CAR STEREO SPECIAL

WHAT'S NEW
IN AUTOSOUND?

HOW TO BUY HI-FI
FOR YOUR CAR

FIRST TESTS:
SONY'S DISC JOCKEY
CAR CD PLAYER

ALSO TESTED:
ONKYO RECEIVER
YAMAHA CD PLAYER
...AND MORE

HOW TO BUY
A CD PLAYER
An Enduring Speaker Idea Takes a Cue From Concerts

The kind of imagination basic to creative achievements—whether they be works of art or feats of engineering—usually requires a springboard—a distinctive point of departure. Dr. Bose began by throwing away most established notions about loudspeakers. Recognizing the fact that most of the sound heard at a live performance reaches the listener not directly from the sound source—the musicians' instruments—but by way of reflections from the walls and ceiling, Dr. Bose fashioned a loudspeaker to disperse the sound in a similar way. In the case of the Bose 901, most of the sound not toward the listener but toward the wall in back of the speaker and toward the sides of the room. Where the rearward and sideways sound hits the walls, it reflects as if from a mirror. Surprisingly, this changes the apparent size of the listening room.

This curious effect is more easily understood by analogy to light reflections. Suppose you look at yourself in a mirror from a distance of five feet. Your reflection then appears not in the plane of the mirror itself; rather, your image seems to be standing five feet behind the mirror. Likewise, the sound reflections produced by the Bose 901 seem to be coming not from the wall but from behind the wall. This gives rise to the impression of sitting in a larger space than the actual dimensions of the listening room. Such spatial enlargement contributes to the illusion of hearing music in the kind of acoustic ambience for which most music was intended. To some degree, this is true of all multi-directional loudspeakers, but the Bose seems particularly effective in its ability to suggest an enlarged environment.

The speaker is unusual in other ways. There are no woofers and tweeters. The sound is generated by nine identical four-inch speakers, each separately chambered within the overall enclosure. To produce full-range sound from this array, a special equalizer is connected to the amplifier as an external device, modifying the amplifier's output to tailor it to the requirements of the speaker. As a Bose engineer explains, "Most speaker designers try to get proper response by stretching the capabilities of the speaker materials. We think it's easier to compensate electronically for the mechanical properties of the speaker's structural elements."

The nine separate speakers in the single box are so arranged that a group of four radiates sound rearward to the one side, another group of four radiates rearward to the other side, and a single speaker faces forward. According to Dr. Bose, this configuration results in a sound field similar to that experienced at a live performance. While the reflected rearward sound creates the feeling of a generous sonic ambience, the forward-facing speaker pinpointed the locations of the musicians on the imaginary stereo stage, thus contributing to what is called "stereo imaging."

In this manner, the speakers must be positioned at least one foot distant from the wall at their rear. Attractive pedestals are available for this purpose, or the speakers may be hung from the ceiling, taking up no floorspace at all and being visually unobtrusive thanks to the uncommon compactness (21 x 12 x 13 inches).

The new version of the Bose 901—called the Series V—sells for $1,400 per pair and differs from its precursors by alterations intended to fortify the speaker against the rigors of digital challenges. The dynamic range has been extended to a staggering 106 decibels—more than enough to brave sonic onslaughts from laserskis. Despite their masterly way with laserized fortissimi, these speakers nonetheless treat the subtler aspects of music with equal aplomb and do not lose their characteristic fullness and spaciousness of sound at moderate or low volume levels.

And since the sound is broadly scattered, one may approach these speakers with some little fear of being sonically blasted.

Their high efficiency allows these speakers to produce room-filling volume levels from relatively modest amplifier wattage. This is also significant for the digital present and future, for it allows the amplifier or receiver to stay within its rated power capacity and avoid overload distortion even at the spectacular sonic peaks typical of many digital recordings. Yet the speakers themselves remain unfazed by even the most powerful signals and can handle as much as 1,000 watts of power—and that third zero is no misprint!

In terms of musical veracity, the Bose 901 ranks with the finest and is convincing with any type of music. From solo piano to massive symphonic ensembles, everything sounds airily open. Especially the sound of strings has a pleasing aura of roundedness. Part of this stems from the sound dispersion achieved by this unique design, which goes a long way toward the accomplishing the ultimately impossible task of making an orchestra believable in the living room.
Future Perfect.

Many speakers today are supposed to be digital ready. But what happens if there's something beyond digital?

The original Bose 901® Direct/Reflecting® speaker was ready for digital back in 1968, because it reproduced music with realism and impact never before heard from a speaker. Today's Bose 901 Series V system brings some 350 design improvements to the original's legendary performance. Unlimited power handling and very high efficiency make the Series V speaker ideal for listening to the best that audio currently has to offer—the digital compact disc. And while no one can predict exactly what the audio future has in store, one thing is certain: it will sound better on the Bose 901 system. Hear the legendary speaker that New York Times audio critic Hans Farnel says "...ranks with the finest and is convincing with any type of music" at your authorized Bose dealer soon. For more information, the name of your nearest dealer and a copy of Dr. Amar Bose's famous MIT lecture Sound Recording and Reproduction write Bose Corporation, Dept. SR901, 10 Speen St., Framingham, MA 01701.

Better sound through research.
FEEL THE BASS

With Radio Shack's Digital-Ready Mach Two.

Our finest speaker system towers above the competition. Its massive 15" woofer delivers a dramatic sonic impact that smaller speakers can't match. Whether you're listening to heavy metal or watching Discovery thunder off the pad, you can actually feel the bass! Ideal for digital audio, the Mach Two handles 160 watts of power, and liquid cooling protects the midrange and tweeter voice coils. And for great looks, the 28" high enclosure has a real walnut finish. Only 219.95 each including 5-year limited warranty. Come in and hear what you've been missing. As little as $21 monthly on Radio Shack/CitiLine credit buys a pair.
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**WHAT'S NEW IN CAR STEREO?**
A survey of trends and developments in autosound equipment
*by Daniel Sweeney*

**SONY'S DISCJOCKEY**
A special test report on the CDX-A10 car Compact Disc changer—in the lab and on the road
*by Julian Hirsch and Christopher Greenleaf*

**TIPS ON BUYING HI-FI EQUIPMENT FOR YOUR CAR**
Some advice on finding a dealer, balancing performance and convenience, and more
*by Gordon Sell*

**CAR STEREO MANUFACTURERS**
A directory to the manufacturers of autosound equipment—with addresses and phone numbers

**HOW TO BUY A COMPACT DISC PLAYER**
An elementary approach that emphasizes features and simplicity of operation
*by William Livingstone*

**MUSIC**

**CHARLES DUTOIT**
Montreal's maestro stresses style and sound
*by Roy Hemming*

**BEST RECORDINGS OF THE MONTH**
The Fabulous Thunderbirds, Brahms's German Requiem, Loudon Wainwright III, and Offenbach's La belle Hélène

**RECORD MAKERS**
The latest from Lone Justice's Maria McKee, pianist Ruth Laredo, John (Johnny Rotten) Lydon, and more

*Vol. 51 No. 5 May 1986 (ISSN 0039-1220)*
JBL, the most respected name in professional sound for over 40 years, is today’s speaker of choice. At live concerts, where 125,000 Watts drive over 600 speakers, and in 70% of the world’s recording studios, JBL is the speaker chosen by professionals—performers, engineers and producers—who depend on the highest quality sound and reliability.

Now, for those who demand the same superior performance, JBL introduces the new “L Series.” Each speaker in the “L Series” has a direct twin in the JBL professional studio monitor line. For the first time, the speakers relied on by recording engineers to mix the music, are available for your living room.

All of these speakers share the technology that is the cornerstone of JBL’s Professional Speaker Systems—all use titanium dome tweeters, filled and laminated polypropylene and Aquaplas drivers, as well as cast frames for sonic accuracy, reliability and power handling.

Visit your local JBL dealer today and listen to professional sound for the home, made in the USA, by the sound professionals...JBL.


For your nearest JBL dealer call toll-free 1-800-633-2252 Ext. 150 or write JBL, 240 Crossways Park West, Woodbury, New York, 11797

A Harman International Company
STereo TV On CABLE
The lack of compatibility between the stereo-TV broadcast system and the nation's various cable-TV networks has been a subject of great concern to many. It turns out that most of the cable systems have no problem sending stereo TV. Others, however, don't deliver stereo sound to their customers for a variety of technical and economic reasons. For the consumer who has just spent several hundred dollars extra to get stereo TV, it is a bad shock to come home and find the system doesn't work. Anyone who is cable-dependent should call his cable company before buying stereo TV.

DollYWood

PARTON'S NEW PARK
The opening of Dollywood, a theme park conceived by RCA recording artist Dolly Parton, is set for the first week in May. Located at Pigeon Forge, Tennessee, thirty miles southeast of Knoxville, Dollywood was created by Parton to preserve the heritage and mountain lifestyle that she says nurtured her as a child growing up in the area. Indigenous arts and crafts are featured along with regional food, games, and music.

MAIL-ORDER CD'S
Columbia House, the direct-mail record and video club, has launched a Compact Disc club. Inquiries should be addressed to Columbia House at 1400 N. Fruitwood Ave., Terre Haute, IN 47811. The club's toll-free phone number is (800) 457-0500. A new mail-order RCA Video Club offers over a hundred film and music-video titles, with an emphasis on the latter. For further information write the club at P.O. Box 91506, Indianapolis, IN 46291, or phone (800) 428-1928.

NEW TO THE CHARTS
References to Ronald Reagan (not always by name) have begun to turn up in current hit albums. Sting alludes to the President in "The Dream of the Blue Turtles" (specifically in Russians, the Top 20 single drawn from the album).

So do the Violent Femmes in their debut album, "The Blind Leading the Naked."

BACK ON THE CHARTS
Another name to add to the roster of major pop artists making significant comebacks these days is that of Little Richard, whose hit single Great Gosh A'mighty is from one of the year's hottest movies, Down and Out in Beverly Hills. Little Richard thereby joins Tina Turner, Patti LaBelle, Aretha Franklin, and James Brown, whose recent comebacks have won them a whole new generation of fans and record buyers.

CHARITY ROCKERS
Two rock benefits are occurring within two days of each other at opposite ends of the country. The day-long concert at the Rose Bowl in Pasadena, California, on April 28, billed as an anti-drug benefit, will feature celebrity performers like Madonna, George Michael, Mr. Mister, the Pointer Sisters, the Beach Boys, and Sheena Easton. A record album and a film of the event are being planned. The four-hour gala Rock for Liberty at Madison Square Garden in New York on April 28 benefits the ongoing restoration of the Statue of Liberty and Ellis Island. The show is being syndicated to some 250 radio stations across the country and will be carried by MTV on cable television.

SOUNDTRACK UPDATED
MCA Home Video has released The Glenn Miller Story, the Academy Award-winning bio-film of the popular bandleader starring James Stewart, with what the company describes as "a new stereo surround soundtrack." The soundtrack of Irving Berlin's Easter Parade, just released by MGM/UA Home Video, has been reprocessed for stereo and "reverted," a new technique involving the use of a computer to rid the track of unwanted noise as well as to predict and fill in sounds that presumably should be present. Easter Parade stars Fred Astaire, Judy Garland, and Ann Miller.

Tech Notes
"Down with Zippers" is a new Monster Cable promotion that encourages consumers to trade in their old zipcords for $4 a foot. NBC and RCA executives predict that 1986 will be the "breakthrough year" for stereo TV, with more than half the color sets sold having stereo-TV capability. Among broadcasters, NBC leads the way with sixty affiliates broadcasting in stereo. CBS has twenty-five, ABC twenty-three, and PBS twenty-three, while thirty-eight independents are broadcasting in stereo. Some experts predict that around five hundred stations will be broadcasting in stereo by the end of 1986. Audio Source has introduced the LLC-ONE CD-player lens cleaner, which consists of a special brush attached to a CD. The price is $26.95. The U.S. Navy is investigating taking CD players to sea, and although they will be used to entertain the crews, their chief purpose is to store hundreds of thousands of pages of technical manuals on CD-ROM discs. It is estimated that one disc can store manuals that would consume 8 to 10 feet of shelf space. Sony and Philips have developed specifications for "CD interactive media," which would enable CD players to handle music, computer data, and limited graphics not possible with the current CD standards. Car-stereo amplifier manufacturer Zapco has been engaged by the Ford Motor Company to produce a seven-band graphic equalizer and a subwoofer amplifier for use in Ford car systems. Nearly two years after discontinuing production of the CED videodisc player, RCA has announced plans to stop producing CED discs by the end of June. Blaupunkt has been named the official car stereo of the Long Beach (California) Grand Prix.
Polk's Revolutionary SDAs

"Spectacular... the result is always better than would be achieved by conventional speakers." Stereo Review Magazine
"The Genius of Matthew Polk Brings You the Breathtaking Sound of the SDAs"

"Breathtaking...a new world of hi fi listening"
Stereo Buyers Guide

"Literally a new dimension in sound"
Stereo Review Magazine

"Mindboggling...Astounding...Flabbergasting"
High Fidelity Magazine

The experts agree: Polk's revolutionary TRUE STEREO SDAs sound dramatically better than conventional loudspeakers!

"They truly represent a breakthrough"
Rolling Stone Magazine

Matthew Polk's critically acclaimed, Audio Video Grand Prix Award winning SDA technology is the most important fundamental advance in loudspeaker technology since stereo itself. Listeners are amazed when they hear the huge, lifelike, three-dimensional sonic image produced by Polk's SDA speakers. The nation's top audio experts agree that Polk SDA loudspeakers always sound better than conventional loudspeakers. Stereo Review said, "Spectacular...the result is always better than would be achieved by conventional speakers." High Fidelity said, "Mindboggling...Astounding...Flabbergasting...We have yet to hear any stereo program that doesn't benefit." Now the dramatic audible benefits of Polk's exclusive TRUE STEREO SDA technology are available in 4 uniquely superb loudspeaker systems, the SDA-IA, SDA-2, SDA CRS and the incredible new SDA SRS.

"Spectacular...Impressive Achievement"
Stereo Review Magazine

The design principles embodied in the SDAs make them the world's first true stereo speakers. When the big switch was made from mono to stereo, the basic concept of speaker design was never modified to take into account the fundamental difference between a mono and stereo signal.

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

"An amazing experience."
High Fidelity Magazine

Words alone cannot fully describe how much more lifelike TRUE STEREO reproduction is. Reviewers, critical listeners and novices alike are usually overwhelmed by the magnitude of the sonic improvement achieved by Polk's Stereo/Dimensional Technology. You will hear a huge sound stage which extends not only beyond the speakers, but beyond the walls of your listening room itself. The lifelike ambience revealed by the SDAs makes it sound as though you have been transported to the acoustic environment of the original sonic event. Every instrument, vocalist and sound becomes tangible, distinct, alive and firmly placed in its own natural spatial position.

You will hear instruments, ambience and subtle musical nuances (normally masked by conventional mono speakers), revealed for your enjoyment by the SDAs. This benefit is accurately described by Julian Hirsch in Stereo Review, "...the sense of discovery experienced when playing an old favorite stereo record and hearing, quite literally, a new dimension in the sound is a most attractive bonus..." Records, CDs, tapes, video and FM all benefit equally as dramatically. SDAs allow you to experience the spine tingling excitement, majesty and pleasure of live music in your own home.

"You owe it to yourself to audition them"
High Fidelity Magazine

You must hear the remarkable sonic benefits of SDA technology for yourself. You too will agree with Stereo Review's dramatic conclusion: "the result is always better than would be achieved by conventional speakers...it does indeed add a new dimension to reproduced sound."

Other Superb Polk Speakers from $85
The experts agree: Polk speakers sound better. Hear them for yourself! Visit your nearest Polk Dealer today.

Where to buy Polk Speakers? For your nearest dealer, see page 116.
by William Livingstone

Gordon Sell, Technical Editor

THE hundredth anniversary of the automobile is being celebrated this year, and it's a bit surprising to be reminded that the car is younger than the phonograph. We celebrated the centennial of recorded sound way back in 1977! Since car stereo turns only sixty this year, it's a little more surprising to realize that forty years passed before somebody combined audio and the automobile.

Often regarded as a stepchild of home hi-fi, car stereo is catching up. "Technological advances such as the Compact Disc, digital tuners, and now fiber optics have appeared in car products almost as soon as in home audio and the automobile," he says, "but with the memories of army life include a lot of behind-the-lines action. For instance, there was a big battle in the barracks over the merits of Teac and Akai open-reel tape decks."

For more than a year after he got out of the army he worked as an electronics technician operating and maintaining portable radio navigation stations in oil-exploration projects in Egypt, Spain, Morocco, and the Canadian Arctic. When he went back to college, he enrolled at New York University, where he earned a B.A. in journalism. After holding various editorial positions on Yacht Racing, Elementary Audiences, and Hi-Fi/Stereo Buyers' Guide, he joined STEREO REVIEW as Associate Technical Editor in 1981 and was promoted to his present position in 1983.

He has been active in all our car-stereo coverage since he joined the staff. "I'm especially interested in it," he says, "because of the ongoing evolution of my own never-completed car system." But in one way or another Gordon is involved in all aspects of STEREO REVIEW's coverage of audio and video products and technology. Perhaps his most important contribution is choosing products to be tested and acting as liaison between manufacturers, the magazine, and Hirsch-Houck Labs. "I am proudest of my part in designing testing procedures used in our comparisons of speaker cables, CD players, and hi-fi VCR's. The VCR tests revealed some surprises. Home video has a way to go in terms of sonic development to meet audiophile standards."

The ongoing evolution of audio technology is what keeps Gordon interested in it. Monitoring its progress is what keeps him making contributions to STEREO REVIEW that give him satisfaction.
COMPUTERS HAVE TAKEN SOMETHING FROM YOUR MUSIC.

Computers have allowed EPI engineers to evaluate new aspects of speaker performance and push noise/distortion to an all-time low. The new computer-tested EPI Time/Energy Series speakers separate the instruments so you can hear the parts as well as the sum.

Their sound is crystal clear, uncolored and more natural than ever.

COMPUTERS DISCOVER THE MISSING LINK. Using computers, EPI engineers discovered that conventional speakers don't reproduce short signals cleanly. Since this type of signal is particularly relevant to the ear's ability to recognize sound it was a profound discovery.

A NEW SOURCE OF DISTORTION. When conventional high quality speakers were tested with very short signals the computer showed they continued to produce sound long after the signal had ended. We call this Time/Energy distortion.

CLOSED THAN EVER TO PURE SOUND. One discovery led to another and it didn't stop until EPI engineers had developed tweeter diaphragms and woofers cones made of new materials formed into new shapes. EPI engineers even developed a special bonding process and special tools and fixtures to laminate together the cone layers with an ideal combination of stiffness and damping. The result is drivers that stop producing sound almost immediately after the signal from the amplifier ends. The benefits are distortion-free sound from solo instruments, and superb detail and a sense of separation from groups of instruments.

The EPI Time/Energy Series represents the most dramatic improvement in the fundamental fidelity of our speakers in the entire history of EPI. Now we know what computers are good for.

Epicure Products, Inc., Newburyport, MA 01950
(800) 225-7932 In MA (800) 892-0565
A Perrelli Company

CIRCLE NO. 12 ON READER SERVICE CARD
Top Tape Decks
I read with interest Craig Stark's review of "Three Top Tape Decks" in March, but I disagree with the point he makes in the sentence, "Among so-called 'purist' audiophiles, it is axiomatic that any audible difference carries with it an infinite worth—a proposition I find plain silly."

What is silly about the quest for perfection? I feel that any audible improvement does have worth, and the closer a system nears perfection, the less finite the worth becomes. Who are the winners, the champions, the No. 1's? It is those who score the most points, have the lowest quarter-mile time, have the highest batting average. There is an infinite difference between a perfect "10," a winner, and second best. The winners go down in history. The second-place finishers just go down.

BOB BOOKMAN
Eagan, MN

Blank Tapes
I enjoyed the "Blank Tape Buying Guide" in March very much. It certainly ended some confusion for me. I was very surprised, however, to note the omission of the tapes that nearly every cassette-deck manufacturer has featured in publicity photos for the last four years—the Teac CRC series cassettes in the "mini-open-reel" package. The information in our buying guides comes from the manufacturers, and in this case Teac failed to supply any current data on its blank tapes.

ROBERT C. RASSA
Granada Hills, CA

Car Stereo
STEREO REVIEW does an excellent job of keeping enthusiasts abreast of the latest in car audio products, but you fail to acknowledge or demonstrate the importance of system engineering in optimizing their performance. Those of us who consider car audio as important as home audio (a growing cult, I might add) take great pride in building systems with good frequency response, excellent imaging, and superior sound quality while maintaining the integrity of the automobile's interior.

