range when it was switched in, with the rolloff beginning at 100 Hz. The loudness control came on abruptly at a volume of -20 to -30 dB below maximum, and it boosted only the low frequencies. With the

MATRIX circuit turned on, the left-channel response rolled off gradually below 100 Hz and above 2,000 Hz while the right channel's response peaked sharply at 70 and 6,300 Hz (see graph). Amplifier distortion was insignificant at most power levels and frequencies.

The R100 shut down while delivering its rated power level at 63 Hz when it was connected to the IHF standard reactive load. This was the first time we have seen a protection circuit activated by this load, which is intended to simulate the impedance characteristics of typical dynamic loudspeakers near their bass resonance frequency. On the other hand, the R100's slew factor exceeded our measurement limit of 25, and the test did not trip its protection circuitry (some other amplifiers do not take kindly to being driven at their full rated output levels up to 500 kHz).

The FM-tuner section of the R100 had good stereo separation and low distortion in its wide-i.f. mode, but using the narrow-i.f. setting had the expected effects of reducing separation (though it was still more than adequate) and increasing stereo distortion. With either i.f. mode, the tuner distortion increased somewhat at very high antenna-signal levels (above 85 dBf).

Comments

Like most receivers, the Ultrix R100 is specifically rated for operation with 8-ohm speakers only. In view of its performance into very low-impedance loads (less than 4 ohms), in this case that restriction should be taken seriously. The R100 may not be suitable for use with "difficult" or exotic speakers having unusual impedance characteristics. It can, however, drive two pairs of "normal" medium-impedance (8-ohm) speakers wired in parallel if their combined impedance does not fall below 4 ohms. Too low a combined value could result in a silencing of the audio output until the signal level is raised.

Otherwise, the Ultrix R100 is so versatile that it is impossible to comment on all its features in any detail. In general, its controls and features worked as claimed and were easy and logical to use. No

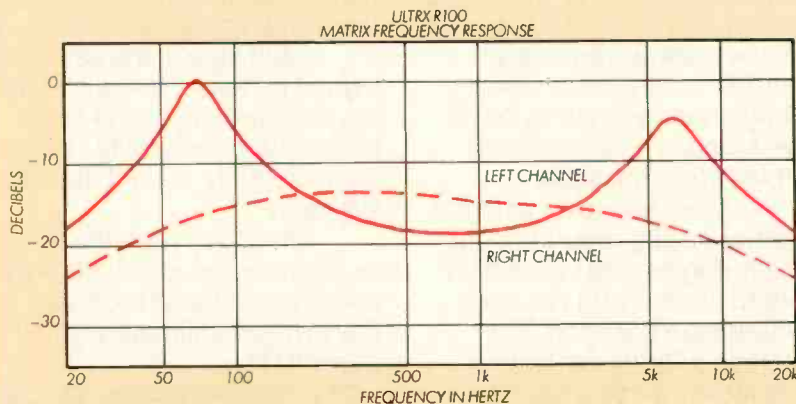
HIRSCH-HOUCK LAB MEASUREMENTS

Audio Amplifier

1,000-Hz output power at clipping: 124 watts into 8 ohms, 165 watts into 4 ohms (see text for 2-ohm results)
Clipping headroom (relative to rated output): 0.93 dB (into 8 ohms)
Dynamic power output: 156 watts into 8 ohms, 264 watts into 4 ohms (see text for 2-ohm results)
Dynamic headroom: 1.93 dB (8 ohms)
Harmonic distortion (THD + noise at 1,000 Hz into 8 ohms): 1 watt, 0.027%; 100 watts, 0.0195%
Slew factor: greater than 25
Sensitivity (1-watt output): phono (MM), 0.215 mV; phono (MC), 0.0245 mV; aux, 15 mV
Phono (MM)-input overload level: 105 to 120 mV
High-level-input overload level: 8.4 volts
A-weighted noise (referred to 1 watt): phono (MM), -73.3 dB; phono (MC), -66 dB; aux, -71.7 dB
Phono-input impedance: 50,000 ohms at 1,000 Hz (cannot be modeled as simple resistance and capacitance)
RIAA phono equalization error: +0, -0.5 dB from 20 to 20,000 Hz

FM Tuner Section

Usable sensitivity (mono): 14.3 dBf (2.9 μ V)
50-dB quieting sensitivity: mono, 15.5 dBf (3.3 μ V); stereo, 38.6 dBf (46.8 μ V)
Signal-to-noise ratio at 65 dBf: mono, 74.6 dB; stereo, 71.8 dB
THD + noise at 65 dBf (1,000 μ V): wide i.f., 0.12% in mono, 0.15% in stereo; narrow i.f., 0.225% in mono, 0.35% in stereo
Capture ratio at 65 dBf: wide i.f., 1.95 dB; narrow i.f., 3.2 dB
AM rejection: 66 dB at 65 dBf
Image rejection: 79 dB
Alternate-channel selectivity: wide i.f., 65 dB; narrow i.f., 80 dB
Adjacent-channel selectivity: wide i.f., 6.5 dB; narrow i.f., 18 dB
Stereo threshold: 29 dBf (15.5 μ V)
19-kHz leakage: -76 dB
Hum: -80 dB
Stereo channel separation: wide i.f., 40.5 dB at 100 Hz, 44 dB at 1,000 Hz, 44 dB at 10,000 Hz; narrow i.f., 26.5 dB at 100 Hz, 28 dB at 1,000 Hz, 27 dB at 10,000 Hz
AM frequency response (-6-dB points): 20 to 2,500 Hz



sweeping claims were made for the MATRIX circuit, and while it did convert mono TV/VCR audio into something that was no longer mono, it was equally far from being true stereo sound. The DNR circuit proved effective, but we missed the capability of controlling its action with source material of varying quality and level. The AM tuner was much quieter than others we have used, picking up less electrical interference than most. Strong local stations, though, overloaded it and were received with high distortion.

The clear and very complete fluorescent display on the R100 is one of the best of its type we have used. Like similar displays on other receivers, it requires full visibility for effective use, so the receiver should be installed around eye level. Since the cabinet top gets quite warm even when the receiver is idling, we recommend that its ventilation not

The dbx noise-reduction system proved to be a useful and effective feature of the Ultrax R100 receiver.

be restricted by placing another component on top of it.

The dbx noise-reduction system proved to be the most useful and effective feature of the R100. We played several dbx-encoded records, and the results were as expected—a dead silent background between selections. And when we used the R100's dbx system with a moderately priced cassette deck of reasonably good quality, it delivered excellent sound from some dbx-encoded tapes we had on hand as well as enabling us to make equally satisfying, low-noise dbx-encoded recordings of phono or line-level signals (a dub from a good CD was virtually indistinguishable from the original on playback). The inclusion of dbx circuitry greatly expands the versatility of a music system based around the R100 because the circuitry works so well and because so few cassette decks are equipped with it. All in all, the Ultrax R100 is a very interesting entry in the receiver market.

Circle 141 on reader service card

SENNHEISER HD 414 SL HEADPHONES

Julian Hirsch, Hirsch-Houck Laboratories



SENNHEISER'S HD 414 stereo headphones were first listed in the 1973 edition of STEREO REVIEW's *Stereo Directory and Buying Guide* and still appear in the 1985 edition, which must qualify them as one of the longest-lived audio components of our time. The successor model, the new Sennheiser HD 414 SL, has been somewhat modernized and restyled, but in performance it is still essentially the old HD 414 (though inflation over the years has inevitably increased the price).

Sennheiser has always been noted for lightweight, supra-aural headphones. The company's "Open-Aire" trademark gives an excellent

description of the sound character of this type of headphone as compared with the tightly sealed circumaural models that dominated the market before the introduction of the HD 414 and similar headphones from other manufacturers. A major difference between supra-aural and circumaural headphones is in their respective ability to isolate the wearer from surrounding sounds. Circumaural phones provide such isolation to some degree (ranging from slightly to nearly total), making them a must for monitoring during a recording session. Supra-aural phones, on the other hand, are literally transparent to outside sound, which may be either

RED AXON

TEST REPORTS

a plus or a minus depending on your particular needs and preferences. They also tend to have slightly less bass response than circumaural phones.

The HD 414 SL has earpieces molded of a very light black plastic with slotted outside surfaces that open the rear of the dynamically driven diaphragms to the outside

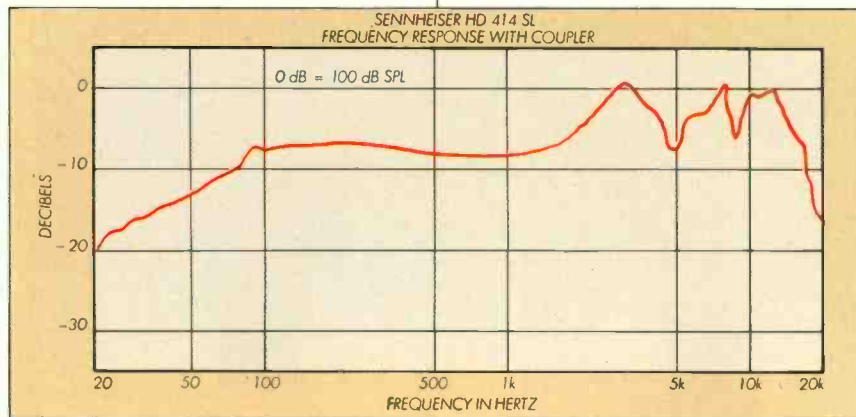
pedance from the original's 2,000 ohms to the SL's 600 ohms, which should make the new phones more compatible with low-power signal sources such as compact portable radios and tape players. Most of the other old specifications were defined in different terms from today's, preventing direct comparison. Price: \$84. Sennheiser Elec-

their measured frequency-response curves would suggest. Nevertheless, in most cases a relatively smooth measured response goes along with smooth subjective response, and the Sennheiser HD 414 SL followed that pattern.

Its sound has the transparent quality that has made the open-air type of headphone so popular, and its relatively uniform high-frequency response avoids any coloration problems such as stridency or noise emphasis. Like most supra-aural phones, the HD 414 SL's do not have a strong lower-bass response, and the distortion in that range at high sound levels makes it impractical to improve the situation much through the use of tone controls or equalization. Still, the phones are by no means lacking in bass, and their overall balance and smoothness place the HD 414 SL in the top rank of today's supra-aural phones. Moreover, the new styling makes them even more comfortable than the easy-to-wear originals.

Obviously Sennheiser, as well as the buying public, has recognized the qualities in the HD 414 headphones that have made them an enduring part of the hi-fi product lineup. We would not be surprised to find a further-developed HD 414 SL still listed in the 1997 *STEREO REVIEW Stereo Buyer's Guide!*

Circle 142 on reader service card



air. The inside of each earpiece (the actual dynamic transducer element is remarkably small, about the diameter of a half-dollar) is largely filled with plastic foam, which is also used for the comfortable, replaceable ear cushions. The extensive use of plastic foam in the earpieces helps to smooth out the frequency response of the headphones and to damp unavoidable mechanical resonances.

The earpieces are mounted on a springy, one-piece black plastic headband, and they can be slid up or down to fit each user. Toothed surfaces on the band keep the earpieces firmly in place. A slender rubber-covered cable is fixed to each earpiece. The two cables form a Y junction with a straight (uncoiled) cord about 10 feet long, which is terminated in a sturdy molded 1/4-inch stereo phone plug. The headphones weigh only about 3 1/4 ounces, not counting the cord.

The new HD 414 SL phones differ slightly on the outside from the original version, and presumably the transducers have also been modified to take advantage of today's improved magnetic materials. The most obvious change in the manufacturer's specifications for the HD 414 and the HD 414 SL is the reduction of the nominal im-

pedance from the original's 2,000 ohms to the SL's 600 ohms, which should make the new phones more compatible with low-power signal sources such as compact portable radios and tape players. Most of the other old specifications were defined in different terms from today's, preventing direct comparison. Price: \$84. Sennheiser Elec-

Lab Tests

The frequency response of the Sennheiser HD 414 SL, measured on our standard headphone coupler, was smoother overall than that of most headphones we have tested recently. From 85 to 1,500 Hz the output was constant within ± 1 dB, and it fell off smoothly at 6 dB per octave below 80 Hz (see graph). At the higher frequencies there were the usual irregularities associated with coupler measurements, but they were relatively small in amplitude. The variation from 1,500 to 16,000 Hz was +8, -0 dB.

The headphones' impedance was 600 ohms, as rated, from 20 to 6,000 Hz, rising gently to 800 ohms at 20,000 Hz. The average midrange output at a 1-volt drive level was 92.5 dB (the rating is 94 dB). Total harmonic distortion at a 1-volt drive level was typically 3.5 to 4 percent from 500 to 100 Hz, rising to 8 percent at 50 Hz.

Comments

We have found over the years that it is rare—fortunately!—for headphones to sound as irregular as



"... Now then, sir, you feel that society's most pressing problems in order of importance are: (a) nuclear disarmament, (b) the projected tax on blank tape, and (c) Communism in Central America?"

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RADIO SHACK ARCHER VIDEO SOUND PROCESSOR

Julian Hirsch, Hirsch-Houck Laboratories



The Archer Video Sound Processor provides three distinct signal-processing functions: stereo expansion, stereo synthesis from mono sources, and Dynamic Noise Reduction (DNR).

THE Archer Video Sound Processor (VSP), a Radio Shack product, is an accessory for an audio/video system designed mainly to enhance the sound portion of a TV program (and to a lesser extent a stereo or mono audio program from a tuner, record player, or tape source) by modifying its spatial characteristics and/or reducing its noise level. The VSP contains a switchable and continuously adjustable DNR (Dynamic Noise Reduction) circuit usable with any program source. When the signal is from a mono source—such as some video-disc players, the headphone jack of a TV set, or an AM radio—a stereo synthesizer produces a pseudo-stereo effect. Comb filtering and phase shifting create two somewhat different output channels, which can then

be returned to the stereo amplifier and used to simulate the effect of a stereo program.

When the VSP is supplied with true stereo signals, from any source, a stereo expander can be used to enlarge the apparent sound stage, again by filtering and phase-shifting techniques. The three distinct signal-processing functions of the VSP, stereo expansion, stereo synthesis, and DNR, can be controlled independently and used alone or in combination. (The actions of the synthesizer and the expander cannot be combined, however, since the former is meant for use only with a mono source and the latter with a stereo one.) Since one method of connecting the VSP to a stereo receiver is through a tape-monitoring loop, tape input/output jacks are duplicated on the rear of the proces-

sor, and the monitoring function is controlled from the front. Playback from a tape deck can also be processed by the DNR and the expander systems, but not by the stereo synthesizer.

The Archer VSP is housed in a silver-colored case that measures 10 inches wide, 6 inches deep, and 2 $\frac{3}{8}$ inches high. Its Radio Shack catalog number is 15-1277. Price: \$79.95.

Lab Tests

We measured the frequency response of the Archer VSP by injecting a signal into the input jack for one channel and measuring the output from both channels. Plotting the two outputs on the same graph clearly showed the action of the signal-processing circuit in use. Where there was a variable adjustment (as for the stereo expander), we repeated the measurements with several different settings.

In general, the signal level was set for a reference output of 1 volt at 1,000 Hz into a standard load of 10,000 ohms in parallel with 1,000 picofarads. It is not practical to measure the characteristics of a DNR circuit in this way, since its action is affected by both the amplitude and the frequency of any signal that may be present, so we evaluated the DNR by listening. The signal-to-noise ratio for various functions and control settings was measured with A-weighting relative to a 1-volt output.

The stereo expander and synthesizer circuits operate on the same basic principle, although their spe-

When the VSP is supplied with true stereo signals, from any source, its stereo expander can be used to enlarge the apparent sound stage.

cific characteristics differ. When a mono signal was passed through the stereo synthesizer, the left-channel output showed deep nulls (about -40 dB) at 1,550 and 5,000 Hz. The right channel had a shallower null, of 18 dB, at 900 Hz, and its output rolled off at both ends of the spec-

trum, to about -12 dB at 20 Hz and -7 dB at 20,000 Hz (see graph). The phase relationship between the outputs of the two channels changed continuously across the frequency band, being a multiple of 90 degrees at 60, 340, 2,000, and 12,500 Hz.

In the case of the stereo expander, when only one channel was driven its output was flat up to about 5,000 Hz and fell off to about -12 dB at 15,000 Hz. However, the output of the opposite channel was flat only

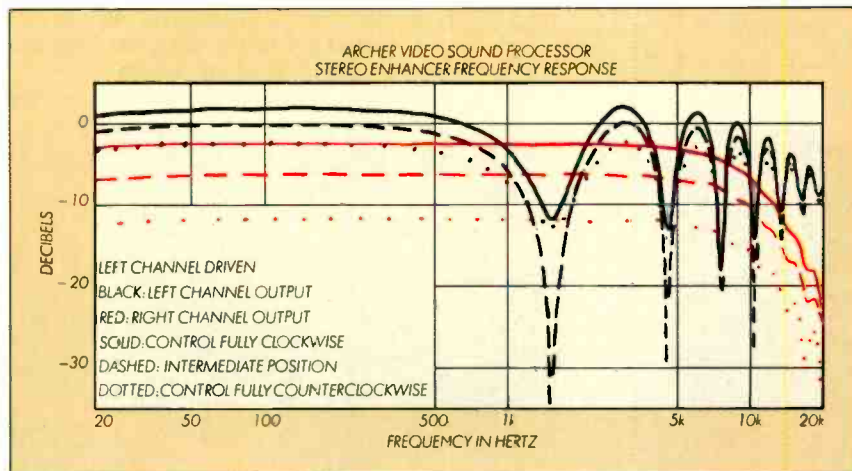
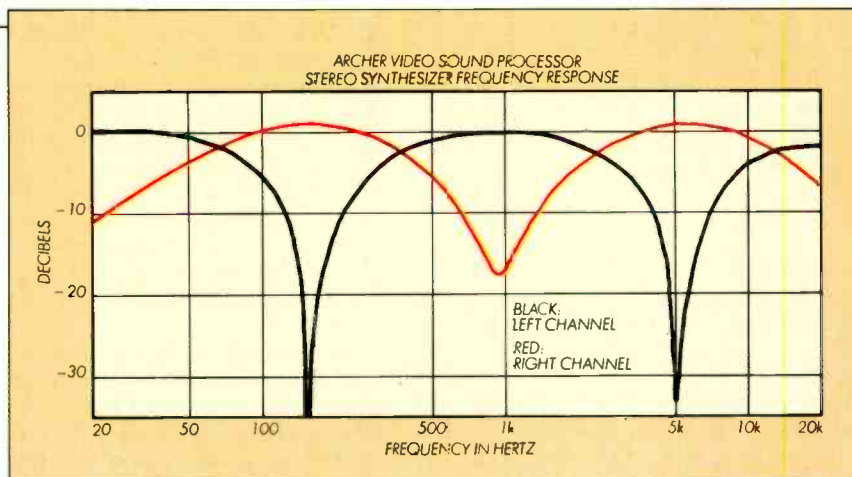
The stereo synthesizer effectively eliminated the dead-center mono image typical of normally operating stereo systems.

up to 500 Hz, dropping at higher frequencies into a series of nulls (see graph). The null frequencies are fixed, but the depth of each notch is controlled by the expander knob. The deepest nulls occurred at intermediate control settings; they were less at either extreme. Another effect of the knob adjustment was to change the relative levels of the signals in the two channels, which were typically about 4 to 9 dB apart in the low and middle frequency ranges.

The VSP's harmonic distortion was acceptably low. With all functions off it was less than 0.073 percent up to a 1-volt output level. The highest THD (generated by the expander) was still less than 1.9 percent up to the same output. The signal-to-noise ratio was 71.5 to 81.6 dB, depending on the operating mode and control settings.

Comments

When evaluating the listening effects produced by the VSP, keep in mind that its main intended application is audio processing for a video system with poor audio qualities. It should not be expected to enhance already high-fidelity stereo music programs, even from the standpoint of a casual listener. The one possible exception to this caveat is the DNR function. At least theoretically, DNR might improve the sound quality of some noisy FM



signals or records. However, like tone controls, its action is continuously adjustable, and if carried to extremes it can degrade signal quality. As the DNR knob of the Archer VSP is rotated from its counterclockwise limit, the level of the higher hiss frequencies gradually drops in the absence of a high-frequency music signal. But if the control is turned too far, "breathing" of the noise background with changes in program can be heard. Near the maximum setting, the highs of the music are audibly attenuated.

The stereo expander did alter the apparent width of the sound stage, as claimed. How much of this effect a listener would want is, of course, a matter of personal choice. Along with the image expansion there is some modification of the apparent frequency response, plus a strong "phasey" quality that sounds something like the result of connecting speakers out of phase and is possibly more annoying.

We used the stereo synthesizer with a mono signal from an FM tuner connected to the rear VCR input of the VSP. In this case we got a clear impression that the two speakers were delivering different sounds, effectively eliminating the dead-center mono image typical of normally operating stereo systems. Whether the result was an improvement over the mono program is arguable, but it did not cause any obvious or unpleasant side effects.

To sum up, our feeling is that Radio Shack's Archer Video Sound Processor may help to add interest and variety to a medium-fidelity mono video sound source when it is played through a stereo audio system. The DNR circuit might improve the sound of some TV programs as well as other noisy mono or stereo sources, though in general this versatile and inexpensive signal processor should be used primarily for video-sound applications.

Circle 143 on reader service card



STATE OF THE ART
IN CAR STEREO

If you still have reservations about the quality of present-day car stereo equipment, take a look at the two head units we tested for this issue. Both the Concord HPL-550 and the Nakamichi TD-700 come up to home-component standards, not just those of five years ago, but also the toughest requirements of today's wide-dynamic-range signals. In different but equally successful ways they combine convenient and versatile operation with state-of-the-art performance.

CONCORD HPL-550

by Julian Hirsch and Christopher Greenleaf

FOR an unusually complete and flexible car stereo receiver/cassette player, the Concord HPL-550 also has one of the most open and usable control layouts we have seen. Its controls can switch in, among other things, a decoder for AM stereo, three tape noise-reduction systems (Dolby B, Dolby C, and dbx), and a proprietary NR system for FM called FNR.

The HPL-550's digital-synthesis tuner has a total of twenty-four station presets available (six for AM and three banks of six each for FM), together with the customary automatic-scan tuning functions. The AM stereo broadcasts that are decoded are those using the Motorola C-Quam format, which seems, at least at this stage in the develop-

ment of AM stereo, to be the most popular.

The tape player has an automatic music-seek function that looks for blank segments between selections. A "matched phase" amorphous-core tape head is said to extend closely matched interchannel phase and amplitude response to beyond 22,000 Hz. The d.c.-operated capstan motor is controlled by a servo amplifier and a tachometer-derived feedback signal to maintain constant speed under conditions of varying load, temperature, and battery voltage.

The audio amplifiers of the HPL-550 are rated to deliver 12 watts per channel to two 4-ohm speakers from 30 to 20,000 Hz with no more than 0.8 percent distortion. The radio can also be switched to drive

JOCK LEUNG





Special Test Report

four speakers with a rated output of 10 watts per channel. Like most car receivers, the HPL-550 also carries a "maximum power" rating (at 10 percent distortion) that is about twice its "high-fidelity" rating.

Much of the Concord HPL-550's ease of use stems from its liquid-crystal display, which can show about twenty functions involving both tuner and tape-player operations in addition to the time. In a somewhat unusual feature, auxiliary input and output connections allow hooking up an external equalizer, image enhancer, or even a CD player. The unit fits a standard 4¼ x 1¾-inch cutout and extends 5¾ inches behind the panel. It weighs 3½ pounds. Price: \$650. Concord Systems, Inc., Dept SR, 6025 Yolanda Ave., Tarzana, Calif. 91356.

Lab Tests

The power amplifiers of the HPL-550 are "bridged," and all output leads as well as the speakers must be

isolated from ground when installed. The amplifiers met their ratings (clipping at 12.6 watts per channel when driving 4-ohm loads at 1,000 Hz), although the requirements for the "maximum power" rating, like all similar ones we have seen, were rather unrealistic. We had to drive the amplifiers into hard clipping in order to obtain 10 percent distortion.

FM-tuner frequency response was outstanding for a car unit and would be quite good for any home receiver. The output dropped sharply above 17,000 Hz, suggesting the use of a highly effective filter to remove the stereo-multiplex pilot and its related frequency components. FM channel separation was excellent throughout the audio band, and in most other respects the

FM tuner measured good or better. The HPL-550's image rejection, in particular, was excellent.

The amplifier section had tone controls with good, though conventional, characteristics. Loudness compensation boosted both high and low frequencies at reduced volume settings. The otherwise complete instruction manual, however, fails to explain the function of the BEQ button, which switches the center frequency of the bass control from 240 to 80 Hz (indicating the latter setting by a barely visible 80 on the liquid-crystal display).

We obtained remarkably flat playback-response curves from the cassette player. There was negligible difference between the 70- and 120-microsecond response, and the steady output readings at the high frequencies indicated positive and well-aligned tape-to-head contact. This level of performance is uncommon even among home cassette decks. Furthermore, the measure-



ments were made through the entire preamplifier and power-amplifier sections, which says much for the inherent response flatness of the tone-control circuits as well. The tape deck's signal-to-noise ratio was very good, especially with the dbx system in use. Flutter was commendably low, though the tape speed was about 3 percent fast (half a musical semitone).

Except for a couple of omissions or ambiguities in the manual, the Concord HPL-550 impressed us as one of the few car stereo receivers we have tested that meets home-component standards. Partly to check out that impression, and partly to see if we could receive any AM stereo broadcasts (we couldn't from our location), we connected the HPL-550 to our regular music system using its line-level outputs. FM broadcasts sounded as fine as with our component system, and so did cassettes recorded with any of the three noise-reduction systems. All in all, this car receiver is a tour de force of compact packaging and high performance. *J.H.*

Road Tests

Separate graphic equalizers may be highly touted, but proper attention to the design of a car receiver's tone controls can accomplish what equalizers promise but more cheaply and with less fuss. The Concord HPL-550 offers a good deal of flexibility in low-frequency spectrum shaping. The BEQ control neatly avoids the typical 180-Hz overemphasis of an average car's interior, letting a listener go for solid, deep bass without getting a boomy sound. For instance, my Volvo's fat bump in response around 190 Hz flattened out considerably when I switched on the loudness control together with a mild bass cut using the 240-Hz BEQ setting.

I could find only two stations broadcasting AM stereo using the C-Quam system, but both came through in listenable stereo whenever I could also receive them in mono. AM stereo operation is automatic but can be defeated with the mono button. Overall AM performance was very good, the sound having an open, clean character usually missing from that band.

FM sound with strong signals was also clear, open, and solid, with neither the graininess caused by noise and distortion nor the sort of collapse in high-frequency response

that sometimes occurs as signal strength deteriorates. Multipath problems were at a minimum. The regular torture spots on our test route were merely irritating, not agonizing, and I could get a number of distant stations in mono.

The FNR FM noise-reduction system appears to work like an automatic high-blend circuit: strong signals are unaffected, but progressively less robust signals get increasing degrees of treble attenuation and a blending of stereo toward mono. With FNR switched in, weak stations are received in mono, with a noticeable attenuation of high-frequency noise that does not dull the music too much. I found the feature effective and subtle during poor reception conditions.

My elderly and overworked C-120 test cassette had nothing to complain about: the HL-550 treated it with gentlemanly good manners, even in search mode, with no jams or tangles. Normal New York City road conditions (they're bloody awful) occasioned a few burbles from the tape transport, but it was generally a good performer. I found the

FEATURES

- Receiver/cassette player with power-amplifier section rated at 12 watts per channel with two speakers, 10 watts per channel with four
- Digital-synthesis AM/FM stereo tuner
- Built-in C-Quam AM stereo decoder
- Auto-scan tuning mode stops at each station for 5 seconds
- Six AM and eighteen FM station presets
- FNR noise-reduction system for weak FM signals
- Tape player with "matched-phase" amorphous-core head for matched channel phase and amplitude responses beyond 22,000 Hz
- Dolby B, Dolby C, and dbx tape noise-reduction systems
- Servo-controlled d.c.-motor tape drive
- Music-search scans tape for blank segments between selections
- Loudness compensation
- Stereo/mono switch
- Auxiliary processor loop for equalizer, image enhancer, or CD player
- Line outputs for driving external power amplifiers
- Front/rear fader
- Liquid-crystal display shows tuned frequency, control status, radio band, selected preset, stereo reception, noise-reduction system in use, and the time
- Bass and treble tone controls; bass control has switchable center frequency

HIRSCH-HOUCK LAB MEASUREMENTS

FM mono usable sensitivity (75-ohm input): 15.6 dBf (1.65 μ V)

Mono 50-dB quieting sensitivity (75-ohm input): 17.8 dBf (2.13 μ V)

Stereo 50-dB quieting sensitivity (75-ohm input): 38 dBf (21.8 μ V)

Tuner signal-to-noise ratio at 65 dBf: 68.5 dB in mono, 67 dB in stereo

Tuner distortion at 65 dBf: 0.175% in mono, 0.31% in stereo

FM frequency response: 20 to 17,000 Hz ± 0.5 , -1 dB

Stereo separation (65 dBf) at 100, 1,000, and 10,000 Hz: 36, 41, and 30.5 dB

Capture ratio at 65 dBf: 2.2 dB

AM rejection at 65 dBf: 46 dB

Alternate-channel selectivity: 57 dB

Adjacent-channel selectivity: 3 dB

Image rejection: 84.5 dB

Tape-playback frequency response (standard BASF test tapes): 31.5 to 18,000 Hz ± 0.5 , -2.5 dB

Tape signal-to-noise ratio (referred to 250 nVb/m at 31.5 Hz, 120- μ s EQ): unweighted, 54 dB; Dolby B and A-weighting, 66 dB; Dolby C and A-weighting, 73.5 dB; dbx and A-weighting, 78.5 dB

Flutter: $\pm 0.1\%$ CCR-weighted peak, 0.06% JIS-weighted rms

Tape speed accuracy: $\pm 3\%$

Fast rewind time for C-60: 102 seconds

Tone-control range: ± 12 dB at 100 Hz; ± 11 , -11.5 dB at 10,000 Hz

1,000-Hz clipping power output into 4 ohms: 12.6 watts

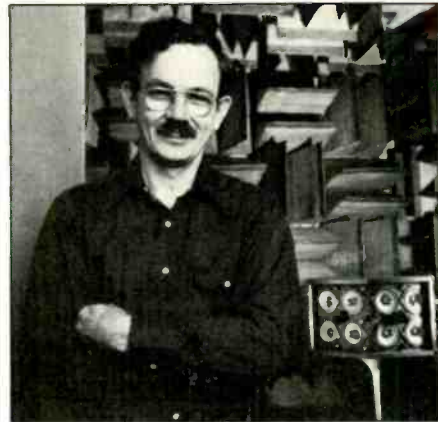
choice of three tape noise-reduction systems (or none at all) a pleasant extravagance. I did not miss auto-reverse since I prefer having guaranteed good performance in one direction (which the HPL-550 certainly delivers) to risking variable treble performance in two.

A blast of radio sound does not inevitably greet the ejection of a cassette (which occurs at tape's end, when the ignition is turned off, or when you push the tuning knob). A button labeled T/R selects between radio or tape. Depending on which component has been selected, either the tuner or tape control buttons are illuminated. The buttons are close together, but only a mittened hand would have a problem using them.

About 2,100 miles had registered on my odometer before impatient phone calls from STEREO REVIEW dislodged the Concord HPL-550 from my car and sent it on its way back. Its complete, well-organized controls and high-quality sound made this one car receiver/cassette player that I would have been glad to keep.

C.G.

Circle 145 on reader service card



Video Soundtracks.

*New paths toward realism.
by William P. Schreiber*

Manager of Home Products Engineering



Television has been with us for less than four decades. Yet no other single medium has had as much impact on our everyday lives. But while television has certainly changed us, it has also changed with us as well.

For example, a lot of us remember when watching TV meant watching a little screen that hid behind doors when not in use. If you were lucky, you had access to three channels and nearly five hours of programming nightly!

Compare that with television today. You can build complete video systems out of

professional grade monitors, VCRs and a host of specialized electronics. You can buy or rent virtually every worthwhile film ever made. You can choose from up to hundreds of channels, thanks to cable and satellite video technology.

Big Theater Entertainment

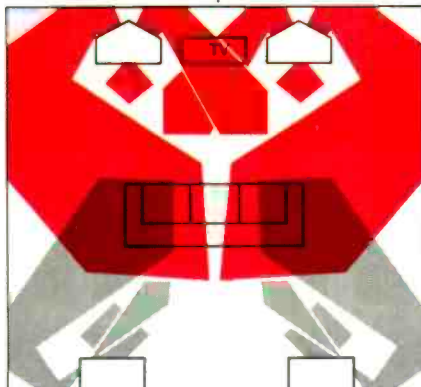
But as far as home video has progressed, watching a movie on a television system is still a limited experience when compared with theater viewing. There's something about being at the movies that brings a film to life. The film's soundtrack and the theater's acoustics are a large part of it—"surround-sound" technology completes the live sensation. In theaters equipped with Dolby Stereo,* the audience

hears lifelike sound through a relatively simple process. First, surround-sound information is recorded (in an encoded form), right into the film's soundtrack. Then, it's decoded in the movie theater by a Dolby processor. Finally, this information is played through speakers located at the

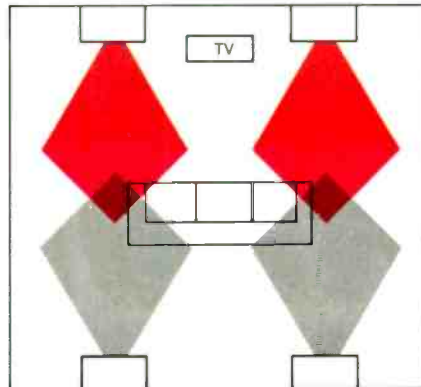
in your living room. And, everyone in the room will hear this effect, regardless of where they're sitting.

Obviously, Bose Direct/Reflecting® speakers can make both music and video soundtracks seem a lot more real. But you can even go a step further with at-home

theater sound—because the same encoded surround-sound information that theaters use is present on many videotapes as well. Combine Bose speakers with a surround-sound system (decoder, second amp, and rear speakers) and you'll get a true theater quality, three-dimensional sound field right in your living room!



Bose Direct/Reflecting® speakers deliver stereo everywhere in the room—even close to one speaker.



With conventional speakers, balanced reproduction is limited to the area between and in front of the enclosures.

sides and back of the theater. The result is that the entire audience sits in the middle of an incredibly lifelike, three-dimensional sound field.

Surround-Sound Realism at Home

With the right equipment, you can create the same sound at home. Bose® Direct/Reflecting® speakers are ideal for this purpose, because their design is based on how sound behaves in areas such as concert halls and theaters. In these environments, you hear a combination of direct sound and reflected sound. Bose invested 20 years in research to create speakers that can accurately reproduce sound the same way. Basically, Bose loudspeakers provide your ears with the critical reflected "cues" you'd hear at a live event, making it sound almost as if the event were occurring

We invite you to audition Bose loudspeakers at your local dealer. For more information, please write to Bose Corporation, Department SR, 10 Speen Street, Framingham, MA 01701.



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Special Test Report

NAKAMICHI TD-700

by Julian Hirsch and Christopher Greenleaf

NAKAMICHI'S TD-700 mobile AM/FM tuner/cassette deck is a less expensive and more compact alternative to the Model TD-1200 (reviewed here in December 1983), though no essential performance qualities have been sacrificed to reduce its price. The most obvious difference between the two models is in their tape decks. The TD-1200 has an ingenious but costly automatic servo system to maintain correct head azimuth alignment. In place of this system, the TD-700 has a knob on the front that can be used to adjust the head azimuth by ear for the best high-frequency response. Also, the TD-700's deck does not have autoreverse, though it does provide automatic repeat and a program-seek function that works

in fast forward or reverse, and it has a dual-capstan tape drive.

Partially inserting a cassette into the loading slot of the TD-700 turns on the tape deck, which draws the tape in and begins playing it (the radio is automatically switched off). If the repeat function has not been selected, the tape ejects at the end of the side and the unit shuts off (or returns to radio operation). When the transport is in one of its fast-speed modes, a second touch on the fast-forward or the rewind button initiates program seek, using the silent periods between selections to find the next one to be played.

Below the tuning buttons are three small tone-control knobs, which are normally recessed flush with the panel. Pressing and releasing a knob causes it to extend for

use; after making the desired adjustment, pushing the knob in leaves it flush with the panel again. Each of the knobs is center-detented. The bass and treble controls have conventional characteristics, although their range of adjustment is somewhat greater than that of most current home or mobile audio systems. The midrange control has its maximum effect at about 200 Hz, where it can compensate for the resonant peaks common in cars.

Another front-panel knob control adjusts the tape-head azimuth in small, detented increments. A red dot marks the normally correct center setting, but the instructions suggest that the user note down the knob setting that gives the best high-frequency response with each tape.

The audio outputs of the Naka-

LOOK/LEUNG



m chi TD-700 are at line level and are brought out separately for front and rear speakers. A separate power amplifier is needed for each set of speakers used. The nearly identical TD-500 differs from the TD-700 chiefly in having a single-capstan tape drive, instead of the TD-700's dual-capstan system, and five station presets instead of six. Prices: TD-700, \$790; TD-500, \$595. Nakamichi U.S.A. Corp., Dept. SR, 19701 S. Vermont Ave., Torrance, Calif. 90502.

Lab Tests

The Nakamichi TD-700 is one of the very few car stereo receivers we have tested that either met or surpassed every one of its significant specifications.

The tape deck of the TD-700 was nothing less than superb. Not only did its frequency response (using the center setting of the azimuth-control knob) span the full 31.5- to 18,000-Hz range of both the

120- and 70-microsecond standard BASF test tapes with only minor amplitude variations, but high-frequency output fluctuations were strikingly absent. The other measurements of the tape-deck output were equally noteworthy, including the low flutter readings (attributable, at least in part, to the dual-capstan drive system).

The FM tuner was also first-rate, with none of the weak areas that so often mar the overall performance of a complex product such as a car stereo receiver. In fact, the signal-to-noise ratio and distortion level of the TD-700's tuner would do credit to a fine home receiver. Like almost all car radios, the Nakamichi TD-700 has an automatic signal-controlled channel blend that produces some unusual relationships between signal level and noise, but these do not diminish its overall fine performance.

The lab measurements of the TD-700 impressed us so much that we

tried listening to it through our regular music system. It was no surprise that it sounded every bit as good as our usual home components when played through a high-quality power amplifier and speakers. The ability of the TD-700's cassette player to virtually match the sound of a Compact Disc player speaks eloquently for its high quality. This Nakamichi car stereo tuner/cassette player invites superlatives. It is, in its entirety, an outstanding audio product. *J.H.*

Road Tests

By sheer feel alone, I knew that the Nakamichi TD-700 was one of the best pieces of car stereo equipment I'd ever had my hands on. The controls were familiar to touch after the first mile—in the dark, in daylight, and when my eyes were riveted on the movements of Brooklyn's incredible drivers. Although I was able to put only about 300 miles on my car while testing the TD-700,



a substantial part of the road tests involved, as usual, both the FM morass of midtown Manhattan and the maze of granite-block streets on the old Brooklyn waterfront.

The TD-700's FM performance was indeed a treat, with a healthy number of stations to choose from. Very distant reception was good, and strong local stations had more solidity, clarity, and depth in their sound than I am used to hearing in my car. The tuner effectively quiets noisy signals, so much so that the rare intrusions of multipath I experienced came as a surprise. Neither particularly loud nor very objectionable, these little sonic trespasses occurred in locations where most car tuners can't produce listenable reception at all.

AM radio being what it is, my ears received no unusually beautiful treatment as I sampled stations from all over the mid-Atlantic region. Where there was enough clean signal to work with, however, the TD-700's three tone controls enabled me to temper treble noise as needed or to introduce greater midrange or bass warmth.

The tone controls generally were very handy. The treble control affects frequencies above around 2,000 Hz, and the bass control works on the range below 500 Hz. The midrange control is centered at 200 Hz, which is perhaps below what audiophiles generally think of as the center of the midrange. But

The lab measurements of the Nakamichi TD-799 impressed us so much that we tried listening to it though our regular music system. It sounded every bit as good as our more costly and much larger home components.

the TD-700 is for use in cars, not living rooms, and the 200-Hz frequency corresponds to the common resonant frequencies of most mid-sized cars. Being a fan of loudness controls, especially the infinitely variable variety, I missed one at first, but the TD-700's tone controls really make one unnecessary.

There's no better proof of the acuity of normal human hearing

FEATURES

- Tuner/cassette player with line-level outputs to drive a separate power amplifier
- Microprocessor-controlled dual-capstan tape drive
- User-adjustable head azimuth for best high-frequency performance
- Automatic repeat function
- Program-seek function uses blank segments between selections
- Dolby B and Dolby C noise-reduction systems
- Digital-synthesis AM/FM stereo tuner
- Auto-scan tuning mode stops at each station for 5 seconds
- Distant/local reception switch
- Six AM and six FM station presets
- Liquid-crystal display shows tuned frequency, radio band selected, preset selected, stereo reception, and time
- Time display can be defeated before installation
- Bass, treble, and midrange tone controls
- Front/rear fader

HIRSCH-HOUCK LAB MEASUREMENTS

FM mono usable sensitivity (75-ohm input): 18.7 dBf (2.37 μ V)

Mono 50-dB quieting sensitivity (75-ohm input): 18 dBf (2.18 μ V)

Stereo 50-dB quieting sensitivity (75-ohm input): 29 dBf (7.8 μ V). Note: separation was minimal at this level because of the auto-blend circuit.

Tuner signal-to-noise ratio at 65 dBf: mono, 73 dB; stereo, 72 dB

Tuner distortion at 65 dBf: 0.1% mono or stereo

FM frequency response (-3-dB limits): 21 to 17,500 Hz

Stereo separation at 100, 1,000, and 10,000 Hz: 32, 39.5, and 24 dB

Capture ratio at 65 dBf: 1.75 dB

AM rejection at 65 dBf: 69 dB

Alternate-channel selectivity: 59 dB

Adjacent-channel selectivity: 2.5 dB

Image rejection: 66 dB

AM frequency response (-6-dB limits): 35 to 3,200 Hz

Tape playback frequency response (standard BASF test tapes, 30 to 18,500 Hz, referred to 315-Hz level): 120- μ s EQ, +2.5, -1 dB; 70- μ s EQ, +2.5, -1.3 dB

Tape signal-to-noise ratio (referred to 250 nVb/m at 315 Hz): 120- μ s EQ, 48 dB unweighted, 63 dB with Dolby B and CCIR/ARM weighting, 72 dB with Dolby C and CCIR/ARM weighting; 70- μ s EQ, 52 dB unweighted, 68 dB with Dolby B and CCIR/ARM weighting, 76 dB with Dolby C and CCIR/ARM weighting

Flutter: \pm 0.05% CCIR-weighted peak; 0.03% JIS-weighted rms

Tape speed accuracy: +0.65% at beginning of tape, +0.15% at end

Fast rewind time for C-60: 72 seconds

Tone-control range: \pm 12 dB at 100 Hz; \pm 10 dB at 10,000 Hz; \pm 10.5 dB at 200 Hz

Line output (maximum from 100% modulated FM signal at 65 dBf, IHF standard load): 1.42 volts

than using an azimuth control while playing a tape. Your first experience with the TD-700 (or another model similarly equipped) will strongly reinforce your faith in your own ability to hear, as well as driving home the point that minutely correct positioning of the tape head relative to the recorded signal is absolutely critical to treble performance. It's not just a matter of the highest frequencies either, the kind that matter more to bats and dogs than to most people. Maladjusted head azimuth will dull even the upper midrange. (It was comforting, by the way, to verify, by using the nominal center position of the TD-700's azimuth control, that recent commercially prerecorded cassettes generally have the correct azimuth these days.) The Nakamichi's dual-capstan transport coped with the granite-block streets near the Brooklyn Navy Yard with regal aplomb.

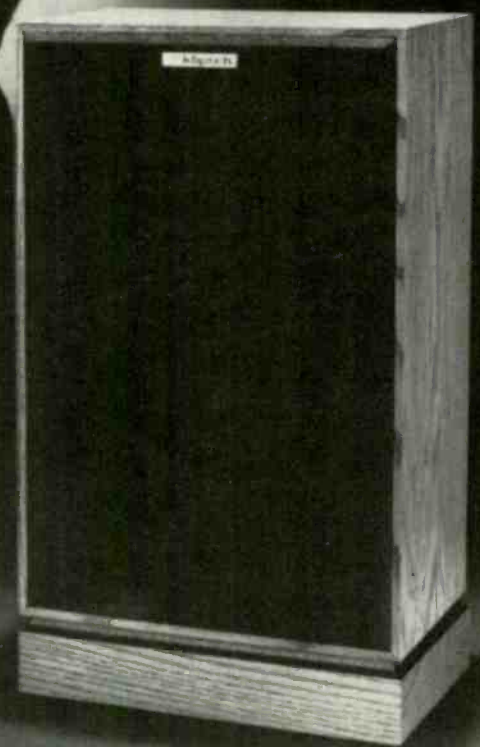
In terms of sound, some very high-quality cassettes played back just as well as on a home deck. Tapes recorded at very high levels did not overload the front end, nor did low-level passages come across

as vague or muddy—as, believe me, they often do in car decks that aren't up to the demands of wide-range music.

The TD-700's motorized tape loading was very gentle, as was its tape ejection. Every aspect of the tape handling seemed firm and secure. Turning off the power when a tape is playing automatically disengages the pinch-roller to protect the tape and player. My old C-120 test tape may be showing its age (from the early Seventies), but not because this deck inflicted any wear on it.

Both on the road and while parked, I had the sensation of using a home tape deck more than an in-dash mobile component. The TD-700 is superbly engineered for ease of use and imperturbability, and it is actually more convenient than its costlier drawer-loading predecessor, the TD-1200. It was easier to get used to and more satisfactory musically than virtually anything else I've tested. And with its elegant, satin-black finish, it is also one of the best-looking car stereo units I've seen. A winner all around. C.G.

Circle 146 on reader service card



The New KLIPSCH kg⁴, Unconventional Thinking At Its Best

It's never been the habit of anyone at KLIPSCH® to be *conventional*. Take, for example, the pillar of the organization, Paul Klipsch. How many 80-year-olds swim in the buff everyday? Or keep two grand pianos in their living room?

Then there's Gary Gillum, one of the design engineers. He drives an immaculate BMW 528i, grows his own vegetables, and lives in a log cabin. Not just any log cabin mind you, but quite an elaborate one he built himself from trees he cleared off his land.

The people of KLIPSCH have never professed to be conventional. Or create speakers that are. The new KLIPSCH kg⁴, pictured above, is Gary's latest creation and serves as an excellent example.

Consider the KLIPSCH designed

tweeter. Good, conventional tweeters may deliver similar bandwidth and smoothness. But nowhere near the detail or dynamic range that so well characterize the KLIPSCH "sound."

Then there are the woofers. It's not conventional to put two in one speaker. Yet, Gary found that two 8" (20 cm) drivers operating in unison sound musically superior to one larger driver in the kg⁴ cabinet. And don't require as much room.

Finally, there's the passive radiator for low bass. Conventional thinking would mount it on the front of the cabinet. KLIPSCH mounted it on the rear. Measurements and listening tests proved it didn't matter. And with it on the rear, the kg⁴ delivers a big sound without a big cabinet.

All of this unconventional thinking results in a speaker which *Stereo Review* CIRCLE NO. 2 ON READER SERVICE CARD

describes as "truly excellent." And one you can likely afford.

Of course, a visit to your nearest KLIPSCH dealer would be a most conventional way to hear the new kg⁴. But since you would be in the pursuit of sonic excellence, the people of KLIPSCH would likely forgive your behavior.

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



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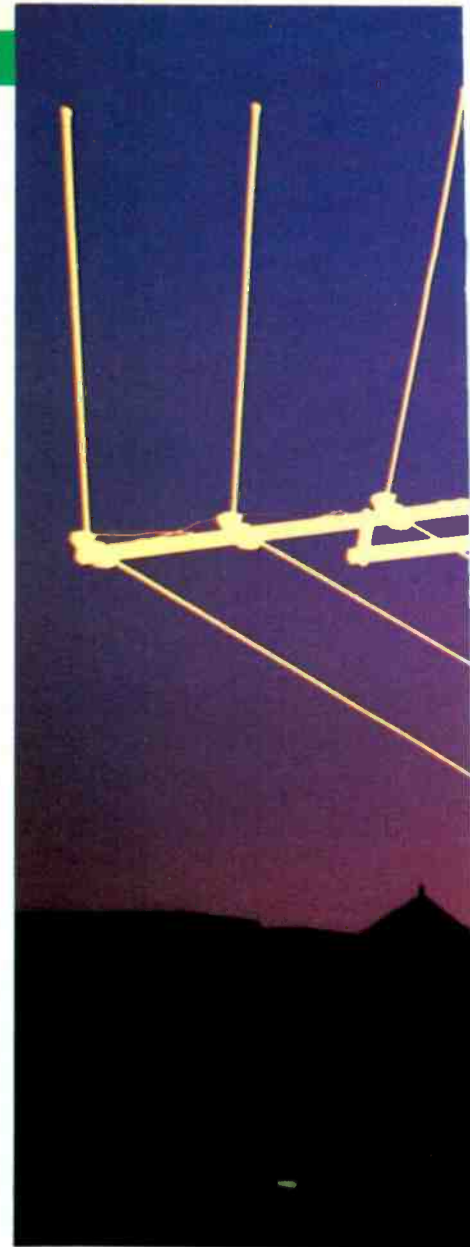
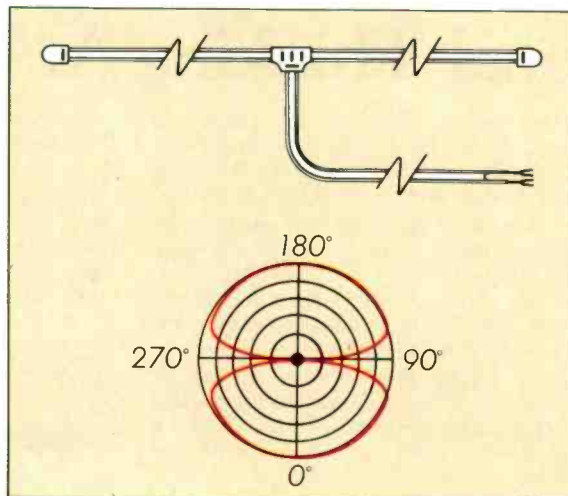
A

NTENNAS

Whether your problem is multipath or weak signals, upgrading your antenna can make a profound improvement in the quality of your FM reception and both the sound and picture quality of TV. It doesn't have to cost a lot of money, and it may save you the expense of moving to a better reception area.

by Julian Hirsch

The low-cost folded-dipole antenna that comes with most receivers and tuners is moderately directional and adequate for most urban and suburban areas. It should be extended fully for the best results.



Of all the components that make up a modern stereo hi-fi/video system, the antenna arouses the least controversy (virtually none at all, in fact) and receives little or no attention from audiophiles. This is a curious state of affairs when you consider the heated discussions that spring up about the "sound quality" of various capacitors, the "musicality" of interconnect wires, and the sonic importance of small high-frequency phase shifts. Unlike esoteric connectors and capacitors, antennas have a demonstrably profound effect on the sound quality of FM reception and



JOHN STUART

A multiband FM/VHF/UHF antenna like the Radio Shack Archer VU-120 (\$56.97) shown here is good for distant reception and to eliminate multipath. If you need to reorient the antenna for different stations, an antenna rotator such as the Archer unit shown below (Radio Shack No. 15-1225, \$59.95), is essential.

both the sound and picture quality of TV reception, especially stereo TV.

Of course, there are some purist audiophiles who would be insulted by the suggestion that they would deign to listen to broadcasts. But most of us who care about sound quality do listen to FM, and even TV, and many of us have at some time experienced the deleterious effects of an inadequate antenna—even if we were unaware that that was the cause of the sonic degradation.

Why do we need antennas?

FM broadcasts provide very low levels of modulated high-

frequency signals, and the minimum signal input level required to get full performance from a good FM tuner is indeed very small. The comparatively high level that is used as a basis for rating a tuner's distortion and noise performance is 65 dBf, which corresponds to only about 3 billionths of a watt, or 0.001 volt, at the tuner's 300-ohm antenna inputs. Most tuners can deliver excellent sound from a signal of that strength.

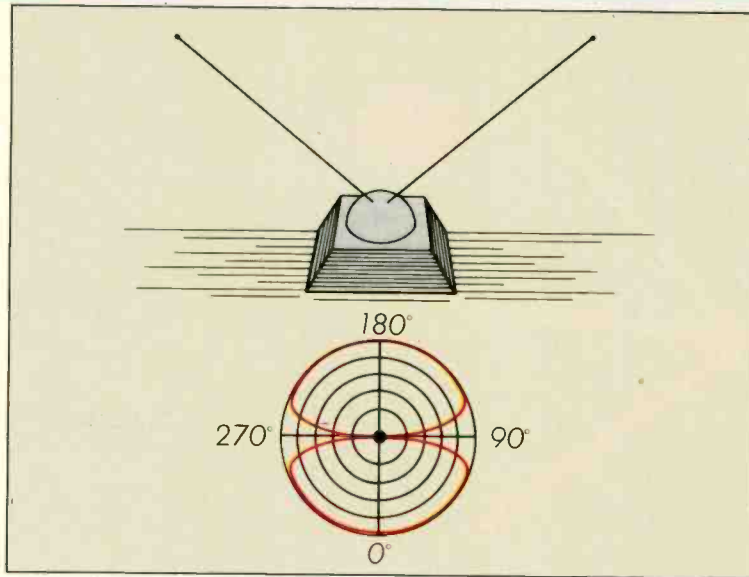
However, this assumes that only one signal at a time is being received. FM tuners can discriminate quite well against interfering signals on the same frequency if the interference is somewhat weaker than the de-

sired signal, but things deteriorate rapidly as the two become nearly equal in strength. Does this mean that if the nearest station sharing the channel with your local favorite is 200 miles away and cannot be heard at all, you won't get any interference? Sorry, it isn't that easy!

Much of the time, especially in urban and suburban locations, broadcast signals are subject to *multipath*. The transmitting antenna is usually omnidirectional, or nearly so, in the horizontal plane, and the radiated signal can be reflected by almost any large object in its path—a building, a bridge, or a mountain, for instance. The reflections can be reflected in



Rabbit ears can be useful for solving multipath problems in an apartment where an outdoor antenna is not practical. Rabbit ears are easy to adjust for best reception.



turn, and the result is that what finally reaches your antenna is not a single direct signal but a composite of signals arriving from many different directions. And, since their routes vary in length, the reflected signals arrive at slightly different times and often have widely different strengths. It is common for some reflections to be as strong as—or even stronger than—the direct signal component.

Multipath reception can degrade program quality in many ways depending on its severity. There may be only a slight, barely noticeable distortion, or it may be so bad that human voices become unintelligible. And even the most advanced tuners are not totally immune. You can check your reception out for yourself. The next time you are listening to a stereo FM broadcast, try switching the tuner to mono. If the quality improves considerably, as it usually will, you will have confirmed that you have a multipath problem—and that you need a better antenna system.

To eliminate multipath effects, an FM antenna should discriminate as much as possible between signals arriving from different directions. Orienting a directional antenna to reject one or more major multipath signal components can make an immediately audible improvement in the sound quality from a tuner. Although

it is usual to aim the antenna at the transmitting station so as to favor the direct signal path, that is not always the best way to aim it. If one of the reflected signals is stronger than the direct signal, for example, perhaps it should be favored.

Sometimes a directional antenna receives signals fairly well from several directions while deep nulls in its polar pattern enable it to reject almost totally the interfering signals arriving from other directions. In such cases, it may be preferable to orient the antenna so that it rejects the strongest multipath signals, as determined by listening while turning the antenna,

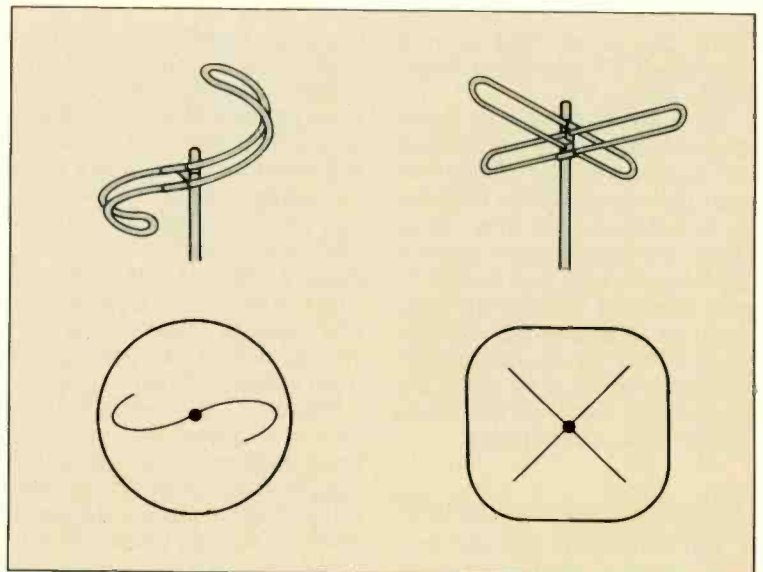
even if that does not provide the strongest reception of the direct signal.

What kind of antenna is the best?

If weak signals rather than multipath are your main problem, as when you are 80 to 100 miles away from the FM stations you wish to hear, the best antenna for you is one with a higher gain than a simple dipole such as the wire "T" antennas furnished with many tuners and receivers. A high-gain antenna provides the tuner with more signal voltage than a lower-gain type, all else being equal. It usually has a long boom with a number of horizontal elements located along its length. Because of the high directionality of such antennas, a rotator is very desirable—even a practical necessity in most cases. In general, the longer the antenna, the narrower its beam width and the more critically it must be aimed (and the higher its cost, although few components of your system are likely to return as great a benefit for the same investment).

Antenna height is also important if you are reaching for a distant station. The nominal maximum propagation distance at FM frequencies is "line of sight." Although this limitation can be exceeded consider-

Outdoor omnidirectional antennas such as the S-shaped and turnstile dipoles shown here can be useful when you have little multipath and stations in all directions.



ably in most cases, the horizon as "seen" from the antenna position should be as distant as possible.

It should be evident that the antenna requirements for FM and TV are much the same. In fact, the simple, bidirectional "rabbit-ear" antenna sometimes used on TV sets is roughly comparable to the folded dipole FM "T" antenna in both its effectiveness and its limitations. The reception problems are similar as well, with multipath reception causing "ghosts" on the TV screen. A mild case of ghosting may appear as nothing more than a slight loss of picture definition, but more severe cases may render a picture useless or even prevent the receiver from locking to the transmitted "sync" signals. The problem and its cure are identical for both FM and TV—a properly oriented directional antenna.

Is a large, expensive antenna system really necessary?

Probably not if you are located within 30 to 50 miles of the FM stations you like to listen to. A moderate-gain outdoors directional antenna (with three to five horizontal elements rather than the eleven or so that might be used in a high-gain antenna), installed 30 feet above the ground, is likely to deliver adequate signal strength from stations up to 50 miles away. If you are willing to settle for mono reception, you may occasionally pull in stations from 200 or more miles away.

In most cases, the major factor that should affect your choice of an antenna is the degree of your multipath problem. A low- to moderate-gain antenna lacks the extreme directivity of a longer, high-gain type. Even if the signal strength in your area is more than enough for good reception, you might find it necessary to use a more directive antenna and to aim it away from the station's transmitter in order to reject multipath components.