HOWARD C. ZIMMERMAN, JR.
Lake Charles, LA

Give us a break. Recognize car audio as more than a stepchild of the audio industry. I'm sure readers would appreciate some how-to's and tips on improving the sound and appearance of their car stereo systems. I have heard and built systems whose sound would make the most critical esoteric audiophile smile.

HOWARD C. ZIMMERMAN, JR.
Lake Charles, LA

I just wanted to thank you for your years of publication, but I wish you would have more on car stereo equipment, the way you did in the May 1984 issue.

WILL CANNON
Fresno, CA

See pages 58, 64, and 68 in this issue.

Retail Professionals
Thank you for publicly revealing the existence of professional audio salesmen in "Speaking My Piece" (March). As an enthusiastic member of the home-entertainment industry, I have thoroughly enjoyed sharing my knowl-

THE $2000 CAR STEREO
(THAT JUST MIGHT FIT IN YOUR CAR)

More than 48 million units...over 34 years experience designed into every state-of-the-art Fujitsu Ten car audio.

CIRCLE NO. 21 ON READER SERVICE CAPE

Write: Fujitsu Ten, 19281 Pacific Gateway Drive, Torrance, California 90502.
We're not playing video games.

If your video viewing goes beyond games and cartoons, you should know that Yamaha has entered the field. With equipment that, like our legendary audio components, is anything but entry level.

The YM-950 25” monitor/receiver features built-in MTS (Multichannel TV Sound) and SAP (Separate Audio Program) circuitry, plus full stereo capability and 134 channels of cable input.

Its 100° black cross-matrix picture tube and advanced design comb filter give you a sharp, high contrast, high resolution picture.

The six-head YV-1000 VHS Hi-Fi video deck is the first of the new generation of VHS machines. With its advanced HQ circuitry, it provides 20% greater picture definition over previous VHS decks. Along with improved brightness and color signal, and reduced video noise. Even in the extended play mode.

And because the circuitry is VHS Hi-Fi, the same high tracking speed that's used to record the video is used to record the audio. So the YV-1000 has a frequency response from 20Hz to 20kHz, dynamic range of 80dB, channel separation of 60dB and virtually unmeasurable wow and flutter. For hi-fi sound that's measurably better than any you've heard.

Connected to a pair of rear speakers, the 30-watt-per-channel SR-30 Surround Sound amplifier brings full movie theater sound into your home.

And the R-9 receiver with remote control and 125 watts per channel* gives you the power and connections to integrate your video components with your audio system.

Of course, you can use Yamaha video equipment to play games. We just wanted you to know that we weren't.

*125 watts RMS per channel, both channels driven into 8 ohms, from 20 to 20,000 Hz, at no more than 0.015% Total Harmonic Distortion.

Yamaha Electronics Corporation, USA, P.O. Box 6660, Buena Park, CA 90622
edge and experiences with those who have less time to follow all the latest improvements in home audio and video components.

JOHN GANNON
Dearborn, MI

Terk Antenna

Julian Hirsch did not do justice to the Terk FM 8403 antenna in his March test report. I live fifty miles from New York City, and the signal paths of that city's stations are interrupted by a mountain. The Terk is the only indoor antenna that gives me a clean, strong signal.

ROBERT RAHTZ
Garrison, NY

Standard of Measurement

I have been a STEREO REVIEW reader since early in 1985, when the dreaded (and expensive) audiophilia bug bit me. Since then the regular doses of your news, views, and reviews have been eagerly awaited (A-weighted?) by me. In all the equipment reviews that have passed through your pages, however, there has never once, to my knowledge, been a detailed explanation of the one piece of testing equipment that is applied in every instance.

I refer, of course, to that shiny little object in the photographs leading off each report, the one with the numerically marked extension. Questions about its dynamic range, signal-to-noise ratio, wow and rumble figures, and even whether it is available in black continually fill my head. Don't you think it is time for Julian Hirsch to give us an in-depth explanation of what is apparently an indispensable piece of test equipment?

JACK CLARK
Attadale, Western Australia

Classical Reviews

After reading January's "Letters" I began to think I was missing out on something. Well, I was right. For the first time in three years of subscribing to STEREO REVIEW I read the music sections. I found that there is more to the magazine than test reports and notes on new products. Your reviews of new releases are indeed informative and interesting. You have helped to educate me, to some degree, in an area I have long appreciated but knew nothing about, classical music. I plan in the future to read all your reviews, not only those on equipment. Thanks for all the good reviews.

LAWRENCE R. CHRISMAN
Mercogliano, Italy

Price Change

There has been a change in the suggested retail price of the Yamaha K-1020 cassette deck featured in March's "Three Top Tape Decks." The new price is $629.
Taken on face value alone, this is the most remarkable car stereo in the world.

Introducing the phenomenal Kenwood KRC-999 cassette tuner. If the face plate isn't enough to make your jaw drop, wait 'til you hear the way the 999 sounds. And performs.

It's the most advanced car stereo ever made.

"Sure," you say, "I've heard that before." But how many car stereos have you heard that are driven by a 16K ROM computer?

A computer that lets you customize the sound to suit your car's environment.

And pre-set electronic volume levels.

And automatically seek out a track anywhere on a side.

And scan the first five seconds of every cut.

And take stations with the strongest signal and automatically program them into memory.

Heard enough?

How about the lowest signal to noise ratio available. Metal tape frequency response of 20 ~ 22.5k (± 3dB). A 7-band graphic equalizer that instantly converts to a spectrum analyzer. Or an automatic azimuth-adjusting hyperbolic-contour tape head. And three drive motors.

Yes. The beauty of the KRC-999 is more than skin deep. It represents the culmination of 25 years of superior audio technology from Kenwood. Consider it our anniversary present to the world of music.

For the Kenwood dealer nearest you, call 1-800-CAR SOUND.
Imagine the concert continuing in your car with the ultimate high fidelity music system. Imagine a car audio system that could deliver music as rich and full as a live concert. Music that surrounds you with solid basses, crystal clear highs and subtle overtones. A high fidelity audio system that delivers the full orchestral spectrum of the symphony to you and all your passengers.

Ford and JBL have taken this music lover's dream and turned it into a reality. They have combined their efforts and resources to develop a remarkable high fidelity audio system now available to you in the Lincoln Town Car.

JBL, the recognized leader in professional loudspeaker design, has been delivering breathtaking sound in concert halls, theaters and movie houses for over forty years. In fact, today, over 70% of the world's top recording studios use JBL loudspeakers.

Ford expertise in electronics and audio engineering speaks for itself with over 50 years of audio design. In addition, Ford maintains one of the most technically advanced
Together, Ford and JBL have provided an outstanding high fidelity audio system for Lincoln Town Car featuring:

- 12 speakers strategically located throughout the car that have been adjusted and equalized to the surrounding acoustics.
- 140 watts of total system power that has been designed with extremely low distortion for comfortable listening even at high volume for long periods of time.
- Advanced audio features including full electronic tuning, Automatic Music Search, Dolby® B, Automatic Tape Equalization and a low frequency control computer for continuous loudness compensation and reduced distortion.

All in all, an amazing audio system. But it’s still almost impossible to imagine how good it really sounds until you hear it for yourself at your Lincoln-Mercury dealer.

*Dolby is a registered trademark of Dolby Laboratories Licensing Corporation.

JBL loudspeakers are featured in world renowned sound systems everywhere, including Tokyo’s NHK Hall, Los Angeles Music Center, Tanglewood Music Shed, Frankfurt Opera House, the 1986 Lincoln Continental and now the 1986 Lincoln Town Car.


**NEW PRODUCTS**

**Audio Control**

Audio Control’s Richter Scale III bass-equalizer/analyzer/crossover has six half-octave bands in the bass range with ±12-dB adjustments. The spectrum analyzer generates warble tones at the center frequencies (22.5, 31.5, 45, 63, 90, and 125 Hz), and the reproduced tones are picked up by a calibrated microphone and shown on a pointer display. Crossover frequency is adjustable with plug-in modules, and the slope is 24 dB per octave. An infrasonic filter cuts signals below 18 Hz at 18 dB per octave. There is a mono bass output and an amplifier bridging adaptor. The connectors are gold plated. Price: $349. Audio Control, Dept. SR, 6520 212th St. SW, P.O. Box 3199, Lynnwood, WA 98036.

Circle 120 on reader service card

**Technics**

The Technics CQ-DP5 is a DIN-sized car stereo Compact Disc player, preamplifier, and AM/FM tuner. The tuner circuitry is housed separately from the in-dash player/control unit. When a CD is playing, the function controls are used for track skip, track search, pause, repeat, and other access functions; in the tuner mode, the same buttons are used for up/down, scan, and seek tuning. The liquid-crystal display shows which track is playing and its elapsed time or which station preset has been selected and the tuned frequency. Up to fifteen CD tracks can be programmed for playback in any order, with a display of the stored program. The frequencies of twelve FM and six AM stations can be memorized for instant access. The preamplifier controls adjust bass, treble, front/rear and left/right balance, and volume. The frequency response of the CD player is given as 5 to 20,000 Hz +0.5, -1 dB, with a signal-to-noise ratio greater than 90 dB. The FM tuner section’s frequency response is said to be 20 to 15,000 Hz ±3 dB, its signal-to-noise ratio 70 dB. Price: $700. Technics, Dept. SR, One Panasonic Way, Secaucus, NJ 07094.

Circle 121 on reader service card

**Teac**

Teac’s remote-controlled ZD-5000 Compact Disc player can reach any one of up to ninety-nine tracks on a CD in less than 2 seconds. Up to twenty tracks can be programmed for playback in any order, and the player can be reprogrammed while it is playing. Low-level distortion is said to be eliminated by maintaining absolute linearity at all input levels during digital-to-analog (D/A) conversion. The digital output filter uses double (88.2-kHz) oversampling and dual D/A converters. The three-beam laser pickup is mounted in a floating suspension for improved isolation. The ZD-5000 features index search and INTRO CHECK, which permits sampling the first part of each track on a disc. A subcode output port is included for future applications. Rated frequency response is 5 to 20,000 Hz ±0.3 dB, and channel separation is said to be better than 95 dB over the full range. Price: $1,100. Teac Corporation of America, Dept. SR, 7733 Telegraph Rd., Montebello, CA 90640.

Circle 122 on reader service card
The best sound you can hear next to Carnegie Hall.

Listen to Toshiba's Portable CD player outdoors and something remarkable happens. It sounds like you're inside a concert hall. There's no distortion. No wow. No flutter. Only pure, concert quality sound.

Yet, when you take home this portable, it's a top of the line CD player. Hooked up to your stereo system through its AC adaptor, it offers features you won't find in other portables: 16 program random memory, 3-beam laser pick-up to guard against mistracking, plus a full function display that monitors the track, lap and remaining time. There's even a 15 function wireless remote control. And, of course, incomparable sound.

Toshiba's portable CD player. Outside of a concert hall nothing sounds better.

In Touch with Tomorrow

TOSHIBA

Toshiba America, Inc., 82 Totowa Road, Wayne, NJ 07470

CIRCLE NO. 52 ON READER SERVICE CARD
Harman Kardon

Harman Kardon’s new top-of-the-line receiver is the hk795i, rated for 70 watts per channel into 8 ohms from 20 to 20,000 Hz with no more than 0.008 percent total harmonic distortion. The amplifier section is said to have an instantaneous current capability of 50 amperes, making it suitable for use with low-impedance speakers. The design uses low levels of negative feedback (15 dB) to improve the dynamic performance, a wide bandwidth (0.2 to 150,000 Hz) to reduce phase shift, and discrete components in the audio stages to improve sound quality further.

There are inputs for a CD player, a turntable, two audio tape decks (with facilities for dubbing in either direction), and a video or auxiliary source. The bass and treble tone controls have selectable turnover frequencies of 400 or 200 Hz for the bass and 2,000 or 6,000 Hz for the treble. Other features include tone-control defeat, loudness compensation, eight AM and eight FM presets, an infrasonic filter, FM muting, and an LED signal-strength meter.


Circle 123 on reader service card

Infinity Systems

The car speakers in Infinity Systems’ Reference Standard Series II have polypropylene woofers for reduced distortion and increased reliability and “Dual Drive” polycell midrange/tweeters for improved midrange and high-frequency reproduction. All the dual-cone models have polycell whizzers. The Model CS-1 ($325) is a 6 x 9-inch component system with a separate clip-on Emit tweeter. Three-way RS systems with Emit tweeters include the 6 x 9-inch A693 (shown, $215 per pair) and the 6½-inch A63 ($165 per pair). Two-way speakers include the 6 x 9-inch A692 ($155 per pair), the 6½-inch A662 ($120), and the 5½-inch thin-mount A52 ($115). The Series II has three dual-cone replacement speakers: the 4-inch A42, with a snap-on grille ($85 per pair); the 4 x 6-inch A462 ($50); and the 3½-inch A32 ($40). Infinity Systems, Dept. SR, 9409 Owensmouth Ave., Chatsworth, CA 91311.

Circle 124 on reader service card

Audio Research

The Audio Research SP-11 hybrid preamplifier uses both FET’s (field-effect transistors) and vacuum tubes in signal circuits and solid-state circuitry in the separate power supply (lower unit in photo). Volume is regulated by level and gain controls. Other knobs control balance, output mode (mono, reverse, stereo, left, right), input (phono, tuner, CD, video, spare), and impedance of the phono input (47,000, 100, 30, 10, or 3 ohms). Switches select source or monitor, copy or normal mode, tape 1 or 2, dubbing direction, muting, and inverted or normal phase. The preamplifier mutes automatically while powering up or down and during any power-line interruption. Price: $4,900 in silver finish, $5,100 in black. Audio Research, Dept. SR, 6801 Shingle Creek Parkway, Minneapolis, MN 55430.

Circle 125 on reader service card

More New Products on page 131
Deciding on a new car?

“If your car is this well equipped, you won’t want to go home again.”
Chicago Magazine

“...their extraordinary Delco-GM/Bose Music System...”
Stereo Review

“...the performance...was astounding.”
High Fidelity

Our experience has convinced us that, regardless of your interest in music, you will require less than one minute of listening to know that you want the Delco-GM/Bose Music System in your next General Motors car.*

Delco GM BOSE

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

*Available on selected models of Cadillac, Buick, Oldsmobile and Chevrolet.
“Leave it to Bob Carver to come up with a CD player designed to please both those who love CDs and those who still have reservations about their sound quality.”
—Leonard Feldman

AUDIO MAGAZINE

The Carver Compact Disc Player answers the audiophile's demand for a CD Player which provides not only the greater dynamic range and richer bass expected from compact disc technology, but also the musicality, spectral balance and spatial qualities of well executed analog high fidelity recordings.

LOGICAL

How logical it is for a physicist dedicated to delivering music with maximum dynamic impact to offer a state-of-the-art CD player. Anyone who ever wondered why Carver makes amplifiers capable of delivering hundreds of watts of power need no longer wonder after they have heard the Carver Compact Disc Player as a sound source.

There are dozens of models of compact disc players now available, many of them demonstrating little regard for the finer points of digital playback technology. Bob Carver was in no hurry. He wanted to do digital right. And he did. The state of the art has advanced considerably since the first players appeared several years ago. The Carver Compact Disc Player makes use of the latest triple laser beam pickups, sophisticated oversampling, digital filtering technology and, very importantly, Carver's unique distortion reducing dither signal that effectively removes the low level quantization distortion existing in all other CD players.

EXCEPT for features like display and programming, the real determining factor in CD player quality is its ability to reconstruct music from digital information bits. And that is not an easy job nor one that can be effectively achieved while skimping on circuitry.

IMPROVED TRACKING

The Carver Compact Disc Player reads discs with more precisely focused laser power than most other models, resulting in improved tracking and less chance of drop-outs when dust or smudges are encountered on a CD.

DIGITAL FILTERING

Along with a potentially audible signal ranging up to 20kHz, there are endless images of the signal at 40kHz, 80kHz and 160kHz. While they are above the range of human hearing, they must be removed from the signal to prevent harmonic problems which could turn into audible distortion. Earlier CD models placed an anti-imaging filter after the digital/analog converter stage. Carver uses DIGITAL filtering ahead of the D/A converter through a process called multiple oversampling. The signal is passed through a shift register which delays the samples, so that the weighted average of a large number of signals is generated. Through a complicated process, frequency bands are suppressed between 20kHz and 160kHz, eliminating harmonic distortion problems early on before the complicated D/A 16 bit translation.

The same oversampling process also distributes the same amount of noise over twice as wide a frequency range, resulting in half as much noise in the final signal. Then after translation to analog, the signal is once again filtered for a gentle roll-off above 20kHz. This yields a marvelously natural musical sound to the final output.

ABSENCE OF PHASE ERROR

One of the important tests applied to determine the effectiveness of digital-to-analog translation circuitry is the reproduction of a square wave.
"Reproduction of a 1kHz digitally generated signal was as close to a true square wave as I have ever seen from a CD player that used digital filtering. (The Carver Digital Disc Player) shows a virtual absence of phase error."

A. Square-wave reproduction, 1kHz.
B. Two-tone phase test signal (200Hz and 2kHz) with Digital Time Lens off.

PLUS THE DIGITAL TIME LENS

On top of this unerring ability to produce natural, real-sounding music from the CD's digital bits, the Carver Compact Disc Player has the remarkable Digital Time Lens circuit to ensure your listening enjoyment.

The Carver Compact Disc Player is the world's only compact disc player to address the problem of the bright, hot, harsh sounding midrange and a lack of ambience and spatial detail characteristic of the majority of compact discs currently available.

When Bob Carver obtained his first compact disc player, he was surprised at the sound derived from most of the compact discs he purchased. The three-dimensional musical perspective which his analog system provided in lush abundance on phono discs evaporated into a flat, brittle wasteland. After extensive testing, Bob uncovered two fundamental flaws in almost all compact discs: 1) An unpleasant, harsh spectral energy balance. The overall octave-to-octave energy balance was shifted on the CD towards more midrange above 400Hz; 2) The amount of L-R signal (which carries the spatial detail of the music) on the CD was inexplicably, but substantially, reduced when compared with the amount of L-R signal found on the corresponding analog disc.

Carver's circuitry corrects the ratio of L-R to L+R by performing one extra, but important mathematical operation on the signal stream that all other CD players fail to perform. This final operation makes all the difference. The result is a natural sound with more of the three-dimensional information that places us in the same space with performers. You won't need the Digital Time Lens on all CDs. But it is there when you need it.

In the beginning, Carver hoped, indeed he expected, that once recording artists and engineers became more experienced with CD technology fewer and fewer CDs would require the Digital Time Lens. But both laboratory and listening tests reveal that the great majority of even the most recently released CDs benefits significantly from the Digital Time Lens.

EASY TO USE

Ease of operation is a hallmark of Carver components and the Carver Compact Disc Player is no exception. A subtle but easy-to-read LCD display not only shows selection number, elapsed time and total time of the CD, but also "talks" to the user. Turn on the Carver Compact Disc Player and the display asks for a disc. When the disc tray is open, the display reminds you with an OPEN readout. When a CD has completed playing, the multi-function display reads END.

With the Carver Compact Disc Player's Programmable Random Access Playback System, track search and programming of different selections is a snap, as is automatic repeat of a previous selection or an entire CD. For classical music lovers, the Carver Compact Disc Player has complete indexing capabilities as well.

The large, easy-to-use feather-touch controls include pause, fast forward and reverse. You can even monitor music at high speed to find a certain portion of a selection.

We know you really enjoy music so, you owe it to yourself to begin your digital experience with the only full feature CD player that has the Carver touch. The only CD player that can actually improve on what is already the best playback medium ever offered.

Audition the Carver Compact Disc Player with Digital Time Lens at your Carver Dealer.

IF YOU ALREADY HAVE A CD PLAYER

By buying a CD Player you made a commitment to vastly improve your sound source, now you can go the short extra step that lets digital realize its true potential. That step is the CARVER Digital Time Lens. Simply connect it between your CD player and your preamplifier or receiver.
FM/CD Dubbing

My favorite FM station uses Compact Discs for almost all its programming. I’m curious about how much of the CD quality is lost by the broadcast process. Also, I record all of my music off the air using an excellent cassette deck. I am considering buying a hi-fi VCR; will it produce better-sounding dubs than my cassette deck?

WILLIAM WHITON
Westport, IN

A few years ago I was asked to be a guest commentator by the New York classical-music FM station WNCN for its first broadcasts of Compact Discs. I knew that both the dynamic range and the frequency range of CD’s exceeded the capabilities of the current FM format, and I was curious as to how well they would come across over the air. During those first experimental broadcasts the strong high-frequency material on the discs tended to overmodulate the transmitter, but the station’s engineers solved the problem with some very judicious high-frequency compression.