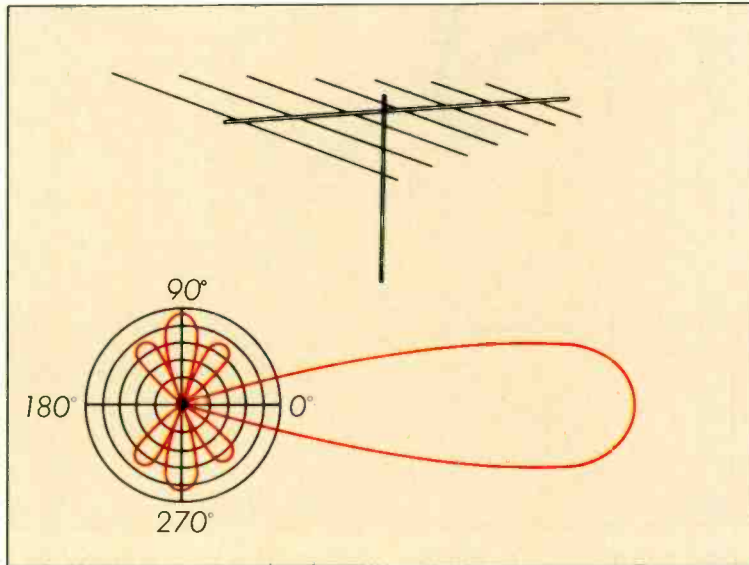
Isn't high signal strength always better than lower?

This is a good question, but I have to answer it with an equivocal "maybe." In a strong-signal area, a high-gain antenna might present your tuner with a sizable fraction of a volt of total signal level (many thousands of times what it needs for good reception), representing the combined contribution of a large number of broadcast signals intercepted by the antenna. Every tuner has an overload limit beyond which its r.f. or mixer stages become nonlinear (like your audio amplifier if you try to drive it too hard). When this happens, the various FM signals mix in the tuner to create intermodulation prod-

uction and noise from signal inputs in the range of 65 to 85 dBf (1,000 to 10,000 microvolts), there is rarely any advantage to providing signals much stronger than that. If you need the directivity of such an antenna but not its high gain, you can weaken the signal with an accessory attenuator (such as Radio Shack 15-578, \$4.95). That way you can avoid overload while retaining the antenna's directional qualities.

Are the antennas supplied with tuners worth using?

Certainly, if you are aware of their limitations. I routinely use these folded dipoles made from 300-ohm TV "twin lead." In my area, strong signals abound,



If you are only concerned with FM reception, a dedicated FM directional "yagi" antenna should solve most of your distance and multipath problems. The on-axis signal will be boosted as much as 6 dB, and off-axis attenuation can be even greater.

ucts that are manifested as spurious signals appearing at various frequencies throughout the FM band. If these fall on unused channels, little harm is done. But they can also fall on or near the frequency of a station that you wish to receive, and, if strong enough, they can interfere with it much as a multipath signal might do.

For this reason, among others, it is usually *not* a good idea to use an antenna designed for long-range, fringe-area reception in an area with strong signals. You won't damage anything if you do, but since any tuner will deliver the least dis-

and it is easy to receive forty to fifty listenable signals with an indoor folded dipole tacked onto the wall. Actually, for my purposes I *prefer* such an antenna—because of its limitations rather than in spite of them. It is often helpful to me to have a really *bad* signal available so I can compare the abilities of different tuners to cope with it. In such a case, I orient the dipole for the greatest distortion instead of the least. Too often, Murphy's Law ("If anything *can* go wrong, it will") enters the picture, and I cannot create sufficiently poor reception!

Seriously, if a simple indoor

antenna delivers satisfactory reception, by all means use it. Just remember that if a station sounds distorted or noisy, and moving the antenna around doesn't completely cure the problem, you may need an external antenna. Don't blame the tuner or the station for inferior sound if you are using a simple indoor antenna.

How about the other indoor antennas on the market?

We have tested a few other indoor antennas, which fall into two categories: passive and active (amplified). The passive ones are often variations on

times they take the form of a tunable r.f. amplifier, or "booster," to be used with some form of passive antenna, either indoors or outdoors. If you cannot, for whatever reason, use a high-gain outdoor antenna, a booster may bring in signals with less noise than an unamplified antenna. The Magnum 105 antenna booster we tested for the September 1984 issue is an excellent example of this type of accessory.

None of these devices or accessories should be considered a fully equivalent substitute for a good high-gain outside antenna. They will help you get more from a less effective antenna, but they will never match the

the FM frequencies in order to reduce the possibility of interference between FM and TV stations. Since this sort of interference can be easily eliminated by a low-cost filter added to the TV lead-in wire, there is really no reason to avoid a multipurpose antenna.

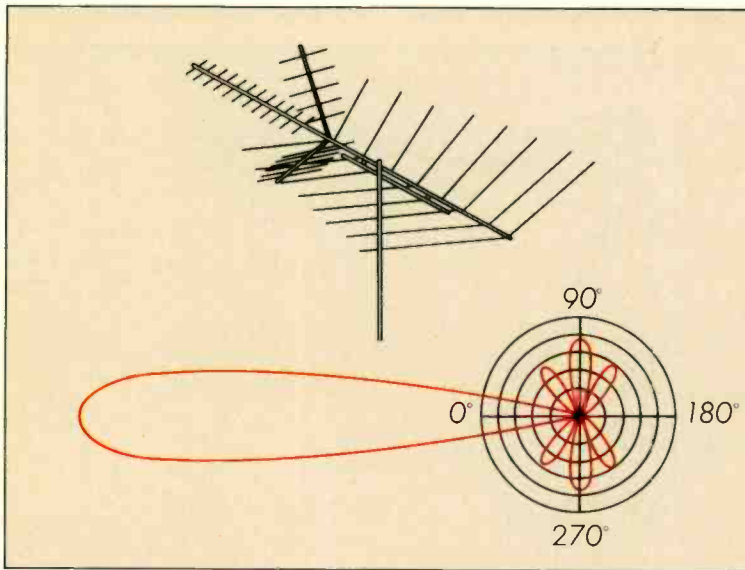
Finally, you should be aware that some outdoor FM antennas are designed to be as omnidirectional as possible. They may resemble an S-shaped dipole, a dipole wrapped around to form a circle, or even a vertical rod or whip. Some of these, especially if installed high up and in the clear, may do a fine job of delivering a strong signal to the tuner (though they will be no match for any multi-element high-gain antenna in that respect), but none of them have any useful directional properties and therefore cannot help solve multipath problems.

What do you do when all other measures fail?

Every now and then we get letters from readers who say they live in what appear to be broadcast "Bermuda Triangles" where FM and TV signals just disappear into overwhelming noise and distortion. Many of these problems turn out to be solvable by creative antenna tweaking or by relocating the antenna—from one end of a roof to the other, say. There are reception problems, such as those faced by dwellers in steel-framed apartment buildings, that cannot be totally eliminated by *any* antenna installation allowed by the landlord. Sometimes a cable TV hookup will offer relief for FM also, though many cable systems, for some reason, provide TV channels only.

In a few cases, the only honest advice to an FM-deprived music lover is to build up a good record and tape collection—or perhaps to move! But for most people, most of the time, a good antenna that is properly installed and connected will pull in clean signals from a satisfying range of FM and TV stations. □

Multipurpose directional antennas will deliver a 4- to 6-dB on-axis gain on FM, VHF-TV, and UHF-TV, with equivalent rejection in off-axis directions. The polar reception pattern shown is a rough average. The different broadcast bands will have different polar patterns.



rabbit ears and may be tunable in frequency as well as adjustable in direction. Few of them, however, have as much gain as a twin-lead or T-shape dipole or even TV-type rabbit ears. Nevertheless, they usually offer some advantage in easily adjusted directionality, so in locations blessed with ample signal strength (such as city apartment buildings), some of these antennas may actually outperform others that can deliver more signal to the tuner but are less versatile in directionality.

Amplified indoor antennas, which are considerably more expensive, can often outperform a simple "T" antenna in almost every respect. Some-

performance of a properly designed and installed antenna system. No matter how good your tuner may be, it can only process the signal that reaches its antenna terminals.

There are few antennas designed specifically for FM reception and sold for that purpose. Since the FM band falls adjacent to the low TV band (Channels 2 to 6) and between Channels 6 and 7, it is often possible to use a TV antenna for FM reception as well. (The Radio Shack antenna shown at the beginning of this article is designed to receive FM, VHF TV, and UHF TV.) However, many TV antennas are designed specifically to *exclude*

by Alanna Nash

EMMYLOU HARRIS



Singer/songwriter Emmylou Harris's first concept album is a milestone in her life—and in country music.

During the past six years, when the pressures of her career and personal life threatened to overwhelm her, country singer Emmylou Harris held fast to an idea. It sustained her through the disappointment of a failed marriage (to producer Brian Ahern) and her worries about creativity and the responsibilities of keeping some fifty people

employed on the road. Harris says that sometimes the idea was "the only seed that kept me going, even though it was really traumatic to make the changes I needed to get to the point where I could even *approach* doing it."

Last year, however, Harris realized the time had come to make her idea a reality.



In what amounted not only to a commercial risk but to a creative and artistic rebirth, she quit the road, separated from her husband, left their California home to relocate in Nashville, and began work on her first major composing project, "The Ballad of Sally Rose." It is a concept album that stands as a tour de force of country writing, singing, playing, and even production.

Based somewhat on Harris's own life, "The Ballad of Sally Rose" is, in effect, a country opera. In the course of thirteen songs, it traces the life of a young woman who opens a show for The Singer, a man she falls in love with, marries, and eventually leaves for her own career. As with any great romance, it incorporates the elements of fate, tragedy, and success tempered by heartbreak and elusive peace of mind.

In the press release that accompanies promotional copies of the album, Harris insists that she is *not* Sally Rose and that her song cycle is not meant to be autobiographical. Yet in many ways Sally Rose's relationship with The Singer (who is never named in the lyrics) parallels that of Harris's friendship with Gram Parsons, the prince of coun-

try-rock who died in 1973 "after consuming too much of everything bad he could get his hands on," as critic John Morthland put it. Harris launched her illustrious solo career on the grounds that she had been Parsons's duet singer and

that she intended to carry on his vision of country-rock. Thus, it is not surprising to turn to "The Ballad of Sally Rose" and find reference after reference to Parsons's life and work—the most blatant being allusions to "Joshua Tree" (Parsons's body was taken to the California desert and buried there near the Joshua Tree Monument) and "Sweetheart of the Rodeo," the title of a country-rock album recorded by the Byrds when Parsons was a member of the band.

What *is* surprising, however, is simply that Harris, who has long been into double nicknames (she once drove a white Pinto she called Rita Pearl) and who for years played a black Gibson J200 guitar with a red rose inlaid on its top, has been so reluctant to own up to her alter ego, Sally Rose.

"I guess I asked for this," Harris said, sighing good-naturedly, when I talked with her at the Nashville office of Warner Brothers Records. "But originally the character of Sally Rose came from a time in 1978 when we were in Rapid

City, South Dakota, which is one reason for the stuff about Mount Rushmore. We had a night off, and we were in a bar, just enjoying ourselves as regular people out for the evening. And whenever somebody thought they recognized me, Phil

[Phil Kaufman, her road manager], being very protective of me, would say, 'Oh, no, that's not Emmylou—that's Sally Rose.' From there, we started taking it that she was my sister or a background singer in my band, and between us she just got to be one of these imaginary characters who become a part of the jargon of the

road. I mean, there was a certain point where we called ourselves "Sally Rose and the Buds."

"There are autobiographical references on the album," she continued. "But on the other hand, it *isn't* the story of my life. Some of those things happened to me, and some of them didn't. But, obviously, Gram is the inspiration, was *always* the inspiration for it."

At first, Harris says, the story had three female characters whose lives intertwined. One was an older woman who'd led a hard life, and another was a more contemporary character. "Sally Rose was just one of them. Then I realized that the only way the story could really make any sense as a record was to have only one female character, so the others were discarded, but I have to admit that I'm still haunted by their ghosts. The other two characters were combinations of friends and people I've known, and Sally Rose is too. But obviously," Harris says, chuckling, "one of those people is *me*."

Aside from the puzzle of who's who on the album (which should have country-music fans studying the lyrics for years to come), one of the most intriguing—and impressive—aspects of "The Ballad of Sally Rose" is that Harris wrote the bulk of the material. Although she has long been recognized as a country songwriter of the first magnitude, she has hardly been prolific, and for the past ten years a severe case of writer's block has kept her

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Harris launched her illustrious solo career on the grounds that she had been Parsons's duet singer and

from writing much else besides *Tulsa Queen*, *Amarillo*, and *Boulder to Birmingham*. The first two were written in collaboration with Rodney Crowell, and the third was written with Bill Danoff.

For "The Ballad of Sally Rose" Harris once again went in search of a co-writer. She decided on Paul Kennerley, the young Englishman who wrote *Born to Run* and *In My Dreams*, both of which appeared on previous Harris albums. The choice was ideal for another reason, however: Kennerley had written two other concept albums, "White Mansions" for Waylon Jennings, and "The Legend of Jesse James," which featured a roster of big Nashville names, including Johnny Cash.

Harris and Kennerley, who met on the Jesse James project, are sort of a mutual-

admiration society, and each gives the other most of the credit for "The Ballad of Sally Rose," even though officially they shared the writing and production duties.

"My involvement in this project is certainly less than half," said the tall, lanky Kennerley when I interviewed him on his own. "I think my biggest contribution was keeping her at it and helping her form the ideas that she wanted to put down. I was really her assistant rather than her collaborator."

Emmylou sees it differently, of course, and according to her Kennerley wrote the music for two or three of the songs (*Heart to Heart* and *Diamond in My Crown* among them). She says he contributed the occasional odd line for others, and on several tunes (*Timberline*, *White Line*) he helped her write the verse or chorus when she couldn't get any further. "He stood over me with a baseball bat until I finished the words for *Diamond in My Crown*."

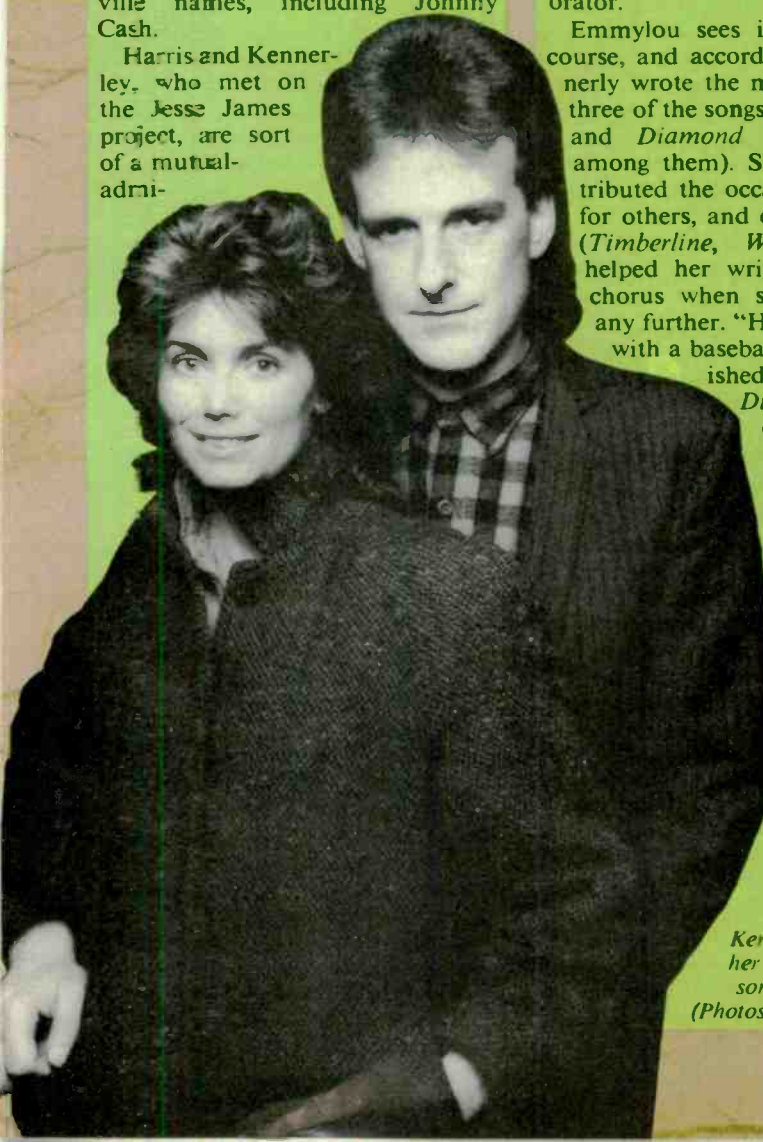
Kennerley reiterates, however, that Harris already had the bulk of the lyrics and the original concept of the album several years ago. "No matter what she says about not doing quite so much [on the album], take it

from me that she did. She's quite a modest person—*very* modest, proportionate to her abilities and talent. She's the best songwriter I've ever been around, and I've been around a few."

Harris and Kennerley are something of a mutual-admiration society, and each gives the other most of the credit for "The Ballad of Sally Rose," even though officially they shared the writing and production.

No matter who wrote what, "The Ballad of Sally Rose" fits the definition of great country music. Taken as a whole, the material evokes an honest and historical sense of pure, rural Americana (as Kennerley's other two theme albums did), with smatterings of distinctive blues, gospel, bluegrass, and straight-ahead barroom country music all woven together. Lyrically, it is a rich and vivid tapestry of imagery and emotion, mystery and pain, often, as in *Sweet Chariot* and *Heart to Heart*, of almost unbearable beauty. And like Harris's best early song, *Boulder to Birmingham*, much of "The Ballad of Sally Rose" carries a desperation, a smoldering, aching passion to connect with the poignant realities that live in the heart and not just the head.

Harris must have felt considerable pressure from the fact that this was the most important album she'd done since "Roses in the Snow" (1980), generally considered her masterpiece, and both she and Kennerley were acutely aware of the production standards set for her in the past by her husband, Brian Ahern. The mastermind of Anne Murray's early records, Ahern began producing Harris's recordings with her first Warner Brothers album, "Pieces of the Sky," in 1975. He went on to establish himself as a brilliant crafter of sound, incorporating—primarily on his wife's records—a myriad of sophisticated sounds and intricate arrangements



Harris with Paul Kennerley, who wrote her Grammy-winning song *In My Dreams*. (Photos by Jim McGuire)

that had never before appeared in country music.

Still, "we never thought of ourselves as actually 'producing' the record," says Kennerley, who had never produced an album before. "We just got on and did it, because we had written it, and it just didn't seem necessary for someone else to do it. Looking back on it now, though, it was a hell of a responsibility. I mean, I didn't want to let her down. But we had an excellent engineer, Donivan Cowart, and he'd worked with Emmy before."

Recorded digitally in Nashville, "The Ballad of Sally Rose" is both an audio lover's delight and a radical departure from standard country-music production. Harris busied herself in working out the vocal parts and arrangements and deciding on the majority of the musicians and singers (including Dolly Parton, Linda Ronstadt, Gail Davies, Vince Gill, Waylon Jennings, and revered studio pickers Emory Gordy, Jr., Hank DeVito, Albert Lee, Buddy Spicher, Russ Kunkel, and Larrie Londin). In the meantime, Kennerley worked with Cowart in coming up with what he calls a "soft and bright" texture to the overall sound, which he explains was achieved by cutting down on the midrange throughout the record.

electric slide in *Diamond in My Crown*, for example—would become even more dramatic. And just as Harris had written the songs with classic country-music references in her titles and with vocal parts that weave in and out of each other, Kennerley followed suit with the instrumentation, a harmonica sneaking in for a small but vital fill on *Timberline* and an amplified mandolin kicking in when least expected.

"It's a very layered album," says Harris, "with lots of textures and little invisible things that Paul put on there, like having ten acoustic guitars on the bridge of *Diamond in My Crown*, where you just hear those sorts of 'drings.' Nothing was added arbitrarily, though," she says. "There was definitely a reason for it, usually to make sure the song built the way we wanted it to."

But the best surprise of "The Ballad of Sally Rose" is that Emmylou Harris's exquisite soprano sounds stronger than it has in years. "I'm a lot healthier than I've been in a long time," Harris says. "Two years ago I had nodes on my vocal cords. Now I'm doing vocal exercises three times a day on the road, and I'm doing regular exercise, too. I think there's a certain point in your life where you have to start taking better care of yourself, or every aspect of your life is going to suffer because of it."

Another reason for her sense of well-being, she says, is her move to Nashville. "I'm constantly touched by the friendliness of people here, the general humanity that makes living here very pleasant. A lot of my old cronies, friends who used to work with me in L.A., are here now, too—Hank DeVito, Rodney [Crowell], Rosanne [Cash], and Ricky

But the best surprise of "The Ballad of Sally Rose" is that Emmylou Harris's exquisite soprano sounds stronger than it has in years. "I'm healthier than I've been in a long time," she says.

[Skaggs]. The country-music industry is incredibly healthy right now, too, and it's encouraging to see so many who've had pop success, like Nicolette Larson, come here and be able to make a country album."

With that openness in the industry, the thirty-eight-year-old Harris hopes to be able to foster more projects such as the excellent album she produced for country-bluegrass singer Delia Bell two years ago, even though she is understandably disappointed at the record's meager sales.

Meanwhile, however, she is on the road with "The Ballad of Sally Rose," dreaming of a Celtic album she hopes to do someday, and planning to complete another collection of country songs she originally started in order to postpone tackling "Sally Rose."

"It was a terrifying thing. It was a long time coming, and it's a good feeling that it's done," she says of the concept album. "I'm hoping that it'll be special to other people, but ultimately it was done because it was personal, and I wanted to do it. It almost doesn't matter if people don't like it, but even if they don't, the important thing is that I've definitely broken the ice and gotten my new working life started.

"All of a sudden," she adds, "I got courageous." □



"We never thought of ourselves as actually 'producing' the record," says Kennerley. "We just got on and did it, because we had written it, and it just didn't seem necessary for someone else to do it."

Instead of the usual pointed instrumental solos and musical lines that Ahern worked into Harris's records, Kennerley opted for few solos, aiming, with the acoustical instruments and guitars, for a backdrop, or a wash of sound in the background, so that the vocals could steer the way and the occasional "cutting" sounds—the close-up miking of the snare drum and the

by Christie Barter & Steve Simels



THE great faces of Johnny Cash and Waylon Jennings will probably appear someday on a country-music Mount Rushmore. Here they are shown with June Carter Cash, whose face isn't bad either, backstage at Radio City Music Hall in Manhattan. The occasion? Post-concert festivities after Jennings and Cash's first joint performances in New York, a sort of musical summit meeting that was as successful as it was unexpected. Cash and Jennings, who have never recorded an album together, are keeping mum about immortalizing the collaboration on vinyl, but an album is reported to be in the planning stages. Stay tuned, fans of black leather. □



The Cashes with Jennings (right) at a musical summit meeting

THEATRICAL composers and producers have been known to marry members of the chorus line and then promote them to starring parts. Such was not the case when composer Andrew Lloyd Webber married singer Sarah Brightman last fall. Lloyd Webber met Brightman when she played a secondary role in the original



Brightman in premiere

London production of his show *Cats* (Polydor Records), but before he married her, she had won the title role in someone else's show—*Nightingale*, a musical by the American composer Charles Strouse (available on the imported That's Entertainment label).

Brightman is the soprano soloist on the Angel recording of her husband's new Requiem, in which she is joined

by tenor Plácido Domingo, the Winchester Cathedral Choir, and the English Chamber Orchestra under Lorin Maazel. The world premiere of the Requiem, with Brightman and many of the same artists, took place at the end of February at St. Thomas Church in New York City. That performance was taped for telecast on the PBS network on Good Friday and Easter, April 5 and 7. □

ANDREW LLOYD WEBBER'S brother, the cellist Julian Lloyd Webber, made news as the central figure in what has been touted as the first airborne book- and record-signing party, which was held aboard Virgin Atlantic Airways Flight 001 at 30,000 feet somewhere between London, England, and Newark, New Jersey. The cellist autographed copies of his new book and new Philips recording, both appropriately titled *Travels with My Cello*, and he played a series of mini-recitals up and down the aisles of the plane to entertain his fellow passengers.

Speaking of the new record, Lloyd Webber says it was "designed to entertain." The contents range from Saint-Saëns's *The Swan* ("probably the most famous cello piece ever") to Rimsky-Korsakov's *Flight of the Bumblebee* and Khachaturian's *Sabre Dance*, which are rarely played on this instrument. As Lloyd Webber points out, "The cello has a range of well over five octaves and can do more than most people think."

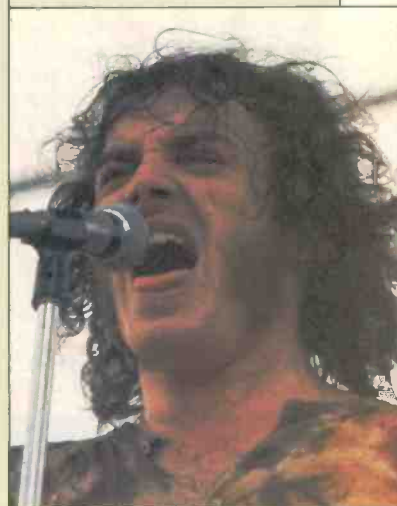
Inserted in the program is a winning *Andante affetuoso* by the artist's late father, William S. Lloyd Webber, an organist and composer. Julian Lloyd Webber's world premiere performance of a set of variations written by his brother Andrew has been released in England on the MCA label.

The family also figures prominently in the autobiographical *Travels with My Cello*, distributed in the United States by Merrimack Publishers' Circle of Salem, New Hampshire. The book is mostly a collection of anecdotes, many recounting Julian Lloyd Webber's frequent brushes with airline and customs officials. □

WHY IS THIS MAN SCREAMING? That's Joe Cocker, of course, ripping his lungs out at the legendary 1969 Woodstock Festival, a social event you may have heard about from your older

brothers and sisters. Now, there's good news both for those who attended and for those who wish they had: you can return to those thrilling days of yesteryear by courtesy of the latest in modern technology. Mobile Fidelity has just released both volumes of the official Woodstock soundtrack albums in a five-CD set featuring music and stage announcements by such notables as the Jefferson Airplane, Sly and the Family Stone, Country Joe and the Fish, the Who, and (of course) Joe Cocker.

More good news: the Woodstock set comes complete with the original cover art plus an order form for a



Cocker at Woodstock

limited-edition reprint of the original concert program—fifty-six pages of prose, photos, and psychedelic illustrations from the deep recesses of the late Sixties. □

Cellist Lloyd Webber, playing over the Atlantic on Flight 001



ALAN DAVIDSON

by Christie Barter & Steve Simels



THE 300th anniversary of Bach's birth is being celebrated this year on the TV screen as well as on records and in the concert hall, and there will be two telecasts by the **Concentus Musicus** of Vienna performing the composer's *Brandenburg* Concertos under the direction of **Nikolaus Harnoncourt**. The first, scheduled for April 26 on the PBS network, is devoted to "The Solo Concertos," or Concertos Nos. 1, 3, and 6. The second program, covering "The Concerti Grossi," Nos. 2, 4, and 5, will follow sometime in June, the exact airdate to be announced.

Harnoncourt has made more than one recording of the *Brandenburgs* with the **Concentus Musicus**. The latest, a digital recording on the Teldec label, is available on LP, tape, and Compact Discs. □

THE touring production of **Stephen Sondheim's** *Sweeney Todd: The Demon Barber of Fleet Street* originally filmed for broadcast on Home Box Office a while back was subsequently released in video-cassette form by RKO HomeVideo. It was



Hearn, Lansbury: demonic

taped at the Dorothy Chandler Pavilion in Los Angeles during a live performance starring **Angela Lansbury**, in the part she created on Broadway, and **George Hearn**, who stepped into the title role when **Len Cariou** left



On the tube: Harnoncourt celebrates the birth of Bach

the New York cast. Viewers who are neither subscribers to HBO nor owners of the RKO tape may treat themselves to the black humor of the Tony Award-winning musical on May 3, when it is scheduled to be telecast by PBS. □

LAST winter, when MGM/UA Home Entertainment was getting ready to distribute *Gone with the Wind* in video, a Washington, D.C., reporter previewing the home version noticed that about forty-five seconds of music in the prologue (a Max Steiner arrangement of *Dixie* for orchestra and choir) was missing. But 30,000 units of the two-tape deluxe packages had already been made, with orders for some 200,000 more waiting to be filled.

Indicative of the exceptional care that MGM/UA lavished on *GWTW* for the home was that even at that eleventh hour the correction was made and the existing tapes were scrapped. None remain, they claim, to become collectors' items. □

TECHNOLOGY MARCHES ON DEPARTMENT: R-&B maitres **Kool and the Gang** (that's lead singer James Taylor up front) have gone video in a big, innovative way. (Their "Emergency" audio al-

bum, of course, is currently all over the airwaves.) In fact, they'll be the first artists in any genre to have a video album with a soundtrack that is digitally encoded.

The album is intended for use with Pioneer's CLD-900 LaserDisc/CD player and similar units marketed under other brand names. These units play Compact Discs, regular laser-read video discs with CX-encoded analog sound, and a new breed of video LaserDiscs with digital audio soundtracks.

The **Kool and the Gang** album (from Pioneer Artists) is a digitally recorded video production of a recent concert the group performed in New Orleans.

Other fully digital video discs immediately upcoming from Pioneer include a **Kiss** album and *Star Trek III—The Search for Spock*. If you

Kool & the Gang: digital



are a **Kool** or **Kiss** fan with an older LaserDisc player, don't fret. These fully digital video discs also contain analog soundtracks, which makes them compatible with earlier players. □

THE Broadway musical *Leader of the Pack*, based on the life and songs of composer **Ellie Greenwich**, made history by being the first Broadway show to go on camera for a music video even before its first public performance.

On a Sunday morning in February, ten days before the first preview, **Annie Golden** joined her co-stars and the rest of the seventeen-member cast at Times Square in Manhattan. They got on their rented motorcycles and along with 200 other bikers roared down Broadway with Golden in the lead singing the title tune. Coffee and donuts were served later.

The *Leader of the Pack* vid-



Greenwich, Manoff: co-stars

eo, which also includes the pop classic *And Then He Kissed Me* sung by **Dinah Manoff**, was produced by Elektra/Asylum/Nonesuch to support both the show and, quite naturally, the original-cast album. The latter, a two-record set, is being released by Elektra Records. □

Vestron MusicVideo has just released "Red Hot Rock," billed as a collection of "uncensored" music videos. They presumably have never been shown on network, cable, or pay TV. Featured, we're told, are "racy, provocative" video versions of hits by **Duran Duran**, **Queen**, **Dwight Twilley**, **O'Bryan**, and the **Tubes**. □

STEREO REVIEW

REPORT ON CAR STEREO





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EVALUATE YOUR CAR STEREO SYSTEM

You can check your system's performance out with some easy test procedures.