During the broadcasts I was able to switch back and forth between the broadcast signal, as picked up by a monitor tuner in the studio, and the original signal sent out to the transmitter. The monitor signal was very good, but the original signal was still audibly better. I suspect that the difference in fidelity quality between your top-of-the-line cassette deck and a hi-fi VCR will be less audible than the differences I heard between the original and the received FM signal. But the VCR does have the advantage of being able to record six hours of material.

FM Microvolts/dbf

Could you provide information to help me convert FM tuner microvolt sensitivity specifications to dbf figures (and vice versa)? Also, why are there two different rating methods, and what does the “f” in dbf stand for?

J. GARY SPARKS
Indianapolis, IN

The accompanying conversion chart includes the most commonly encountered figures. Note that the conversion is valid only for 300-ohm inputs; for 75-ohm inputs the microvolt values should be halved. Although the Philips TS544 test disc does not show any differences in error-correcting ability among the latest CD players, it does have the advantage of being calibrated and thereby establishing minimum acceptable standards for error correction.

In general, I would consider a Compact Disc itself to be defective if it has audible problems or is physically unplayable on a machine that is able to track the Philips test disc. It also occurs to me, however, that the error-correction circuitry of your particular sample of the model of H-H Labs tested might not be doing its job. I suggest you check with the manufacturer, and offer to send in the problematic CD’s for checking.

Spke Power

I understand that there are large signal spikes in music and that CD’s are able to record them. Do these spikes get through the amplifier and move the speaker cones to create spike sound pressure?

O. O. CALLAWAY
Carlsbad, CA

What you refer to as “signal spikes” are usually called peaks, although I must admit “spikes” not only conveys a more vivid picture but also avoids the confusion between the mathematica(l peak value of a sine-wave signal (1.41 times the rms voltage) and the amplitude peaks in audio waveforms.

A power amplifier’s ability to deliver momentary musical signal peaks (or spikes) that exceed its FTC continuous-power rating depends on two factors: (1) the ability of its power supply to main-
"Will Those Speakers Work With My CD?"

The introduction of the compact disc player has created a lot of confusion and false information.

At KLIPSCH®, we think you deserve to know the truth: any good loudspeaker or amplifier will work with a CD.

The virtues of a CD are really quite simple. You get a more durable "record," so to speak. That is, scratches become a thing of the past. And you get tremendous increases in dynamic range. Now what does that mean?

Simply stated, the expanded dynamic range of a CD allows you to hear lifelike musical surges. Loud portions of music are closer to the loudness of the original performance; quiet portions are more realistic too. And you should know that dynamic range provides the emotional qualities of music. Which brings us to the purpose of this message.

Since our first model in 1943, KLIPSCH® Loudspeakers have delivered more dynamic range than any other loudspeakers made. We had a love for dynamic range before most companies knew what it was.

You don't have to have new speakers with a CD. But to hear a CD at its best, all the dynamic range and emotional power, make sure you listen to KLIPSCH. You'll hear a real difference for your hard-earned dollars.

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Audio Q. And A.

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Decibel Wars

Q In shopping for new stereo equipment, I am principally concerned with lots of volume. When I complained to the man in the next apartment about how loud he was playing his music, he replied that he was going to blast me out of the building. I want to make sure that I have enough sonic muscle to fight back. Is 200 watts a channel enough?

ROYCE P. BOONE
New York, NY

It appears to me that you and your neighbor intend to engage in a no-win battle of sonic annihilation. For those who want loudness for legitimate reasons, however, here are some guidelines:

To achieve both fidelity and loudness, you will need large, high-efficiency speaker systems. Every 3-dB increase in speaker efficiency reduces the power demands on the amplifier by 50 percent. Make sure that the impedance of your chosen speakers doesn’t dip into a region (2 ohms or so) where the driving amplifier runs out of current, or else make sure that the amplifier has sufficient current capacity to handle any impedance.

Personal experience has convinced me that even a speaker with a high, 91-dB sensitivity can use all the power it can get when very high volume levels are desired. I would suggest 200 watts per channel as a minimum.

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Circle No. 54 on Reader Service Card

Circle No. 54 on Reader Service Card

Manufacturer’s Plant D-3002 Wedemark, West Germany

CIRCLE NO. 54 ON READER SERVICE CARD

Audio Q. And A.

October 1986
Subscribing to Stereo Review makes sense. Whether you're shopping for your first stereo system, upgrading your present one, looking for maintenance tips or trying to sort through the hundreds of new recordings released every month, Stereo Review has answers you can rely on.

Our world-famous Equipment Test Reports help you select new audio equipment. Explanations of features, laboratory test results and comments from our expert technicians make it easy for you to select components for a great audio system.

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Stereo Review also helps you select the music to play over your sound system. We cover every category of recording on disc or tape, to help you steer away from uninspired performances or mediocre recordings.

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Use the coupon to subscribe—and save 50%!
VIDEO BASICS

by Chris Albertson

If you are thinking of adding a videodisc player to your system, you have in all probability already installed a VCR, which means that you have experienced the agony of having to make the right choice among more models and makes than any single catalog holds. Rest assured that selecting a videodisc player is a much simpler task, for there are only a handful to choose from. The problem is more likely to be finding a store that carries them.

Never properly promoted, the videodisc medium has yet to capture the imagination of Americans. It is generally agreed that the enormous growth of the videocassette market owes much to the early introduction of pornographic software, but while cassette buyers could take home such spicy items as Debbie Does Dallas and Nuns in Nirvana, early videodisc customers reached the wall of propriety with the purchase of R-rated Hollywood movies. That situation has since changed, but videodiscs also suffered another handicap.

In the beginning, there were two systems competing for the American videodisc market. One of these was RCA's CED (Capacitance Electronic Disc) system. The low prices of CED players and discs lured many people into a purchase they would soon regret, and the highly publicized demise of the CED system fostered the common misconception that videodiscs in general are a medium of the past.

Not so. In fact, the future looks bright for the laser-read videodisc, which was developed jointly by MCA and Philips and promoted most vigorously by Pioneer, whose LaserDisc and LaserVision trademarks are often used generically. The recent introduction of noise-

SOME COMMONLY ASKED QUESTIONS

- Can I record on videodiscs? No, it is strictly a playback medium.
- Does my TV set have to have a special video-input terminal? No, a videodisc player is connected in the same way as a VCR, but it's easier because you only have output, no input.
- Does my TV need a stereo decoder? No, videodisc players can be connected directly to your stereo system. In the absence of an audio system, the disc's soundtrack will be heard through the television set's speaker(s).
- Are videodiscs expensive? They are generally less expensive than the videocassette versions, ranging in price from $13 for an 8-inch music single to $59 for a complete opera. Movies on videodisc are usually $25 to $35.
- How much software is available? There are more than 3,000 laser-read videodisc titles at present, with 30 to 40 new releases each month. Then, too, there is a tremendous number of Japanese imports. Although there is not an overabundance of outlets, videodiscs are also available for rental.
- What is the difference between the CLV and CAV formats? The CLV (constant linear velocity) or extended-play format allows a playing time of up to one hour per 12-inch side (55 minutes for digital-sound versions) with chapter search. CAV (constant angular velocity) or standard-play discs let you take advantage of all the special effects—such as random frame search, variable-speed slow motion, and on-screen lapsed-time or frame numbering—but the playing time is reduced to 30 minutes per side (19 minutes for digital-sound releases).
free digital sound and of dual player units that can also play the increasingly popular Compact Discs have made the medium more attractive to the consumer and sparked interest in laser-videodisc players among such established audio manufacturers as Teac and Yamaha, who now find it quite natural to introduce a line of these machines. New sources of software are also appearing, with Thorn EMI/Home Box Office Video the latest major company to make its titles available in the LaserDisc format.

Nevertheless, while interest in the medium is growing among manufacturers and consumers, the products (both players and discs) continue to keep a surprisingly low profile in the stores. The purchasing process thus begins with a search. I suggest you try the major audio/video stores first, then perhaps the department stores.

Players range in price from $299 for the Pioneer LD-660 to $1,100 and up for a model that also handles Compact Discs. The LD-660 has neither remote control nor random frame and chapter search, and it will not reproduce digital sound, but the picture quality is superb, and, thanks to the built-in CX noise-reduction decoder, even the analog sound can be impressive. There is, however, a dramatic difference in features and general design with the next step up, and you might find it well worth the $200 or so additional expense. The higher-priced machines also boast an advanced, more reliable laser-pickup system. All laser-read videodisc players can play both the 8- and 12-inch discs in color and stereo, and all play both the CLV and CAV formats (also known as extended play and standard play—see box).

If all you want to do is watch movies or music videos, the Pioneer LD-660 will do rather nicely, but I can say from experience that having the frills is a lot more fun. For one thing, the more elaborate players allow you to use a recently issued encyclopedia on disc and to enjoy such two-way interactive releases as Murder, Anyone? and The History DisQuiz with a special remote control so that you can “talk back” to the TV set. Try doing that with a videocassette player.

---

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The sonic performance of Magnaspheres is so close to real, so unnaturally natural, they have already accomplished something no other product has ever done—they’ve won a record three "Decibel d’honneurs," France’s most prestigious audio award. And the Magnasphere’s unprecedented ability to exploit the capabilities of compact discs is already the talk of the European audio community. Right now the Magnasphere Delta, Gamma and Beta are available through a small, carefully selected network of dealers in the United States. Visit one soon and hear the new standard in loudspeaker dispersion, imaging and three-dimensionality.

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CIRCLE NO. 35 ON READER SERVICE CARD
by Julian Hirsch

When Are Nonstandard Measurements Justified?

I n reviewing reader mail, I have noticed several questions dealing with legitimate aspects of audio-equipment performance that are rarely discussed in hi-fi magazines because they call for nonstandard specifications or measurement techniques. I am a firm believer in standardized test procedures, which provide the only basis for meaningful objective product comparisons. Decades ago, when there were no suitable hi-fi standards, I had to devise my own. In later years I served on several industry standards committees, and after suitable standards were promulgated I used them to the greatest extent possible. But there are still some aspects of equipment performance that are not dealt with by current standards, so it is occasionally necessary to resort to nonstandard procedures—or simply to omit making a measurement that might be misleading because no satisfactory technique is available.

One example is the mechanical noise emitted by some products. Such noise can arise from humming or buzzing power-transformer laminations in amplifiers or receivers (often aggravated by vibration of their metal cabinets), the whir of cooling fans in some high-power amplifiers, “clunks” from solenoid operation in some tape decks and VCR’s, and occasionally the grinding or rubbing together of some portions of component mechanisms. Most of these effects are present to some degree in any mechanical system; the question is whether they are audibly intrusive on your listening experience.

After you carefully select system components for (among other things) their very low electrical noise outputs, it is possible to find that their acoustic noise is plainly audible in the absence of a program or when you listen at low levels. Sometimes the noise is only momentarily disturbing (the sounds of tape-recorder switching solenoids and of the tape-loading mechanisms in most VCR’s are typical examples), but an audible steady sound from a tape deck or fan motor is something that I, at least, find intolerable. I do not intend to discuss the treatment for this malady—sometimes there is none short of replacing the offending component—but readers with the same feelings have asked why we do not measure and report on the acoustic noise output of the products we test.

There are several reasons why we do not. Although there are standards for measuring ambient noise, they usually reflect health and safety considerations in business and industry. I do not know whether there are any standards dealing with annoyance factors. I do know, from personal experience, that health and safety noise standards can be totally inadequate for that application. For example, the noise output of power lawn mowers, chain saws, and similar equipment is regulated in my local community. The law allows something like a 55-dB sound-pressure level (SPL) at a distance of 100 feet from the noise source. On summer days the din from these machines can be (subjectively) deafening, yet my own measurements with a sound-level meter have shown that it is well within the legal limits. Similarly, while there are probably standards for measuring the noise output of typewriters and other office machinery, I am sure they are equally valueless for application to a hi-fi listening room.

One key reason for this is that the annoyance factor depends on both the time and frequency characteristics of the noise (in other words, its waveform) in addition to its level. During music listening, a steady, moderate-level hum or noise is less bothersome than irregular or periodic impact sounds or other sudden changes in level. How can we measure such effects in any subjectively meaningful way? The best I can do is to comment on the subjective mechanical (acoustic) noise output of a product if it is audible or obtrusive. Bear in mind, however, that such effects are often found with some individual samples of a product but not all or even most others. Ours might be quiet while yours will hum—or vice versa!

A very different question concerning nonstandard measurements was raised by another reader. He observed that some manufacturers advertise the current-output ratings of their amplifiers (sometimes as high as 40 to 60 amperes) and wonders how this specification relates to voltage or power-output ratings.

Conventional test standards call for terminating an amplifier in a resistive load (typically 2, 4, or 8 ohms), and the power output is calculated by measuring the voltage across that resistance. The power (in watts) is the square of the voltage divided by the resistance. Some people are fond of pointing out that no speaker presents a resistive load...
TECHNICAL TALK

Testing and yield more meaningful results, it is possible to infer something of the limitations of an amplifier with speaker loads from another measurement. An actual speaker load does not look to the amplifier output like a purely passive combination of resistance, capacitance, and inductance. As the voice coil moves under the application of a drive signal, a voltage is induced in the coil by virtue of its motion in the speaker's fixed magnetic field. The mechanical inertia of the voice coil and cone introduces phase shifts at certain frequencies, causing the test signal and the speaker's internally generated voltage to interact in such a manner that the speaker briefly draws a much larger current than would have been expected from its passive impedance and the amplifier's output voltage.

Looking at it another way, the speaker's impedance under dynamic conditions can be several times lower than its static impedance, which suggests that an amplifier should be able to deliver, at least for brief periods, a much larger current than steady-state ratings would call for. That is part of the rationale for the high maximum-current ratings ascribed to some amplifiers, and it makes good sense, although I know of no controlled tests that have confirmed the listening benefits of such a design.

We measure maximum current output indirectly by making both dynamic and long-term power measurements into loads of 2, 4, and 8 ohms even when the amplifier is not rated for 2-ohm operation. I feel that an amplifier that cannot deliver a reasonably high output into 2 ohms might not always be able to perform with full effectiveness with 8-ohm speakers. I freely admit that I have no proof of this; it is merely a reasoned judgment.

These measurements are far from)

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Excellence is our only standard
testing an amplifier's ultimate current-output capability. For example, if an amplifier can drive 10 amperes through a 2-ohm load, its power output is 200 watts. How then, can we verify a claim for a 40-, 50-, or 60-ampere capability? Ideally the amplifier should be short-circuited (loaded with 0 ohms) and the maximum unclipped current waveform measured. There are at least two flaws in that procedure. First, most amplifiers show their displeasure at driving a short circuit by shutting off, blowing a fuse, overheating, or self-destructing. Second, the most practical way to measure current, especially under dynamic conditions, is to measure the voltage across a very small load resistance, preferably less than the amplifier’s internal impedance. But if the amplifier has an internal impedance of 0.1 ohm (many have less than that), it is difficult to load it with something significantly lower.

Frankly, we have never attempted to subject an amplifier to the sort of abuse implied by such an "ideal" measurement. Most amplifiers will not drive even a 2-ohm load for any length of time without shutting down, or worse, and on the few occasions when we have gone to 1 ohm, operation could not be sustained long enough to make a measurement. So we have to admit that we cannot verify most claims for high current output, except by noting how well the amplifier behaves with loads of 2 ohms.

There is a somewhat related situation involving speakers. We drive a speaker with a 1- or 2-cycle sine-wave burst at several frequencies to see how much input (voltage) it will handle without obvious acoustic waveform distortion. In some cases this type of measurement can result in the amplifier's shutting down or an apparent clipping of its output at an unexpectedly low voltage—given that the amplifiers we use for these tests (the Carver M-1.5t and the NAD 2200) are capable of enormous outputs into resistive loads (even 2 ohms or less) as well as into most speaker loads. It is conjecture, but the most reasonable explanation for the observed effect seems to be that the speaker-test operation presents the driving amplifier with just the sort of unacceptably low load impedance described above.

Of course, the pulse-power test is nonstandard. For that matter, every speaker measurement is nonstandard since no industry-wide measurement standard exists at present. Every tester tries to measure what he thinks is meaningful within the limits imposed by test facilities. Test methods evolve constantly, although the unique nature of the loudspeaker makes it unlikely that we will soon see a speaker standard that compares to the existing EIA tuner and amplifier standards.

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You may have noticed that most speakers sound their best only if their grille panels are removed. That’s because a portion of their sound diffracts off the thick inner edges of the panels, reaching your ear later than the direct sound. Some audio frequencies are reinforced and others cancelled, distorting frequency response. The diffracted, delayed sound also smears the time cues essential to accurate stereo imaging.

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You’ll never have to sacrifice our great looks to enjoy our great sound.

Boston Acoustics
YAMAHA CD-2000
COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

Yamaha's highly flexible new top-of-the-line CD player, the CD-2000, includes such deluxe features as direct numerical track access, programmable playback of tracks in any sequence, music search, repeat operation, and "phrase" repeat of any defined portion of a program. Among its other features are dual gold-plated output jacks carrying fixed and variable signal levels and a DIN connector that provides subcode outputs for compatibility with future accessories that will allow still video images or other visual information to be extracted from a suitable CD and displayed on a video monitor.

The basic playback operations are controlled by a row of black keys along the bottom of the front panel. These include fast forward and reverse search with the program audible, track skipping in forward or reverse directions, and an index key that displays the current index number (when applicable). The CD-2000 does not, however, allow the programming of indexed portions of a disc. A SPACE INSERT control adds 3-second quiet intervals between the tracks during playback.

The display window initially shows whether there is a disc in the horizontal front-loading drawer and, if so, its total number of tracks and total playing time. After playing has commenced, it shows the current track number and elapsed playing time in the track, the status of the REPEAT and SPACE INSERT buttons, and the setting of the volume control (which affects both the rear-panel variable outputs and the front-panel headphone jack).

A total of twelve selections can be programmed, and the CANCEL button can be used to correct any errors in entering the program. Repeated operation of the CHECK button displays the programmed track numbers in order, and pressing the REMAIN TIME button converts the time display from the elapsed time in the current track to the remaining time on the entire disc or in the programmed sequence.

The Yamaha CD-2000 uses a three-beam laser pickup. The program is oversampled at 88.2 kHz, and independent left- and right-channel digital filters are used to remove the unwanted components above 20,000 Hz. Yamaha claims that conventional CD circuits are microphonic and that even the digital integrated circuits are affected by noise and vibration that impinges on the structure of the player. Therefore, in addition to isolation of the disc drive and laser mechanisms from external vibration, the CD-2000 uses a Vibration Damping circuit assembly that is said to give it a purer output than the usual construction methods.

The Yamaha CD-2000 is 17\(\frac{1}{8}\) inches wide, 11\(\frac{1}{2}\) inches deep, and 4 inches high, and it weighs about 11\(\frac{1}{2}\) pounds. It is furnished with a wireless remote controller that duplicates most of the front-panel controls, including the volume adjustment, index button, and even the drawer open/close control. Price: $799. Yamaha International Corp., Dept. SR, 6600 Orangethorpe Ave., Buena Park, CA 90620.

Lab Tests

The output level from the fixed outputs of the CD-2000 was 2.06 volts from a maximum-level (0-dB) recorded test signal. The maximum output from the variable outputs was 5.15 volts, and it could be reduced to unmeasurable levels by the volume control. The volume changes were smooth, unlike typical digital control systems, since the level is actually varied by a motor-driven analog potentiometer. The channel levels were matched within
Lots of new companies make speakers for cars. We’ve made speakers since this car was new.
In 1954, the Dodgers were in Brooklyn, Brando was on the waterfront, and Elvis was in Sun Studios. In September 1954, a classic two-seater called the Ford Thunderbird went into production.

That same year, Acoustic Research invented the Acoustic Suspension principle and used it to create another classic; the first high fidelity bookshelf speaker. Soon, AR products became the most revered, most sought-after, most imitated speakers in history.

Now, Acoustic Research puts its years of loudspeaker experience on the road. With the sophisticated new GCS Speakers. Most car speakers aim their tweeters at your rear window, not at your ears. AR's GCS-100 system has separate component woofers, midranges and tweeters. So you can mount the tweeters up front, where you can hear them. And the GCS-300, a classic 6 x 9, tilts the tweeter towards the front. While many car speakers have no crossover at all, these AR speakers have true electronic crossovers for minimum IM distortion. And while others use flimsy paper cones, AR uses ultra rigid polypropylene.