ARE you completely happy with your car stereo system? Do you wonder if it is giving you your money's worth? Does listening to music on the road seem much less satisfying than listening in your living room?

While it is no longer unreasonable to expect a good car stereo system to provide hi-fi sound, listeners whose ears are "calibrated" to the sound of their home systems may be unsure whether sonic shortcomings on the road are flaws in the system or simply effects of a drastically different listening environment, continually varying reception conditions, and so on. The performance of car systems has become comparable in many ways to that of home systems, but there will always be striking differences between them, and different standards have to apply.

Evaluating your car system is especially important if you're thinking of upgrading. You need to zero in on the areas of performance that need improving—and that *can* be improved. If you start shopping for a new system with only the vague feeling that you want "something better," you could easily wind up with something you'll like even less.

Road testing a car stereo system involves no esoteric procedures or measurements with costly test equipment. It is simply a matter of putting a system through its paces, of checking how well it copes with the widest possible variety of operating conditions that it is ever likely to encounter.

Any meaningful listening test requires some control over the program sources. This is easy to achieve when you are evaluating the tape player in your car system. First of all, select several cassettes of *music that you know well*, encoded for as many different noise-reduction systems as

your car player can handle. For convenience in comparative listening tests, also make up one or two special test cassettes with short dubbed passages representing a variety of types of music and NR encoding as well as sustained-pitch test tones. (See the box at the end of this article for some tips on how to make up your own car stereo test tape.)

You'll need test tones on your tape to help evaluate the steadiness of your player's tape transport and also, if it is an autoreverse deck, to compare the frequency response in the forward and reverse directions. (The test tones should be recorded at the same points on both sides of the cassette so you can easily switch between them for comparison.) You can also use a passage of music that maintains roughly the same volume level, pitch, and tempo for some time, and you should include a section (again, on both sides) of recorded pink noise or FM interstation hiss to help evaluate the high-frequency response. The test tones, sustained musical passages, and hiss will let you hear whether your player has noticeably unequal performance in the two directions of tape motion, as many autoreverse decks do.

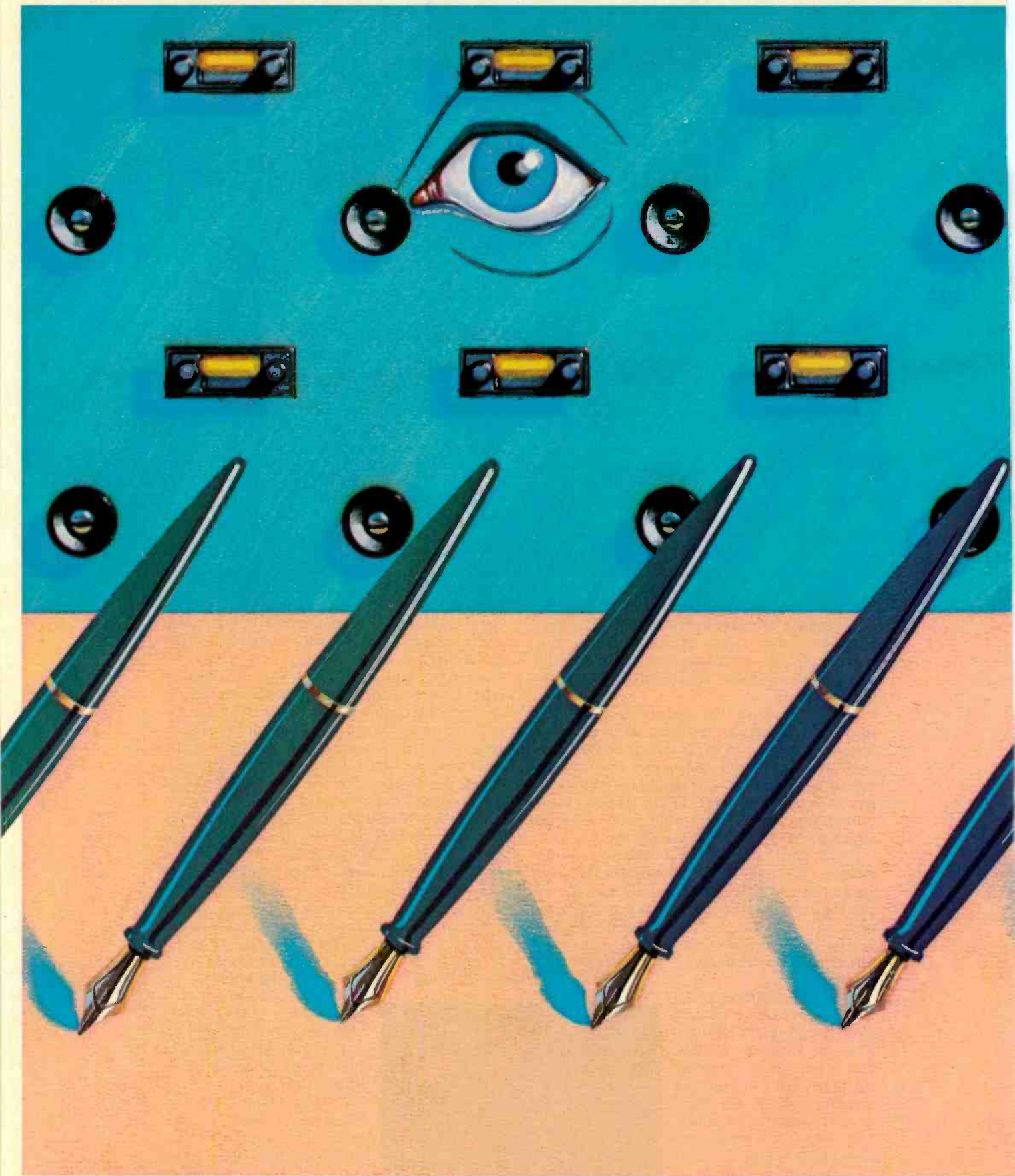
For evaluating the tuner, you'll need a selection of broadcast stations. The best approach is to preset or jot down the frequencies of three or four stations in each band, *including at least one distant station in each group*. If the distant station's frequency is close to one or more strong local stations, so much the better

for your testing. Although you can't, obviously, control the programming on your test stations, it's a good idea to select stations that you regularly listen to, at home and in your car, so that their sound will be familiar to you.

Finally, before you start listening critically, give your equipment a chance to show what it can really do. Clean and demagnetize

by Christopher Greenleaf





the cassette player's heads and capstans, extend the antenna fully, and make sure that there are no mechanical problems with your speaker installation. Go over the speaker mountings with your eyes and fingers to check for loose wires or panels, wires touching a diaphragm or voice coil, loose dirt in a voice coil, or a coating of lint on the specially treated dome of a midrange driver. You want to be listening for sonic shortcomings in *normal* operation, not rattles or buzzes caused by a faulty installation job!

The "human engineering" of a car stereo head unit—the tuner/tape player, which may or may not include the amplifier and even an equalizer—is much more critical than the ergonomics of home audio components. Badly designed controls and displays can be unsafe, not just inconvenient.

You've probably become pretty used to your system's head unit, but try to approach it as if it were new. Go over all of its knobs, buttons, and sliders one by one. In each case, ask yourself if the control is really conveniently placed, securely fastened, and firm enough under your fingers to be used with confidence while driving in traffic. Knobs that spin too easily or that produce great changes (in volume, tone, frequency, etc.) with only a slight rotation are difficult and distracting to use. Whether a control turns, slides, or pushes, there should be enough resistance to prevent accidental activation and to give you feedback.

Controls and Displays

The volume and fader controls should not have detents, but tone and balance controls benefit from some tactile indication of a neutral or center position. This holds as much for slider controls as for knobs and rings. A well-designed control button will signal activation with a click or beep of some kind at the end of its travel. Good human engineering will make even the most full-featured control panel easy to operate. Judge whether any parts of your unit's panel are too crowded to let you find and operate the control you want with minimal distraction from the road.

In a car, control-panel displays have three very different levels of

ambient light to contend with: daylight, dusk, and darkness. Dusk is the greatest challenge, since the dim light coming from outside the car is likely to be more distracting than helpful. The frequency and tape-direction displays should always be fully visible, but many other functions only need enough illumination to let you find the controls when necessary. See if your unit's illumination system really works the way the manual says it should.

Tests of your system's ergonomics, like many listening tests, should be tried first with the car parked and the motor switched off, then repeated on the road at different speeds and in different driving conditions. The initial stationary evaluation will give you a kind of "benchmark" for your judgments, since it shows how well your system performs in the most favorable circumstances—and you don't have to watch the road.

The Tuner

While you can't check if your car tuner's performance is precisely up to spec without a bench full of electronic gear, let alone make subtle comparisons among the different brands, your ear alone *can* tell you whether it's good, great, mediocre, or lousy in the most important parameters. You'll want to listen for problems in the areas of *sensitivity* (how well it pulls in the distant stations you want to hear), *selectivity* (whether there's interference from other stations close by on the frequency band), *quieting* (how noisy a signal gets before it stops being received), *multipath resistance*, and *automatic channel blending* and *treble attenuation* for poor signals.

With the advent of AM stereo, the AM performance of car radios is worth a review even by audiophile listeners. Reception should be clear and quiet enough for you to distinguish the widely varying broadcast quality of different AM stations. Many AM broadcasters still settle for inexcusably poor technical quality—an audibly narrow frequency range, high noise levels, and outright distortion. Others, however, particularly those using one of the AM stereo formats, are likely to be more conscientious about their signal quality. If your AM tuner is a

good one, their broadcasts will come bursting out of your speakers with a power and richness rivaling a number of FM stations. And, in my experience, a well-engineered AM tuner in a car radio is a good indication of high quality elsewhere.

Nonetheless, FM is still the main broadcast medium for music. Its strengths are a wider bandwidth than AM (better frequency response) and less noise (at least under good reception conditions). Its weaknesses are a shorter range, easily degraded stereo separation, and susceptibility to multipath interference and blockage by obstacles in line of sight of the transmitter. FM reception in the car will always be variable since it is dependent on how far and in which direction the transmitter is located.

Your tuner will perform best with the car parked in the path of a good signal source. Check a variety of stations up and down the dial, both near and distant, and get a good impression of what your reception can be at its best. Listen for the effect of switching from stereo to mono if your unit has a manual control for this. See if any local stations are so strong that they sound better with the local/distant (DX) sensitivity switch changed from its usual distant setting.

When you pull away from the curb and begin to move through local signal fluctuations, your experience with the tuner's performance under the best conditions will be a welcome standard against which to judge its performance on the road. Take a ride far out into the country and observe how the signal degrades. This will reveal how well circuits in the radio cope with weak and erratic reception.

It's also a good idea to listen to a number of other car systems so as to become familiar with the different effects of multipath distortion, signal loss, and high-blend problems that are possible. You will notice audible multipath in many situations, but with a well-designed tuner it never becomes really obtrusive. At its least obnoxious, multipath produces a short burst of "hash" or "cotton wool" that is not seriously distracting. At its worst, multipath can be sustained and sound louder than the music, tearing it to shreds. Multipath problems can usually be greatly reduced by switching the tuner into mono.

Tuning ease, the number and con-

venience of station presets, and legibility of the frequency display are important factors if you travel a lot or like to listen to a wide variety of broadcast fare. A tuner with many presets enables you to choose quickly among lots of stations, and a convenient search/scan function helps you find something listenable even in unfamiliar territory.

The Tape Player

Except for car Compact Disc players—which are just becoming available—the versatile hi-fi cassette still gives the most programming flexibility and the best audio performance in car stereo. If your system's cassette player can handle the two main tape equalizations and has at least Dolby B, it's unlikely to be the weakest link in your audio chain—unless it's badly designed or poorly adjusted, or unless you fail to clean and demagnetize the heads regularly.

With your car parked, slip in one of your test cassettes (preferably one you could easily replace if it became damaged) and try every possible combination of transport controls. There should be no hint of reluctance to respond or any compromise in tape-handling gentleness.

The eject mechanism should work well every time. (A faulty eject is one of the most common lapses in performance I encounter. Some units eject a cassette only partially or not at all some of the time.) With a cassette in place, try switching off the stereo system or the car's ignition. Note in each case whether the tape ejects, whether you hear a solid click as the pinch-roller disengages, or whether the mechanism simply stops where it is with the cassette inside. (The owner's manual will probably tell you what the deck is supposed to do, but check it for yourself.)

Now try some listening. With a good tape in a good player, the sound should be crisp, firmly settled on pitch, and noise free. For your stationary "benchmark" tests, you can apply pretty much the same standards as you would at home. Try all the combinations of noise-reduction systems and tape types to decide what sounds best in your system. Make an A/B comparison of each tape with the noise-reduction

system on and off to check that the circuits are working properly. If you find that ferric tapes recorded with Dolby C work better on your machine than chrome tapes with Dolby B, so be it: this is the fodder your deck thrives on.

For more specific tests, use the special test tape(s) you prepared. Use the steady test tones you recorded to check for wow and flutter (a slow or fast wavering of the tone). Check both directions with an autoreverse player since different pinch-rollers and capstans are used for forward and reverse. Also listen for a change in pitch as you change directions, which would indicate that the transport is faster in one direction than in the other. If you have a high-quality home deck, you can use it to test the speed accuracy of your car player. Record a passage of some length on your home deck (at least 10 minutes), then play it back on the car player, using a stop watch to time it in each case. A difference of only 6 seconds in a 10-minute recording amounts to a 1 percent speed difference between the two players, which could be significant in terms of musical pitch.

The interstation hiss (or pink noise) that you recorded on your test tape will let you check your player's high-frequency performance. If the hiss sounds dull, it could indicate that the playback head is misaligned, and if it sounds very different when you change directions on an autoreverse deck, something may be wrong. On the other hand, some autoreverse decks that perform satisfactorily in one direction but not in the other may be suffering from design compromises rather than any manufacturing defect or maladjustment. If the difference bothers you, you can simply ignore the autoreverse feature and play your tapes only in the direction that sounds best. Or you can shop for a replacement unit that's more consistent.

In road testing, pay careful attention to how well the tape transport deals with shocks and bumps. Poor shock handling can damage tapes as well as irritate your ears. Irregular road surfaces that affect each wheel differently provide the best (most challenging) test. Listen to the same tape—the steady tones on your test cassette are best for this—on the same road at a number of different driving speeds in order to present different periods of vibration to the

A TESTING CHECK LIST

1. Getting ready

- Select music test cassettes.
- Record special test cassette.
- Select test broadcast stations; preset on tuner or note frequencies.
- Clean and demagnetize cassette player heads and capstans.
- Look for speaker mounting flaws.

2. The head unit

- Check all controls for convenience, "feel," durability.
- Check display illumination in different light conditions.

3. The tuner

- Check FM and AM sound quality on best signals.
- Check FM sensitivity on weak signals.
- Check FM selectivity.
- Check FM multipath resistance.
- Check channel separation and auto high-blend on FM stereo and, if available, AM stereo broadcasts.
- Check interstation quieting on AM and FM.
- Evaluate tuning ease.
- Are there enough presets?

4. The tape player

- Check transport controls.
- Check auto eject/disengage.
- Check noise-reduction systems.
- Check for speed and pitch consistency in autoreverse.
- Check performance with the tape types you use and determine the best-performing tape/noise-reduction combination.
- Evaluate overall sound quality.
- Check resistance to shock and vibration.

5. The amplifier

- Select optimal input sensitivity.
- Check for adequate peak power.
- Check for adequate sustained power.

6. The speakers

- Evaluate placement for imaging and tone.
- Use tone controls (or equalizer), loudness switch, and fader to optimize sound, then evaluate tonal shortcomings.

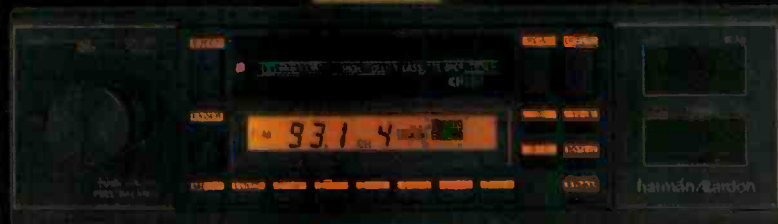
7. Summing up

- List shortcomings and assess their importance in light of your specific needs and preferences.

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tape transport. Not many players will resist *every* jitter and shudder, but a good one will ignore all but the most severe bumps in the road.

The Amplifier

Evaluating your system's amplifier is simple, whether it's built into the head unit (making it a "receiver") or separate, whether you have one or two pairs of speakers. You have enough power if you can play music as loud as you want to hear it without audible strain. And if the power amplifier in your system has switchable input sensitivity, you'll want to check that you have the optimal setting. The volume level at which you hear distortion should change perceptibly with each alteration of the sensitivity switch(es). Obviously, the setting that allows the greatest level of clean sound is the one you want.

Since peak-level power and continuous-output power are different, you'll need either different test cassettes for each or different selections on your specially recorded test tape. To test for your system's capability of reproducing sustained sound, use an orchestral or big-band recording without heavy percussion. (If your taste runs that way, the massive, sustained chords in music for large pipe organ make an excellent test program source.) To test the system's peak output, use music with lots of transients—percussion, piano, the spikier kinds of rock. If you were able to record some very clear, steady tones on your test tape, use these to check for distortion.

In each case, slowly turn the volume up until it is as loud as you think you would ever want it. If there's no distortion, or if the distortion is too slight to be bothersome, you're okay. If you start getting noticeable distortion at levels you consider moderate or low, you probably need extra power. (Be sure *not* to push the system *past* the point of unmistakable distortion, since you might blow out your speakers!) Repeat these tests on the road at different speeds and in different driving conditions as well as when you are parked. What might seem very loud in a parked car may well be too low in city traffic.

Speakers

Speakers are always the most difficult and subjective component to evaluate. Rattles and buzzes can usually be identified quickly as mechanical problems, but the source of an "unpleasant" or an "unmusical" sound is anyone's guess. I find that very few modern name-brand car speakers misbehave even at high listening levels if they are rigidly mounted in properly baffled panels or other firm surfaces and are adequately powered. As with home equipment, car speakers are more likely to be damaged by *too little* power (which forces you to turn up the volume, increasing the average power and distortion delivered to the speakers) than by too much.

Just as at home, your car speakers are interacting in a complex way with their environment. If you don't like their sound, it may be the

fault of the placement as much as or more than of the speakers themselves. Experiment with your tone controls, loudness control (if your head unit has one), and equalizer (if any) to try to tailor the sound more to your taste. Here is where it is especially important to use cassettes of music you are already familiar with. If you know how it *should* sound, you'll be better able to tell where your system falls short.

Adding It Up

After you've checked everything and done all the listening tests that seem relevant, tot up your mental (or even written) notes of pluses and minuses in light of your own driving and listening habits. A tuner with a mediocre AM section may be a continual source of disgust to one user but a matter of indifference to another. Lack of deep bass in the speaker output might drive a lover of organ music to perform major surgery while one who prefers listening to autoharp and hammered dulcimer couldn't care less. Excellent FM sensitivity is obviously not as crucial as fine multipath suppression for driving inside a large city, but clean stereo in FM or AM can be a major requirement for any user in any location.

Once you've gone through this process of evaluating your system, you might even decide that you like it pretty well after all! But if you don't, you'll have a much clearer idea of what to look for in add-on equipment, upgrades, or a whole new system. □

HOW TO MAKE YOUR OWN TEST TAPE

BESIDES a variety of short, familiar musical selections, a good test tape should include two distinctly different test signals—a steady tone (or several tones at different pitches and levels) and an interval of hiss or pink noise. Also, there should be a relatively substantial musical selection (10 minutes or more) whose length you have precisely timed on your home deck.

You can record a steady tone from many sources: a CD test disc, an LP test disc, a record-level calibration oscillator, a telephone dial tone, the test-pattern tone from a TV broadcast (this is a very stable tone), or a sus-

tained tone from a musical recording.

The best hiss signal to record is the pink-noise segment of a test disc. If that is not available, record the hiss you get when you tune between stations on the FM band. If you hear only silence from your tuner, switch off the FM muting or switch from stereo to mono. If there are no empty spots in the band, disconnect your antenna.

Both the hiss and the steady-tone signals should be recorded at the -10-dB level on your deck's indicators in order to avoid high-frequency saturation. If your car player is autoreverse, you should record the same

signals at the same points on both sides of the tape so you can compare the playback as you switch between forward and reverse.

For the timed segment, which you'll use to test your car player's speed accuracy (assuming your home deck is accurate!), you'll need a stopwatch and, preferably, a microphone. Use the microphone to record announcements signaling the exact beginning and end of the segment and the stopwatch to time it played on both decks. If the segment is exactly 10 minutes long and your car player finishes it 9 seconds early, it is 1.5 percent faster than your home deck.



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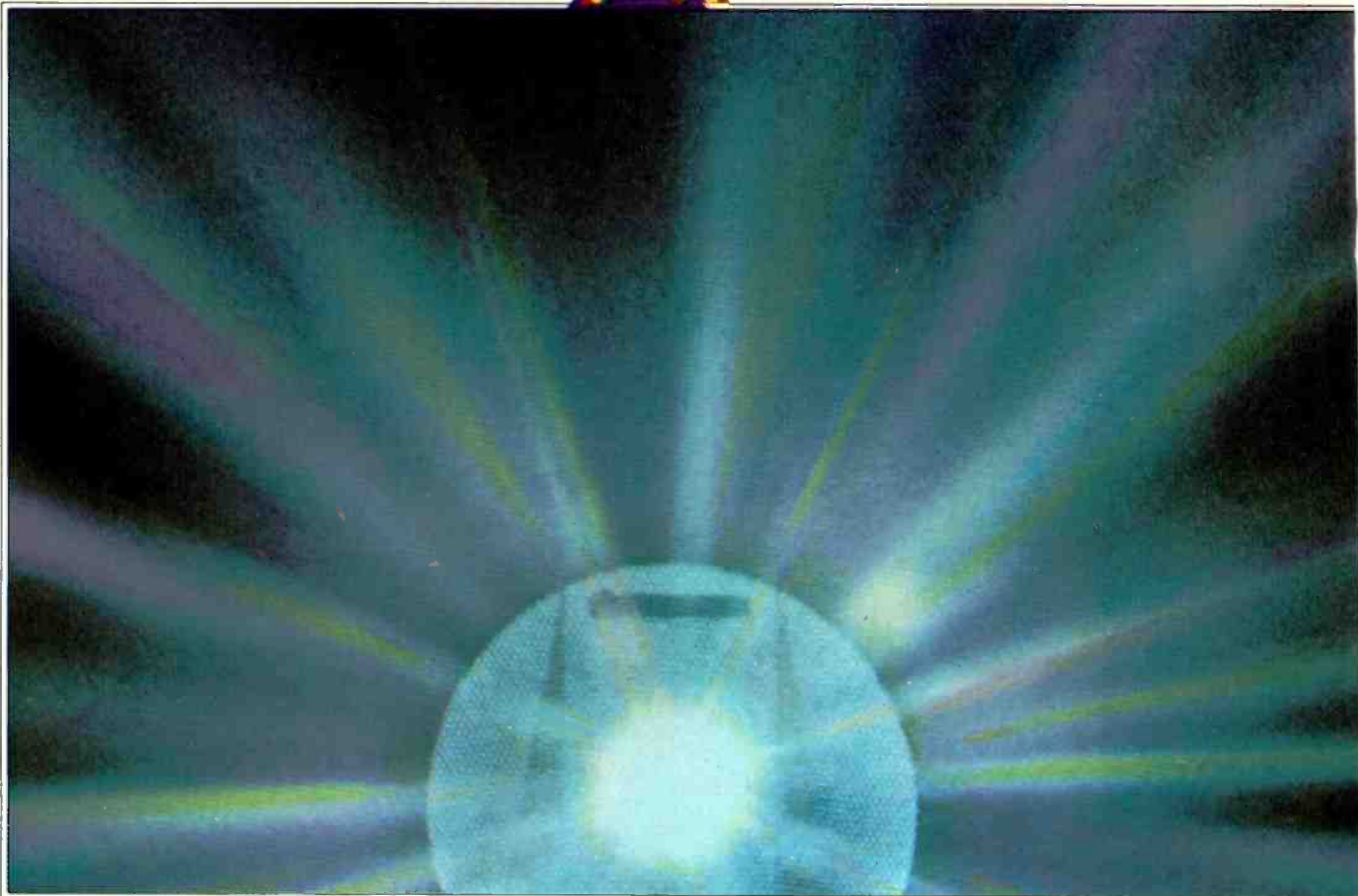
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SPEAKERS

Choosing the right loudspeaker system for your car is critical to getting good sound.

Some advice from industry experts will help you make that choice simpler and more rewarding.

by Daniel Sweeney



MOST audio enthusiasts know that loudspeakers are their most significant single purchase and the focal point of their home systems. Loudspeakers exhibit enormous variations in size, design, cost, amplification requirements, room sensitivity, and, of course, sonic character. This very lack of uniformity compels speaker buyers to exercise a great deal of judgment in selection.

Curiously, such careful discrimination is not the norm in the purchase of automotive loudspeakers. Instead, car stereo shoppers tend to concentrate on the signal source—the radio, the cassette player, and, more recently, the automotive CD player—even though car speakers are just as important and as variable as those for home use. I can only attribute the lack of emphasis on car

speakers to widespread confusion about how speakers are integrated into an automotive environment and how they are best evaluated.

Automotive loudspeakers employ essentially the same technologies used in products for the home. They reproduce sound in the same way, they are designed according to the same principles, and ultimately they should be appraised using the same criteria as with home speakers. These criteria include the usual technical standards, such as frequency response, dynamic range, dispersion, distortion, and efficiency, as well as subjective criteria—in other words, personal reactions and sonic preferences.

Applying these criteria is where the difficulty lies. A home speaker is a fully engineered system with fairly consistent and predictable behavior in a wide range of listening environ-

ments. Sure, the listening room affects response, but, as noted by Rich Inferrera, a highly regarded auto-sound installer and owner of Rich's KarTunes in Watertown, Massachusetts, "Most home speakers work in most rooms." If you liked it in the dealer's showroom, you'll probably enjoy it at home.

A car speaker is a different proposition. Most car speakers are *not* fully engineered systems since they lack complete enclosures. Most are nothing more than a driver or two and a simple crossover network—a cavity in the car is needed to complete the enclosure.

Moreover, a car speaker's response depends greatly on the acoustics of the car's passenger compartment. In comparison with almost any listening room, a car's interior is small, cramped, and extremely cluttered. The air volume of a car's passenger compartment is so low as to place a significant acoustic load on the front of the speaker driver. What's more, the interior generally creates diffraction and absorption problems and boundary effects, and it often suffers from severe standing waves. All this makes for ragged frequency response in the installed system. The car's interior becomes in a real sense an extension of the loudspeaker enclosure, and an installer who wants to put together really high-performance systems must gauge the effects of each car's interior and adjust his installation strategies accordingly. (The problems aren't quite as severe in vans, which have much more volume than cars—though they're still a lot smaller than most rooms.)

It follows that if you listen to a car speaker mounted on a showroom wall, you won't hear the same sound from it you'd hear in your car. This isn't to say that you can't learn anything about a speaker from listening to it on a display board. Most of the auto-sound experts I talked with maintain that board listening can reveal some aspects of speaker performance.

Roger Holdaway, a pioneering high-end installer and owner of Speakerworks in Orange, California, claims that "You can hear the distinctive colorations of speakers on the board. Those are generally apparent in any environment." But Sandy Gross of Polk Audio adds, "You can judge the high-frequency and midrange response pretty well on the board, and, of course, the

efficiency. The bass is less predictable."

Larry Daywitt of ADS also feels that listening boards can be useful: "It depends on the board. Some are close approximations of a car environment, others are inadequate. Most are useful for making A/B comparisons of speakers. I think the main thing you can get out of a board is an appreciation of how a speaker sounds at high volumes. That's very important in a car."

But Tom Robbins of Infinity Systems feels that boards give very misleading impressions of speaker efficiency: "If you play a selection with a lot of bass through a speaker on a display board, every woofer on the board will resonate like a passive radiator. The speakers which aren't in the circuit will damp out the bass, and the speaker you're auditioning will not sound as loud as it would by itself. The impression is very misleading. Some boards are built into modules that resemble a car's interior, and those are much better, but there's really no substitute for a demonstration car."

While experts might disagree on the virtues of display boards, no one would dispute that they have limitations. Everyone I spoke with agreed that you cannot make a comprehensive assessment of a car speaker in the unnatural setting of the showroom and that you can't get much of an idea from the listening board which speaker model would sound best in your own car.

Fortunately, there are other ways to select car speakers. To a considerable extent you can narrow down your choices simply by an exercise of logic once you understand the various categories of car speakers and how the different types perform. You can then limit your listening tests to a few specific models and seek out demonstration cars—preferably resembling your own—that have speakers of approximately the same type as those you're considering.

Automotive loudspeakers can be categorized in a number of different ways, but John Bishop of AudioMobile Corporation suggested what I feel is the most useful breakdown for the ordinary consumer. Bishop divides most car speakers into three broad categories: "traditional," separates, and satellite/subwoofer systems. (His own company was instrumental in developing both the second and third categories.)



A classic "plate" speaker, the ADS 300i has a 1-inch soft-dome tweeter (with three-way level control) and a 5¼-inch high-compliance woofer with a 12-dB-per-octave crossover at 2,500 Hz. For use with 5- to 100-watt amps. \$134.50/pair.



Sony's XS-700 is a satellite-type three-way system using the company's APM (Accurate Pistonic Motion) drivers and a heavy-duty crossover network. It is rated to handle 120-watt amplifiers. \$500/pair.



Audio Control's EQ-X is a two-way variable-frequency crossover network and graphic equalizer. The equalizer has half-octave spacing in the critical range (for cars) of 45 to 180 Hz and octave spacing up to 16,000 Hz. \$299.



The new KEF GT-100 two-way system has a 1-inch tweeter, a 4½-inch woofer, and claimed response down to 50 Hz. \$250/pair. The \$750 GT-200 system includes four of these speakers, fitted with acoustic-suspension enclosures, and two trunk-mounted subwoofers.



B&W's LM-1 can be used as a satellite in the enclosures shown here or mounted in a panel using various mounting spacers. It has a 4-inch Kevlar woofer, a 1-inch midrange, and a ¾-inch tweeter. \$498/pair.



The Bose 1201 Mobile Music System includes a power amplifier and two speakers, either 4½-inch door units (\$299) or 6 x 9-inch rear-deck models (\$349), with the amp's response matched accordingly.

The "traditional" automotive speaker, as Bishop describes it, is one that's intended to fit into standard mounting locations with little or no modification of the car's interior or body. The best examples are elliptical speakers that fit into standard rear-deck cutouts, measuring 6 x 9 inches or 4 x 10 inches, and 5-inch round speakers designed for door mounting.

Speakers in the second category, the separates, are much less common. These systems consist of separate woofers, tweeters, and sometimes even midrange drivers, each with its own mounting hardware, linked by a remote, outboard crossover module. The ADS 320i is perhaps the best-known example of the type, though many other companies market such systems, including Boston Acoustics, Canton, Polk, Nakamichi, and Yamaha.

Separates permit mounting drivers far away from each other. In a two-way separates system a tweeter could conceivably be placed several feet away from the woofer. There's nothing quite like this in present-day home loudspeaker design. And, although separates inevitably cost more to install than traditional car speakers, they offer some distinct advantages.



First, separates can best utilize the available interior mounting surfaces and cavities, in effect distributing the driver enclosures around the car's interior. Such an arrangement will generally result in at least slightly smoother and more extended frequency response than from traditional speakers with similar driver dimensions. Use of separates may also permit mountings that are difficult or impossible otherwise, such as putting tweeters on the dash or window pillars.

More controversially, separates lend themselves to what Bishop likes to call "sound effects" installations, referring to the practice of separating the drivers by a considerable distance and spacing them around the car for a surround-sound effect. Some listeners find this sort of sonic crossfire captivating, but a wide separation of driver elements does not make for seamless integration of sound across the audio spectrum or for stable imaging, and this type of installation appears to have become passé.

The third major category of automotive loudspeakers, and generally the most expensive, is the satellite/subwoofer system. Satellite/subwoofer systems broadly resemble the same configuration in the home. Two small, generally two-way speakers handle most of the audio range while one large driver, a subwoofer in a separate mounting, takes care of the low bass. Satellite/subwoofer systems virtually always utilize an outboard amplifier and often bi-amplification complete with electronic crossovers.



Car satellite/subwoofer systems tend to differ from their home counterparts both in execution and in market position. Home satellite/subwoofer systems are basically augmented bookshelf speakers. They often give the appearance of being rather modest products. In cars, on the other hand, such systems are the *ne plus ultra*. Furthermore, the subwoofer in a car system is far less likely to be monophonic than a home subwoofer, and the crossover is also apt to be more complex than in a home model. Subwoofers for the home generally use a single crossover point set anywhere from 120 Hz down to about 50 Hz. Car models often have two crossover points, a sub-bass rolloff at around 80 Hz or higher, then a mid-bass rolloff below 250 Hz or so. The gap between these crossover points coincides with the fundamental resonance frequency of most cars' interiors.

Satellite/subwoofer systems for cars are expensive, are nearly always difficult and costly to install, and work best with multiple amplifiers and electronic crossovers, which involve considerable additional expense. But a properly installed satellite/subwoofer system offers a level of performance not obtainable from either traditional car speakers or separates.

Although most automotive loudspeakers fit into one of the three categories we've described, there are numerous exceptions. Among them we find a fair number of small, fully enclosed box speakers that are generally mounted on swivels on the car's rear deck. These resemble the smallest home bookshelf speakers or mini-monitors—and, in fact, some models are designed for either automotive or domestic use. While

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such speakers often offer excellent sonics, they are declining in popularity for two reasons: they are easily stolen, and they tend to obstruct the driver's vision.

One type of automotive speaker is in a category unto itself. The Bose 1401 and 1201 systems use several full-range drivers in a direct-reflecting mode of sound propagation similar in principle to that used in the famous Bose 901 home speaker.

I might also put in a separate category the relatively new "plate" speakers, most of which are surface-mounted two-way units that do not fit in standard cutouts but generally allow for a variety of fairly easy installations. About the same size as standard 6 x 9's, plate speakers generally offer smoother frequency response, though at a higher price.

What is a suitable loudspeaker system for your car depends on the car itself, your budget, your audio performance requirements, and, finally, your concern for security and aesthetics. With these variables in mind, let's re-examine the three main categories of car speakers.

Traditional speakers, as I've noted, are designed to fit in standard mounting holes—that is, to be installed with little or no cutting of your car's interior surfaces. For this very reason, however, not all standard speaker models are easily installed in all cars. For instance, cars with 4 x 10-inch cutouts are not the ideal match for 6 x 9-inch speakers, although adaptor kits are available, and skilled installers can cut and otherwise modify mounting surfaces to make speakers fit. But cutting and adaptor kits add to installation costs, and low-cost installation is the primary reason for choosing a standard type of speaker in the first place.



For obvious reasons, 6 x 9's have more extended bass response than do smaller-size speakers, but fewer new cars these days have 6 x 9-inch cutouts, and many lack even the second-choice 4 x 10-inch mounting holes. The lack of such openings presents some problems if you hope to avoid custom installation.

For instance, if you have a hatchback or station wagon and thus no rear deck or trunk with the standard mounting holes, you will be effectively restricted to the sort of standard speakers that can be mounted in

the doors, the kick panels, or, possibly, the rear roof pillars. But with most standard speakers that can fit these locations, bass response will be pretty feeble below 100 Hz. Thus, if you want an economical system in such a vehicle, you'll have to settle for weak bass. If you want a wide-range system, you'll have to buy more expensive speakers and pay for a more customized installation. There's really no way around this problem with any vehicle lacking a trunk.



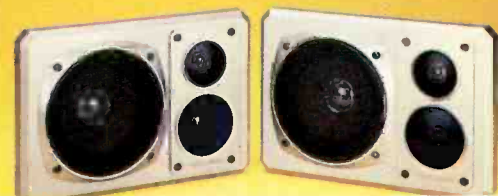
till, in other types of vehicles standard speakers can give much more satisfactory performance, so they shouldn't be dismissed out of hand. You should also recognize that considerable variations in performance exist among the different types of speakers in the "traditional" category, which includes full-range speakers, "whizzers," coaxials, three-ways (often called "Triaxials" or "Triaxes," though these terms are trademarks for the three-ways made by Jensen). We might also include, by stretching the definition of the category, surface-mounted plates.

Full-range speakers are seldom used for high-fidelity applications in the car, or in the home, for that matter. A cone that is flat and accurate through the vital midrange will invariably roll off in the bass and treble. Equalization can extend response to a degree—sometimes quite successfully, as in the Bose systems—but with most budget-priced, full-range speakers, equalization cannot prevent breakup and beaming in the treble or produce high output in the bass.

A whizzer is a subsidiary cone in the center of the speaker that vibrates independently at high frequencies. Whizzers are found in cheap replacement speakers and are not comparable in performance to true multi-element systems.

Coaxials and three-ways (Triaxials) are the cheapest and most compact multi-element loudspeakers for the car. In coaxial speakers, as the term suggests, all the driver elements lie on the same axis. The tweeter is mounted on a bar or stalk in front of the woofer. In both coaxials and three-ways, each driver has its own voice coil, and a conventional crossover joins them.

Coaxials are very popular because



Radio Shack offers this Realistic brand three-way flush-mounting system with a 5 1/4-inch woofer, 2 1/2-inch midrange, and 2-inch tweeter. It has a full crossover network and fits into a standard 6 x 9-inch rear-deck speaker cutout. Model 12-1854, \$69.95/pair.



Panasonic's new EAB-697 is a three-way, flush-mounting 6 x 9-inch system. Its Direct Sound tweeter is angled forward in order, it is said, to provide better treble dispersion and improved stereo imaging. It can handle amplifiers rated up to 100 watts. \$119.95/pair.



Canton's Pullman system is a one-piece stereo unit designed for rear-deck mounting and hatchbacks. Each channel has a 3/4-inch dome tweeter, a 1 1/4-inch dome midrange, and two 4 1/4-inch long-throw woofers. \$450.



Boston Acoustics' Model 751 is a six-piece separates system. For each channel there is a 1-inch-dome tweeter module that can be flush-mounted or surface-mounted, a 5/4-inch woofer, and a crossover module. Maximum power-handling capability is 50 watts. \$200 complete.



A whole range of flush-mounting two- and three-way systems as well as plate speakers are offered by JBL. Shown left to right above are the LT-1, a two-way plate speaker (\$300/pair); the T205, a flush-mounting two-way (\$150/pair); the three-way T545 (\$250/pair); and the two-way T425 (\$200/pair).



Polk's MM XII is a two-way flush-mounting speaker with a 6 1/2-inch woofer and a 3/4-inch tweeter. It has an automatic-reset tweeter protector and can be used with amplifiers delivering from 5 to 150 watts. Mounting depth is adjustable. \$200/pair.

of their compact dimensions and ease of installation. In the case of 6 x 9- and 4 x 10-inch coaxials the design also permits the use of a fairly large woofer within the standard cutout. According to some manufacturers, however, inevitable sonic tradeoffs are involved in all coaxial designs. Andy Petite of Boston Acoustics, a major manufacturer of plate-type car speakers, claims that almost all coaxials have ragged high-frequency response because the tweeter isn't baffled. "Boundary effects are almost unavoidable with coaxials," he says, "not to mention modulation distortion caused by putting the tweeter in the path of the woofer."

Three-ways come in for even more criticism. "They're part of the 'more is better' approach to auto-sound," says Roger Holdaway of Speakerworks. "How can you expect to get decent response when most of the woofer's radiating surface is blocked by other drivers?"

Holdaway and other high-end installers tend to advocate plates rather than coaxials if the customer is willing to spend upward of \$150 a pair. This greater expenditure will buy speakers that somewhat resemble the front panel of home bookshelf models. The woofer, tweeter, and midrange (if any) occupy separate positions along a baffle, thus keeping interference between drivers to a minimum.

Installation is generally fairly simple with either coaxials or plates—after all, that is one of the main selling points of either type. But in order to extract the maximum performance from the speakers, the installer must be aware of certain basic principles.



If, for instance, you want the kind of imaging you'd get from properly set-up loudspeakers in the home, the tweeters in the car system must be aimed at the listener's head. (Obtaining precise imaging for multiple listeners is just as difficult in the car as it is in the home.) With coaxials, particularly 6 x 9's, that's often difficult, though some of the newer models with swivel-mounted tweeters, such as JBL's and the Pioneer Maxxial line, give the installer a good deal of freedom in positioning. In the case of plate speakers, depending on the type of car and the dispersion characteristics of the

tweeter, mounting the speakers on the kick panels or the front doors may yield reasonably good imaging.

Separates, of course, provide for much more flexibility in mounting and, if the drivers are not too widely separated, can provide a very coherent soundfield. Separates also tend to work in the greatest variety of vehicles. Their chief drawback is high price. Separates are usually more expensive than either coaxials or plates, and installation costs will naturally be higher.

The third category of car speaker systems, the satellite/subwoofer combination, is predictably the most expensive, and its performance is most dependent on the skill of the installer. Buying a satellite/subwoofer system also tends to present the most difficult selection process for the consumer because there is so much variation among the products themselves.



Just a few years ago all satellite/subwoofer systems for the car were completely custom-made. Enclosures and passive crossovers were fabricated for both the satellites and the subwoofers, and only the drivers were stock items (in most cases domestic loudspeaker drivers were employed). As major autosound manufacturers began to move into the high end, satellite/subwoofer systems became more standardized. Today's systems are likely to use a pair of ordinary plate speakers in the front and specialized automotive subwoofer drivers in back.

The subwoofers themselves may take a number of different forms, depending in part on the type of vehicle in which they are to be used. The commonest installation consists of a pair of woofers mounted facing upward on the rear deck, with the trunk cavity serving as an infinite baffle. This approach generally gives satisfactory results, but since trunk dimensions vary and trunks themselves are not acoustically dead, bass reproduction is sometimes less than perfect. More sophisticated installations have the subwoofers enclosed in cabinets, generally of the acoustic-suspension type. There is much disagreement among installers and engineers as to which approach is better.

Recently a number of companies, including Philips, Pioneer, Alpine, and Audio Pro, have introduced en-



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closed self-amplified subwoofer systems intended for mounting on a rear deck or in the luggage space of a hatchback. Such systems offer substantially better low-bass performance than standard car speakers, but because of limitations in driver and enclosure size, they still do not approach the performance capabilities of custom-made subwoofers

Evaluate your car speakers in view of the system you might ultimately want, not just the one you now have.

with 10- or 12-inch drivers and many liters of enclosure volume. On the other hand, readymade subwoofers are generally cheaper than custom sub-bass systems, and they do not take up trunk space or demand much skill on the part of the installer. And because they are enclosed, their response is more readily predictable from one car to another.

Speakers installed in an automobile, just as in a home system, cannot perform better than their associated components. It makes no sense to purchase an elaborate satellite/subwoofer system if your cassette deck lacks response below 40 Hz or if your amplifier has 10 percent distortion at rated power and puts out no more than 20 watts altogether.

You should also evaluate car speakers in view of the system you might ultimately want, not just the one you currently have. For instance, if a wide-range satellite/subwoofer system appeals to you but the cost exceeds your budget, you might consider buying high-quality plate speakers because they can easily be used as satellites if you later decide to upgrade. In other words, choose wisely for your initial system and you may not need to replace much when you put in a more ambitious system later on.

Finally, as with any speaker, audition automotive products with program material you know and enjoy. Don't let the dealer set the ground rules for your evaluations. And don't be too surprised if what you hear in a good demonstration vehicle nearly equals the sound of a good home system. Serious products exist in today's market, and the days when mobile audio offered performance no better than a cheap portable radio are long gone. □

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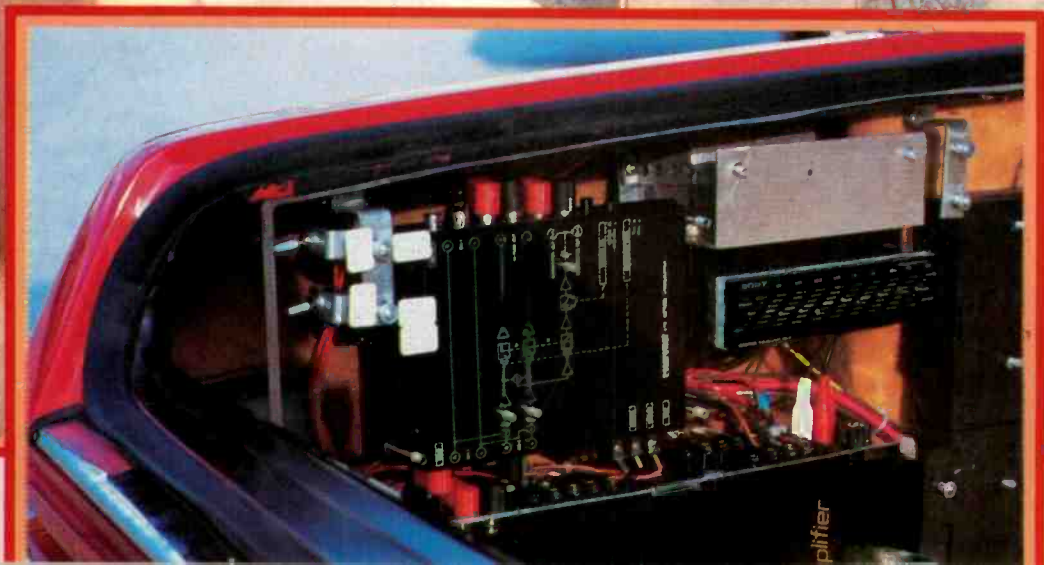


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by Gordon Sell

SYSTEMS

Miami Nice: a custom audio installation in a Mercedes convertible—what could be nicer?

It may look like a Miami Vice squad car, but it's not. The real owner, who wishes to remain anonymous, is a twenty-one-year-old American from Venezuela who loves fine automobiles and has been an audio enthusiast since his early teens. The system he has in his Mercedes 380SL convertible was designed and installed by Sound Plus Wood of Boca Raton, a company that specializes in installing fancy audio and video systems in homes, cars, aircraft, and yachts. The equipment used in the system includes a Nakamichi TD-1200 tuner/cassette deck, two Nakamichi/PA 300 power amplifiers mounted back to back in the trunk, a Proton electronic crossover, a Sony graphic equalizer, two Visonik subwoofers, and ADS 320i speakers in the doors.

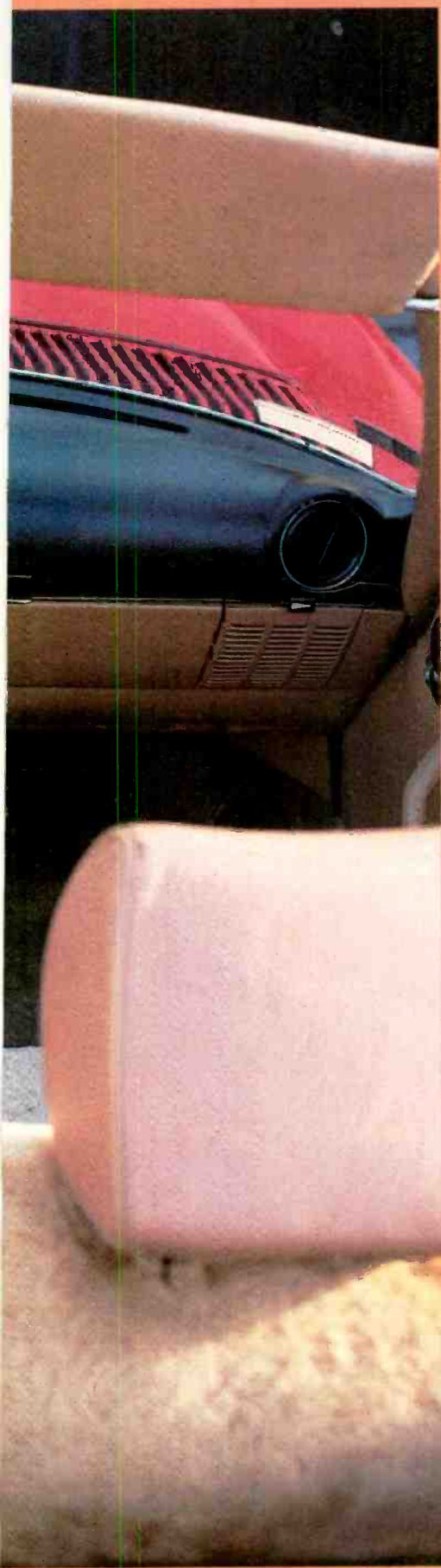
Walt Kaltenback of Sound Plus Wood designed the car stereo system for correct imaging and balanced frequency response. More than half the installation time was spent constructing and installing the subwoofer enclosure that is behind the small jump seats. According to Kaltenback, the goal was for "clean, tight bass rather than a big thump at 120 Hz." The subwoofer system is powered by one of the

power amps and the ADS speakers by the other. A small hand-held spectrum analyzer was used to determine the frequency balance of the car, and the trunk-mounted equalizer was intended to be set once and kept far from the reach of curious passengers.

Interestingly, according to Sound Plus Wood, the sound quality in the car doesn't change much when the top is down. The owner and the installer auditioned a number of different speaker combinations in the existing mounting holes before making their decision.

One rather unusual feature of this installation is battery memory back-up for the Nakamichi TD-1200, which sometimes suffers a memory loss if the car's voltage drops below 9 volts (a problem that Nakamichi has rectified on later models of the tuner/cassette player). Sound Plus Wood is also proud of the use of 40-strand, 6-gauge power wire and 16-gauge leads for the speakers. These cables are said to keep the power-lead impedance to less than 0.01 ohm, reducing noise problems and allowing optimum efficiency.

The entire stereo system took sixty-six man hours to install and cost \$5,500 including all the components—except, of course, the convertible itself. □



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HOW TO BUY CAR STEREO

by Larry Klein

What many first-time buyers really seem to want in a car stereo system is simply an upgraded, four-wheeled version of a portable boom box. Their overriding concern appears to be their installation's ability to boom and screech *loudly*.

But the more sonically sophisticated readers of this magazine would surely rather have fidelity than flash. To help you avoid the many traps that can ensnare the unwary car stereo buyer, beginning on the next page are some hints about choosing a system to match your budget, your taste, and your car.

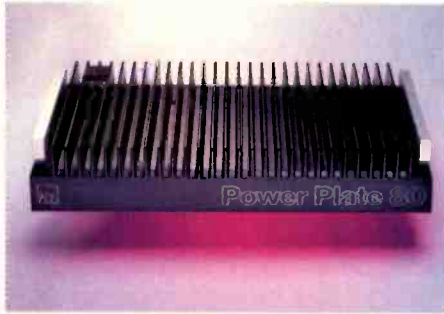


Pioneer's KEH-9000 is an in-dash cassette/radio with DIN chassis. The tuner section has six AM and twelve FM presets and digital-synthesis tuning. The autoreverse cassette player has Dolby B noise reduction. There is also a four-band graphic equalizer and an amplifier rated at 10 watts. \$440.



Blaupunkt's BPA-415-A four-channel power amplifier is rated to deliver 8 watts per channel with less than 1 percent THD from 40 to 20,000 Hz into a 4-ohm load, or 15 watts at higher distortion levels. A compact 5¼ x 6½ x 1½ inches, it uses line-level or amplifier output signals. \$110.

JEFF GIANCZ



P

ower Plate 80, from ADS, is a two-channel accessory amplifier rated at 40 watts per channel into a 4-ohm load with less than 0.1 percent distortion from 20 to 20,000 Hz. Like most powerful car amps, it has a d.c.-to-d.c. switching power supply for high output voltages. \$259.



H

arman Kardon's CH-160 cassette/tuner has a unidirectional cassette player that is said to avoid the performance sacrifices of autoreverse. It has Dolby B and Dolby C noise reduction. \$475.



C

arver's "Car Amplifier" is rated to deliver 120 watts per channel, 240 watts in the bridged mono mode. It has a built-in crossover for biamping. \$350.

Look carefully at amplifier power ratings.

Because power output is the most prominently promoted specification, and because it is most likely to be used as a quick measure of overall quality, it is also subject to the most hanky-panky. Manufacturers seldom deliberately lie in their ratings, but they may derive them using non-comparable techniques that yield more impressive numbers. One manufacturer's fast-and-loose "20 watt" rating may reflect no more real power than some other manufacturer's more legitimate "4 watt" rating.

Moreover, a total wattage figure alone is meaningless. If, for example, the spec sheet simply states, "Power: 20 watts," with no qualifications, even an engineer couldn't tell whether that's the total for four channels, two channels, or one channel; whether 20 watts is the momentary peak output or continuous power; at what load impedance the power rating was derived; what the distortion level is at full output; and how wide a frequency range the output covers. A legitimate—and good—power rating would read something like this: "25 watts continuous for two channels [or 50 watts for one channel] into 4 ohms from 20 Hz to 20 kHz at 0.25 percent total harmonic distortion."

Remember that higher wattage does not necessarily mean greater fidelity.

If you want enough power to throw a dance party in the supermarket parking lot, blow out the ears of your back-seat drivers, or help sustain a macho image—go for it! Just make sure that your speakers can take all that drive signal without mechanical or electrical failure. To my ears, car systems usually fail to make the sonic grade *not* because they lack sufficient power, but rather because their tonal balances and stereo perspectives are deficient. These problems usually derive from low-quality speakers and/or speakers mounted in the wrong places.

Consider what kind of music you like to listen to and how loud you like it.

If you like loud rock, you're going to need more power than if you prefer quiet chamber music. Rock music generally has a great deal more sonic energy in the high and low ends of the audio frequency spectrum than classical music, which tends to have its energy con-



T

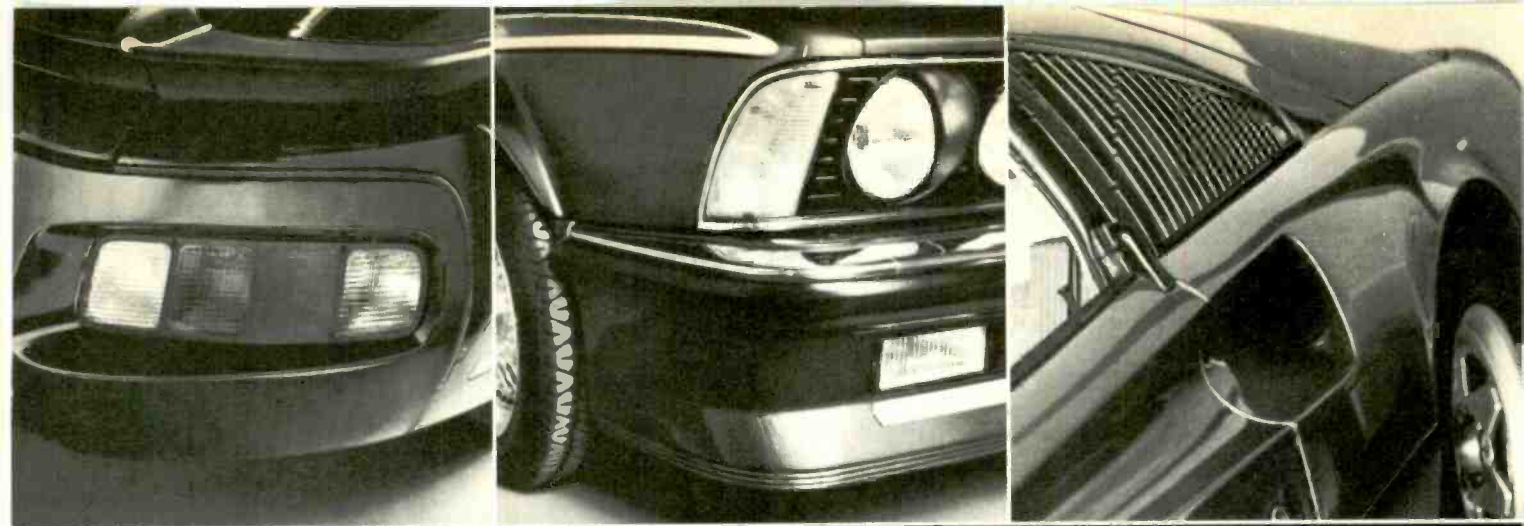
he cover of our special Report on Car Stereo (page 55) shows, clockwise from bottom, the Harman Kardon CA240 amp, \$295; the Boston Acoustics 751 speaker separates, \$200; Alpine's 7165 cassette/radio, \$380; Yamaha's YCR-950 cassette/radio, \$600; the Panasonic CQ-S934 cassette/radio, \$350; Blaupunkt's Aspen SQR24 cassette/radio, \$320; the Pioneer TS-1645 three-way speaker, \$110; and (center) Jensen's ATZ500 cassette/radio, \$520.

centrated in the midrange. Since high-level lows and highs demand more from an amplifier than mid frequencies, a more powerful amp is required for loud and clean rock.

Try to evaluate your power needs rationally.

First have your dealer demonstrate some low-power (4-watt) receivers to give you a standard for comparison, then listen to some 12-watt systems. The higher-power systems should sound cleaner because they provide more acoustic headroom for loud musical peaks. If you want still more power, you can always add a booster or a component power amplifier. Boosters connect between the receiver's speaker-output wires and the speakers; power amplifiers plug into the line-output jacks found on many of the better receivers. Remember when upgrading that you have to *double* the available power at least before there is any audible benefit. It scarcely pays to go from a 15-watt model to a 20-watt one in hopes of getting louder or less distorted sound.

Remember also that an honest continuous-power capability of about 12 watts per channel is about as much as can be crammed into a reasonable-sized receiver chassis. If



Finally, car audio as good as your car

Very few companies selling car stereos are real *audio* companies. With 75 years of experience reproducing sound, Denon wishes to point out the level of their home audio technology present in the new DC-series of car audio equipment.

For example, the only audio components—home or auto—offering the level of circuit sophistication found on the new Denon Car Audio DCA-3250 Power Amplifier are Denon's own top-of-the-line receiver and separates.

Similarly, the Dynamic Range Expansion circuitry found on Denon's new Car Audio DCR-7600 AM/FM Stereo Tuner/Cassette Deck otherwise can be found only on Denon's DE-70 Dynamic Equalizer.

The *differences* between Denon car and Denon home audio equipment will become apparent the moment you sit behind the wheel. To build car audio for people who love good sound as much as fine cars, Denon created a very limited, ultra-high quality range of car audio components, specifically engineered to become *part* of the automobile. Controls fall to hand and information is displayed with the *driver* clearly in mind.

For the car lover, Denon Car Audio does more than offer true auto high fidelity—it becomes an integral part of the thrill of driving.

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you know from the outset that you want a car system with substantially more power, you can get more bang for your bucks with a head unit that comes *without* an amplifier (these are known as tuner/cassette players or tuner/tape-deck/preamps). Such units avoid the redundancy of built-in power amplifiers that either go unused or do nothing more than feed the input jacks of a higher-power amplifier. They tend to be rather pricey, but generally they also represent the state of the art in FM reception and tape playback.

Don't evaluate car stereo specs the same way you do those for home components.

Even though it's nice to know that your car amplifier goes from 20 Hz to 20 kHz, neither the very low end nor the very high end is going to be reproduced cleanly—or heard clearly—in your car. Conventional car speakers, even with ideal baffling and a minimum of masking road noise, are not likely to reproduce an *audible* range any lower than 50 to 60 Hz on the bottom end or higher than 13 to 14 kHz on the



Audiovox's Hi-Comp HCC-2250 is a DIN chassis flat-face cassette/radio with Dolby B, key-off eject, twelve presets, and a 15-watt amp. \$400.

top end. But that's plenty wide for excellent sound. (Because of speaker-design and room-acoustics limitations, many home systems do no better than that either.) So you don't have to be too concerned about rated frequency range. Distortion, on the other hand, can be signifi-

cant. If the distortion at normal playing levels (a watt or so) is above 1 or 2 percent, the music may sound slightly veiled or unclear compared with a good home system. Unfortunately, most car stereo manufacturers don't specify distortion at levels other than full-power output. At normal listening levels the distortion may be several times higher than the figures for home hi-fi equipment.