Ultimately, making car speakers is easy. The hard part is making speakers sound good. And that's precisely what AR has been doing for 32 years.
TEST REPORTS

FEATURES

- Oversampling at 88.2 kHz
- Separate digital filters for left and right channels
- Three-beam laser pickup
- Direct access to any track through numerical keypad
- Up to twelve programmed selections in any order
- Audible music search in fast forward or reverse
- Skip to beginning of each track in either direction
- Repeat play of entire disc, programmed sequence, or defined program segment
- Space insert adds 3-second pause between tracks in playback

LABORATORY MEASUREMENTS

Maximum output level: 2.06 volts (fixed); 5.15 volts (variable)
Total harmonic distortion: 1.00 Hz; 0.0022% referred to 0 dB; 0.0032% referred to -10 dB; 0.017% referred to -20 dB
Signal-to-noise ratio: 98 dB referred to fixed output (2 volts); 99 dB referred to variable output (5 volts)
Channel separation: 95.5 dB at 1,000 Hz; 79.5 dB at 20,000 Hz
Frequency response: ±0.1 dB from 20 to 20,000 Hz
Cueing time: 2.5 seconds
Cueing accuracy: A
Impact resistance: sides, A; top, B
Defect tracking: tracks all maximum defect levels on Philips TS4A test disc

YAMAHA CD-2000 FREQUENCY RESPONSE

We have often wished that CD players had output-level controls, if only so that their levels could be matched to those of other program sources used in the system. We have seen only a couple of players that have this feature, and Yamaha's analog control is a clear winner as far as we are concerned. In addition, the availability of a smoothly controlled audio level with a healthy 5-volt maximum output makes the CD-2000 ideal for driving any power amplifier directly, without an intervening preamplifier.

The Yamaha CD-2000's smooth, analog output-level control was a clear winner, and its 5-volt maximum output makes it ideal for driving any power amplifier directly, without an intervening preamplifier.

We remain unconvinced about the importance of "microphonic" circuits in degrading CD sound. For one thing, we have never heard any evidence of such degradation. Although Yamaha's literature shows some impressive spectrum-analyzer photos of the effects of microphonics in CD circuits, there is no indication of their magnitude. It certainly cannot hurt, however, to remove even this minute flaw (if it exists) from a music system.

Nit-picking aside, we liked the Yamaha CD-2000 very much and can honestly say we have never used a better CD player—or, indeed, one we would choose in preference to it if such a choice became necessary. It definitely embodies the Yamaha tradition of quality, and if it has any weaknesses, we did not find them.

36 STEREO REVIEW MAY 1986
SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.
The Pioneer® SD-P40 is not a projection television. It is a projection monitor. The first of its kind.

And in one masterstroke, all—not some, but all—of the compromises associated with projection television have been eliminated.

In fact, the SD-P40 is not merely far superior to any other conventional projection system, it is also superior to all but a few direct-view monitors.

**450 LINES. AND THAT'S THE BEGINNING.**

The horizontal resolution on the SD-P40 is more than 450 lines.

The brightness is more than 300 footlamberts. It is actually brighter than any direct-view system.

The contrast has a dynamic range more than twice that of conventional projection systems.

**THE END OF BIG-SCREEN COMPROMISE.**

Ambient light, one of the great problems in projection video, is no problem at all. In fact, there is less deterioration in contrast due to ambient light than in direct-view systems.

Focus, so much a problem in conventional projection systems, is sharp to the edges of the screen. Further, the picture is equally bright regardless of what angle you are viewing it from.

Blacks, so often grey on conventional systems, are rich while holding detail.

The fuzziness you're so used to seeing around white lettering and objects at high brightness, known as "blooming," is eliminated.

Color values are exceptionally accurate.

For the first time, a true skin tone is achieved in the presence of a vivid green. At last, color compromise is eliminated.

The exceptional performance of the Pioneer SD-P40 is the result of several major technological advances developed by Pioneer engineers over the last 3 years.

**PIONEER INTRODUCES THE WORLD'S FIRST PROJECTION MONITOR.**

**AN UNPARALLELED LENS. A REVOLUTIONARY LENS SYSTEM.**

The lens itself is the largest projection lens ever developed for private use—with a maximum bore of 160 mm.

Perhaps even more significant is Pioneer's development of the world's first liquid-cooled optical-coupling system. Far superior to conventional silicone gel or air coupling systems, the "Liquid Lens" is clearly the most accurate, efficient projection lens system ever devised.

**MAJOR ADVANCES IN CIRCUITRY.**

A new High-Voltage Stabilizing Circuit eliminates anode voltage drop, preventing darkness in white areas and focus loss.

A new Black-Level Stabilizer Circuit automatically sets the optimum black level to the signal source.

A newly created Dynamic Focus Circuit guarantees sharp focus to the edges of the screen.

And new High-Focus CRTs utilize not one but three electron lenses. These, combined with a newly developed Linear Tracking Focus System, result in a focal performance superior to conventional CRTs.

**THE HEART OF A SOPHISTICATED AUDIO/VIDEO SYSTEM.**

Inputs are provided for a LaserVision player.
and two videocassette recorders, in addition to 139 cable-capable channels with 10-key direct access. There's an MTS decoder for stereo/SAP broadcasts, and a simulated-stereo processor. There's a built-in high-powered 12W + 12W amplifier, with two built-in 6¾-inch speakers. There's a monitor output, and a TV output. There's even a variable audio output that lets you control volume through your hi-fi system by remote control.

In fact, the entire system is controlled by one 54-function System Remote control (which will also control Pioneer LaserDisc and VCRs bearing the SR symbol).

We could go on and on. Suffice it to say, all you have to do is see the Pioneer SD-P40 once, and you will suddenly understand the difference between the world of projection televisions and the only projection monitor in the world.
Onkyo TX-RV47 Audio-Video Receiver

Julian Hirsch, Hirsch-Houck Laboratories

Onkyo's TX-RV47 combines a highly versatile audio and video control center with an amplifier rated to deliver 55 watts per channel continuous output into 8-ohm loads from 20 to 20,000 Hz with no more than 0.08 percent total harmonic distortion. It carries dynamic-power ratings (at 1,000 Hz) of 90 watts per channel into 4 ohms or 73 watts into 8 ohms. In addition to all the usual control features, it has sound-processing circuits that can simulate stereo from mono programs, expand the sonic image of a stereo program, and dynamically enhance the bass response. There is also a four-channel matrix system designed to extract "surround sound" from encoded stereo movie soundtracks as well as ordinary two-channel stereo programs.

The TX-RV47's digital-synthesis AM/FM tuner has both automatic and manual tuning modes and sixteen station presets that can be assigned to either band. The preamplifier has inputs for a phono cartridge, a CD player, and two audio tape decks, with dubbing possible from Tape 1 to Tape 2. It can also control two VCR's and a videodisc player (VDP), channeling their video outputs to an external TV receiver or monitor and their audio to the hi-fi system's speakers. Videocassettes can be dubbed from either VCR to the other, and the sound portion of any video program can be replaced by a program from any of the audio inputs.

Except for three small horizontal sliders for bass, treble, and balance, all the receiver's controls are soft-touch keys or pushbuttons, and most of their functions are duplicated on the supplied wireless remote control. Although preset stations cannot be randomly accessed from the remote control, it can step through the presets sequentially in either direction or else scan them automatically with a 5-second pause on each station. The display window on the front panel provides complete information on the receiver's operating status.

In addition to the usual audio input and output phono jacks, the rear apron of the TX-RV47 contains jacks for the video inputs and outputs from the VDP and VCR's. A slide switch for each VCR selects either mono or stereo audio output (stereo is usable only with a hi-fi VCR), and a third switch disables the audio "beep" that normally accompanies any operation of a tuning or input-selector button. There are insulated spring terminals for the two pairs of speaker outputs and four a.c. outlets (three of them switched). The binding-post antenna terminals for AM loop and 300-ohm FM antennas are supplemented by an F-type jack for use with 75-ohm coaxial inputs. Finally, there are two integral cables, terminated in DIN plugs, to connect a compatible Onkyo record player or cassette deck for control by the receiver's remote unit.


Lab Tests

The Onkyo TX-RV47 is a relatively large and heavy receiver for its rated power, and as a result it became no more than moderately warm at any time during our tests, including the 1-hour preconditioning period at one-third rated power.
European technology at affordable prices

Mission Electronics Corp. of America 5985 Atlantic Drive, Unit 6, Mississauga, Ontario L4W 1S4 Phone: (416) 673-3777

Circle No. 54 on Reader Service Card
The audio amplifiers had no difficulty driving loads as low as 2 ohms at power levels considerably exceeding their 8-ohm ratings. The amplifier's dynamic headroom (2.14 dB) was also excellent for a moderate-fier's dynamic headroom (2.14 dB)ing their 8-ohm ratings. The amplifiers rated specifications (see box).

The loudness-compensation control boosted both low and high frequencies as the volume setting was reduced, although the effect was only slight until the volume was set at least 30 dB below its maximum. Below this point the response was fixed, with a maximum bass boost of 7 dB and a treble boost of 5 dB. The SIMULATED STEREO circuit is a comb filter that modifies the frequency response of each channel to create the illusion of a "true" stereo signal.

The stereo IMAGE EXPANDER appears to be a phase and amplitude modifier that spreads the soundstage across a larger portion of the room (sometimes beyond the limits of the speaker positions). The DYNAMIC BASS EXPANDER is an unusual circuit that boosts the response below about 100 Hz when the program contains energy in that band, but only in proportion to the signal level. At low levels the response is not affected, and the bass is gradually boosted at higher program levels, to a maximum of about 6 dB.

The FM tuner section of the TX-RV47 was in some ways quite ordinary and in others outstanding. For example, its 44-dB image rejection is only marginally acceptable for a good-quality home receiver, though it still surpassed the manufacturer's rating of 40 dB, and the alternate-channel selectivity of 51 dB fell slightly short of the rated 55 dB. In some other important respects, however, such as its capture ratio of 6 dB. and AM rejection of 80 dB, the tuner far surpassed both its own ratings and the expected performance of a receiver in its price class.

Comments

Onkyo has created a highly versatile and attractive receiver in the TX-RV47. It does many things and virtually all of them very well. If you have, or plan to have, an integrated audio/video entertainment system, this receiver could meet your needs. The emphasis seems to be on the audio portion of its capabilities, in which it provides more genuinely useful control than most other receivers we have seen. Its video role is essentially one of signal switching, with no attempt to provide specialized video modification.
effects besides the option of substituting any audio program source for the recorded video soundtrack. But most users will probably find the audio and video dubbing capabilities more than adequate.

We used all of the TX-RV47's audio control and signal-modification features in our listening tests, and they all worked well for their intended applications. The four-channel surround-sound matrix was especially interesting to us. Since there is no independent control of the rear speaker level, we wondered how effective the system would be. In a word, very! Apparently the results are quite satisfactory as long as both front and rear speakers are of moderate sensitivity (say, 85 to 90 dB), with an effect of enhanced spaciousness even though the rear speakers are rarely audible as distinct sound sources. The rear speakers carry only the difference signal (L - R) and are effectively silent during mono programs. A novel feature of the Onkyo matrix system is that the lower-bass frequencies, which usually have little or no separation, are injected full strength into the rear speakers at all times. The intent is to impart an enhanced bass response to the overall system (especially if the rear speakers have good low-end response) without losing the spatial enhancement of the speaker matrix. The circuit seemed to have the desired effect, as did the dynamic bass enhancer.

Everything about the Onkyo TX-RV47 worked as it was supposed to, leaving us with a very positive feeling about it. Although the receiver is certainly feature-laden, it is easy to use, and every control does something useful. If you are a purist, you don't have to use all its features to enjoy its performance. Even though some of the super-power receivers on the market today might give you the impression that 55 watts per channel is a skimpy power reserve, the TX-RV47 is far from underpowered. Its amplifier section can deliver a lot more than 55 watts into almost any speaker load it is likely to face without getting hot or even tripping its protection circuits (they never operated during our tests, which tend to be rather abusive of an amplifier). This is a lot of receiver for the money.

**SIGNET MK440ML PHONO CARTRIDGE**

*Julian Hirsch, Hirsch-Houck Laboratories*

The Signet MK440ml Dual Moving MicroCoil phono cartridge embodies several advanced and unique design features, some of which are suggested by its name. Its two small, low-mass coils are mounted at right angles to each other and are driven by a thin, tapered beryllium cantilever. The cantilever is coated with 24K gold applied by vapor deposition, a process Signet claims effectively damps the high-frequency resonance typical of moving-coil cartridges while adding little to its effective moving mass. The use of a nude-mounted, square-shank MicroLine diamond stylus also contributes to the low mass of the stylus/cantilever system. The MicroLine stylus is ground in an extended line-contact shape, which is said to give it about three times longer life than an elliptical shape and a narrower scanning radius (2.5 micrometers) for improved high-frequency tracing. For stylus replacement, the cartridge must be returned to Signet.

The coils of the MK440ml are wound with linear-crystal oxygen-free copper, whose use is thought by some to improve the sound properties of audio components. Although the magnet uses high-energy samarium cobalt, the tiny coils (whose impedance is rated at 3 ohms) develop only about 0.1 millivolt of output at normal recorded levels, thus requiring a step-up device between the cartridge and the preamplifier. Signet recommends using its MK12T universal moving-coil cartridge transformer, which can be switched to input impedances of 3, 20, or 40 ohms or can be bypassed completely when you are using a moving-magnet cartridge.

The Signet MK440ml, which has standard ½-inch mounting centers, is housed in a metal case that provides both shielding and a flat, rigid mounting surface between the cartridge and the tonearm shell. The cartridge weighs 7 grams, well within the balance capability of almost all tonearms. We tested, and listened to the MK440ml through the MK12T step-up transformer but did not measure the transformer's performance separately. Manufacturer's suggested maximum retail
**TEST REPORTS**

**Lab Tests**

For our tests, we installed the Signet MK440ml in a low-mass tonearm (the well-damped system resonance was in the 8- to 11-Hz range). Although we experienced no problems with the cartridge's vertical alignment, its flat bottom and the small protrusion of its stylus require that the arm be close to parallel to the record surface. The measured vertical stylus angle of the cartridge was 20 degrees, as rated.

We measured the tracking limits of the cartridge, as a function of its vertical tracking force, with several high-velocity test records. At its minimum force rating of 1 gram, the MK440ml easily tracked the low and middle frequencies of our Cook and Fairchild high-level records and the 80-micrometer level of the German HiFi #2 record.

We also used the DIN 45-549 tracking-test record, which has a set of 300-Hz test bands equivalent to those of the HiFi #2 record, though it is recorded at higher levels (120 micrometers instead of 100 micrometers) and seems to be trackable at slightly higher levels with most cartridges. With the Signet, we could play its 90-micrometer band at 1 gram and the 100-micrometer band at the cartridge's maximum rated force of 1.6 grams. We used a 1.5-gram tracking force throughout our other tests.

The two channels had identical outputs of 2.3 millivolts through the other tests.

**Comments**

Judged solely by its measured performance, the Signet MK440ml has exceptional tracking ability and response flatness throughout the audible range. In fact, among the moving-coil cartridges we have tested, only a few could track very high levels as well as this one, especially with tracking forces in the 1- to 1.5-gram range. Although it appeared that the cartridge could be used satisfactorily at 1 gram, we decided to use 1.5 grams to be on the safe side. The MicroLine stylus shape should keep record and stylus wear at negligible levels even at that force.

The proof of a cartridge is in the listening, however, and here the MK440ml confirmed the verdict of our test records and instruments. It is a superbly smooth, transparent, and easy-sounding cartridge. Obviously, the results were best with very good records, with some even rivaling good CD's in their clarity and freedom from distortion. Not one of the records we tried, however, showed a trace of hardness or distortion. The cartridge's frequency response was ideally balanced, with no sense of emphasis (or loss) at any frequency.

Frankly, in many ways the Signet MK440ml measured and sounded like an ideal (perfect, if you will) moving-magnet cartridge, with a striking absence of the typical aberrations of moving-coil cartridges such as high-end "sizzle" and the almost universal problem of poor to mediocre tracking ability. This should be taken as the highest praise, since we strongly believe that the important thing about a hi-fi component is how well it works, and not how it works! In fact, the only faults we find with the MK440ml—its non-user-replaceable stylus and low output voltage—derive from its purely moving-coil characteristics.

The MK12T is a superb transformer, but we had to use all of its voltage step-up (the 3-ohm setting) to obtain a comfortable listening volume while retaining a little reserve gain. The transformer is (as claimed) very well shielded against hum pickup from stray fields, but ground loops in the system can introduce hum that is very difficult to eradicate. This problem is typical of moving-coil cartridges, and if you have the patience you can overcome it. Still, it is not easy to achieve as good a signal-to-noise ratio with a moving-coil cartridge as with a good moving-magnet type.

In spite of an admitted lack of enthusiasm for moving-coil cartridges as a class, we have come to the conclusion that these Signet components form one of the most highly refined record-playing combinations available to the audiophile. You can buy cartridges very nearly as good (and probably a lot easier to optimize in your system) for a lot less money, but it is not likely that you could find one significantly better at any price.

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As its name indicates, the John Bowers Active 1 speaker is an "active" system; that is, it has built-in power amplifiers and requires only a line-level audio input for its operation. It is the initial product from John Bowers, Ltd., a company whose founder is the "B" of the well-known British manufacturer, B&W Loudspeakers.

An active speaker (sometimes also called a "powered" speaker) enjoys a number of recognized advantages over a conventional passive speaker, which requires a signal from a power amplifier. The complex and costly crossover network required for a standard multiple-driver speaker system is replaced in an active system by efficient low-level crossover circuits at the input to the amplifiers, rather than at their outputs. The reference to amplifiers (plural) is another key to the properties of an active speaker design. Normally at least two power amplifiers are used, one to drive the woofer and the other for the tweeter.

In a three-way active speaker, it is not uncommon to use a passive crossover between the midrange and high-frequency drivers, although a third amplifier is another option open to the designer. Each amplifier in an active speaker system can be matched, in its power capabilities and frequency response, to its associated driver, thus greatly reducing or eliminating any undesirable interaction between an amplifier and the complex impedance of its driver. Amplifier intermodulation distortion, though rarely a problem in any case, is also effectively eliminated by channeling different frequency ranges to separate amplifiers. Bass response, for any given enclosure size, can be extended by active equalization in the low-frequency amplifier. An integrated protection system can prevent damage to either the amplifiers or the drivers from excessive inputs. Integrated tone controls can be designed to compensate for variable room acoustics. Finally, the complete package (speaker and amplifiers) is inherently compatible and easy to operate.

While all these advantages might suggest that active speakers are "the way to go," they have disadvantages as well. Active speakers are usually expensive, though not unreasonably so compared with the cost of purchasing separate amplifiers and speakers. To the hard-core audiophile, active systems have the disadvantage of removing freedom of choice in component selection. There is also a more tangible disadvantage: the complete loss of use of the system should either the drivers or the amplifiers fail, since user replacement is not possible.

The John Bowers Active 1 can be considered either a two-way or a three-way system, with two apparently identical 6-inch Bextrene-cone woofers operating in a ported enclosure. The output of one, the bass driver, is rolled off above 300 Hz by a passive equalizer while the other, the bass/midrange driver, continues up to about 2,000 Hz before its electronic crossover to the single 1-inch polyamide-dome tweeter.

Both woofers have the same low-frequency response and are driven by an amplifier rated for 200 watts into 4 ohms. The tweeter is driven by a 100-watt (8-ohm) amplifier. The electronic components are entirely enclosed within the speaker cabinet, whose back is a metal plate with external heat-sink fins. There are two rotary-switch frequency-trimming controls on the rear of the cabinet. The three-position HF switch provides the option of a small boost or cut in response above 3,000 Hz. The six-position LF switch boosts or cuts the response...
Below 200 Hz to compensate for the effects of room boundaries on the loudspeaker's bass response.

Other rear-panel features include a power switch and a.c. line-cord connector, a phono-input jack for unbalanced inputs, and a socket for balanced audio inputs (a slight internal wiring change is required for this mode). There are also red and green pilot lamps. The red light indicates that the system is powered. Any audio signal appearing at its input connectors automatically switches on the amplifiers (together with the green pilot lamp). The system remains active for about 15 minutes after all input has been removed, then it shuts itself off. In operation, the power consumption of each Active 1 ranges from 120 watts at zero drive to 400 watts at full drive. In standby mode it draws only 4 watts of power.

The specifications of the Active 1 include a frequency response of 45 to 18,000 Hz ± 2 dB with the LF control set to maximum, a 30,000-ohm input impedance (balanced or unbalanced), and a dispersion of more than 60 degrees horizontally and 10 degrees vertically. The input sensitivity is rated at 175 millivolts (mV) for a sound-pressure level (SPL) at 1,000 Hz of 95 dB measured at 1 meter.

The John Bowers Active 1 measures 24½ inches high, 10 inches wide, and 15¾ inches deep including its cloth grille, and it is supplied with a stand that places its top 33½ inches from the floor. Each system unit weighs 66 pounds. The cabinets are finished in black-ash, natural oak, or walnut veneers. Price: $2,995 per pair. John Bowers, Ltd., distributed by Anglo American Audio, Dept. SR, P.O. Box 653, Buffalo, NY 14240.

Lab Tests

Our measurements followed conventional practice except that no external amplifier was used and neither the voltage across the speaker drivers nor their actual operating power levels were measurable (or of any importance). The Active 1's sensitivity for our reference 1,000-Hz acoustic output of 90-dB SPL at 1 meter was 135 millivolts. Our low-frequency distortion measurements were made at the same input level. We measured the response first with the speaker's controls set as received—HF at the middle, or 0 setting, and LF just below its middle setting—and made additional measurements to determine the effects of the controls at their limit settings. Although we made close-miked measurements at each of the woofer to establish their operating-frequency limits, we also measured their combined overall response with the microphone midway between them and close to the front of the cabinet.

The room response of the Active 1 speakers was very smooth, sloping gently down as frequency increased. The woofer response was comparably flat and smooth, and the two curves spliced easily to form a composite curve that dropped a total of about 8 dB from 100 to 20,000 Hz, with no irregularities greater than 2 dB in that range. The woofer output decreased rapidly below 80 Hz, reaching the 20,000-Hz level at 55 Hz. We were unable to measure the output at the woofer port, which was inaccessible underneath the enclosure and surrounded by the perforated-steel support structure. Its small size relative to the area of the two woofers suggests, however, that its contribution to the total bass output would be relatively slight.

The HF control varied the output by 2 dB in the 13,000- to 20,000-Hz range, with a decreasing effect down to about 4,000 Hz. At maximum boost the control flattened out the response curve slightly. The LF response adjustment range was considerably greater, about ±5 dB below 150 Hz and less than 1 dB at 700 Hz. The factory setting gave the flattest overall response in our composite curve as well as the best sound with the speakers 2 to 3 feet from the wall behind them.

The bass distortion was extraordinarily low, less than 1 percent from 100 down to 40 Hz and only 3.5 percent at 30 Hz. Encouraged by the smoothness of the speaker's midrange response, we also extended our distortion measurements to higher frequencies, where it increased gradually from 0.1 percent at 200 Hz to 0.24 percent at 600 Hz. These measurements were made with a 135-mV input, correspond-
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of 0.4 millisecond at 300 Hz. According to the manufacturer, the system contains electronic delay compensation to correct for differences in group delay between the bass and treble drivers; it appears to be very effective.

Comments

The John Bowers Active 1 certainly measured like a fine speaker, and we are happy to report that it sounds as good as its measurements imply—beautifully balanced and uncolored. We found it equally enjoyable with the HF control at 0 and at maximum boost. The bass output from the two 6-inch drivers may not satisfy those who are accustomed to using subwoofers, but it compares very well with the output from good 12-inch woofers in cabinets at least twice the size of the Active 1. If you like a lot of bass, setting the LF control to maximum will help, although we often found the resulting sound a bit too heavy. The important thing is that this system has enough response flexibility to adapt to a wide variety of listening environments and tastes. Very few speakers we have used are as well equipped in this respect.

The Active 1 looks deceptively small from the front (it is considerably deeper than it is wide), but it is a heavyweight. It is supplied with plastic glides that distribute its weight sufficiently to prevent indenting floors or carpets. It is also furnished with sharp feet ("carpet spikes") for those who prefer their speakers anchored to bedrock, or as nearly so as possible.

We compared the John Bowers Active 1 with some other more conventional (unpowered) speakers, including a few in its own price range. Its sound was definitely in the same class as the best of them, although of course tastes differ so widely that it would be foolhardy to make any firm comparisons. And when you consider that a good power amplifier for speakers of this caliber is likely to cost $500 to $1,000 and would still not be able to provide the same degree of protection (and probably not the same maximum undistorted sound level) as the Active 1 system does, even its price begins to look more down to earth.

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**FRIED TRIPLET SPEAKER SYSTEM**

Julian Hirsch, Hirsch-Houck Laboratories

The Fried Beta is a small, moderate-priced speaker that can be used either in a conventional stereo installation or in combination with a Fried subwoofer to form a three-piece Triplet system. The Beta is a two-way speaker with a 6½-inch polypropylene-cone woofer crossing over at 2,000 Hz to a 2½-inch "cone-dome" tweeter (the dome is at the center of a conventional cone). A series-configuration crossover network is claimed to provide proper phasing for the system along with 12-dB-per-octave crossover slopes. The drive levels are set internally, and there are no external adjustments.

The Fried Beta is neither an acoustic-suspension system nor a vented system but a hybrid of the two design approaches. The cabinet is effectively closed insofar as acoustic radiation from the rear of the woofer cone is concerned, but there are two ½-inch-diameter holes on the speakerboard described as a "pressure release." Backed with foam damping material, these holes are intended to reduce the internal pressures normally created in a small sealed box and to approximate a nonresonant (aperiodic) system. A pair of five-way binding-post input connectors and a reset button for the speaker's protective circuit breaker are recessed into the rear of the cabinet.

The cabinet measures 13½ inches high, 8 inches wide, and 8 inches deep, and it is finished in simulated-walnut-grain vinyl with a snap-on black cloth grille. Each speaker weighs 11½ pounds. The Beta's specifications include 8 ohms nominal impedance, a sensitivity of 89-dB sound-pressure level (SPL) at 1 meter with a 1-watt input, and a frequency response of 60 to 16,000 Hz ± 3 dB. Fried recommends an amplifier power of 25 to 100 watts per channel.

The Fried Duo subwoofer supplied to us with the Betas was designed primarily as a bass extender for Fried's Beta and Q/3 speakers. Although the subwoofer can be used with other small speakers, differences in speaker impedance characteristics can affect the overall system performance.

The subwoofer's single, front-facing driver is a 10-inch polypropylene-cone woofer with separate voice-coil windings for the left- and right-channel stereo inputs. Although the channels are summed at low-bass frequencies, the subwoofer normally operates only below about 100 Hz, so stereo separation is unaffected. If a separate subwoofer is used for each channel, the voice coils of each unit are connected in parallel. Fried's literature describes the subwoofer as "heavily braced, damped with free-flow filters, and loaded by a 'line tunnel' that provides an auxiliary source of time-accurate very low bass." The only visible opening in the cabinet is a foam-filled strip half an inch high across its bottom front. The cabinet's finish matches that of the companion Fried speakers, and it meas-
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ures 24 inches high, 15 inches wide, and 12 inches deep. Weight is about 45 pounds.

The crossover network built into the Fried subwoofer uses the same series configuration featured in the Beta system, with a nominal crossover frequency of 110 Hz. There are no adjustments since its efficiency and crossover characteristics are designed to be compatible with the Fried Beta and Q/3 speakers. Each channel's input is protected by a 2.5-ampere fuse. Two fuse holders, two sets of five-way binding posts for the amplifier inputs, and two sets of speaker outputs (for the left and right satellites) are recessed into the rear of the cabinet. A diagram and instructions are supplied for internal rewiring of the subwoofer for biamplified operation, which may be necessary for use with other manufacturers' satellites but is not recommended for use with the Fried speakers. The rated frequency response of the subwoofer extends down to 32 Hz, within a few decibels, and it has a nominal impedance of 8 ohms.

Suggested retail price for the Fried Triplet system is $625, which includes $300 per pair for the Beta satellites and $325 for one Fried Duo subwoofer. Fried Products Co., Dept. SR, 7616 City Line Ave., Philadelphia, PA 19151.

Lab Tests

We measured the frequency response and other characteristics of the Fried Beta and subwoofer as a system as well as separately. Following the manufacturer's recommendations, we mounted the Betas about 8 feet apart on stands that were about 25 inches high and equally far from the rear wall. We tried the subwoofer in two locations: behind one of the speakers and in the recommended placement, midway between and slightly in front of the satellites.

The measured sensitivity of the Beta system was 86 dB at 1 meter with 2.83 volts of pink noise in a one-octave bandwidth centered at 1,000 Hz. Its impedance was about 6 ohms at 20 hz and rose to 18 ohms at its bass resonance of 80 Hz, then fell to its minimum of 5.3 ohms at 150 to 200 Hz. The impedance rose again to about 22 ohms at 1,800 Hz and remained above 11 ohms from there to 20,000 Hz. These measurements indicate that the Beta's nominal impedance should be rated as 5 or 6 ohms rather than 8 ohms. The subwoofer's bass resonance was at 39 Hz, where its impedance was about 14 ohms. Its minimum impedance was about 4 ohms at 150 Hz, above which it rose smoothly to more than 1,000 ohms at 15,000 Hz. The combined impedance of the Beta and the subwoofer was much like the Beta alone above 150 Hz and like the subwoofer alone below that frequency. The minimum combined impedance was 3.8 ohms at 250 to 300 Hz.

The room response of the Beta was quite uniform and smooth. Except for a moderate peak and dip in the 300- to 500-Hz range, evidently the result of a floor reflection, the response varied only about 7 dB overall from 70 to 17,000 Hz. The tweeter's dispersion was excellent for a radiator of its dimensions. The close-miked woofer frequency response was maximum at 100 Hz, falling the expected 12 dB per octave at lower frequencies and dropping gently at higher frequencies to about −9 dB between 1,000 and 2,000 Hz. Although the output measured at the “pressure release” holes had about the same response shape as the cone's output, it was 10 to 15 dB lower in level (more like 30 dB lower when corrected for the sizes of the two sources) and therefore contributed nothing significant to the total acoustic output of the Beta system.

The results above 100 Hz were very similar when we paired the Betas with the subwoofer, although because of room resonances the output below 100 Hz was both higher in level and less regular than that of the unaided Beta. The close-miked response of the subwoofer peaked at 50 Hz, falling off at 18 dB per octave below that frequency and more gradually from 50 to 140 Hz, where it was down 6 dB, and then at 18 dB per octave from 140 to 300 Hz. The electrical crossover frequency (the −3-dB point) between the subwoofer and the Beta satellites was 170 Hz, but the actual acoustic crossover was considerably lower, apparently around 100 Hz.

Our usual practice of splicing a woofer's response curve to the room response of the other drivers to derive a composite frequency-response curve is less meaningful for a three-piece system like this one since the remote placement of the subwoofer makes its actual acoustic performance somewhat unpredictable and largely independent of the bass output of the satellites. All we can say about the complete Fried
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TEST REPORTS

Triplet system is that its bass extends to the vicinity of 30 Hz. The subwoofer’s distortion at a constant 4.5 volts input (equivalent to a 90-dB SPL from the Beta at 1,000 Hz) was quite low, varying between 0.6 and 2 percent from 100 to 35 Hz. At the same drive level, the small woofer of the Beta generated distortion levels from 1.7 to 3 percent at frequencies of 100 to 60 Hz, rising to 7.7 percent distortion at 40 Hz. Of course, when the Beta is used with the subwoofer, frequencies below 100 Hz never reach its woofer, so its distortion remains negligible.

Our FFT measurements on the system confirmed the key characteristics of its room response. The group delay was excellent, varying about 0.4 millisecond overall through most of the audio range, with occasional excursions to 0.8 millisecond below about 4,000 Hz.

Our peak-power tests of the system confirmed Fried’s claims of an exceptional dynamic range for speakers of this size and price. At 100 Hz the subwoofer did not rattle or otherwise distort with a 1- or 2-cycle tone burst until the power input reached 360 watts into 5 ohms. At the same frequency, the woofer of the Beta, operated without the subwoofer, reached its excursion limits and generated a highly audible rasping sound at 120 watts into 8.5 ohms, which is still a very creditable performance for a 6½-inch cone driver. At 1,000 Hz the Beta took the full output of the amplifier, which clipped at 255 watts into the Beta’s 15-ohm impedance. Finally, at 10,000 Hz, the amplifier clipped at 327 watts into 11 ohms without any signs of distress from the Beta’s 2½-inch tweeter.

Comments

Despite the claims of aperiodicity made for the Fried Beta, and implied for the Fried subwoofer, both speakers had the expected low-frequency resonances. It was not evident from external measurements or the audible sound of the system that the “pressure release” holes on the Beta, or their equivalent on the subwoofer, contributed to any special performance characteristics. Beyond this minor quibble, our overall reactions to the Fried Triplet system were unquestionably positive.

We listened to the Betas alone for some time, but after adding the subwoofer we preferred the Triplet system. The overall sound quality was not much different—for should it have been, since the Betas were radiating almost all of the audible sound from the system. But it was instructive to disconnect the satellites and listen only to the output of the subwoofer. There is very little musical or vocal content below 100 Hz, and all that could be heard was a formless, low-level rumbling. Added to the output of the Beta system, however, this almost subliminal floor of low bass transformed a pair of rather good small speakers into a system where the full audio range was very much “all there.” The combined system is able to compete on even terms with many larger and more costly systems.

Even without the subwoofer, the Beta was still a very easy speaker to live with. Its sound quality was very well balanced and did not convey any of the sense of “smallness” or “thinness” that afflicts so many small speakers. The Beta was also free of most of the common problems of inexpensive speakers, such as the edginess and mid-bass coloration that often result from the peaked bass response of a small woofer. Although the system exhibited a slightly soft quality, its output was smooth and covered a wide frequency range. The sound stage was as wide as the speaker spacing allowed, without any of the artificial effects that appeal to some listeners. The speakers were just plain good to listen to.

Fried calls the Betas “mini monitors,” which implies an ability to handle high-level program peaks without dynamic compression or damage. Our peak-power tests certainly confirmed that ability.

The bottom line is that the Fried Beta is one of the best speakers of its size and a strong contender in its price class, where the competition is severe. And the combination of the Beta with the Fried subwoofer is one of the most potent three-piece systems you can find at a list price around $625, very inexpensive for this type of system.

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If you can't afford it, spare yourself the heartache of listening to it.

We are all aware that money aside, it is an easy matter to upscale our quality of life, but difficult to lower it. In this regard, ignorance is bliss and strict abstinence is sometimes better than a taste of something finer that we can't have. So it is with Concord high-fidelity, high performance car audio. One listen, one taste, will significantly alter your demands for mobile high-fidelity.

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WHAT’S NEW IN CAR STEREO?

A survey of trends and developments in autosound
by Daniel Sweeney

NEW is still the byword in car stereo. Manufacturers of autosound components rarely boast about how long they have been in business or claim their products are made the old-fashioned way. And, not surprisingly, autosound has produced no classic components that hold their value on the used market and serve as enduring benchmarks of audio performance.

Instead, car stereo manufacturers emphasize the new and novel technologies in unending succession, instantly outdating last year’s marvels. The cautious consumer is likely to wonder how many of the product revisions of the present represent significantly new answers to the problems of musical reproduction in the automobile, what innovations are the beginnings of new trends and which are dead ends, and what real changes are occurring behind the constantly refurbished costume jewelry of LED’s and liquid-crystal displays.

Factory Sound Systems

The most important change in autosound is as much a marketing phenomenon as a technological revolution, and that, of course, is the rise of serious factory sound systems. A few years back, Bose and General Motors collaborated on an equalized, multi-amped factory system for Cadillacs, Corvettes, and other luxury cars that set new standards for the auto industry. The Delco-GM/Bose Music System was very much an isolated development, a lone high-quality pioneer among the many low-quality factory systems built into most cars.

But now Ford has entered into a similar collaborative venture with JBL and Chrysler is working with Infinity Systems. The Ford-JBL marriage has already borne fruit in the form of a multi-amp, equalized, controlled-dispersion system that features sub-bass and high power, neither of which the Delco-GM/Bose system has.

Indeed, the Ford-JBL system more closely resembles the work of the better esoteric custom installers and thus would appear to represent a real threat to aftermarket components (those designed to replace the original equipment built in by the car’s manufacturer). Ford also promises a Sony-manufactured CD player as a factory option in the Lincoln Town Car some time this year.

Meanwhile, across the Pacific, Mazda has introduced a multi-amp system, rated at 100 watts total and complete with a CD player, for the RX-7 sports car, and Toyota collaborated with Fujitsu Ten to create an impressive system for the Toyota Celica GT-S. Mercedes-Benz, Saab, and Volvo are said to be developing
sophisticated audio systems as well. Powerful, tuned autosound systems are still far from standard in luxury cars, but they are starting to appear in greater numbers. And unlike many esoteric aftermarket installations, which still feature disco-style, sizzle-boom sonics, the more sophisticated factory systems are tuned for linear amplitude and phase response.

Do such developments mean that factory systems will begin to take the lead in the debut of new technology? Not necessarily. Factory systems require extremely long lead times for development, and the decision-making process required to initiate a project—after preliminary design work has been completed—may itself take many months.

As one manufacturer bidding on a Detroit subcontract said, "It takes a committee action for an auto maker to change one resistor in a circuit." He may be exaggerating just a bit, but the relative slowness of automakers in embracing the Compact Disc format is testimony to the basic conservatism of the industry with regard to audio.

Digital Sound in Cars

The digital Compact Disc format is another recent innovation in autosound, and it should come into its own this year. Automotive Compact Disc players were introduced in 1984, but through most of last year availability was limited, with only Sony and Sony-derived players being shipped in large numbers. This year, the majority of established autosound manufacturers will have at least one Compact Disc player in their product lines, including such companies as Sanyo and Fujitsu Ten.

We can also expect sharp drops in price on the retail level. Low-end players will go for suggested lists of $300, with discounts likely. In other words, Compact Disc players will soon be available for about the cost of a midpriced cassette/radio.

The big question concerning new product developments for 1986 is whether any digital audio tape (DAT) players will be brought to market before the end of the year. A representative of one prominent Japanese cassette-deck manufacturer says that research and development on conventional analog cassette machines has virtually ceased in Japan and that the industry as a whole is readying itself for a rapid transition to a compact, digitally encoded magnetic-tape format.

The Electronic Industries Association of Japan has already blessed a rotary-head standard for DAT and simultaneously left the door open for an alternative fixed-head standard (a ruling strongly reminiscent of our own Federal Communication Commission's decision to let four AM stereo formats fight it out in the marketplace). But no fixed-head standards exist so far, and the etched, thin-film playback heads necessitated by a fixed-head format are still too expensive for consumer applications.

To add to the confusion, a number of manufacturers favor the existing 8mm rotary-head digital-tape standard used for 8mm video cassette recorders. Certainly an automotive audio-only 8mm cassette player could be developed fairly rapidly, though the standards for 8mm specify a narrower bandwidth (cutting off at 15,000 Hz) than that of either the rotary-head DAT or the Compact Disc format.

THERE'S little question that the Japanese audio industry as a whole sees DAT as an eventual replacement for the standard analog cassette deck. Earlier, Sony had taken the position that the Compact Disc format, by virtue of its application to portable music systems, would cause home recording to disappear. No one is expressing that position anymore, but, at the same time, many of the marketing people within the major companies are concerned about consumer acceptance of a new digital format hard on the heels of the first.

Within the industry, the prevailing view is that the Compact Disc should be allowed to penetrate very deeply into its potential market before any new digital audio format is introduced.

Otherwise, expect no revolutions in 1986 beyond increases in consumer prices. The devaluation of the dollar relative to the yen is bound to result in some upward movement on retail prices for Japanese goods, which, of course, include the majority of autosound components. Speculation is still rife as to the extent of price escalation during the remainder of the year.

But if autosound systems remain fairly stable in 1986, the components that make them up continue to evolve.

Head Units

Cassette radios combine a cassette player, an AM tuner, an FM tuner, control knobs and buttons, and a power amplifier; cassette tuners have all that except for the power amp. With the CD format appearing in the car, we now have CD tuners that replace the cassette-player section with a CD-player section. Whatever signal sources are included, the head unit is the brain of any car stereo system.

Despite price reductions and ready consumer acceptance, the growth of the Compact Disc format in the automobile will not be as rapid as in the home. The sonic advantages so obvious in the home—the low noise, low distortion, and broad dynamic range—are not as obvious in the car. Through 1986, the overwhelming majority of head units purchased will be cassette radios, not CD radios, and the new models will be plentiful.

So what distinguishes the new cassette radios and cassette tuners? First of all, analog tuning will virtually cease to exist in aftermarket tuners or radios regardless of price. The digital-synthesis tuner is now...
the industry standard. Another trend is the appearance of full-logic cassette decks at prices under $300. Full-logic decks provide for solenoid-operated transport functions that avoid stressing the tape.

Also look for tuners and receivers with CD inputs permitting instant hookup of a portable, battery-operated Compact Disc player. Head units permitting such hookups are said to be “CD ready.” A different way to attain CD readiness is with an adaptor introduced by Sparkomatic that converts the output of a portable Compact Disc player into an FM signal, permitting the user to connect the CD player via the antenna cable. With this device (at a list price of about $30), a CD player can be added to virtually any radio in existence—whether factory or aftermarket. One might carp about the compromise in Compact Disc fidelity entailed by such a strategy, but many people are attracted to the CD as much for its durability as its sound qualities.