Don't make buying decisions based solely on the sound of components installed in a dealer's showroom demo panel.

A receiver's FM reception in the store is worthless as an indicator of how well it will perform in a moving vehicle. FM reception on the road typically suffers from "picket fencing" (a rapid fluctuation of the signal) and other noises and distortions that occur because the car is moving through zones of varying signal strength and degrees of multipath interference. Some car stereo receivers and tuners resist these problems better than others, but demonstrations in fixed locations

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You get Dolby noise reduction from the deck, plus a music search system that permits scanning of cassette programs in both the forward and reverse modes. And a

further refinement is the solenoid soft-touch operating buttons usually found only on the most expensive home cassette decks.

With enormous power and the least cluttered control panel extant, this receiver/deck is designed for minimal eye movement combined with all the listening satisfactions of the home system.

But Audiovox hasn't stopped at sound systems in bringing motorists the comforts of home. Whether you're considering our new AudioTel™ mobile cellular phones or our electronic car security systems, Audiovox leads the way with a host of features the competition hasn't even considered yet. Audiovox. We've made cars more livable for a whole generation of drivers.

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will never reveal their differences. A tuner's ability to pick up stations—which you *can* determine with a demo-panel setup—does not have any correlation with its ability to reject interference.

A cassette deck's frequency response *can* be judged fairly accurately by an in-store listening test, particularly if the dealer has it set up for headphones. Take along your own high-quality cassette, preferably one you dubbed yourself, to avoid being misled by a souped-up

demo tape. If you are checking an autoreverse player, listen to your tape in both directions of play. If there's a loss of highs in one direction but not in the other, it may either be typical of the model or simply a defect in the sample you are listening to, so try another. And if the showroom sample plays well in both directions, make sure that the one you buy does also. The one factor in tape-deck performance that *won't* show up during an in-store demo is its resistance to road

shock and vibration. Some decks will get an audible case of the jitters when you hit a bump or pothole while the better models will play on serenely.

When you're selecting speakers, you can be sure that if a pair sounds rotten in the demo panel, they will sound even worse in your car. Unfortunately, the reverse isn't true. It's always best to have speakers you're considering buying demonstrated as installed in a car whose interior is roughly similar to yours. Where the speakers are placed is at least as important to their sound as their inherent capabilities. The best tweeter in the world isn't going to deliver highs to your ears if it is playing somewhere down around your ankles.

With the receiver or tuner/cassette player, the thing to check in the store is not the sound but the feel, accessibility, and understandability of its controls. Of course, ease of use should also be checked from the driver's seat in a demo car.

Don't buy a cassette deck without auto eject.

The better cassette decks either automatically eject the tape if the ignition is turned off or else disengage the tape from the drive mechanism. If your deck does not have such a feature, you'll have to remember to eject any tape manually before you switch off your ignition. Failure to observe this precaution can result in damage to your tapes and your player.

Don't buy any equipment without first asking your dealer if it will fit in your car.

Dealers have manuals provided by the car stereo manufacturers that specify which models fit in which cars using (if necessary) which adaptors. If a dealer tells you that he has nothing that will fit into your dash without major metalwork alterations, try another dealer.

Seriously consider getting a multiband equalizer, either as an add-on or built into a receiver.

A good equalizer, used with discretion, can make an enormous difference in the quality of the sound you hear because it can help compensate for both poor car acoustics and frequency-response inadequacies in your installation. Many equalizers come with booster amps as part of the package; if you decide on one of these models, make sure the amp has enough additional

Car Speakers: **Boston** Style



Introducing the Model 751

Boston Acoustics has created an automotive speaker system for the listener who demands the best from his car stereo

The sound of most car speakers is compromised because they are placed on rear decks playing "into" the rear window, or down low in doors or kick panels, playing to your feet and knees. No speaker in placements such as these can give the midrange or treble response necessary to satisfy the critical listener.

The Boston Acoustics Model 751 can. Because it is a system consisting of six separate components, each unit can be placed where it can do its job correctly. The 750LF woofers can be placed low, for best bass response; the Varimount™ tweeter

modules can be mounted high up, near ear level, for natural voice and "big" stereo imaging; and the 751X crossovers can be tucked away in doors, trunks, glove compartments or anywhere suitable to the installation.

The Boston Acoustics Model 751 delivers the music. Your Boston Acoustics Dealer delivers the Model 751. See him soon for a demonstration.

Yes, Boston Acoustics, I'm interested. Please send me:

- Information on the 751 and your other models.
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power to make a worthwhile improvement.

Remember that every 3 dB of bass boost requires *double* the power from your amplifier. With an equalizer capable of a boost of 10 dB or greater, your amplifier can easily run out of power. In addition, the cone suspensions and voice coils of your speakers can be damaged if they aren't designed to handle the additional power. How do you know if you are using excessive equalization? Simple: if previously clean sound becomes muddy or harsh, or if you hear snapping sounds on peaks, your midranges and woofers are about to be in trouble. You won't get an early warning of disaster when you use excessive treble boost—your tweeters will just quietly burn out.

If you like a good strong bass line without boominess, consider getting a subwoofer.

A true subwoofer can be installed anywhere in a car since it operates in a frequency range low enough to be nondirectional. Usually a subwoofer is installed in existing factory cutouts in the rear deck. A single subwoofer, if powered separately or self-powered, can serve both stereo channels.

If you decide on a three-way speaker system using separate drivers, make sure it is installed with special care.

Systems that consist of separate woofers, midranges, and tweeters are frequently installed incorrectly, producing an unnatural and incoherent sound field. For the best stereo imaging, the tweeters and midranges for each channel must be installed close together and as far toward the front of the car as possible. Unless a true subwoofer is used, the bass drivers should also be installed somewhere up front. This will prevent splitting up the sound field between bass and treble, which can be bothersome to anyone who prefers natural sound. Because of their size, separate woofers are typically installed in the rear deck, far from their optimum location.

Some people are bothered when most of the sound comes from the rear of the car, while others find it unobjectionable. Your preference may depend on what kind of music you listen to and how carefully you listen to it. Classical music listeners usually strongly prefer the sound to come from up front as in a concert hall; pop/rock listeners frequently

like the feeling of being immersed in the music. Talk over your preference with your dealer, because it will influence the kind of setup you get. An installation with a conventional 6 x 9-inch subwoofer in the rear deck and the midrange/high-frequency drivers in the front doors will work for a classical listener only if the subwoofer has a low enough crossover frequency. Some listeners find a pair of good two- or three-way 6x9's on the rear deck quite satisfactory as their main speakers.

Investigate a variety of dealers before you pay your money and drive home with your goodies.

Check their installation facilities, the brands they have available, and especially the catalogs and buying guides they offer. Also check catalogs from mail-order outfits, since they often have a network of local installers and will provide helpful advice over the phone. Each dealer will have a few favorite brands (nobody can stock everything) and probably an assortment of recom-

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mended systems ranging from the "\$130 complete" budget special to complex installations featuring triamplification with electronic crossovers feeding six amplifiers driving six or more speakers, etc. (In my view, such complex setups often do more for the owner's ego than his ears, but if that's your taste and cost is no obstacle, why not?)

A good reason for getting catalogs—and *STEREO REVIEW's* new 1985 *Car Stereo Buyers Guide*—in advance is to avoid showroom shock brought about by a salesman's introducing five or six costly options "you simply must have" even though you've never heard of them before. Doing your homework will give you a fighting chance of knowing what he is talking about, and perhaps even the ability to decide in advance what you do and don't want in your system. At the very least, studying catalogs will help you put together a list of intelligent questions.

Should you consider installing your new system yourself?

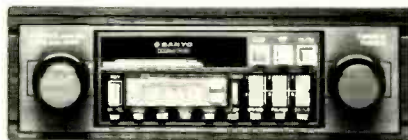
That depends on your mechanical aptitude, your familiarity with your car (mechanically and electrically), how easy your car is to work on, what tools you have available, the complexity of the installation, and the availability of advice and counsel if you run into trouble. Having spent a year doing installations and repairs on car radios back when they still had tubes, and having gone through about a dozen systems of my own in three different cars, I still chose to have my most recent set of three-way speakers installed professionally. But if you aren't fazed by the above list of considerations, go right ahead.

Given the hundreds of models of car stereo components available, how do you choose?

In the same way that porcupines are said to make love—very carefully! Don't rush into your purchase—or let a salesman rush you into it. Spend time shopping, check out what's available, and ask your friends with good car or home systems what they recommend. Read the reports in magazines such as *STEREO REVIEW* that conduct rigorous test-bench and road tests on a wide variety of models. Car stereo equipment can be a major purchase. It makes sense to spend as much time in research before buying your system as you did before you bought the car it's going in. □



Sony's CDX-R7 CD player and AM/FM tuner has a DIN-size dash unit and a separate tuner module. \$700.



Sanyo's FTE-25 is a radio/cassette player with Dolby B, a 9 1/2-watt amp, and twelve presets. \$300.



Kenwood's KRC-4000 has twelve presets, Dolby B, and a 4-watt amp. \$319.



Clarion's 8725RT is a DIN-chassis unit with Dolby B, ten presets, and a four-channel, 4 1/4-watt amp. \$399.



Marantz's CAR372 has twelve presets, Dolby B, and a 10-watt amp. \$300.



Sansui's RX-4000 has twelve presets, Dolby B, key-off eject, and a 16-watt power amplifier. \$289.

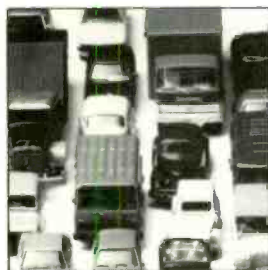


Mitsubishi's RX-734, in a DIN chassis, has ten presets and a 3 1/2-watt amplifier. \$240.



Maxxima's compact MSX-667 has DNR and a 4-watt amp. \$259.

HI-WAY HI-FI



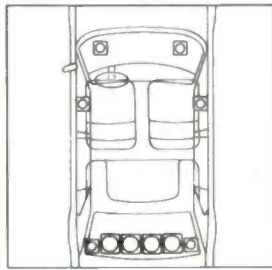
The Deciding Factor

As a "music room," a car presents considerable problems: tight and cramped, half upholstery, half glass – and filled with road noise. What's true in the living room is especially true here: good sound depends upon the loud speakers and their positioning.

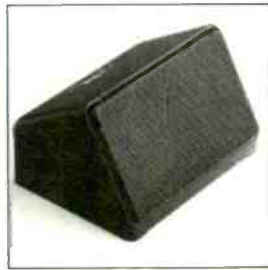


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Comments from Canton

Klaus Dotter, Canton's chief acoustic engineer, stresses that there is no one "right" solution for every auto installation. However, choosing quality components, from the electronics to the speakers, should be first and foremost in your selection of quality auto sound.

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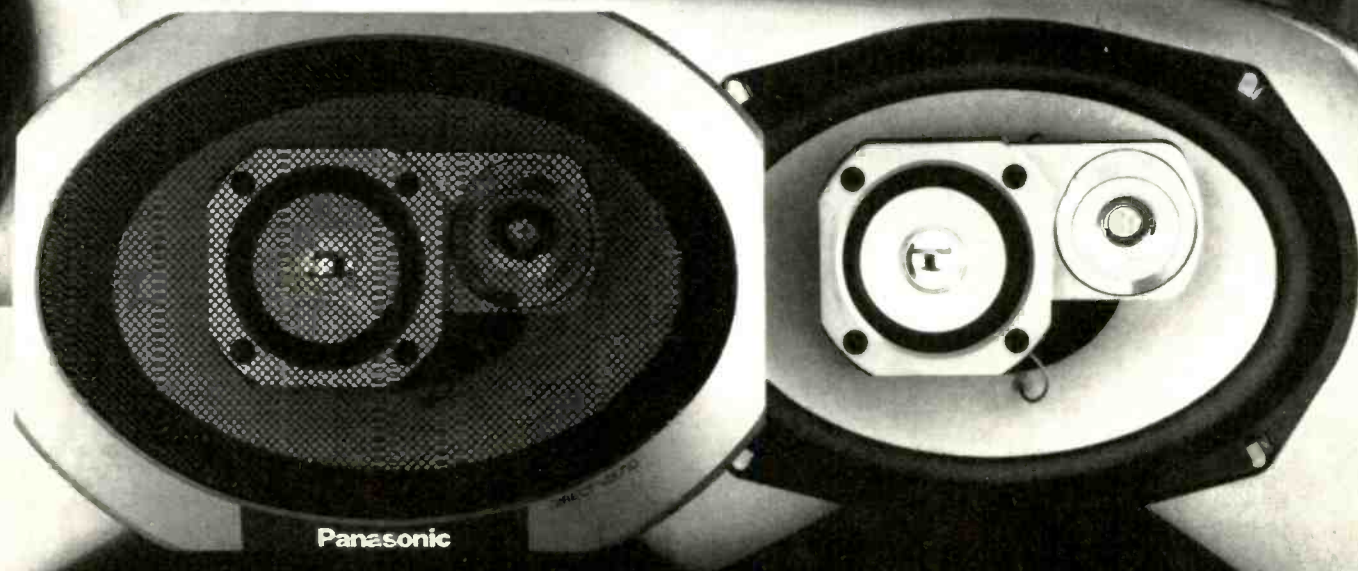
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Stereo Review's critics choose the outstanding current releases

A PERFECTLY BALANCED MESSIAH

OF all the recent recordings of Handel's *Messiah* using historically authentic performance practices and early instruments, the latest one, conducted by Ton Koopman on the Erato label, is without a doubt the best. In fact, it might be the best available version even including performances on modern instruments.

One of the greatest virtues of the Koopman recording is the quartet of vocal soloists: soprano Marjanne Kweksilber, "alto" James Bowman, tenor Paul Elliott, and bass Gregory Reinhart. We know that Handel himself usually chose his singers more for their ability to do justice to the texts than for their vocal pyrotechnics. Each of the four Koopman has chosen projects the meaning of the texts with moving simplicity, and each of them also possesses a highly individual vocal timbre. Bowman's "He was despised and rejected" is heartrending, and Kweksilber's "I know that my Re-

George Frideric Handel (1685-1759)



deemer liveth" is a testament of unswerving faith. Reinhart's virile voice represents the Lord as the Rock of Gibraltar, and Elliott at once removes us from the toils of everyday life with his opening "Comfort ye."

The instrumental playing by the Amsterdam Baroque Orchestra is at all times precise, and its characteristic "white" sound infuses the performance with a freshness rarely experienced when the music is played by a modern orchestra. The chorus, called "The Sixteen," is a fine one, and the continuo playing, by Koopman himself, is strong but not obtrusive.

Above all, though, it is the conductor's complete understanding of the music's style and substance that puts this *Messiah* at the top of the list. Many early-music groups, in trying to break down the artificial barrier between sacred and secular performance practices created during the last century, have sought to banish undue pomp and stodginess in works like *Messiah* by jacking up the tempos. But overkill in this regard can result in skittish-sounding performances, with stately French overtures turned into music for the Keystone Kops.

Koopman gives *Messiah* all the dignity and spaciousness the sacred text requires, but at the same time he dispels any heaviness with clarity of tone and with the inner vitality afforded by sharply etched articulation in the singing and playing. He achieves a perfect balance of pacing and texture, and that balance has been beautifully captured by the recording, which makes the most of the differences between the solo and tutti passages. This recording reminds us that there is as much delicate chamber music in *Messiah* as there is colossal orchestral and choral music. Koopman's reading puts all the parts of this manifold work into proper perspective.

Stoddard Lincoln

HANDEL: *Messiah*. Marjanne Kweksilber (soprano); James Bowman (alto); Paul Elliott (tenor); Gregory Reinhart (bass); chorus, the Sixteen; Amsterdam Baroque Orchestra, Ton Koopman cond. ERATO/RCA • NUM 751303 three discs \$32.94, © MCE 751303 three cassettes \$32.94, © ECD 88050 three CD's no list price.



THE ANGUISH OF RICHARD THOMPSON

RICHARD THOMPSON, guitarist and songwriter extraordinaire, remains one of rock's great under-utilized resources, but his new Polydor album, "Across a Crowded Room," could change all that. It's a pretty substantial piece of work.

Basically, "Across a Crowded Room" is the diary of a genuine, adult human being who is in considerable distress, but who also happens to be a great musician. On *Love in a Faithless County* at the end of side one, for example, Thompson responds to the breakup of his marriage with a dissonant, sinister tune, guitar and vocal work that recalls the soundtrack of *The Omen*, and some of the most cynical lyrics of his career, including the advice, "Always make your best moves late at night/Always keep your tools well out of sight." By the end of side two, he has worked his way through alternating moods of jealousy, regret, surprise, spite, and, in the chilling *Ghosts in the Wind*, with its anguished, haunted guitar, a profound despair.

Of course, Thompson has always trafficked in this sort of thing, and, as usual, not all of the songs here are howls of anguish. *Fire in the Engine Room* is a rousing mixture of folk accordion and heavy-metal thrash, and the almost reggae *You Don't Say* features lovely backing vocals by Any Trouble's Clive Gregson.

Still, the overall mood of "Across a Crowded Room" is as bleak as anything by the Sex Pistols. On songs like *Walking Through a*

Wasted Land, a haunting meditation on contemporary England with soul horns and some of the most achingly intense guitar solos ever recorded by anyone, and *When the Spell Is Broken*, a tune that more or less redefines the word somber, Thompson has managed the difficult feat of writing both honestly and poetically, without a hint of bathos, about a deeply personal grief—and with a backbeat, no less. Strong stuff. *Steve Simels*

RICHARD THOMPSON: *Across a Crowded Room*. Richard Thompson (vocals, guitar); Simon Nicol (guitar); Bruce Lynch (bass); Dave Mattacks (drums); other musicians. *When the Spell Is Broken; You Don't Say; I Ain't Going to Drag My Feet No More; Love in a Faithless Country; Fire in the Engine Room; Walking Through a Wasted Land; Little Blue Number; She Twists the Knife Again; Ghosts in the Wind*. POLYDOR 825 421-1 \$8.98, © 825 421-4 \$8.98.

NEW GRASS REVIVAL COMES BACK STRONG

IT'S been more than three years now since New Grass Revival, the premiere progressive-bluegrass band, underwent a major personnel change. Courtney Johnson and Curtis Burch split off to see if the grass really was bluer on the other side, and the remaining members, Sam Bush and John Cowan, added banjo *Wunderkind* Bela Fleck and singer/songwriter Pat Flynn to form what would be talked about in bluegrass circles as the ultimate progressive supergroup.

After what seems like eons of waiting, the revitalized band has finally turned out its first album, and if any record can be worth such a wait, "On the Boulevard" is.

I will say up front, however, that it takes a little getting used to. Anyone who thinks that the band might have turned back to a bit more traditionalism will be surprised; instead, the group has moved even further into its own unique, indescribable, and innovative blend of jazz, rock, reggae, gospel, r-&-b, and

whatever else that strikes its fancy.

On first listening, the album is a little offputting because successive songs are so different from each other that there seems to be a lack of cohesion. That feeling disappears quickly, though, as rehearsals make it apparent that the glue holding the album together is the high quality of the material and the arrangements, the extraordinary individual musicianship, and the ensemble approach to the performances. While most of the songs allow room for each of the musicians to stretch out in heart-racing improvisations, the group is still intent on playing as a band and not as four flashy pickers trying to outdo each other.

I have some quarrel with the mix on a couple of the numbers, and the final song on the album does end a bit abruptly, giving the album a rather curt finish. Overall, though, "On the Boulevard," named for Pat Flynn's striking opening song, is an exciting, joyful tour de force that delivers a host of surprises at every turn. The picking is, of course, above reproach. Of the two new members, the contributions by Fleck, who probably had to cool off in the shower between takes, need no special comment. Flynn, a former L.A. studio player, brings the group a distinctive songwriting ability, a dynamic guitar presence,

and a strong occasional lead or third-harmony vocal, adding to the perfect ensemble blend.

If you are going to buy only one album of acoustic music this decade, better hurry up and get a copy of "On the Boulevard" before they're all gone. *Alanna Nash*

NEW GRASS REVIVAL: *On the Boulevard*. Sam Bush (vocals, mandolin, fiddle, guitar); John Cowan (vocals, bass); Pat Flynn (vocals, guitars); Bela Fleck (vocals, banjo). *On the Boulevard; Earth, Water, Wind and Fire; You're the Best Friend That I Know; Just Is; County Clare; One More Love Song; You Don't Knock; One of These Trains; Get In the Wind; Indian Hills; One Love/People Get Ready*. SUGAR HILL SH-3745 \$8.98. © SH-C-3745 \$8.98.

TENNSTEDT'S ROMANTIC NEW WORLD

THERE are eight digitally mastered recordings of the Dvořák *New World* Symphony listed in the current Schwann catalog. Five of them, including Angel's new one with the Berlin Philharmonic Orchestra led by Klaus Tennstedt, are available



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New Grass Revival: from left, Cowan, Bush, Fleck, and Flynn

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Conductor Klaus Tennstedt: passionate Dvořák

RICHARD HOIT/ANGEL RECORDS

on Compact Disc as well as LP and tape, and there is one suited to just about every taste. If you like your Dvořák infused with high-Romantic poetry, you should find the new Tennstedt recording right up your alley.

The opening bars in this performance are very slow and hushed almost to a whisper, an approach that enhances the impact of the thunder and lightning that follow. The main allegro is briskly played, but canny tempo fluctuations make the music's flow organic rather than metronomic.

Ardor is the hallmark of Tennstedt's interpretation. The slow movement is superbly eloquent, and the handling of dynamic contrasts is highly dramatic. Some listeners may raise eyebrows, however, over Tennstedt's emphasis on the solo clarinet when the time comes for it to join the English horn in the famous largo melody. A sharp rhythmic edge characterizes the main body of the scherzo, but any hardness is softened by exquisite handling of the two trio sections. Tennstedt drives the finale in a fiercely purposeful way toward its triumphant close when the three chief themes of the symphony are combined.

The recording as such is balanced and full bodied on the LP version, with just the right amount of room resonance to provide glow to the string tone. The CD, however, had decidedly more bite in the attacks, with the trumpets sounding a bit fierce. Some listeners may find that a moderate cut in the treble is needed for best results on their playback systems.

The most formidable interpretive rival to Tennstedt's *New World*, and one that is also available in both digital LP and CD formats, is James Levine's RCA recording with the Chicago Symphony. Levine is more generous with repeats, and his highly charged reading is, overall, perhaps more taut and ferociously dramatic. Tennstedt's, on the other hand, is both brilliant and passionate. Comparing these two with recorded performances by great conductors of the past suggests an analogy with the respective approaches of Arturo Toscanini and Bruno Walter. *Chacun à son goût!*

David Hall

DVOŘÁK: *Symphony No. 9, in E Minor, Op. 95 ("From the New World")*. Berlin Philharmonic Orchestra, Klaus Tennstedt cond. ANGEL ● DS-38140 \$11.98, © 4XS-38140 \$11.98, © CDC 47071-2 no list price.

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CLASSICAL

- **BACH: *Suites for Solo Cello***. Yo-Yo Ma. CBS M2K 37867. "Intimately scaled, plenty of fire" (April 1984).
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- **HANDEL: *Arias***. Horne. ERATO/RCA ECD-88034. "Virtuosically sung, brilliantly recorded" (February 1984).
- **MOZART: *Piano Concertos Nos. 19 and 23***. Pollini, Böhm. DG 413 793-2. "Clean, vigorous, graceful Mozart" (May 1977).
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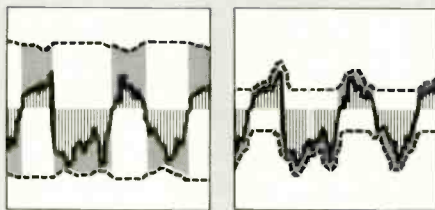
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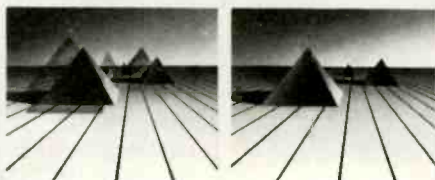
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Julian D. Hirsch, STEREO REVIEW (December, 1982)

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CIRCLE NO. 49 ON READER SERVICE CARD

Discs and tapes reviewed by
Chris Albertson
Phyl Garland
Alanna Nash
Mark Peel
Peter Reilly
Steve Simels

PAT BENATAR: *Tropico*. Pat Benatar (vocals); instrumental accompaniment. *Diamond Field*; *We Belong*; *Painted Desert*; *Temporary Heroes*; *Love in the Ice Age*; and five others. CHRYSALIS FV 41471, © FVT 41471, no list price.

Performance: *For fans only*
 Recording: *Very good*

Pat Benatar's "Tropico" is less interesting as a record than as a case example of how records are marketed today. So far, Chrysalis has released only one single from the album, *We Belong*, but already there are three videos—*We Belong*, *Diamond Field*, and *Ooh Ooh Song*. As soundtrack music, "Tropico" has the requisite fire and flash needed to punctuate Benatar's extravagant posturing in Fragonard lace. As a musical experience, it's of interest only to fans of her tough, straddle-legged style.

What strikes me most about "Tropico" is how little it seems to originate from or reflect Pat Benatar at all. Songs like *Takin' It Back*, although written about Benatar's experience as a Rock Star Sex Symbol, are clearly the impressions of the multi-hyphenated Neil Geraldo, Benatar's husband-producer-guitarist-songwriter. Whether the subject is the bankrupt American Dream (*Suburban King*) or the seductive sleaze of the city at night (*Diamond Field*), it's a man talking, with Benatar mouthing the words. She's never seemed so much like a puppet. I suppose it's a trivial point considering Benatar's appreciative audiences, but I thought I'd mention it. Enjoy the videos. *M.P.*

DEEP PURPLE: *Perfect Strangers*. Deep Purple (vocals and instrumentals). *Under the Gun*; *Nobody's Home*; *Mean Streak*; and five others. MERCURY 824 003-1 \$8.98, © 824 003-4 \$8.98.

Performance: *Sui generis*
 Recording: *Good*

"Perfect Strangers" is Deep Purple's first album in nearly a decade, and

Explanation of symbols:

- = Digital-master analog LP
- Ⓢ = Stereo cassette
- Ⓢ = Digital Compact Disc
- Ⓢ = Monophonic recording

VELVET UNDERGROUND

YES, sometimes it is okay to raid the archives. Case in point: the lovely "VU" by the Velvet Underground, finally released by Verve after years of moldering in the vaults (occasional bootlegs notwithstanding). Long rumored as the great "lost" Velvets album, "VU" was recorded by Lou Reed and Co. in late 1969 and early 1970. The band switched labels soon after, but Verve refused to part with the tapes, and they've remained in that company's hands ever since. Now, beautifully remixed and generally spruced up, the recording has been issued to coincide with Verve's rerelease of its other "official" Velvet Underground albums—all of which, incidentally, have been similarly remastered and are being offered at a bargain price.

What does "VU" sound like? Sort of what you'd expect, actually. It's clearly transitional, falling neatly between the almost Olympian repose of the preceding "Velvet Underground" and the more overt pop sounds of "Loaded," the band's final studio effort, which was to follow shortly afterward. The moods are often playful (as in the ad-libbed spoken asides during *Temptation Inside Your Heart*), and there's a fairly studied emphasis on angelic Byrd-like harmonies (*Foggy Notion*). But there's also a

fair amount of the Velvets' patented instrumental aggression (Reed takes an absolutely blistering solo on *I Can't Stand It*, a song he redid to far less effect on his first solo album), and throughout there is that unmistakable Velvets sensibility—the feeling that the people making the music were aware that neither the peace-and-love platitudes of the time nor the accepted limits of pop music really had much to do with life as most of us lived it.

The Velvets got tagged as campy nihilists while they were active, largely because of their Andy Warhol association, but I think that if you listen carefully to the music on "VU" you'll find something that's considerably more positive, more realistic . . . even brave. These guys were a great American rock-and-roll band, and it's good to hear from them again, even fifteen years after the fact. *Steve Simels*

THE VELVET UNDERGROUND: *VU*. The Velvet Underground (vocals and instrumentals). *I Can't Stand It*; *Stephanie Says*; *She's My Best Friend*; *Lisa Says*; *Ocean*; *Foggy Notion*; *Temptation Inside Your Heart*; *One of These Days*; *Andy's Chest*; *I'm Sticking with You*. VERVE/POLYGRAM 823 721-1 \$8.98, © 823 721-4 \$8.98.



Velvet Underground around 1970: from left, Sterling Morrison, Maureen Tucker, Lou Reed, John Cale

GERARD MALANGA/VERVE/POLYGRAM RECORDS

though a sticker on the cover proclaims that "Destiny brought them together again," my own guess is that more, uh, earthly concerns were at work. Anyway, the time was clearly right. The churning heavy-metal these guys pretty much invented is now a reliably profitable genre. If "Perfect Strangers" proves anything, it's that while the members of the band may have gained paunches and lost a little bit of hair, their performances lack none of their original Visigothic charm.

Actually, for a contemporary heavy-metal album, this one seems almost neoclassical in its restraint. Guitarist Ritchie Blackmore, one of the most obnoxious showboaters of our age, plays with a lot more imagination and feeling than I remember his being capable of. Don't get me wrong. The music here is the same sort of lumbering, overwrought, often sexist noise Deep Purple was dispensing in the early Seventies. Yet there's an undeniable kick to some of it (*Knocking at Your Back Door* actually works up what used to be called a groove), and the sound of Jon Lord's Hammond organ sticks with you, even if you wish it wouldn't. All of which is a roundabout way of saying that if a cut from "Perfect Strangers" came on the radio, I wouldn't necessarily change the station. S.S.

EVERYTHING BUT THE GIRL. Tracey Thorn (vocals); Ben Watt (guitars, organ, piano, vocals); vocal and instrumental accompaniment. *Each and Every One; Tender Blue; Another Bridge; Frost and Fire; Fascination; Crabwalk*; and six others. SIRE 25212-1 \$8.98, © 25212-4 \$8.98.

Performance: *Two schools of cool*
Recording: *Intimate*

If you spotted the two members of Everything But the Girl flipping through the bins at a record shop, it's not likely you'd put the two together. The fragile, spike-haired Tracey Thorn

would almost surely be checking out the latest British pop releases, while goateed, brush-cut Ben Watt would be back in the jazz section poring over an old Miles Davis session. That contrast is one of the charms of this album, a synthesis of Eighties British *Angst* and the cool, Latin-flavored jazz popularized in the Fifties by West Coast artists like Stan Getz.

Thorn's almost girlish alto conveys a sense of vulnerability, of someone whose feelings lie uncomfortably close to the surface. Paired on these songs with Watt's gently swinging but emotionally neutral guitar octaves and piano-and-organ chords, she suggests a quiet romantic evening gone sour, as if some terrible secret were being revealed just as a bossa nova record plopped down onto the turntable. Close attention to the lyrics bears out this disquieting impression.

Thorn and Watt are backed by a fairly large contingent of jazz instrumentalists, including saxophone, brass, and percussion. There's not a synth in sight. Although it drags a bit on side two, "Everything But the Girl" is a generally successful mixture of styles some twenty-five years and thousands of miles apart. M.P.

JOHN FOGERTY: *Centerfield*. John Fogerty (vocals and instrumentals). *The Old Man Down the Road; Rock and Roll Girls; Big Train (From Memphis); Mr. Greed*; and five others. WARNER BROS. 25203-1 \$8.98, © 25203-4 \$8.98.

Performance: *Ground double*
Recording: *Nice*

As long-awaited comebacks by living legends go, John Fogerty's "Centerfield" is a hell of a lot better than, say, Lennon/Ono's "Double Fantasy." But, speaking as a Fogerty/Creedence fan of long standing, I'm frustrated that it's only about a double instead of a home run. The basic sound, of course, is pure Creedence (Fogerty plays every note

here, by the way), that inimitable blend of Sixties hard rock, country twang, and the blues by way of Howling Wolf, all held together by Fogerty's every-note-there-for-a-reason guitar work and instantly recognizable voice, which has not changed a whit. Some of the songs jump off the record so vividly—*Old Man Down the Road, Rock and Roll Girls*—that it's obvious Fogerty's hit-single sensibility is intact as well.

The problems come when Fogerty tries to get serious. His self-imposed isolation since his "retirement" in 1976 has left his lyric writing in something of a timewarp. *I Saw It on T.V.*, despite a moving switcheroo in the last verse, verges uncomfortably on *American Pie* territory, and the two songs addressed to the venality of his former record company (*Mr. Greed* and *Zanz Can't Dance*), while musically compelling, come across as depressingly trite, hippie anticapitalist rants. Still, so much here is wonderful—the utterly authentic rockability of *Big Train from Memphis*, the soul stew of *Searchlight*—that you're inclined to forgive the lapses. Let's just say that it's good to have Fogerty back and hope that by his next album he'll seem a little more in touch with contemporary life. S.S.

JUDY GARLAND: *From the Decca Vaults*. Judy Garland (vocals); vocal and instrumental accompaniment. *I'm Always Chasing Rainbows; Poor You; Friendship; Yah-Ta-Ta, Ya-Ta-Ta (Talk, Talk, Talk); March of the Doagies*; and four others. MCA © MCA-907 \$8.98, © MCAC-907 \$8.98.

Performance: *For fans*
Recording: *Good restoration*

This is a collection of alternate takes or unreleased tracks recorded by Judy Garland in the Thirties and Forties. For Garland fans they are a must; for the rest of us they are only fitfully interesting. Garland's heard in several duets—with Bing Crosby in *Yah-Ta-Ta, Yah-*

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Ta-Ta, with Johnny Mercer in *Friendship*, and with Kenny Baker in *March of the Doagies* (a number cut from *The Harvey Girls*). It wasn't until relatively late in her career, at the time of her historic "Live at Carnegie Hall" album, that Garland really developed much microphone technique. All during her film career she simply stood there and sang like the great vaudevillian she was, and the communication was instant, direct, and overpowering. On these sides she often seems to be belting blindly, with little or no attempt to accommodate her style to the recording medium. P.R.

DON HENLEY: *Building the Perfect Beast*. Don Henley (vocals, percussion, keyboards); vocal and instrumental accompaniment. *The Boys of Summer; Man with a Mission; You're Not Drinking Enough; Building the Perfect Beast; Not Enough Love in the World*; and five others. GEFEN GHS 24026 \$8.98, © MSG 24026 \$8.98.

Performance: *Angry*
Recording: *Very good*

No matter what you make of "Building the Perfect Beast," one thing is for certain: Don Henley is not a happy man. If this album, his second solo effort since the dissolution of the Eagles, is any real indication, Henley's dissatisfaction runs long, deep, and full circle.

His problems begin on side one with matters personal and romantic in *The Boys of Summer* and *Not Enough Love in the World*. On the whole, these songs—and particularly their heavy synthesizer treatments—are not the bittersweet, dreamy tales of disappointment so integral to rock-and-roll but dark and disturbing outbursts of emotion that signify a man on the edge. By the second side, the music has followed the evolution of someone whose failures have pressed too hard on his mind, and the focus shifts to encompass Henley's larger (and somewhat overreactionary) political and social worries. At the album's finish, he offers no redeeming solutions.

This is an album of tortured songs, with vocals so achingly raw they nearly bleed. Henley may not have built a truly perfect beast, but in exposing the soul of a man who grasps frantically for even the slightest control over his life, he has created a frightening and powerful portrait of the underside of America's Everyman. A.N.

KOOL & THE GANG: *Emergency*. Kool & the Gang (vocals and instrumentals). *Emergency; Fresh; Mised; Cherish; You Are the One*; and two others. DE-LITE 822 943-1 \$8.98, © 822 943-4 \$8.98.

Performance: *Reliable*
Recording: *Good*

Kool & the Gang can always be counted on to deliver easy-to-listen-to r-&-b dance music. Though some of their tracks are less than distinguished, at

least two selections here guarantee the kind of musical pleasure the group can generate when in peak form. One is *Mised*, a kicking dance tune that has already become a hit single. The other, a far more interesting item, is *You Are the One*, which has a novel off-beat cadence and just a trace of reggae. If you listen carefully, you'll discover that the lyrics are those of prayer. It's nice to see that good guys can still win. P.G.

NEW GRASS REVIVAL: *On the Boulevard* (see *Best of the Month*, page 88)

SHALAMAR: *Heart Break*. Shalamar (vocals and instrumentals); other musicians. *Amnesia; Dancin' in the Sheets; Whenever You Need Me; Heart Break; Don't Get Stopped in Beverly Hills*; and three others. SOLAR 60385-1 \$8.98, © 60385-4 \$8.98.

Performance: *Their best*
Recording: *Excellent*

The name is all that remains of the original Shalamar, which emerged in the late Seventies during the age of disco. "Heart Break" suggests that the trio has finally arrived at the right combination

Impressive Press

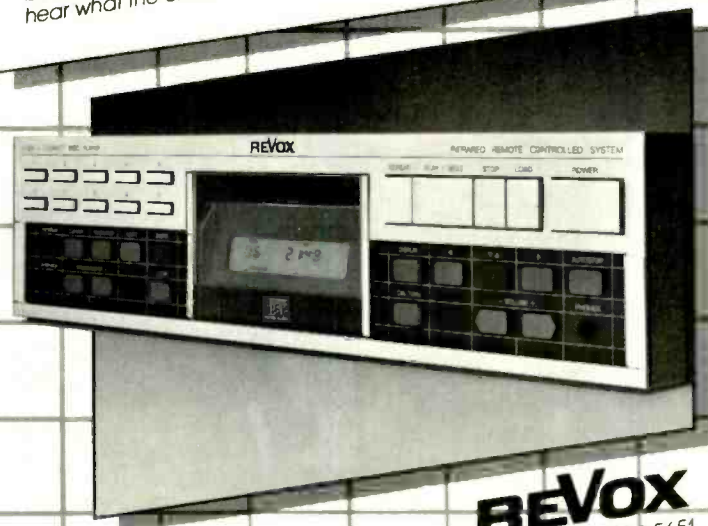
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CIRCLE NO. 47 ON READER SERVICE CARD

of personnel and style, for it's their best album yet. Howard Hewitt, lead vocalist and a member since 1979, has taken a firm hand in shaping the group's new musical thrust and dazzling image (they look just as good as they sound). He produced this album to showcase Shalamar in sharply conceived, rock-influenced dance music that still remains true to its r-&-b roots.

The show-stopper here is the opener, *Amnesia*, which takes off like a space shuttle and never flags as the group blazes through unexpected changes. Part of the credit for it should go to George Duke, who co-wrote the song and produced the track. Here, as elsewhere, Micki Free supplies blistering guitar licks that sear at the edges. No less an asset is the newest member of the group, keyboardist Delisa Davis, a former college beauty queen who shows considerable talent as a composer. Her main contribution here is *Whenever You Need Me*, a fine ballad.

Shalamar today is not just another disco-funk group. They now have enough pizzazz to qualify for a spot at the top. P.G.

RAY STEVENS: *He Thinks He's Ray Stevens*. Ray Stevens (vocals, keyboards, synthesizers); vocal and instrumental accompaniment. *I'm Kissin' You Goodbye*; *It's Me Again*, Margaret;

Mississippi Squirrel Revival; *Erik the Awful*; *Joggin'*; and five others. MCA MCA-5517 \$7.98, © MCAC-5517 \$7.98.

Performance: *Certifiable insanity*
Recording: *Very good*

If you always suspected that Ray Stevens's cornbread wasn't baked quite through, you'll be sure of it with this one. Known primarily as a novelty artist who occasionally tries to get serious (he won a Grammy for his bluegrass rendition of *Misty*), Stevens is also one of Nashville's all-around geniuses, often writing, arranging, and producing all the songs on his albums *and* doing all the voices and playing the instruments.

Here, he merely concentrates on doing a first-rate, all-comedy album, and for the most part, he succeeds. Not all the songs will have you rolling on the floor, but there are enough genuinely hysterical moments to have you bouncing pomegranates off your head. I'm not about to try to summarize these off-the-wall ditties, but I will say you've never heard anything until you've heard an allergy-prone band sneeze in four-part harmony. A.N.

RICHARD THOMPSON: *Across a Crowded Room* (see *Best of the Month*, page 87)

GENE WATSON: *Heartaches, Love & Stuff*. Gene Watson (vocals); Gene Watson's Farewell Party Band (instrumentals); vocal and instrumental accompaniment. *I Guess You Had to Be There*; *One Hell of a Heartache*; *Got No Reason Now for Goin' Home*; *Wino's Prayer*; *That's When You Know It's Over*; *I Must Be Somebody Else*; and four others. MCA MCA-5520 \$7.98, © MCAC-5520 \$7.98.

Performance: *Honky-tonk heaven*
Recording: *Good*

Gene Watson is a hard-core country singer from the Merle Haggard mold, and, to tell the truth, he's going to be in Haggard's league in almost no time at all. His warm and impeccably controlled baritone simply oozes experience in life's blind alleys and one-way streets.

Watson is another disciple of the Keep Country Country school of thought (one reason commercial Nashville isn't so keen on him despite his long list of hits), and he and co-producer Russ Reeder have kept their album lean, clean, and honkin'. It's a pleasure to hear a record done right and so true to its concept. Keep your eye on this guy. Anybody who has the guts to record a song called *Wino's Prayer* is bound to make it big, some day, one way or another. A.N.

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JAZZ



TERESA BREWER: *Live at Carnegie Hall & Montreux, Switzerland.* Teresa Brewer (vocals); Dizzy Gillespie, Clark Terry, Cootie Williams (trumpet); other musicians. *St. Louis Blues; Breakin' Up Is Hard to Do; Romance in the Dark; Mood Indigo; New Orleans; That's When the Music Takes Me; Baby Won't You Please Come Home;* and eight others. DOCTOR JAZZ W2X 39521 two discs, © WXT 39521 one cassette, no list price.

Performance: *Excellent*
Recording: *Very good remotes*

In the early Fifties, when Teresa Brewer had a sizable segment of the pop-music public putting another nickel in her nickelodeon, so to speak, it would have been difficult to imagine her performing within a jazz context—much less with such players as Dizzy Gillespie, Joe Newman, and Cootie Williams. Times have changed, and the very tall wall that once separated jazz and pop is now only a thin, easily scaled partition, but that is not the only reason Brewer sounds so natural on her new, jazz-oriented live double album. It is also because she has matured as an artist.

The album is split evenly between performances at Carnegie Hall and at the Montreux Jazz Festival, the former being far superior by virtue of better accompaniments. There is also a pleasant balance of pop and jazz material, though it is the jazz segments that yield the best performances. There are two versions of Ellington's *It Don't Mean a Thing If It Ain't Got That Swing*, in one of which, at Carnegie Hall, Brewer is joined by Dizzy Gillespie for a scat duet and some delicious input on jew's-harp. Clark Terry's strong presence enhances the Montreux version of the Ellington favorite, making it the best selection from that side of the Atlantic. Among other highlights are Joe Newman's spirited contribution to *After You've Gone* and a lovely rendition of *It Had to Be You* featuring clarinet obbligatos by Johnny Mince.

I know it isn't fashionable in jazz circles to take Teresa Brewer seriously, but I must report what my ears tell me: this is a fine album by a singer who can sing circles around Linda Ronstadt, in the ballad department, and hold her own in impressive company. C.A.

TOMMY FLANAGAN AND HANK JONES: *Our Delight.* Tommy Flanagan, Hank Jones (piano). *Robbins Nest; Jordu; Confirmation; Autumn Leaves;* and three others. GALAXY GXY-5113

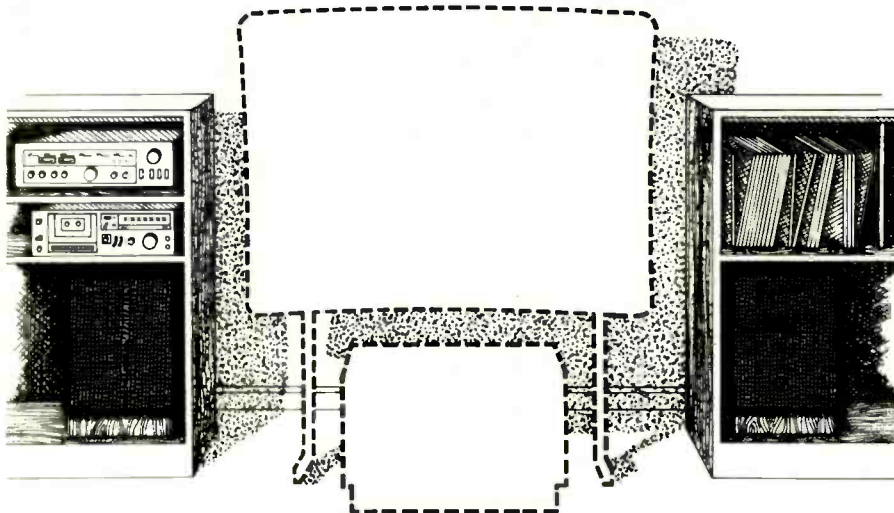
\$8.98, © 5-5113 \$8.98, © FCD 614-5113 no list price.

Performance: *Masterly*
Recording: *Very good*

Tommy Flanagan and Hank Jones never achieved the individual popularity of such contemporary colleagues as Oscar Peterson or McCoy Tyner, but they have never lacked the respect of jazz fans, musicians, and critics. Although both pianists have spent considerable time in the shadows of the singers they accompanied, both have earned places in the top ranks of their profession. This

1978 duet album will quickly demonstrate why. "Our Delight" is still delicious and a worthy item for rerelease on CD, whence this review. The seven selections are drawn mostly from the bop repertoire, and there is so much going on that each playing reveals new facets of the fine performances. C.A.

VINCE GUARALDI: *Cast Your Fate to the Wind.* Vince Guaraldi (piano); Monte Budwig (bass); Colin Bailey (drums). *Since I Fell for You; Moon River; Generique; Samba de Orpheus;* and four others. FANTASY F-8089 \$8.98, © 5-



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Laurie Anderson's U.S.



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LAURIE ANDERSON'S monumental four-part performance piece, *United States*, was recorded live at the Brooklyn Academy of Music in February 1983. Because of both the nature of "performance art" and the extraordinary length of the work, the recorded version released by Warner Brothers, "United States Live," poses a number of problems for the listener. But Anderson's highly personal, idiosyncratic vision of this country is so continually surprising—and just plain *funny*—that my quarrels with the recording may seem almost beside the point.

The four parts of *United States*—Transportation, Politics, Money, and Love—are linked by the common theme of the isolation we have brought upon ourselves by our fascination with and enslavement by technology. The format is simple: Anderson or one of the other performers relates a story against a minimalist accompaniment of sustained tones or sound effects; in performance there is also a background of motion pictures, slides, or dance. Interspersed between the stories are songs, longer passages of music or film, and sometimes choreographed action. The stories are essentially independent of each other. Usually delivered in a dry monotone, often through a Vocoder or other synthesized device, they are invariably humorous.

Anderson's genius lies in her ability to turn a commonplace—walking the dog or waving "Hello"—into a symbol of absurdity. She makes us rethink hundreds of ordinary objects and occurrences in these *United States*: trees, dogs, hula dancers, airplanes, telephone answering machines, automobiles, evangelical preachers, the Apollo moon landing, babies, bus drivers, home. And

as disorienting as Anderson's vision are the electronic instruments she employs, such as an electronic violin played with a neon bow, or the tiny "pillow speaker," which is inserted inside her mouth so that she can alter recorded sounds played through it by moving her lips.

The many remarkable visual and theatrical effects in *United States* point up the shortcomings of an audio-only recording. In performance, the multimedia work lasts more than seven hours (usually divided into two evenings), but the recording has been edited down to four and a half hours. Even so, there's barely enough real music here to fill two discs, though we get plenty of the synthesized sound effects that burble away under the episodic monologues and dialogues.

I have to question whether audio discs and tapes are a suitable medium for presenting a work that is as much a visual experience as a musical one. Of course, any medium other than live performance in a theater is going to require some compromises. Probably in recognition of this problem, *United States* has also been released in an illustrated paperback book from Harper and Row. The book can serve as a libretto and visual accompaniment for the recorded performance, and I think it is essential to full enjoyment of the album. Taken together, the book and recording probably come about as close to documenting Laurie Anderson's singular, impressive achievement as anybody can reasonably expect. *Mark Peel*

Laurie Anderson: *United States Live*. Laurie Anderson (vocals, violin, electronic instruments); other musicians. WARNER BROS. 25192-1 five discs \$29.98, © 25192-4 four cassettes \$29.98.

8089 \$8.98, © FCD 607-8089 no list price.

Performance: *Beauty lasts*
Recording: *Very good*

Jazz impressions of film and stage music were rampant in the late Fifties and early Sixties, so it was inevitable that the hauntingly beautiful music from the Brazilian film *Black Orpheus* would find its way into the jazz repertoire. There were many recordings, but few matched the ones by pianist Vince Guaraldi. Fantasy has now issued a Compact Disc of the 1965 Guaraldi album that featured the film's four popular tunes and as many more home-grown ones. The sound is as remarkable as the music. *C.A.*

Jean-Michel Jarre: *Zoolook*. Jean-Michel Jarre (keyboards, electronic devices); Laurie Anderson (vocals); other musicians. *Ethnicolor*; *Wooloomooloo*; *Blah-Blah Cafe*; and four others. DREYFUS FDM 18118, © FDM 40-18118, © FDM CD-18118 no list price.

Performance: *Enthralling*
Recording: *Excellent*

It is hard to describe Jean-Michel Jarre's "Zoolook," but, unlike so many "indescribable" records, it is worthy of your ears—especially if you have adventurous ones. Jarre's music sounds like no other, and he achieves that distinction without resorting to the kind of *unmusical* sounds that so often assault us these days. Laurie Anderson meets the challenge here of speaking in twenty-five languages, including Quechua, Sioux, Balinese, and Madagascan—to name some of the more common ones—and the whole thing is expertly blended in some sort of audio Cuisinart. It is all very creative. *C.A.*

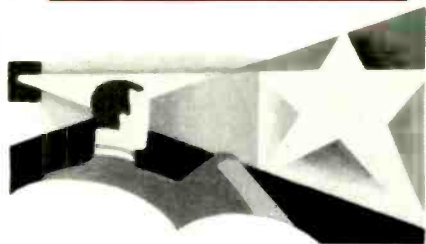
Morgana King: *Portraits*. Morgana King (vocals); instrumental accompaniment. *You Go to My Head*; *Moment of Truth*; *Send In the Clowns*; and five others. MUSE MR 5301 \$8.98.

Performance: *Exquisite*
Recording: *Good*

Listening to Morgana King is like drinking a fine old cognac, intoxicating and mellow. Hers is an immediately identifiable sound, with a voice of rare clarity, range, and precision. She has a special way of embracing every note, but she's always alert to the lyrics.

In "Portraits" King is presented in a spare and subdued instrumental setting that throws her voice into relief and imbues it with a warm glow. The material is eclectic. She treats Marvin Gaye's *What's Going On* and *Save the Children* almost as though they were standards in the classical repertoire. Jazz standards like *You Go to My Head*, *Lush Life*, and *If You Could See Me Now* shimmer, gem-like, at her touch. Lesser-known numbers like *Moment of Truth* are also handled with consummate artistry. This is music for connoisseurs. *P.G.*

FILM & THEATER



BEVERLY HILLS COP. Original soundtrack recording. Patti LaBelle: *New Attitude*; *Stir It Up*. Pointer Sisters: *Neutron Dance*. Danny Elfman: *Gratitude*. And six others. MCA MCA-5553 \$8.98, © MCAC-5553 \$8.98.

Performance: *Plenty loud*
Recording: *Satisfactory*

The film *Beverly Hills Cop* is practically guaranteed sleep-proof. I'm not talking about the acting talents of Eddie Murphy but about the soundtrack. It's raucous and fast-paced enough to stave off the slightest threat of a snooze, which is not to say it's all that good. Performed by a wide assortment of musicians, the selections are heavy on rhythm and light on imagination. Patti LaBelle can breathe life into the feeblest scrap of a song, but even her powerful efforts on

New Attitude and *Stir It Up* cannot save them from mediocrity. *Axel F*, an electronic ditty by Harold Faltermeyer, who supervised all the music for the film, is catchy, with sound effects resembling perking coffee. By far the best thing is the Pointer Sisters' *Neutron Dance*, which is already available on their album "Break Out." My advice is to invest in the Pointers instead. *P.G.*

COUNTRY (Charles Gross). Original soundtrack recording. Orchestra, Charles Gross cond. WINDHAM HILL WH-1039 \$9.98, © WT-1039 \$9.98.

Performance: *Dreary*
Recording: *Good*

Jessica Lange is an interesting actress but not as interesting as she seems to think she is. She not only starred in but produced *Country*, a Steinbeckian yarn about farmers trying to save their land from the Feds right here in the 1980's. Even with the help of Sam Shepard as her co-star, J. C. Penney couture for her wardrobe, and a uniformly grim facial expression, she fails to be convincing in the movie. The score that Charles Gross wrote for it is equally unconvincing. It's long on "authentic" Midwestern "country" feel but drastically short on invention, vitality, and substance. It merely drones along, trying hard to sound important and meaningful. *P.R.*

JERRY'S GIRLS (Jerry Herman). Original-cast recording. Carol Channing, Leslie Uggams, Andrea McArdle (vocals); Jerry Herman (piano, vocals); orchestra. POLYDOR © 820 207-1 two discs \$11.98, © 820 207-4 one cassette \$11.98, © 820 207-2 two CD's no list price.

Performance: *Some charm*
Recording: *Good*

Jerry's Girls is a staged compendium of Jerry Herman's words and music from several of his Broadway hits (*Mame*, *Hello Dolly*, *La Cage aux Folles*) and some of his misses (*Dear World*, *Mack and Mabel*). The show, starring Carol Channing, Andrea McArdle, and Leslie Uggams, has been touring the country for a year or so with some success. For this set Herman himself appears at the piano for a sing-along finale.

Unfortunately, there are no undiscovered gems lurking here. Herman's songs seem either to make it on initial impact or wither on the vine. The performances are all extremely "theatrical," which is to say that they are all punched so hard they almost become cartoons. The only one to escape relatively unscathed is that great self-created cartoon, Carol Channing, who belts, warbles, and squeaks through her numbers with tongue always firmly planted in cheek. *P.R.*

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ALBINONI: *Il nascimento dell'Aurora*. June Anderson (soprano), Dafne; Margarita Zimmermann (soprano), Zeffiro; Susanne Klare (soprano), Flora; Sandra Browne (alto), Apollo; Yoshihisa Yamaj (tenor), Peneo; I Solisti Veneti, Claudio Scimone cond. ERATO/RCA ● NUM 751522 two discs \$21.96, © MCE 751522 two cassettes \$21.96.

Performance: *Tidy*
Recording: *Good*

Albinoni's *The Birth of Aurora* is one of those typical quasi-operatic Baroque works written to celebrate the birth of a noble child. To achieve the proper tribute, the anonymous librettist has given a twist to the myth of Daphne and Apollo: as Daphne undergoes her transformation into a laurel tree, she dedicates her sacrifice to the newborn, proclaiming that the branches of her tree should be made into a wreath for the child's head. Although the plot has little to say to us today, the music does.

The performance here is thoroughly professional, if not revelatory. The singers discharge their arias neatly, the instrumental playing is clean and precise, and it is all well recorded. S.L.

BACH: *Brandenburg Concertos (BWV 1046-1051)*. Amsterdam Baroque Orchestra, Ton Koopman cond. ERATO/RCA ● NUM 751342 two discs \$21.96, © MCE 751342 two cassettes \$21.96, © ECD 88055 two CD's no list price.

Performance: *Luminous*
Recording: *Beautiful*

BACH: *Brandenburg Concertos (BWV 1046-1051)*. Philharmonia Virtuosi, Richard Kapp cond. CBS M4X 39358 two discs, © M4T 39358 two cassettes, no list price.

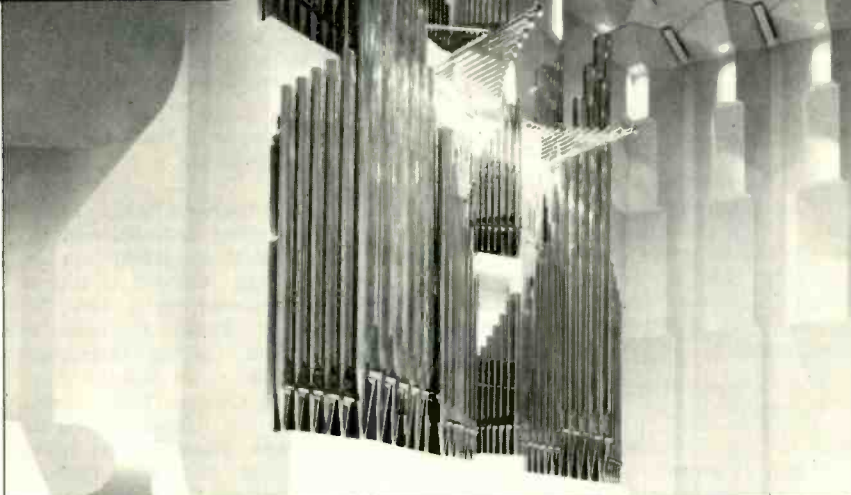
Performance: *Pedestrian*
Recording: *Good*

As played by the Amsterdam Baroque Orchestra under the direction of Ton Koopman, Bach's *Brandenburg Concertos* take on a warmth and intimacy of expression that they often lose in the

Explanation of symbols:

- = Digital-master analog LP
- © = Stereo cassette
- Ⓢ = Digital Compact Disc
- Ⓜ = Monophonic recording

SAN FRANCISCO'S NEW ORGAN



Organist Murray (inset) and the Ruffatti organ in Davies Symphony Hall

IN April 1984 the San Francisco Symphony celebrated the installation of the Ruffatti organ built for the orchestra's new home, Davies Symphony Hall, with a week of performances by Michael Murray. Telarc has now released a recording of Murray's dedicatory solo recital, following up on his recent Telarc album of Joseph Jongen's *Symphonie concertante* with the San Francisco orchestra conducted by Edo de Waart. The recital program is about evenly divided between works by Bach and by French masters of the nineteenth and twentieth centuries—Franck, Widor, Dupré, and Messiaen.

The Ruffatti organ is a fine-sounding and richly versatile instrument. Murray puts it through its paces splendidly, and he is recorded with astounding vividness (I listened to the CD for this review). The delicate shimmer of the bell sounds in the opening of Bach's chorale prelude *Der Tag, der ist so freudenreich* contrasts most effectively with the tread-like effect in *Wir glauben all' an einen Gott*. The brilliant opening of the Messiaen piece is especially effective in the utterly natural acoustic frame, without added resonance or any hint of electronic boost.

The majestic Franck *Final* is a suit-

ably jubilant climax to a stunning display built on solid musical substance. If the furniture trembles now and then in this concluding piece or in the last of the Bach chorales, take it as a reassuring confirmation, by way of contrast, of the rock-firm musical source. I am tempted, as I have no doubt many others will be, to call this the finest recording yet made of an organ in any environment. It certainly makes one of the strongest cases yet in any type of music for the capabilities of the Compact Disc format.

Richard Freed

MICHAEL MURRAY: *Organ Recital*.

Bach: *Prelude and Fugue in C Major (BWV 545)*; *Chorale Preludes: Kyrie, Gott heiliger Geist (BWV 671)*; *In Dir ist Freude (BWV 615)*; *Von Gott will ich nicht lassen (BWV 658)*; *Gelobet seist du, Jesu Christ (BWV 604)*; *Ich ruf' zu dir, Herr Jesu Christ (BWV 639)*; *Der Tag, der ist so freudenreich (BWV 605)*; *Wir glauben all' an einen Gott (BWV 680)*. **Messiaen:** *Dieu parmi nous*. **Dupré:** *Prelude and Fugue in G Minor, Op. 7, No. 3*. **Widor:** *Symphony No. 6, Op. 42, No. 2*. **Adagio. Franck:** *Final in B-flat Major, Op. 21*. Michael Murray (organ). TELARC ● DC-10097 \$12.98, © CD-80097 no list price.