Recoton’s CD adaptor ($20) is a simple cable with a mini plug at one end that goes into the headphone output of any player and a cassette-shaped gizmo at the other that fits into any transport. It is claimed to cause no sound degradation at all. Other companies have other techniques for getting the output of a portable CD player into a car’s audio system.

There are two new remote changers designed for trunk mounting. Sony’s DiscJockey (see special test report in this issue) is built around a Compact Disc player rather than a cassette deck. It holds ten discs, is fully programmable, and includes two switchable compression circuits for adjusting dynamic range for noisy automobile interiors. It also has a surround-sound matrix reminiscent of the old Hafler circuit.

The Alpine Model 7375 cassette changer ($1,500) has a magazine that holds up to six cassettes, which can be played in any order. It is fully programmable from an in-dash module, but perhaps most remarkable is that it communicates with the module by an optical fiber transmitting light instead of an ordinary cable transmitting electricity.

Alpine has been quietly conducting research on fiber optics for a number of years because the advantages of optical over electrical transmission of signals in an automobile are considerable. Automobiles are plagued with an abundance of electrical noises, many of which will enter an audio system through ground loops or false grounds where electrical charges seeking a ground circulate through the chassis of the car instead of returning directly to the battery. Such ground loops work particular mischief on low-level audio signals.

Fiber-optic transmissions, which utilize pulses of laser light traveling through fiberglass cables, do not require grounding, are completely unaffected by stray electrical charges, and will not themselves interfere with any audio component. The only problem with fiber-optic transmission, apart from its higher cost, is that the output of a fiber-optic system cannot be used to power a speaker directly.

Fiber optics is fine for low-level signals, but the light signal must be converted into alternating current via photodiodes and then amplified electronically in order to perform any work. Hirschman’s OAX-201 antenna ($500), which uses fiber-optic cable instead of wire, is said to have no signal or bandwidth loss and to be much more resistant to noise and interference.

In terms of signal sources, the emphasis in 1986 is clearly on tape decks rather than on tuners. But this year is seeing much interest in a companding FM broadcast system called FMX that is said to extend usable FM stereo reception as far as present mono reception (see “Technical Talk” in the March issue). In other words, with an FMX tuner receiving an FMX broadcast, the stereo reach of the station will be equal to its former mono reach. The system is said to be fully compatible with existing tuners; an FMX tuner will have better reception than a standard tuner, but a standard tuner can receive an FMX broadcast as well as a nonencoded broadcast.

With radio stations able to go FMX (thus increasing their listening audience) for roughly $5,000, manufacturers are working feverishly to perfect the integrated circuits that can decode the encoded signal. NAD was the first to announce an FMX tuner for the home, but car-stereo manufacturers aware of the problems of mobile reception will not be far behind.

Besides FMX, nothing very momentous is happening in radio circuitry, though several manufacturers are showing refinements in the
F R O N T - E N D developments are not limited to trick circuitry, however, and one thing we're certain to see more of is removable head units with slide-out chassis. This concept was introduced by Sony and an accessories manufacturer named Bensi a couple of years ago and has since been adopted by Kenwood with great success. This year, Denon, Philips, Grundig, JVC, and Clarion will offer removable head units as well, and all these companies expect to do big business with them, especially with customers who have been ripped off by car stereo thieves.

Amplifiers

Last year saw a lot of activity in the amplifier category, including a Magnetic Field car amplifier from Carver, a Class A amp (more or less) from Soundstream, and MOS-FET amps from Hafler, Soundstream, and Rockford-Fosgate. In the same year, a number of prestigious home audio manufacturers offered high-end amplifiers for the car, including Infinity, Harman Kardon, and Crown as well as Hafler and Carver.

This year promises less excitement, but it should bring a plethora of new models as the amplifier market expands in the wake of Compact Disc players. While the compression circuits used in the Sony DiscJockey are certainly welcome—the broad dynamic range of CD's sometimes makes the loud parts too loud or the soft parts too soft—the loud parts do demand a lot of power, and many Compact Discophiles are buying more power for their car systems.

Most new amplifiers will only be new in terms of model numbers and cosmetics. In general, manufacturers are sticking with proven circuits, but we can still expect a few evolutionary changes.

The major trend in amplifiers is the growth of the four-channel category. Among manufacturers offering four-channel amplifiers are Blaupunkt, Precision Power, Nakamichi, Hifonics, and Monolithic, with more sure to follow. Four-channel amps are generally used to power front and rear satellite speakers. Manufacturers favor the format because of the tendency of installers in the past to wire two pairs of speakers in parallel (reducing the impedance from 4 to 2 ohms) and then to try running all four from a single stereo amplifier. Most amps just don't like 2-ohm loads, and overheating can be a problem with continuous 2-ohm operation. One speaker per channel is best.

Another trend in amplifier design—one that is largely unheralded—is the total substitution of integrated circuitry for discrete components. For the last couple of years, automobile amplifiers have used IC input and driver stages, with discrete transistors only used at the output stage. Now the increasing availability of power IC's with up to 50 watts output has led to the general use of IC's throughout lower-powered amps. Since, all things being equal, IC's are cheaper than hand-assembled discrete circuits, the cost of amplification is likely to go down even in the face of dollar devaluation.

Still, a few high-end manufacturers, notably ADS, Infinity, Harman Kardon, and Hifonics, are selling new amplifiers with discrete circuitry only, on the theory that such circuits sound better (completely discrete circuits are still used in high-end home amplifiers retailing in excess of a thousand dollars).

Other borrowings from domestic esoterica are fully complementary circuitry, offered by Nakamichi and Hifonics, and low negative feedback, a characteristic of Denon and Hifonics amplifiers. Most automotive amplifiers still remain pretty simple compared with the high-end products for the home, but clearly a market is emerging for brute-force, high-spec units.

Another development in automotive amplification that may be the beginning of a trend is built-in equalization to compensate for high ambient noise levels and the consequent necessity for relatively high playback levels. Rockford-Fosgate has marketed pre-equalized amplifiers for years, but now Linear Power has announced that it is developing a sophisticated loudness-control circuit. How these manufacturers will come up with average curves for the myriad of cars on the road and whether other manufacturers will follow suit remains to be seen.

We may also see more widespread use of modulated power supplies. The modulation here is in the voltages of the power-supply rails for the output stage. In such a scheme, the rail voltages go up for peak power demands but stay low when the output power is low. Modulated supplies are smaller, cheaper, and more efficient than conventional supplies, and they have won considerable acceptance in high-power applications in the home and in sound reinforcement.

Last year Carver introduced an
The chief drawback of a parametric, aside from its somewhat higher cost, is the difficulty in using it. It's not a toy, it's not a user-friendly tone control, but it's a tool for obtaining optimally flat response that should generally be used with a professional-quality pink-noise generator and a spectrum analyzer. Hifonics' parametric is accordingly intended primarily as a tool for professional installers.

While not a true parametric, Precision Power's PAR 224 ($250) is much more flexible than most graphics. Each of its four bands has several selectable center frequencies, making it what is sometimes called a parographic. Another fairly powerful new automotive equalizer is Audio Control's EQX ($299), which allows for half-octave adjustments. Finally, Coustic has introduced the EQ-1030 combination equalizer/spectrum analyzer/crossover ($300), a component also aimed primarily at the installer.

Speakers

The biggest news in car speakers is flat diaphragms, currently offered by Sony, Ultrad, Pioneer, and SFI; they should be appearing in many other product lines in the future. Why flat? Primarily for easy installation and easy shipping. Space is critical in both instances, and flat speakers have very low profiles and take up little space.

In the past, flat drivers have not enjoyed much success in home applications because of the very non-linear behavior of such drivers once the breakup level was exceeded. But intensive research efforts have been devoted to improving such drivers in Japan, and such research may bear fruit. Then, too, the ready availability of steep-slope electronic crossovers tends to make breakup problems less critical in car installations than in single-amped domestic speakers.

Meanwhile, cones and domes are still the predominant drivers in use, with paper very rapidly giving way to synthetic cone materials. Philips recently showed a new acrylic-fiber cone material, and combinations of polymer plastics with carbon also seem to be finding favor. Of course, in an automobile, the linearity and self-damping characteristics of a cone material are almost secondary to its ability to survive extremes of temperature and moisture.

A s far as speakers are concerned, no radically new categories have appeared this year, but there does seem to be a significant increase in large, portable, upholstered box systems intended for use in pickup trucks and vans. Such systems, which are larger than many home speakers, are made by a number of manufacturers, including Pyle, Philips, Poly Power, Devastator, and Stillwater Designs.

Growth also seems to be occurring in the area of subwoofers, and a number of manufacturers are offering 12-inch and even 15-inch cones. The growing popularity of high-powered, multi-amped, bass-heavy custom systems may have contributed to this trend.

Things to Come

The most interesting future products from autosound manufacturers may not be audio components at all. Last year Etak, a small Northern California firm, introduced a cassette-based navigation system for automobiles that projects road maps on a small stalk-mounted video screen. Philips recently showed a more sophisticated system of this type based on a laser-scanned video disc, and the company has developed a radio navigation system using satellite signals.

We can expect research efforts in sound reproduction to focus on two areas: more sophisticated system equalization and better switching power supplies. Another possibility is fully digital amplifiers. The shape of future systems is, of course, unknowable, but we can be fairly certain that the industry will continue to promote what's new.

S T E R E O  R E V I E W  M A Y  1 9 8 6  6 3
SONY'S revolutionary CDX-A10 “DiscJockey” is more than just a car Compact Disc player, more even than a car CD changer, novel as that is. It is even more than just an unusually impressive engineering tour de force of miniaturization. What it represents is the first step toward moving car stereo electronics out of the dashboard and into the trunk or another protected area—safe from covetous eyes and meddling fingers.

The DiscJockey consists of two basic modules and an optional third. The main unit, designed for trunk mounting, is a combination CD player/changer and preamplifier inside a protective case measuring about 12¾ x 5¼ x 8¼ inches. Its weight is about 12½ pounds. A long umbilical cable connects the trunk unit to a remote control/display unit, called the Commander, that measures 7 x 1 x 2 inches. The cable's length allows the Commander to be placed virtually anywhere in the car within reach of the operator—who doesn't have to be the driver.

The Commander's dimensions allow it to fit into a
Besides testing the Sony CDX-A10 Disc Jockey and the XT-10 tuner on the bench, operating them from a 14.4-volt d.c. power supply, we also connected the audio outputs to a high-quality music system and spent some time listening to both tuner and CD sources and using the system's various operating features.

The maximum unclipped output across a standard EIA load of 10,000 ohms in parallel with 1,000 picofarads was about 1.7 volts, and the channel levels (from a CD test disc) differed by 0.36 dB with the control unit's balance indicator centered. The interchannel phase shift was 72 degrees at 20,000 Hz and varied between about 9 and 30 degrees over much of the audio range; presumably this effect was due to the tone-control circuits and not the CD player itself. The square-wave response indicated that analog low-pass audio filters were used.

Other measurements, though not always a matter of home CD players, were far superior to any analog system, including distortion at 1,000 Hz of 0.2 percent referred to the 0-dB level and 0.025 percent referred to −20 dB; A-weighted signal-to-noise ratio of 93 dB; frequency response from 20 to 20,000 Hz ± 0.4 dB; and channel separation of 68 dB at 1,000 Hz and 37.5 dB at 20,000 Hz.

The CDX-A10 was outstanding in its error correction and ability to withstand physical shock. All the calibrated errors on our Philips TS44A test CD were played without a problem, and the player made the transition from Track 17 to Track 18 of the TS4 disc with no loss of the opening syllable of the second track. It scanned from Track 1 to Track 15 of that disc in 4 seconds (about average), but about 10 seconds were required when a disc change was involved. On the test bench there were audible mechanical sounds during a change, but these would not be heard from a trunk-mounted unit. As for coping with physical shocks, the CDX-A10 was clearly the best CD player we have seen in this respect, as it would have to be for its intended service environment. The most violent pounding on the case of the changer—even dropping it on the bench from a height of several inches—produced not the slightest audible malfunction.

The XT-10 tuner module's FM section was also very good with respect to usable sensitivity (8.3 dBf, or 0.7 μV, in mono) and most other characteristics. The 50-dB quieting sensitivity was 20 dBf (2.8 μV) in mono but unmeasurable in stereo because of the automatic channel-blending circuitry. Signal-to-noise ratio at 65 dBf was 74 dB in mono, 69.5 dB in stereo. Capture ratio at 65 dBf was 2.5 dB. Frequency response was 30 to 15,000 Hz + 1.5, −3 dB. Channel separation was 33 dB at 100 Hz, 42 dB at 1,000 Hz, and 31 dB at 10,000 Hz.

The automatic tuning distortion (THD + noise) like that of most car radios we have measured, was higher than that of a typical home receiver: 0.38 percent in mono, 2.76 percent in stereo (at 65 dBf). Measuring the alternate-channel selectivity, however, yielded a minimum of about 110 dB, a figure we find very hard to believe. Sony's rating is 75 dB, a good figure in itself. The adjacent-channel selectivity of 3.5 dB was more consistent with typical car tuner performance.

The AM tuner section's frequency response had a peak of more than 11 dB at 30 Hz and rolled off above 1,000 Hz but varied only ± 6 dB overall from 50 to 3,000 Hz. The tone controls had excellent response characteristics, with a sliding bass turnover point from about 200 to 100 Hz and a maximum boost or cut of 12 dB. The treble response curves hinged at about 1,500 or 2,000 Hz, and their range was ± 7.5 dB at 20,000 Hz.

Standard dashboard cutout is desired, but such a "hard-wired" installation seems to miss the point. The chief advantage of the Disc Jockey is that the control module can be put in any convenient position—on top of the dash, on the adjacent seat, on top of the trunk, or anywhere else one wants to put it, and can be controlled remotely by the Commander. The tuner is housed in a flat metal box about 6 or 7 inches square and 1 inch thick. Besides the cable connecting it to the CDX-A10 preamplifier, there is a coaxial antennacable extension that accepts the car's existing antenna cable at one end and plugs into the tuner module at the other. Suggested retail price for the CDX-A10 two-piece system is $999.95; the XT-10 tuner costs $129.95. An Automotive Jukebox

The CDX-A10's main unit has line-level outputs for driving external front and rear stereo power amplifiers and speakers (not included). Brackets are supplied for rigidly mounting it on the trunk floor (or another suitable surface). A hinged, rubber-gasketed cover seals out moisture and dirt. Opening the cover reveals the CD player/changer, which is designed to accept a special disc magazine, the XA-10, that holds up to ten CD's. The inner case is suspended on soft springs that effectively isolate the player from road shocks and physical vibration from the car. The magazine-and-changer system answers one of the more serious objections that might be leveled against an automotive CD player—the difficulty, and even danger, of inserting and replacing discs while one is driving. Ten CD's can provide enough varied entertainment for the longest period of uninterrupted driving anyone is likely to do.

To facilitate selection and programming, Sony supplies a folder with each disc magazine that has ten transparent envelope "pages" into which you can slip the printed cover/annotation inserts from the CD jewel boxes. The folder can be kept with the Commander to give instant reference to the contents of each disc and the order in which they are loaded in the magazine.

Remote Commander

The CDX-A10's remote Commander contains a number of push-buttons, most of which serve dual functions for either CD or tuner operation. It also switches the system power and has a multifunction illuminated LCD display window. In the tuner mode, the display shows the tuned frequency, band, preset station number, local/dx mode, and mono/stereo mode. Up to ten AM and FM station frequencies can be stored in the tuning memory. A row of short bars in the window shows the relative volume for display.
setting, which is raised or lowered by pressing the UP or DOWN control button. A unique SELECT key changes the function of the UP/DOWN keys, and the display indications, to adjust the bass and treble tone-control response, the left/right balance, and the front/rear fader. The tuner has automatic (signal-seeking) scan as well as channel-stepping and rapid-scan modes.

In CD operation, most of the Commander's controls work analogously to their tuner functions. The ten station-preset buttons are used to select or program particular discs and tracks. The player can be programmed to play up to ten selections or discs in any order along with many other programming options, giving the CDX-A10 the most extensive CD programming facilities we have seen. The tuner scanning buttons are used to step the laser ahead or back one track at a time or to advance it rapidly (with audible playback) to a specific passage. The display shows the program number (if applicable), the current disc and track numbers, and elapsed playing time on that track.

The Commander also has three SOUND EFFECT keys that function with either the CD or the radio input. The SURROUND key feeds an L—R signal to the rear speakers for enhanced ambience. And there are two controls—identified as DRS 1 and DRS 2 (for Dynamic Range Suppression)—that compress a CD's wide dynamic range by different amounts in order to make the quiet passages more audible in the relatively noisy car environment.

**Performance**

When the CDX-A10 was connected to a home hi-fi system, it performed as well as its excellent bench measurements (see box) would suggest. The XT-10 tuner module was equally impressive, outperforming most conventional car stereo tuners in many respects.

The Sony DiscJockey could even be a highly satisfactory, though fairly expensive, substitute for a standard home CD player. Its remote Commander has all the operating controls you would need other than the power switch for a 12-volt d.c. power supply, and the player/changer unit could be tucked away almost anywhere. More realistically, besides automotive use, the system would be ideal for a motorhome or trailer installation, to which it would bring real high fidelity if teamed with good mobile power amplifiers and home-type loudspeakers.

The Sony CDX-A10 and its accessory tuner are emphatically not "just another car stereo," even if a deluxe model. The price and installation requirements make it unlikely that the DiscJockey will be a mass-market item, but we are likely to see future products incorporating some of its design concepts that will make their mark on home systems as well as in mobile applications. In fact, Sony tells us that the same disc magazine will be usable in future home CD changers. Sony's reputation for product innovation is reinforced by the DiscJockey.

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**ROAD TESTS**

MY experience with the Sony DiscJockey was in a Sony-owned van that was also fitted out with the company's new automotive video component system. With the small remote Commander, whose long umbilical cord allows you to place it anywhere, comfortably in the palm of my hand, I began my initial check of the controls.

All the preamplifier functions—such as bass, treble, volume, balance, and front/rear fader—are compactly yet logically placed on the nearly flat control surface. Of course, the buttons and readouts appropriate for the signal source in use are illuminated. Having only the pertinent data at your fingertips is becoming commonplace in high-end car stereo gear, but the Sony Commander's display is better than most.

For instance, the volume setting is clearly indicated even when the system is turned off, so there's no way you'll suffer from audio meltdown when you power up.

Although I was able to find my way around the basic functions immediately, because many of its moderately "familiar" at first glance, my learning curve for the various kinds of CD programming was longer. You can program up to ten track selections from anywhere on the ten discs in the magazine, program up to ten complete discs in any order, or simply play any particular disc. A disc that's just the tip of the programming iceberg, with a fifteen-track non-rotatable memory option included as well. Cueing between discs takes just 10 seconds, even between Disc 1 and Disc 10.

One element that makes the car/CD marriage fascinating to anyone who likes dynamically wide-range music, such as symphonic works, acoustic jazz, and good vocal recordings, is that the dynamic "window" in a moving car is much narrower than the program material. With this in mind, Sony has included a three-position dynamic-range control on the Commander. In its normal (off) setting, the signal is untouched. The other two settings, DRS 1 and DRS 2, respectively provide mild compression or somewhat more emphatic compression to "tame" excessive peak levels. The quiet passages are left unaltered, but the compression of the louder passages brings them relatively closer to level.

At the several volume settings—and highway speeds—I tried, I found that the DRS1 setting gave more musically pleasing results for critical listening. The DRS2 setting, however, was able to reduce the contrast between very loud and very soft passages to the point where I no longer felt I had to use the volume control to level things out relative to vehicle noise. We have needed a dynamic-range control in high-end auto sound equipment for a long time—cassettes could benefit from such a feature too—and it's nice to see the first one becoming a reality.

Such dirty tricks as a drive through the crated streets and alleys around the old Brooklyn Navy Yard left the DiscJockey CD player unfazed. Railway crossings, missing pavements, frost heaves, and hard turns did not cause it to skip even once. I have never experienced with cassette players the same kind of "FM Bermuda Triangle" beneath the old Brooklyn Navy Yard left the DiscJockey unfazed. Railwa crossings, missing pavements, frost heaves, and hard turns did not cause it to skip even once. I have never experienced with cassette players the same kind of "FM Bermuda Triangle" beneath the old Brooklyn Navy Yard left the DiscJockey unfazed.
ONCE you've heard great car stereo sound, there's no way you'll ever be satisfied again with ordinary car stereo. In fact, many people who have experienced the best would rather travel in silence than listen to anything less.