ORGAN PHOTO: JANE IDZ

many "busy" recordings of them. The ensemble sound of the authentic instruments and Koopman's attention to minute details make for a rich and cleanly articulated tonal fabric. By underlining the natural ebb and flow of the phrases with a solid beat, he brings a living pulse to the music that is human and warm. The Amsterdam Baroque Orchestra, on the evidence of this album, must certainly be counted as one of the finest ensembles among those currently playing early instruments. Their concern for historical authenticity is combined with true musicianship.

As for the Philharmonia Virtuosi under Richard Kapp, you have to wonder why we need yet another set of *Brandenburgs* that simply gets through the notes. Completely lacking in articulation and played with a metrical rigidity, the music spins on and on with little sense of shape. After all we have learned about Baroque performance during the last ten years, it is hard to believe that a group today can still play these works like this. S.L.

BERLIOZ: *Les Nuits d'été*. DEBUSSY: *La Damoiselle élue*. Frederica von Stade (mezzo-soprano); Susanne Mentzer (narrator, in Debussy); Tanglewood Festival Chorus (in Debussy); Boston Symphony Orchestra, Seiji Ozawa cond. CBS M 39098, © MT 39098, no list price.

Performance: *Highly polished*
Recording: *Fine*

Frederica von Stade is one of today's most elegant singers. All that she performs is carefully studied, in the best sense, and meticulously executed. Her singing here is a case in point. Her French is impeccable, her intonation excellent, her vocal delivery at all times free and pure. And she is ably accompanied by Seiji Ozawa and the Boston Symphony.

The Berlioz cycle, more familiar than the less-performed Debussy piece, is most celebrated for *Le Spectre de la rose* and *Absence*, both expressively sung here, with beautiful control and sense of line. The *Villanelle*, the one happy poem of the six by Théophile Gautier, brims over with lighthearted joy. The three remaining songs of the work, dark of mood and introspective, are sensitively sung with careful attention to the poetry.

Debussy's *La Damoiselle élue* is a kind of monodrama supported by female chorus and a *recitante* (nicely spoken by Susanne Mentzer). In her soliloquy, Von Stade illuminates the way the text, by D. G. Rossetti, counterbalances innocence and physical longing, heavenly and earthly love, so that the pitfall of a mawkish sweet-sadness is avoided. Its place is filled by resignation and hope, piety and desire—a diverse mixture the singer makes us experience with sympathetic reaction. R.A.

DEBUSSY: *La Damoiselle élue* (see BERLIOZ)



Von Stade: meticulous, illuminating

DVOŘÁK: *Symphony No. 9* (see Best of the Month, page 88)

GIORDANO: *Andrea Chénier*. Luciano Pavarotti (tenor), Chénier; Montserrat Caballé (soprano), Maddalena; Leo Nucci (baritone), Gérard; Kathleen Kuhlmann (mezzo-soprano), Bersi; Astrid Varnay (soprano), Contessa di Coigny; Christa Ludwig (mezzo-soprano), Madelon; Tom Krause (baritone), Roucher; Giorgio Tadeo (bass), Mathieu; Piero de Palma (tenor), Incredible; others. Chorus of the Welsh National Opera; National Philharmonic Orchestra, Riccardo Chailly cond. LONDON 410 117-1 three discs \$32.94, © 410 117-4 two cassettes \$32.94, © 410 117-2 two CD's no list price.

Performance: *Exciting if uneven*
Recording: *Excellent*

Andrea Chénier, a milestone in the history of *verismo* opera but, curiously, the only one of Giordano's works to have a place in the established repertoire, deals with a historical figure destroyed by the forces of a historical event. Indeed, a listener with some knowledge of the French Revolution and the personalities behind it will probably find the opera more colorful than one who comes to the music historically cold. But even without that background it's easy to be caught up in the clear, readily comprehended, and appealing music with which Giordano tells his story of love, violence, and sacrifice.

The present recording is distinguished by a virtually all-star cast under the direction of a conductor with a strong sense of theater. Riccardo Chailly's taut conducting evokes incisiveness and tension from the National Philharmonic—and, when required, tender lyricism. The Welsh National Opera Chorus gives a very satisfying performance too, singing the refined melodies of Act I with suavity and grace, and, as revolutionists, bringing a high degree of

dramatic excitement to Acts II and III.

The most rewarding vocal performance is that of Leo Nucci as Gérard. His is a warm, full-bodied baritone, uncovered and with a fine timbre. The "*Nemico della patria*" is a smoothly sung and powerful examination of the character's love-hate dilemma. The vignette that Christa Ludwig creates of the blind Madelon is, for me, the second most moving aspect of this recording. The sequence lasts a bare five minutes but is so touchingly drawn by this superb artist that it becomes unforgettable.

Luciano Pavarotti is disappointing. His voice seems to have lost the lyric flow and melting legato of earlier performances; instead, it has taken on a rather explosive quality. This change may have been made for dramatic effect, but "*Un di all'azzurro spazio*" in Act I sounds like a series of open-throated statements, and "*Come un bel di di maggio*" lacks the tenderness and tranquility that the aria needs, at least at the beginning. His finest moment is perhaps Chénier's self-defense in Act III. As Maddalena, Montserrat Caballé has infrequent opportunity to float her ravishing pianissimos, now virtually the stamp of her performances, but she does some lovely singing, if with an increased carefulness.

The remaining members of the cast are nearly all commendable, with Kathleen Kuhlmann's Bersi, Tom Krause's Roucher, and Piero de Palma's Incredible deserving special recognition. Astrid Varnay's decision even to have undertaken the small role of the Countess di Coigny is regrettable in view of the many splendid performances of leading roles in which this great singer has triumphed in the past.

This recording, then, is interesting mostly for Chailly's interpretation, for the performances of Leo Nucci and Christa Ludwig, and for the occasional moments when the two principal artists sing as we have grown accustomed to hearing them. R.A.

HANDEL: *Messiah* (see Best of the Month, page 87)

HAYDN: *Symphony No. 100, in G Major ("Military"); Symphony No. 104, in D Major ("London")*. Academy of Ancient Music, Christopher Hogwood cond. L'OISEAU-LYRE ● 411 833-1 \$11.98, © 411 833-4 \$11.98.

Performance: *Excellent*
Recording: *Good*

Now that Christopher Hogwood and the Academy of Ancient Music have paved the way for authentic performances of the Mozart symphonies, they seem to be turning their attention to those of Haydn. Even more than Mozart's, Haydn's pithy orchestrations sound best on old instruments. However well you might know these two popular works, you will hear much more in these strong readings, especially in the wind writing of the second movement of the *Military* Symphony. S.L.

MOZART: *Sinfonia Concertante in E-flat Major (K. 364); Violin Concerto No. 2, in D Major (K. 211)*. Iona Brown (violin); Josef Suk (viola); Academy of St. Martin-in-the-Fields, Iona Brown cond. ARGO 411 613-1 \$10.98, 411 613-4 \$10.98, 411 613-2 no list price.

Performance: *Virile, sinewy*
Recording: *Rather hard-edged*

In musical terms, this simultaneous CD and LP release from Argo offers eminently satisfying realizations of Mozart's early D Major Violin Concerto and his more mature, amply scaled *Sinfonia Concertante*. Iona Brown has been concertmaster of the Academy of St. Martin-in-the-Fields for many years, and she provides strong direction along with a sinewy violin performance style reminiscent of Adolf Busch in his prime. Josef Suk, in the *Sinfonia*, forsakes his usual violin for the viola and produces a gorgeous dusky tone. The two soloists display flawless teamwork, especially in the deeply touching slow movement.

Unfortunately, on Compact Disc at least, the performers are betrayed by a recording that makes the solo violin sound harsh and sharp-edged. The first-movement cadenza of the Violin Concerto is particularly objectionable in this respect. I have long felt that to use close microphone placement in a digital recording is to court sonic disaster, and here the soloists have indeed been cast in a glaring light that negates the essential musicality of their performances. Even the Academy's orchestral ensemble sound is a bit fierce and outsize in body. In short, for all my partisanship in favor of the CD medium, this CD aroused my active dislike. Perhaps the LP is a little easier on the ears. *D.H.*

POULENC: *Concerto in D Minor for Two Pianos and Orchestra; Concert champêtre for Harpsichord and Orchestra*. Gabriel Tacchino, Bernard Ringeissen (pianos); Jean-Patrice Brosse (harpsichord); Monte Carlo Philharmonic Orchestra, Georges Prêtre cond. ANGEL DS-38122 \$11.98, 4DS-38122 \$11.98.

Performance: *Very good*
Recording: *Lifelike*

Poulenc wrote his Concerto for Two Pianos for himself and his friend Jacques Février, and they recorded it with Georges Prêtre and the Paris Conservatoire Orchestra for a now-deleted Angel disc that paired the same two works as this new one; Aimée van de Wiele was the harpsichordist in the *Concert champêtre*, which was written for Wanda Landowska. Those performances had not only unique authority but a unmatched charm. The early-Sixties recording, though, did less than full justice to the clarity of Poulenc's scoring, and in that respect the new disc is revelatory. Actually, the new performances themselves are clearly more fetching than those in any other current record-

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ing of either work. The balance of the harpsichord and the orchestra in the *Concert champêtre* is conspicuously successful. Jean-Patrice Brosse, about whom no information is given in the notes, plays with fine feeling for the unique character of this work, and his Pleyel harpsichord is evidently built to the same specifications as the powerful one the same maker produced for Landowska. Gabriel Tacchino, always eminently persuasive in Poulenc's music, and Bernard Ringeissen, whom I last encountered in an Alkan program on MHS, clearly delight in their assignment, and Prêtre does as well by his new partners as he did by his old ones. *R.F.*

PUCCINI: *Manon Lescaut*. Mirella Freni (soprano), Manon; Plácido Domingo (tenor), Des Grieux; Renato Bruson (baritone), Lescaut; Kurt Rydl (bass), Geronte; Robert Gambill (tenor), Edmondo; Brigitte Fassbaender (mezzo-soprano), a singer; others. Chorus of the Royal Opera House, Covent Garden; Philharmonia Orchestra, Giuseppe Sinopoli cond. DEUTSCHE GRAMMOPHON 413 893-1 three discs \$32.94, © 413 893-4 two cassettes \$32.94, © 413 893-2 two CD's no list price.

Performance: *Gripping*
Recording: *Bright, clear*

It would be difficult to imagine a more convincing performance of this, the first of Puccini's operas to bear the stylistic signature which was to be his throughout the remainder of his composing career. The cast is a strong one, headed by two artists who have made the leading roles particularly their own.

Vocally, temperamentally, and visually, Mirella Freni is Manon, as her performances this season at the Metropolitan Opera testify. In the present recording, she sings beautifully and with a feeling for the character that comes across with arresting immediacy. If she lacks the occasional gloriously floated high notes Montserrat Caballé brought to the 1972 Angel recording, she compensates doubly by virtue of her complete identification with the part. Plácido Domingo has grown in the role of Des Grieux since singing it opposite Caballé in the Angel recording. Opposite Freni he portrays the hopelessly torn lover most affectingly and with a lyricism that makes all the more telling his admirably handled dramatic passages.

The third star of the recording is Giuseppe Sinopoli, whose spirited conducting moves the drama along at an absorbing pace. He has overcome what I consider two trouble spots in the score: the Act I Lescaut-Geronte conversation backed by the chorus, which is often unheard although important to the plot; and the Minuet Scene, which is literally a show stopper, in that it does nothing to advance the action save to give Des Grieux time to come to Manon. In Sinopoli's hands, however, the chorus of scheming men is heard, and

the dancing lesson, though still an ex-crescence dramatically, is musically delightful. The celebrated intermezzo preceding Act III is sensitively molded as well.

Renato Bruson provides a robust if unprincipled Lescaut, warmly sung and subtly inflected to bring out nuances of character, as one has come to expect from this dependable artist. As Edmondo, Robert Gambill gives a valid personality to the young student who aggressively and cleverly engineers Des Grieux's flight with Manon, and Kurt Rydl's Geronte is rich-voiced and properly sinister. A pleasant surprise is the brief appearance of Brigitte Fassbaender as the madrigal singer, a section she performs charmingly. *R.A.*

SIBELIUS: *Symphony No. 2, in D Major, Op. 43; Kuolema, Scene with Cranes, Op. 44, No. 2.* City of Birmingham Symphony Orchestra, Simon Rattle cond. ANGEL 4 DS-38169 \$11.98, © 4DS-38169 \$11.98.

Performance: *Passionate, poetic*
Recording: *Very good*

SIBELIUS: *Symphony No. 2, in D Major, Op. 43; Finlandia, Op. 26.* Cleveland Orchestra, Yoel Levi cond. TELARC © CD-80095 no list price.

Performance: *Dispassionate*
Recording: *Excellent*

This most-recorded of the seven Sibelius symphonies gets a reading from young Simon Rattle that conveys both its poetry and drama, though sometimes at the risk of straining the structural elements in the first two movements. Rattle projects a deeply plangent view in the slow movement, making the most of the highly dramatic pauses in the score. Both here and in the opening movement, great care is taken with internal details and clarity of line. The wind-swept scherzo moves along smartly, with a lovingly phrased middle section. It was good to hear the bombast of the big tune in the finale soft-pedaled, yet the pacing keeps things moving with unerring flow to the celebratory end.

I confess, however, that my favorite music on this disc is Rattle's intensely poetic treatment of the lovely and magically atmospheric *Scene with Cranes* from the incidental music to *Kuolema (Death)*, from which another excerpt, *Valse triste*, has become all too familiar. The sound throughout is spacious, bright, and as full-bodied as the Birmingham players can deliver.

In the Telarc release of the Second, paired with *Finlandia*, we have one of the world's fine virtuoso orchestras, but its resident conductor of the past several years, Yoel Levi, is still unable to bring to his performances the passionate conviction conveyed by Rattle. Even the gorgeous recording, made in the virtually ideal acoustic environment of Cleveland's Masonic Auditorium, cannot compensate for what to my ears sounds like a neat, merely routine run-through. *D.H.*

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Discs and tapes reviewed by
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ABBA: *Abba, Again.* Abba (vocals); instrumental accompaniment. *Souper Trouper; The Day Before You Came; The Heat Is On; I Know There Is Something Going On; When All Is Said and Done;* and three others. MONTEREY HOME VIDEO 131467 VHS Stereo and Beta Hi-Fi \$19.95.

Performance: *Swedish cool*
 Recording: *Good*

The smooth Swedish foursome known by their initials has been enormously successful in Europe for more than a decade and, to some extent, in the U.S. since the late Seventies. Abba looks wholesome, their layered sound is easy to follow, and though the material often borders on the predictable, there's something very appealing about their music. On "Abba, Again," the group's new video, I found the music of *Souper Trouper* and *Under Attack* more interesting than the visuals, but sight and sound come together more evenly on the slightly Jacques Brel-like *The Day Before You Came*. Near perfection is reached with a devilishly infectious feature number for Agnetha Faltskog, *The Heat Is On*, a Caribbean romp. **C.A.**

LIONEL RICHIE: *All Night Long.* Lionel Richie (vocals, piano); vocal and instrumental accompaniment. *All Night Long; Running with the Night; Hello; Penny Lover.* RCA/COLUMBIA PICTURES 60420 VHS Hi-Fi \$14.95, 20420 Beta Hi-Fi \$14.95.

Performance: *Slick*
 Recording: *Very good*

"Why is it that singers want to be actors and actors want to be singers?" Brenda Lee once asked me. Well, I haven't the faintest idea, but Lionel Richie's compilation of videos demonstrates that for some reason they still do. On "All Night Long," Richie acts his way ("stands around dramatically" is more like it) through four conceptual videos and then repeats two of the songs, the title tune and *Running with the Night*, in a concert. Directed by two of video's Big Bobs—Rafelson and Giraldi—the segments are superbly lit and expertly staged and photographed. But, pretty as they are, they aren't very grabby, and soon your thoughts slip away to what you're going to fix for dinner and whether the dog has any food.

Part of the problem is that the whole thing is so glossy and unflinchingly slick

PAVLOVA

IN terms of today's ballet techniques, the work of Anna Pavlova can, at times, seem oddly old-fashioned, but when placed in the proper perspective her accomplishments remain larger than life. Celebrating the hundredth anniversary of her birth, "Pavlova," a splendid hour and a half of ballet entertainment, was first produced for the stage in 1981 as a joint production of Montreal's Société Radio-Canada and Premiere Performance Corporation in New York. Sony's video version, recorded in 1982, is hosted by Leslie Caron and features ten performances tastefully linked by Caron's narrative and by photographs tracing the prima ballerina's life and thirty-year career.

The principal dancers in this video special are by no means household names, but you might recognize a few, including Ron Reagan, and their work does them proud. The individual selections are often stunning, but it is the overall production that really struck my fancy—the sets, the choreography, the costumes, the clever use of video effects in the still-photo bridges. You will either love or hate designer Gilles André Vaillancourt's see-through plastic costumes in the excerpt from *The Sleeping Beauty*, a somewhat radical

but effective production in which many of the dancers don Glad bags yet remain ever so traditional in their dancing.

Truer to Pavlova's time and style of presentation are Jolinda Menendez's *Dying Swan*, choreographed by Fokine, and Amanda McKerrow's rendering of *California Poppy*, the little number to Tchaikovsky's music that Pavlova whipped up after her first visit to Hollywood. Other high points include a softly focused, heavily chiffoned Menendez flowing in Isadora Duncan-like fashion through Pavlova's own interpretation of *La Nuit* and a delightful excerpt from Act I of *Coppelia*, danced and choreographed by Ann Marie De Angelo.

As I indicated, this release is a gem, and it comes in a properly handsome package—a red-and-gold book-like box housing the cassette and an illustrated printed program. **Chris Albertson**

PAVLOVA: A TRIBUTE TO THE LEGENDARY BALLERINA. Music by Kreisler, Minkus, Tchaikovsky, Delibes, others. Choreography by Marius Petipa, Anna Pavlova, Michel Fokine, Amanda McKerrow, others. Leslie Caron, host. SONY VIDEO LP 96W50036 VHS Stereo \$69.95, 96W00035 Beta Hi-Fi \$69.95.

The legendary Pavlova (below) and narrator Caron



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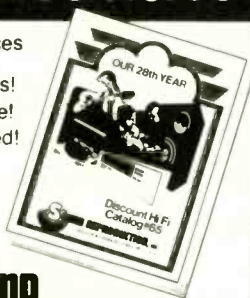
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MISCELLANEOUS

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as to seem like a video tour book—to the point that even the live performances look like Hollywood musicals. The concerts do pump a little excitement into the thing, though, and they end up being more emotionally engaging than the concept pieces, one of which (*Penny Lover*) cost a quarter of a million dollars to make. It just goes to show, I guess, that most singers should stick to doing you know what. A.N.

TINA TURNER: *Private Dancer*. Tina Turner (vocals); vocal and instrumental accompaniment. *What's Love Got to Do with It; Better Be Good to Me*; and two others. SONY VIDEO 45 97W50067 VHS Hi-Fi \$16.95, 97W00066 Beta Hi-Fi \$16.95. PIONEER ARTISTS PA-85-M017 LaserDisc \$12.99.

Performance: *Mixed*
Recording: *Ditto*

Just as the production on Tina Turner's 1984 blockbuster LP was all over the place, with five different producers handling the individual songs, the four video vignettes here are about as different in quality and style as you can imagine. Three directors—Mark Robinson, Brian Grant, and David Mallet—were brought in to do the job.

Of the four segments, two are performance videos and two are concepts, and nearly all of them have problems. The first, a concept video of the leggy, mini-skirted Turner walking the streets of New York wailing *What's Love Got to Do with It* to every ragamuffin she meets, in spots looks hilariously like a TV hosiery commercial ("Street people prefer Hanes"). Technically, however, it looks pretty good, except for the lip-sync, which is ghastly—and which gets even worse in the second video, a faked concert rendition of *Better Be Good to Me*. Of the four, though, *Better Be Good to Me* is probably the most consistent in overall quality as well as the truest to Turner, who twitches her thighs and plays on her cat-woman persona in spike heels and a black-leather suit that looks left over from Elvis's comeback special.

The cover of Al Green's great *Let's Stay Together* looks as if it were made during Turner's former life, since it features two other female singer/dancers who look amazingly like Ikettes.

The most disappointing video of the lot, however, is *Private Dancer*, where Turner plays a drab 1930's-era "Dime-a-Dance" girl who fantasizes her way through her dreary turns. Although visually this is the most satisfying segment, the concept is absolutely maddening. *Private Dancer* is one of the most darkly erotic songs ever written, and I am fairly sure it is *not* about the kind of dancing portrayed here. If it is even about dancing at all, I hear it as the kind a woman does alone, up on a stage, with men stuffing money down the front of her costume.

All in all, Tina Turner, one of the truly great performers and a surprisingly decent actress, deserves better than she

gets here. Granted, it's a treat to be able to watch her slink and slither through those songs (is there a more sensual woman on the face of the earth?), but this is also a good example of how some videos can be too literal, others not literal enough, and still others just not up to the talent involved. A.N.

U2: *Live at Red Rocks—Under a Blood Red Sky*. U2 (vocals and instrumentals). *Gloria; 11 O'Clock Tick Tock; I Will Follow; Party Girl*; and four others. MCA HOME VIDEO 80067 VHS Stereo and Beta Hi-Fi \$29.95.

Performance: *Impassioned*
Recording: *Okay*

Recorded at the Denver concert that also produced U2's similarly titled live album, this video catches the best Irish rock band since Van Morrison's Them in absolutely splendid form. Musically, it's about as impressive as they come, with instrumental work that's inventive and passionately felt (guitarist the Edge is no less than thrilling) and a performance by lead singer Bono Vox that accomplishes the nearly impossible—turning a typical Nuremberg Rally-scaled outdoor concert into something that seems almost intimate. You get a real feel for the genuine warmth of the relationship between this band and its (mostly) youngish audience. Combine that with U2's chiming neo-folk rock and unpretentious personal charm, and you have a package that's irresistible, right? Well, no. Unfortunately, the music and the atmosphere are ill-served by the unimaginative, made-for-MTV camera work (everything seems to have been shot from knee-level), and the soundtrack, while listenable, can't compare with the rich textures of the audio-only version. L.M.

VERDI: *Rigoletto*. Garbis Boyagian, Alida Ferrarini, Vincenzo Bello; Chorus and Orchestra of Arena di Verona, Donato Renzetti cond. Production staged by Carlo Lizzani; Carlo Savi, designer; Brian Large, video director. MASTERVISION 371 VHS Hi-Fi and Beta Hi-Fi \$74.95.

Performance: *Excellent*
Recording: *Fine, but sloppy dub*

This is a fine 1981 performance of *Rigoletto*, taped in the Roman amphitheater at Verona, Italy, and gloriously dominated by Alida Ferrarini's Gilda. The immense sets are even more impressive than the ones for the *Aida* performance released on LaserDisc a couple of years ago that we raved about in these pages. I would like to see this *Rigoletto* on LaserDisc too, for there is an annoying fuzziness on the tape, as though it were a fifth-generation home dub or the cameras had been out of focus. I find this fault with most prerecorded video cassettes, and with today's technology there is no excuse for it. Equally inexplicable is that the audio for the final four minutes of Act I is repeated without video before Act II begins. C.A.

WHAT THEY'RE WATCHING



SHIRLEY LOVE

*Mezzo-Soprano,
Metropolitan Opera*

FOR many musical artists hi-fi equipment is not just a source of entertainment, but also a professional tool they use in learning new music and in analyzing their performances. For some, like opera singer Shirley Love, video equipment has become a similar necessity.

"I felt I had to have it," says Ms. Love. "I've been on many of the Live from the Met telecasts, such as an opening-night *Otello* and last year's gala, and I've filmed a *Barber of Seville* for Sony that so far has been released on video only in Japan. I wanted to be able to see those performances on my home screen, so I bought a VCR, and I'm absolutely mad about it."

Ms. Love is also a concert singer who tours regularly with the Bach Aria Group and appears as a soloist with the nation's major symphony orchestras. In connection with these performances, she is often interviewed on television. For example, you may have seen her on PBS recently when she was interviewed on the MacNeil/Lehrer NewsHour about her work with the St. Louis Symphony.

"Giving interviews is another kind of performance," she says. "And you have to study yourself and the way you present yourself to the media."

Ms. Love studies her performances with a Sharp VHS video-cas-

sette recorder. "My Sharp hi-fi system had met my needs very well—turntable, receiver, tape deck, and so forth—so I went Sharp all the way with a VCR. At first I had a little trouble hooking it up (the instruction booklet lost something in translation between here and Japan), but once I got the wires properly matched and connected, it has worked perfectly, and I would recommend it to anyone."

But it's the entertainment potential of home video that has made Ms. Love so crazy about her VCR. "I love old films, and I can think of no better way to relax than sitting in the living room with a glass of wine and my feet propped up while watching a favorite Ingrid Bergman movie or something like *Now, Voyager* with Bette Davis. And it's a wonderful way to entertain your friends."

There are not a lot of TV programs Ms. Love wants to preserve by taping them off the air. "I taped the *Ellis Island* series on PBS because I enjoyed the book," she says. "And, of course, I want some of the Great Performances and gala concerts such as Luciano Pavarotti at Madison Square Garden. Friends often tape these for me when I'm on the road."

Theater is one of Ms. Love's great interests, and she would like to see more drama offered on prerecorded video cassettes. She does not limit her opera-watching to her own performances. She thinks Video Arts International's version of Strauss's *Der Rosenkavalier* with Elisabeth Schwarzkopf is an "indispensable historic performance," and she has bought MCA Home Video's *Traviata* with Teresa Stratas and Plácido Domingo. "The *Carmen* with Julia Migenes Johnson and Domingo [on Media Home Entertainment] is wonderful. I think it's the best filmed version of an opera I have ever seen."

Ms. Love has not yet invested in a Compact Disc player. But since her latest recording, Janáček's *Diary of One Who Vanished*, is selling especially well in the CD version (Arabesque Z6513), she may soon find that a CD player is a necessary professional tool for her as well as a source of entertainment.

William Livingstone

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MAY 1985

by Ralph Hodges



*John Bowers and the
Civilized Loudspeaker*

THERE comes a time at every biannual Consumer Electronics Show, after many days of wandering the aisles, when a reporter is obliged to seek refuge or drop in his tracks. When I feel the warning symptoms coming on, I make directly for the solemnly darkened room in which the latest generation of the English-made B&W loudspeakers is being demonstrated. My reasons are several: I have never heard a B&W speaker system I couldn't like, and some of them I positively adore; B&W persists in demonstrating its speakers with superbly prepared open-reel tapes of music that has genuine nutritional value, and the company representatives leave you alone with that music; and, finally, it is damned hard, even for a magazine editor, to locate a truant reporter in a solemnly darkened room.

It was a surprise to learn that the B&W demo tapes are "nothing special at all." According to John Bowers, the B of B&W, "We take the excerpts off of LP's, just as you would do, with the sort of care I imagine you would exercise. The records are carefully selected, of course, as is the playback and recording equipment. But it should come as no shock to discover that the results sound good. Sounding good is our business."

Bowers is one of those people who make the audio business a pleasure to engage in, his personality an amalgam of technical inspiration, musical enthusiasm, and irresistible charm. "I fell in love with music at age eleven, destroyed the family Radiogram shortly afterward in an attempt to make it sound better, and found myself with a career. But there's nothing remarkable about this. Everybody I know in the U.K. who is serious about audio has almost precisely the same story to tell."

A Mr. Wilkins, the W of B&W, enters the picture only briefly, as a partner in a retail operation that financed Bowers's higher education at Brighton Technical College. "It's not a famous place at all," Bowers explained. "Four nights a week, plus all Sunday, plus all the private tuition you could afford. But I was committed and ambitious, as well as quite determined to get out of audio retailing, which was not going through its happiest period. People were coming in to buy bits and pieces to screw into cabinets, and then coming back to complain that the bits and pieces were wrong." Properly fitted out with a degree, Bowers departed to form B&W Loudspeakers in the mid Sixties.

My first direct encounter with the B&W line occurred in the mid Seventies and involved the Model DM6, whose design was said to provide inter-driver time coherency, a very fashionable performance feature at the time. It was a listenable enough speaker, and it could, as advertised, reproduce a recognizable square wave directly on axis at most frequencies. But I had on hand several other speakers that could provide square waves off axis as well and did not look, as the DM6 did, like a pregnant troll. I did not find it disagreeable to ship the DM6 back. But then came the B&W Model 801.

The 801—now designated the 801F in recognition of a new composite material used for its mid-range enclosure—was one of those products that became celebrated before most people even knew about it. As very occasionally happens with a loudspeaker, the earliest purchasers of the B&W 801 decided that they really didn't care how it

measured in this or that listening room or what the reviewers would have to say about it. There was something so right-sounding and likable about the speaker from the outset that they couldn't imagine not owning a pair, numbers be damned.

According to Bowers, at this time every major record label in the Western world is using the 801, or its larger and louder relative the 808, for classical-music monitoring. Considering what sonic catastrophes many of these majors *used* to use, and quite cheerfully from all indications, that may not seem the highest endorsement. But it does show that B&W designs are having an influence far beyond that of your typical audiophile loudspeaker.

Lately, Bowers has led his company into such areas as minispeakers and car stereo—ventures that have caused some audiophiles to question whether he is really serious after all. "People ask why we didn't keep the company small, cozy, and exclusive," he remarks. "But if we hadn't grown, we couldn't have afforded the £500,000 research department that developed the 801 and 808."

As this column appears, so will Bowers's latest innovation: an active loudspeaker (meaning that it includes its own power amplifier) to be marketed by a newly formed company bearing his name exclusively. "I will confess that the active loudspeaker is intended for the doctor and his wife, or anyone else wanting good sound without the intricacies of hi-fi hobbyism. However, for us it has a greater significance.

"As speaker designers we are obliged to be knowledgeable about other elements in the chain, such as amplifiers and cables. In my opinion, based on some experience, the best way to understand amplifiers is to try to build an active loudspeaker and make it work as well as it can. Then you really learn what amplifiers and cables are all about."

About one thing Bowers is especially emphatic: "No one will ever make the perfect loudspeaker. We're never going to get there." Nevertheless, he is never going to stop trying to make *better* loudspeakers. □

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