Getting that great sound, however, is not just a matter of walking into a store and plunking down your American Express card. You can't just buy any conglomeration of components that fits your fancy and your budget—you have to plan your car stereo system around your car. A little bit of common sense and a little bit of homework will go a long way toward getting you the best possible sound in your car. To start with, here are some tips to point you in the right direction and help you avoid the pitfalls waiting for the ill-prepared shopper.

1. Listen to other car stereo installations.

Start listening critically to car stereo systems owned by friends, and go around to local dealers to hear what they have to offer. As you become more experienced and more critical, you will get a clearer idea of what you want for your own car—and you'll be better prepared to evaluate alternatives. For instance, you'll learn the difference between good, clean, solid bass and the boomy, overemphasized bass common in mass-market installations. Audition systems with a cassette you know well from home listening so you can tell when the tonal balance is off or the imaging isn't right.

2. Evaluate your own car.

Your car's design configuration will determine what you can and cannot do when it comes to installing speakers, wires, in-dash head units, and other components. In most cars the location of the head unit will be pretty obvious, but if you want to add an equalizer, a CD player, or a booster amplifier you need somewhere to put it. If you can't live without at least five 100-watt amplifiers but your Toyota lift-back only has room under the cargo deck for two James Michener novels, you'll need to develop an alternate plan.

For speakers, look at the existing
mounting holes, if there are any, and then survey the dashboard, doors, kick panels, and any rear surfaces that might be used. Try to determine if there is room behind these surfaces for the speakers or if they will interfere with the door latch or window hardware.

Don't put a square peg in a round hole.

Most of today's cars come with pre-engineered mounting holes for a radio and speakers. Some cars have dashboards that can accommodate almost any head unit made; others have small dash openings with little clearance behind them. A reputable dealer will have various manufacturers' installation guides, which will tell you if their products will fit your car with no modification, with minimal modification, or only after major dashboard surgery. The same is true for loudspeakers. If there is room for a 4-inch driver in the door and a 6 x 9-inch in the rear deck, the least troublesome system you can select is one that uses speakers of those sizes in those locations. Choosing speakers that won't fit means more work and more money for the installation, but the results may be worth the cost.

Install it professionally.

Even if you believe you are capable of doing a professional-quality car stereo installation on your own, think twice before you charge ahead. If it is a relatively easy job—such as replacing an existing speaker with one about the same size or installing a radio in a dashboard where there is plenty of room to work and the wiring is very straightforward—then read over the directions several times and proceed with great caution. If the job looks feasible but still somewhat challenging, however, you should probably take it to a professional installer—such installation jobs are almost always much harder than they look. When in doubt, go to a pro.

Find a dealer you can trust.

Choosing a dealer/installer is one of the hardest parts of buying a car stereo system. While there are some very good independent installers, it is safest to have the system installed by the dealer who sells it to you. Otherwise, if you have problems with it, the dealer can blame the installer and the installer can blame the dealer's equipment, and neither may fix the problem without extra charge.

Before you buy anything, ask to see the dealer's installation facilities and to inspect some of his work in progress or some recently completed installations. If he refuses access and gives you the old line about his insurance policy not allowing customers in the work area, shop elsewhere.

Choose the speakers first.

Most people buy a car stereo system backwards. They buy the in-dash unit, and perhaps some amplifiers, and then, almost as an afterthought, they buy some speakers. And since they probably went over budget on the electronics, they try to scrimp on the speakers. In terms of your final objective, however, speakers, and speaker locations, are the first things you should choose. This is where the time you spent evaluating your car and thinking about what you want from your system will pay off. And be sure to insist on good speakers from a reputable manufacturer.

Keep your speaker system simple.

Too many people think that the key to great car stereo sound is to install dozens of speakers in every available nook and cranny—an approach that has resulted in some pretty absurd and generally rotten-sounding systems. Some of the most successful car stereo installers keep their systems simple, using a mid-range/treble speaker in each of the car's four corners and a subwoofer/system wherever it fits.

Usually it's best to have four identical corner speakers, or at least speakers that sound very similar, since using speakers with different characteristics could make the sound image shift around as the different models favor different frequencies in the program. As much as possible, aim each speaker at the listener on the opposite side. That way the speaker closest to each listener is somewhat off axis, reducing its apparent loudness, while the far speaker is on axis and sounds louder. Carefully done, such an installation can give both front-seat passengers the impression of an equal left-right channel balance.

If you can't afford a separate subwoofer/bass speaker for frequencies under 125 Hz—which will require a crossover and another power amplifier—try using two midrange/treble speakers up front and a pair of similar full-range speakers in back.

If your system has problems with tonal balance, these can usually be cured with careful adjustment of tone controls, the loudness control, or, if necessary, an equalizer. If you have an equalizer, it's best to adjust it carefully and install it out of sight so bored passengers can't mess up your settings.

Get more power than you think you'll need.

Because of the high ambient-noise levels in moving cars, car stereo speakers and amplifiers have to work much harder than their living-room cousins. Even people who say they prefer quiet listening turn up the volume when they have a clean-sounding, adequately powered system. The reason many systems in cars aren't played loud is that their underpowered amplifiers are driven to high distortion levels at anything but the lowest volumes, making the music unpleasant to hear. Moreover, the distortion from an amplifier that is being pushed too hard contains a lot of high-level, high-frequency signals that can burn out a tweeter.

Beware, however, of unrealistic amplifier power ratings. Some car stereo manufacturers claim an output power that produces 10 or 15 percent distortion, and some four-channel amplifiers carry as their rated power the total output for all four channels. I have seen "100-watt" amplifiers that, in reality, could deliver only 15 watts per channel with acceptable distortion.

Consider separate components as well as all-in-one head units.

At first glance, most car stereo head units seem pretty much alike, but there are some significant variations. A cassette tuner includes a tuner, a cassette player, and a
buy a car stereo cassette player with those noise-reduction systems. But if you only buy mass-produced prerecorded cassettes, almost all of which use Dolby B, that is all you need. Be aware, however, that there are some good prerecorded Dolby C cassettes on the market, and once you have a good car system you may find your cassette buying becoming more discriminating.

**Look for a tape player with the right balance of features.**

Autoreverse cassette decks can work pretty well, but many don't deliver the same frequency-response performance in both directions because of the difficulty of maintaining precise azimuth alignment. Recently, some manufacturers have started offering high-performance unidirectional car decks. You need to decide which is more important to you: the convenience of autoreverse or the possibility of higher performance from a unidirectional deck.

An important feature that is available on better cassette units is key-off eject/disengage. If you have trouble remembering to eject the tape before you turn off your car's ignition, this feature will do it for you, saving you from dented tapes, a dented pinch-roller, and the increased wow-and-flutter and even jamming that can result from leaving a cassette loaded with the mechanism engaged.

**Don't overlook Compact Discs.**

There are several ways to play CD's in your car. You could get one of the new tuner CD players and forget about tape, or you can buy an add-on CD player and keep your radio cassette player. A variation on the latter option is to use one of the many CD adaptors to connect a portable CD player to your system. It could run off its own batteries or be plugged into the cigarette-lighter socket. This route is a bit awkward, but it might be a good interim sound system before you buy a car CD player.

**Shop around.**

Product quality in the car stereo field varies greatly, with performance ranging from near-audiophile level to worse than "mid-fi." To get good sound in your car, you'll have to study test reports, get recommendations, and shop just as carefully as you would for your home system. Check specifications, compare features, and get some hands-on feel for the controls. If a cassette radio is awkward to adjust in a display board, it will be almost impossible to deal with while you're driving. If the controls feel cheap and flimsy, the problems may be more than cosmetic. Buying from a reputable car stereo specialist is a good way to avoid junk products.

**Don't get discouraged.**

For every piece of well-engineered, well-made car stereo equipment on the market, there are dozens of "bargain" units that make your ten-year-old clock radio look sophisticated. For every good car stereo dealer/installer, there are a lot of other people selling car stereo equipment. You may not find the right mix of product range and installation expertise at your first stop, but keep looking. Once you hear the system that careful shopping can achieve, you'll wonder how you ever lived without it.


AFS Kriket, P.O. Box 68893, Indianapolis, IN 46268. (317) 872-0088. Speakers.

Aiwa America, 35 Oxford Drive, Moonachie, NJ 07074. (201) 440-5220. Cassette radios, equalizer amplifiers, speakers.

Alaron, 185 Park Street, P.O. Box 550, Troy, MI 48099. (313) 585-8400. Cassette radios, equalizer amplifiers, speakers.

Allsop, 227 N. El Camino Real, Box 2486, Encinitas, CA 92024. (206) 734-8461. Cassette radios, amplifiers, equalizer amplifiers, speakers.

Alphasonik, 701 Heinz Avenue, Berkeley, CA 94710. (415) 548-4005. Cassette radios, equalizers, speakers, accessories.


Babb Corporation, 3230 A Towerwood, Farmer's Branch, TX 75234. (214) 484-8573. Speakers.

Bib Hi Fi Accessories, P.O. Box 27682, Denver, CO 80227. (800) 325-0853. Accessories.

Blaupunkt, 2400 South 25th Avenue, Broadview, IL 60153. (312) 865-5200. Cassette radios, cassette tuners, CD components, amplifiers, equalizer amplifiers, signal processors, speakers, accessories.

Boston Acoustics, 247 Lynnfield Street, Peabody, MA 01960. (617) 879-7330. Amplifiers, speakers.

Bose Corporation, 100 The Mountain Road, Framingham, MA 01701. (617) 846-8100. Speakers.

B&W Loudspeakers, P.O. Box 653, Buf falo, NY 14240. (416) 297-0595. Speakers.

Bose Corporation, 100 The Mountain Road, Framingham, MA 01701. (617) 879-0001. Speakers.


Bullion Corporation, 9409 Owensmouth Ave., Chatsworth, CA 91311. (818) 709-9400. Amplifiers, speakers.

Carver Corporation, P.O. Box 1237, 19210 33rd Avenue W., Lynnwood, WA 98036. (206) 775-1202. Cassette tuners, amplifiers.

Cerwin-Vega, 12250 Montague Street, Arleta, CA 91331. (818) 896-0777. Signal processors, speakers.

Clarion, 5500 Rosecrans, Lawndale, CA 90260. (213) 973-1100. Cassette radios, equalizer amplifiers, signal processors, speakers, accessories.

Concord Electronics, 6025 Yolanda Avenue, Tarzana, CA 91356. (818) 344-9335. Cassette radios, amplifiers, signal processors, speakers.

Coustic, 4260 Charter Street, Vernon, CA 90058-2596. (800) 227-8879. Cassette radios, amplifiers, equalizer amplifiers, signal processors, speakers.

Craig Corporation, 921 W. Artesia Blvd., Compton, CA 90220. (213) 537-1233. Cassette radios, equalizer amplifiers, speakers.

Canton North America, 254 First Avenue North, Tarzana, CA 91356. (818) 344-9335. Accessories.

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CAR STEREO MANUFACTURERS

Craigslist, 425 P.O. Box 229, Riverdale, NJ 07457. (201) 835-5002. Accessories.

Cribbage, 9409 Owensmouth Ave., Chatsworth, CA 91311. (818) 709-9400. Amplifiers, speakers.

CromaClean, 4395 Valley Fair Road, Simi Valley, CA 93063. (805) 527-7690. Accessories.


Discwasher, 1407 N. Providence Road, Columbus, MO 65201. (314) 449-0941. Accessories.

Discwasher, 1407 N. Providence Road, Columbus, MO 65201. (314) 449-0941. Accessories.

Discwasher, 1407 N. Providence Road, Columbus, MO 65201. (314) 449-0941. Accessories.

Discwasher, 1407 N. Providence Road, Columbus, MO 65201. (314) 449-0941. Accessories.
JBL (Harman America), 240 Crossways Park West, Woodbury, NY 11797. (516) 496-3400. Speakers.

Jensen Car Audio, 4136 North United Parkway, Schiller Park, IL 60176. (312) 671-5680. Cassette radios, amplifiers, equalizer amplifiers, speakers.


JVC Corporation of America, 71 Slater Avenue, Middletown, RI 02842. (800) 421-1910. Cassette radios, cassette tuners, amplifiers, equalizer amplifiers, signal processors, speakers.


MTX Electronics, One Mitek Place, Winslow, IL 61089. (815) 367-3811. Speakers.

Mustang Electronics, 11 West 30th Street, NYC 10001. (800) 327-1544. Cassette radios.

Nakamichi USA Corporation, 19701 S. Vermont, Torrance, CA 90052. (213) 538-8150. Cassette tuners, amplifiers, signal processors, speakers, accessories.


Peconic Industries, 1157 Pagni Drive, Elk Grove Village, IL 60007. (800) 228-6380. Cassette radios, amplifiers, equalizer amplifiers, speakers.

Phase Linear by International Jensen, 4134 N. United Parkway, Schiller Park, IL 60176. (800) 323-4815. Speakers.


Pompano Manufacturing, 2501 NW 17th Lane, Pompano Beach, FL 33064. (305) 979-4305. Accessories.

Precision Power, 2140 East 5th Street, #8, Tempe, AZ 85281. (602) 947-1444. Amplifiers, signal processors, speakers.

Proton, 777 W. Artesia Boulevard, Compton, CA 90220. (213) 638-5151. Cassette radios, cassette tuners, amplifiers, equalizer amplifiers, signal processors, speakers.

Pyle Industries, 501 Center Street, Huntington, IN 46750. (219) 356-1200. Cassette radios, cassette tuners, equalizer amplifiers, signal processors, speakers.

Realistic (Division of Tandy Corp.), 1300 One Tandy Center, Fort Worth, TX 76102. (817) 390-3011. Cassette radios, amplifiers, equalizer amplifiers, signal processors, speakers.

Recoton Corporation, 46-23 Crane Street, Long Island City, NY 11101. (718) 392-6442. Accessories.

Sansui Electronics Corporation, 1250 Valley Brook Avenue, Lyndhurst, NJ 07071. (201) 460-9710. Cassette radios, cassette tuners, amplifiers, equalizer amplifiers, speakers.

Sanyo, 1200 Artesia Boulevard, Compton, CA 90220. (213) 537-5830. Cassette radios, CD components, amplifiers, equalizer amplifiers, signal processors, speakers, accessories.

Scopec Industries, 4565-8D Industrial Street, Simi Valley, CA 93063. (805) 522-1827. Accessories.

Sentrek Industries, 751 Racket Club Drive, Addison, IL 60101. (312) 628-6767. Cassette radios, amplifiers, equalizer amplifiers, signal processors, speakers.

Sharp, 10 Sharp Plaza, P.O. Box 588, Paramus, NJ 07652. (201) 265-5600. Cassette radios, speakers.

Sherwood, 13845 Artesia Blvd., Cerritos, CA 90701. (213) 926-6337. Cassette radios, amplifiers, equalizer amplifiers, speakers, accessories.

Sonic Research, 180 Sunny Valley Road, New Milford, CT 06776. (203) 354-9332. Speakers.

Sony, Sony Drive, Park Ridge, NJ 07656. (201) 930-1000. Cassette radios, cassette tuners, CD components, amplifiers, equalizer amplifiers, speakers.

Soundstream Technologies, 2907 182nd Street, Redondo Beach, CA 90278. (213) 214-4652. Cassette tuners, amplifiers, signal processors, speakers.

Southern Audio Services, 2099 Crater Lake Dr., Baton Rouge, LA 70814. (504) 924-9964. Speakers.

Sparkomatique, Routes 6 and 209, Milford, PA 18337. (717) 296-6444. Cassette radios, amplifiers, equalizer amplifiers, speakers, accessories.


Speco, P.O. Box 624, Lindenhurst, NJ 11757. (800) 645-5516. Equalizer amplifiers, speakers, accessories.

Stillwater Designs, 1212 South Main, Stillwater, OK 74074. (405) 624-8510. Speakers.

Sunnyong, 30 Congress Drive, Moonachie, NJ 07047. (212) 620-7177. Cassette radios, amplifiers, equalizer amplifiers, speakers.

Technics, One Panasonic Way, Secaucus, NJ 07094. (201) 348-7000. Cassette radios, cassette tuners, CD components, amplifiers, equalizer amplifiers, signal processors, speakers.

Ultrx, 1200 Artesia Boulevard, Compton, CA 90220. (213) 537-5830. Cassette radios, amplifiers, speakers.

Yamaha Electronics, 6600 Orange Grove Avenue, Buena Park, CA 90620. (714) 522-9105. Cassette radios, cassette tuners, CD components, amplifiers, equalizer amplifiers, signal processors, speakers, accessories.
THE career of the French-Swiss conductor Charles Dutoit is zooming like few others on the classical-music scene today. His London/Decca recordings with the Orchestre Symphonique de Montréal are best-sellers as LP’s, cassettes, and Compact Discs. One critic recently called Dutoit/Montreal the hottest team since Sir Georg Solti and the Chicago Symphony.

Dutoit, who turns fifty this coming October 7, is also in demand as a guest conductor by virtually every major orchestra on both sides of the Atlantic, and he is the only conductor other than Leonard Slatkin who has conducted all of America’s “Big Five” (Boston, Chicago, Cleveland, New York, Philadelphia) in the same season. This spring he completes a three-season stint as principal guest conductor of the Minnesota Orchestra, and he is already booked as a guest with the New York Philharmonic, the Philadelphia Orchestra, and the Metropolitan Opera, among others, through 1990.

There are some detractors who say that Dutoit’s tall-dark-and-handsome looks, his lively, ingratiating manner, and his dapper, square-jawed sexiness on and off the podium have had more to do with his success than his music making. Some critics wonder whether he conducts the French repertoire he specializes in as well as such illustrious predecessors as Ernest Ansermet, Pierre Monteux, and Charles Munch.

Dutoit’s many admirers, on the other hand, feel that he does. And almost everyone agrees that he is one of the few conductors to rise to prominence in recent years who are more concerned with style, orchestral color, and the texture of sound than with interpretation. Dutoit’s standards for sound are high and unflinching.

“I hate the brown international sound,” Dutoit told me during an interview in New York. “It’s what we call in French passe-partout—something that fits everything. I am much more concerned about the specific color of every piece I play.”

As he talks, Dutoit’s words flow quickly and spiritedly, with his light French accent adding lilt to his phrases. “Style, for me, is the basic thing we have to solve,” he says. “There is an enormous difference between the way Schubert and Mozart should sound, or between Schumann and Brahms, and so on.”

Dutoit points out that his mentor, Ernest Ansermet (founder and for many years conductor of the Orchestre de la Suisse Romande in Geneva), had a big influence on him in this regard. “He made me aware of the different colors in different composers—such as...
the differences in Stravinsky and Bartók, and composers of every period.

"There is also a big difference between playing loud and playing noisy," he continues. "In some halls, I always have to remind the brass and percussion to play loud and lively, with full texture, but not noisily. The more you force an instrument, the less you produce. I like beautiful sound. Most of the repertoire is made to sound beautiful—except maybe for some modern pieces with their very strange noises and effects."

At a time when many other orchestras have lost their recording contracts or get recording engagements only infrequently, the Orchestre Symphonique de Montréal has maintained one of the busiest recording schedules in the world. "I think a big part of our success is our work on balance, color, and sound," Dutoit says with pride.

He prefers to record using only two tracks, not the multitrack system that is prevalent today. With the latter, he complains, the engineers do the mixing of the performance, not the conductor. "If you use fourteen or sixteen tracks, with everything mixed separately, the conductor can never really judge balances," he argues. "Then, while listening to a playback after a take, if the conductor says this or that balance isn't good, the producer can say, 'Don't worry, we'll fix that in the mixing.' I hate that! London/Decca doesn't do that. What I hear in the playback is what's going to be produced on the record. Since music is the art of sound, I think the sound on a record must be what the conductor wants."

Compared with many other present-day conductors, Dutoit was a latecomer to music. He grew up in Lausanne, and he was about eleven when he began lessons on the violin. As a teenager, he pursued musical studies at the Lausanne Conservatory, then at the Academy of Music in nearby Geneva, where he came under the spell of Ansermet. He studied violin, viola, piano, and percussion and then moved on to composition and conducting at the Accademia Musicale Chigiana in Siena, Italy, and at the Berkshire Music Center at Tanglewood in the United States.

In 1963, Dutoit became an assistant conductor with the Berne Symphony and made his conducting debut with that orchestra. A performance of Stravinsky's Le Sacre du printemps brought him to the attention of Herbert von Karajan, who invited him to the Vienna Opera in 1964 as an assistant. He subsequently held conducting posts in Zurich, Gothenburg, and Mexico City, steadily building his repertoire and developing his all-important sense of style and color.

Dutoit credits Zubin Mehta and Isaac Stern with the breakthrough that led to Montreal. "Zubin was one of the first to have confidence in me," he says. "Back in the Sixties, he invited me to Israel to conduct the Israel Philharmonic, and the music making was wonderful. As a result, Zubin spoke to his brother Zarin (now the Montreal orchestra's manager), and Isaac recommended me to Montreal at the same time. I conducted in Montreal in February of 1977—and six months later I became music director."

In Montreal, Dutoit found a symphony orchestra that had fallen on difficult times in the ten years since Zubin Mehta had left it. (Mehta had shared the Montreal and Los Angeles Philharmonic directorships for most of the Sixties.) According to Dutoit, "The orchestra was depressed and looking for somebody to do something. I guessed right away what could be done with motivation, drive, and ambition in the good sense. So I said let's see what we can do. I was a catalyst." He was also French-speaking and from a basically French cultural background, unlike his immediate predecessors. He used those assets—plus his own considerable skills and commitment—to give the orchestra

During our interview, I asked Dutoit for his personal comments on some other conductors, past and present:

Ernest Ansermet: "He was a tremendous influence on my development, not only musically but also intellectually. He was a humanist who needed to understand many other fields and to relate them to each other. He brought so much clarity and light to music."

Charles Munch: "An extraordinary performer! He was almost a monster on the stage, in the sense that he just took over the orchestra and made everything his thing. It was hard to remain seated after a Munch performance. When I was a student at Tanglewood, I got to talk to him a lot. I liked him very, very much."

Pierre Monteux: "I met him only twice, at Tanglewood. He was so adorable, in a good sense, and so charming with his white shoes, white suit, and white mustache. I was so impressed when he gave the downbeat for Strauss's Don Juan. It was just a very small motion—and the orchestra was exploding! He had tremendous control with such tiny movements."

Herbert von Karajan: "He is just the opposite of Ansermet and others who relate music to philosophy and light. He is more the Black Forest style of shadow and darkness and mystery. But I learned from his concentration—you know, like a yogi, with power coming from the inside. I played viola in his Lucerne Festival orchestra several sum-
motivation, discipline, and a sense of style. He made it clear that he would not tolerate sloppiness, mediocrity, or an "I don't care" attitude. Soon both the orchestra and its conductor were the talk of the town—and then, through recordings, of the whole music world.

Dutoit has now hired about sixty percent of the orchestra's players. Many of them are young, and there is no longer a primarily provincial character to the orchestra. "Whenever we have an opening," he says, "I try to hire the best that is available—wherever the player is from. Of course, whenever we can get a good qualified Canadian, I feel it is better for the stability of the orchestra to hire a Canadian musician."

Is there much rivalry between the Montreal orchestra and the Toronto Symphony? Dutoit smiles impishly. "Oh, yes, an active rivalry—but it's a cordial one. I've conducted in Toronto, and Andrew Davis has conducted in Montreal. I've told Andrew we should work out some kind of regular exchange, but now, as you must know, he is leaving Toronto, so I don't know what will happen with his successor."

Dutoit bristles a bit whenever he hears himself and the Montrealers described only in terms of French music. His own repertoire, he points out, runs from Monteverdi to Gershwin and Stockhausen. As he puts it, "We have had some of our biggest recording successes with the French repertoire, especially Ravel. But we have also recorded Russian music, such as Rimsky-Korsakov's Scheherazade and Stravinsky's Sacre, Spanish music by Falla, Respighi's Roman trilogy (Pines, Fountains, Festivals), a Mendelssohn record, and a Bartók record. And this spring we will record Holst's The Planets. One of our latest is a record of seven Suppé overtures—German music, lovely music that shows off our brio and virtuosity, and music that is fun to play. There's nothing wrong with that."

Like most conductors today, Dutoit admits that he rarely gets a chance to hear other conductors with their home orchestras. Whenever he goes to a city as guest conductor, the music director is usually off conducting somewhere else. "Most of us know each other chiefly from records," he says with a shrug.

"I conduct about 150 concerts a year, and when I do have a day off I don't often feel like going to a concert. I like to go to the theater. Or, best of all, I like to stay at home with my beautiful wife." Marie-Josée Drouin is Dutoit's third wife and a Canadian celebrity in her own right. An economist, she is executive director of the Hudson Institute of Canada, the country's top "think tank." Dutoit remains good personal and professional friends with his second wife, the Argentine pianist Martha Argerich. "We are civilized people," he says without defensiveness. "She played concerts with us recently on our European tour."

Dutoit's contract in Montreal runs through 1988, and he has already been approached by other orchestras in North America and in Europe. "I haven't made up my mind yet what I will do," he says, "but I would certainly not like to destroy what I have done in Montreal by leaving abruptly. Europe is something very special, but I've come to the point now where I prefer the American society to work with. Here people are more enthusiastic about taking chances. I like that. For at least the next ten years or so I want to stay here. I'm very happy in this part of the world."

A few years ago, some critics were saying that second- and third-level orchestras in North America were doomed, that only the top five to ten major orchestras could survive healthily in the near future. Charles Dutoit and the Orchestre Symphonique de Montréal have done much to change that prognosis—and in the process they have brought new excitement to the cultural life of this continent.
DIGITAL recording technology and the Compact Disc system have brought change to almost every aspect of hi-fi. Music is recorded and played back differently, and without the annoyance of tape hiss and the ticks and pops of LP surface noise, it actually sounds different. The generally superior sound quality of the CD system is apparent even to audio novices. Everyone I know who has heard a Compact Disc system demonstrated in a home listening room has wanted to buy one.

The speed with which the American public embraced the video cassette recorder was phenomenal. Figures for sales of CD players in the scant three years since they were first offered to American consumers show that the Compact Disc is being accepted at an even faster rate than the VCR.

Your first question in considering the purchase of a Compact Disc player might well be: Is this a good time for me to buy one? The answer to that question is a resounding Yes.

Obstacles to sales in 1983 were the high prices of players and the limited selection of music available on Compact Discs. Both obstacles have been overcome.

Prices have been reduced dramatically, and there is tremendous variety in the kinds of music available on the four to five thousand Compact Discs listed in current catalogs.

Prices now range from less than $200 for a few players marketed under brand names that have not been long associated with hi-fi equipment to more than $1,500 for players with special features. No matter what your budget is, you should therefore be able to find a unit that will permit you to enjoy the benefits of this revolutionary advance in audio technology.

Before you go shopping you should think a bit about the way you listen to music and how you will use your CD player so that you can judge the appropriateness of various features for you. Each extra bell or whistle adds something to the cost of the unit and may add clutter to the control panel and needless complication to the way you operate the machine. I tend to be a minimalist when it comes to features, but there is no reason why you should deny yourself the convenience and pleasure of any of the tricks a CD player can perform, and features constitute one of the principal grounds on which you should base your choice.
An elementary approach that stresses features and simplicity of operation rather than the elusive difference in sound.

Remote control. Manufacturers of television sets have taught us to enjoy the convenience and sense of power that comes from changing channels without leaving one's easy chair—or hot tub for that matter. Similarly, it is very handy to be able to control your CD player from your favorite listening spot. If you listen primarily to pop, rock, or jazz albums made up of many short selections, it is particularly useful to be able to skip a band you don't care for without leaving your seat. Infrared wireless remote controls either come with many of the units that cost more than $500 or $600 or are available as options.

Access functions. An advantage the turntable has over the tape cassette is the comparative ease with which you can locate a particular band on an LP or even a passage of music within a band. Designers of CD players have worked very hard to make it easy to gain quick access to desired passages on a Compact Disc with pinpoint accuracy.

CD's are divided into numbered bands or tracks. If you want to play Track 9, you may have to press a button nine times to select it. But some players have direct access for quicker service—press 9 on a button or key pad and Track 9 is played.

The bands or tracks on a CD may be subdivided with digitally encoded indexing points, which break the tracks down into smaller sections so that you can zero in on the exact part of a piece of music you wish to hear. This is particularly useful with lengthy classical compositions, which may have only three or four tracks for the movements of a concerto or symphony. Not all players can access by index code, but this feature will probably become more important in the future as more Compact Discs are manufactured with indexing cues encoded on them.

There are various scanning and searching functions that give additional flexibility in finding the passages you want to play. You may find it helpful to have audible fast scanning of a disc. Some units have search systems that play the first few seconds of each track until you find one you want to hear.

Programming. Random-access programming is probably the most highly touted convenience feature on CD players. It makes it possible for you to be a disc jockey, reprogram the order of the tracks on a Compact Disc, and play them back in whatever rearranged sequence you wish. Players vary widely in the number of selections they can program.
The top-loading Beogram CDX from Bang & Olufsen looks very different from other players.

If you listen primarily to classical music, it is not likely that you will want to scramble the scenes of an opera or the movements of a symphony and reprogram them out of their normal sequence. But if you listen to a lot of pop albums and if you enjoy putting machinery through its paces, you can have a lot of fun programming a CD player. One Magnavox unit can remember instructions for 785 tracks from different discs.

A programming refinement I like is the Random Play feature on the Pioneer PD-M6 Multi-Disc player. This permits you to leave the random sequence in which the tracks are played to the machine. Giving a pleasant element of novelty to familiar albums, this feature is also available on other players, such as some Sony models on which it is called Shuffle Play.

Displays. The display panel on all the players will tell you which track is being played. A considerable amount of additional information can be called up on certain players—such as elapsed playing time or remaining playing time on a track or disc—which is useful if you do a lot of home taping.

Headphones. There are people who maintain that listening via headphones is the best way to appreciate Compact Discs (or any other kind of recorded music), but not all CD players are equipped with headphone jacks. If you want this feature, look for a unit that also has a separate volume control.

Special Options

Portability. The small Sony and Technics portable CD players are marvels of engineering and miniaturization. When Sony introduced the D-5 at $299.95 in 1984, it was not only the smallest available CD player, but the cheapest. Since it could be used as an add-on unit for a home system, it was viewed not just as a classy way to take CD's on the road, but as an inexpensive way to play Compact Discs at home.

If you know that you will take advantage of the portability of these units, it would make sense to consider buying one and using it at home as well. But I would not recommend that you choose one of these if you intend to use it only with your home system. At this same low price both Sony and Technics, as well as many other manufacturers, now have weightier units that are designed for home use and are easier for those with big hands to operate.

Multi-Play. Toshiba has a unit, the Model XR-V22, which can play two CD's in sequence or can be programmed to alternate back and forth between them. The Pioneer PD-M6 changer will play up to six CD's in sequence, in your programmed order, or in an automatically selected random order. Its ability to provide more than six hours of music makes it ideal for anyone who wants long stretches of background music at home, in a doctor or dentist's waiting room, or even, I suppose, in a bar or restaurant.

Nikko has a changer that accommodates sixty CD's. Sony makes a changer for use in automobiles, so it is reasonable to expect a home changer from them before long and changers from other manufacturers as well.

Special circuitry. If you often play music just for background listening, you may find that the wide dynamic range afforded by Compact Discs means that the volume drops too low or becomes obtrusively loud for your purposes. In that case you might consider the Model DX 3 from dbx. Its special circuitry includes a compression control that evens out the volume peaks and valleys for smoother background listening. Also included is a signal-processing circuit to increase or decrease the spaciousness of the sound field.

The Carver CD Player includes the Digital Time Lens, a special circuit designed to improve the quality of improperly recorded Compact Discs. It can be switched out for playing correctly made recordings.

CD plus Video. I hope you haven't written off Pioneer's LaserDisc home video system. In fact, the system has been upgraded so that new LaserDiscs have digital audio soundtracks. Consequently, it is not surprising that Pioneer has introduced a machine that plays both Compact Discs and LaserDiscs, the Model CLD-900. Similar units (manufactured by Pioneer) are available from Luxman, Teac, and NAD.

After you have considered the convenience features and other options available to you, you can look for a CD player whose features mesh with your listening habits. You can do a little advance window shopping in test reports and manufacturers' ads in this magazine or the listings in the Equipment Buying Guide section of the February issue. That way, when you get to the store, you can already have an idea of a number of units on dbx's DX 3 can provide compression for background listening.
actual models that have the features you want and are in your price range. Obviously, as in shopping for any kind of product, you will give preference to a CD player made by a company whose reputation for quality and service you respect.

_In the Store_

Only in the store can you really assess a unit's look and feel. Most stores other than the cheapest discount outlets will let you operate the basic functions of a CD player in order to get a feel for it. In giving buying advice on any kind of equipment, I always lean heavily on human engineering. It has been my experience that one does not get used to a button or knob that is awkward to operate. It merely becomes more irritating with time.

Operate the PLAY, PAUSE, and FAST FORWARD functions, for example. Are the buttons and key pads of a size that is suitable for your fingers? Are they clearly marked so that you will not have to use a flashlight and magnifying glass to operate them at home?

Does the unit feel rugged and well made? You pay extra for ruggedness, and you should expect the ADS CD 3, for example, to give a greater feeling of solidity, precision, and quality than, say, the Emerson CD 150. The ADS player weighs 20 pounds and lists for $895. The Emerson player weighs less than 10 pounds and is widely available for less than $200.

Check the speed with which a unit responds to its controls. How long does it take to find a track you have punched in for play? Outside the dentist's chair, the longest seconds in my life are probably those few that it takes for the tonearm of a semi-automatic turntable to return to its rest. CD players vary considerably in the time they take to search for and find a particular track and even in the time it takes for the loading door or drawer to open.

Most CD players are front-loading with a drawer that slides out to receive the disc you want to play. There are a number of top-loading machines for you to choose from, however, if that method seems easier or more natural to you. But remember that a front-loading machine usually requires less shelf room for easy operation than a top-loading model and fits more easily into a rack-mounted or "tower" installation.

Don’t apologize for being interested in the way a unit looks. Many people respond to the sturdy, almost industrial appearance of Carver equipment. Others like Bang and Olufsen's Scandinavian styling. If you are tired of the aluminum look or the black that has become basic in audio equipment, there are many shades of gray in between, and Luxman even has an opulent gold-toned line.

Once you get a CD player, I predict that you will be using it a lot, and it’s important to buy one that you will enjoy looking at and handling. If you are interested in extensive programming and indexing functions, take along a CD with numerous tracks and encoded indexing points when you go shopping and hope that a cooperative salesperson will permit you to operate a player’s programming features. If not, perhaps he or she will demonstrate it for you.

In the store you should also check for shock resistance by tapping the unit’s case at different points while it is playing to see if physical impacts cause it to mistrack or shut off. If a player mistracks simply from your operating its controls, it is either defective or too touchy for you to consider, but you needn’t subject it to assault and battery or kick its tires.

You can generally give extra preference points to recent models. Our Hirsch-Houck Laboratory tests showed that a group of $300 CD players current during the latter part of 1985 outperformed most of the players that sold for three or four times that price in 1983. I find that most new models are easier to operate and respond with greater speed.

Don’t bother to try to make comparison tests of the error-correction abilities of players you are considering. If you keep your Compact Discs in good condition, any CD player that is operating properly will play them without problems.

_Technology and Specifications_

Should you look for a unit that has digital instead of analog filters? What is oversampling? Are three-beam laser devices better than one? Our more technically oriented readers will, of course, want to know as much as possible about how a CD player works and what is going on inside its case. But just as good speakers can be produced using any one of a variety of design approaches, so can CD players. Many inexpensive players have three-beam lasers, and top-of-the-line

*he optional remote control for the ADS CD3 also operates other ADS Atelier components.*
models may have one or three. These are not questions that should influence your choice of a player.

But what about specifications? The audio specifications on all CD players are wonderful. Distortion has reached the vanishing point, the dynamic range is almost more than you want for home listening, and the frequency response is fantastic. There are measurable tiny differences in the frequency response of various players at the very highest frequencies, but they are simply not significant.

The notion that there are not enough differences in CD players’ specs to influence a buying decision is very hard for long-time audiophiles to accept. They are accustomed to poring over spec sheets and lab-test measurements, and they are not comfortable with this change that the Compact Disc system is bringing into the equipment market. But for a lot of other people, who would like to own good equipment and enjoy the best sound but have never been comfortable with all those numbers, this change is liberating.

Sound Quality

The most controversial aspect of the performance of Compact Disc players is the quality of sound they deliver. There are people—including some well-respected audio experts—who insist they can hear subtle, but significant, differences in the sonic performance of various CD players. They speak of differences in such things as “smoothness,” “sweetness,” and “musicality.”

On the other hand, from the time CD players were first introduced the editors of this magazine have taken the position that the measurable differences are too small to take into account in choosing a player. Julian Hirsch, who has conducted all our individual and comparative tests of Compact Disc players, has repeatedly stated that the difference in sound quality from one player to the next is inaudible or insignificant.

We all agree that some very poorly recorded Compact Discs have been released (just as there have always been some analog LP’s of poor technical quality), and that comparative sound quality is a basis for choosing software (CD’s) but not for choosing hardware (CD players).

To verify the evidence of our own ears we decided to conduct blind listening tests of a range of CD players. Since our staff members had already taken a stand on the question, none of us were included in the listening panel. To eliminate any possible appearance of bias on our part we had the tests carried out by David L. Clark, of DLC Design in Ann Arbor, Michigan, far from Hirsch-Houck Laboratories and far from our New York offices. Ian Masters, a freelance writer, was commissioned to report on the results.

Published in our January issue, the results showed that using test signals in A/B comparisons under carefully controlled laboratory conditions, the listeners were able to hear minute differences just often enough to have statistical significance. When music was used in the comparisons instead of test tones, however, the panel could not hear any significant differences or indicate preferences for one machine over the others.

If all the players sound alike, you may well ask, why not just buy the cheapest one available? For the same reason that you don’t buy the cheapest watch that will keep time accurately or the cheapest car that will transport you to work and back. In buying a watch or a car you are interested in features, styling, quality of construction, durability, ease of operation, and even pride of ownership. The same factors play a part in your choice of a CD player.

Among the changes brought about by new digital technology is the simplicity of operation of CD players. This appeals to large numbers of buyers who were daunted by the complexity of choosing and operating conventional hi-fi equipment. The sonic virtues of the Compact Disc system have made many jaded record collectors get excited about music all over again. They find themselves thrilled once more by the standard recorded repertoire as they rebuild their collections on Compact Discs.

Any way you look at it, the digital age of recording is too exciting for you to miss, and the important thing is for you to buy a CD player now. If you can only afford the cheapest one, buy that and hope you can trade up in a year or two.

And if a friend or a salesperson tries to demonstrate to you that one player sounds better than another, be sure that they are played at equal volume in the comparisons. Otherwise, the louder one will always sound better. If in such a comparison you should hear one that does sound “smoother,” “sweeter,” or more “musical” to you, my advice is to buy that player. It is the one that will make you happy.
The Teac PD-200 Compact Disc Player won’t add anything to your music. No hiss. No pops. No wow. No flutter. Which means nothing comes through but the music, pure and clear. Random memory programming lets you choose the selections you want to hear in the order you want to hear them. You can repeat, edit, search, and seek with the touch of a finger.

When music is your passion, listen to Teac—made purely for music.
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CIRCLE NO. 33 ON READER SERVICE CARD
Stereo Review's critics choose the outstanding current releases

THE FABULOUS FABULOUS THUNDERBIRDS

SELF-STYLED “fabulous” rock acts are nothing new. There have been the Fabulous Poodles and the Fabulous Rhinestones, and even the Who once billed themselves as “the world's most fabulous group.” But that was then, and this is now, as the psychedelic revivalists are fond of proclaiming, and the Fabulous Thunderbirds are about as fabulous as anybody could want.

A blues band with all the authenticity of early Butterfield or J. Geils but with superior pop instincts and an overlay of Texas frat-party rowdiness, these guys have been cult figures for a couple of years. Given recent developments, however—the ubiquity of ZZ Top, the rise of T-Bird Jimmy Vaughan’s younger brother Stevie Ray, and the difficult-to-resist grunge-rock appeal of their latest album, “Tuff Enuff”—the Thunderbirds may at last be poised to break through to wider popularity.

Produced by Dave Edmunds with his usual exemplary attention to serious fun, “Tuff Enuff” strikes a near-perfect balance between rooted blues purism and commercial accessibility. Among the standout tracks are Tell Me, an infectious romp from the catalog of Rockin’ Sidney (My Toot Toot) Simien; the hilarious Why Get Up, in which lead singer Kim Wilson spins a tale of justifiable paranoia while the band makes like the bastard child of the Coasters behind him; Wrap It Up, which gets my vote as the definitive Sam and Dave cover of 1986; and the raucous instrumental Down at Antones, one of the coolest blues-harp workouts since Little Walter gave up the ghost.

None of this stuff is particularly profound, of course (if there is a subtext, it’s what Nick Tosches referred to as the Chicken Shack That Transcendeth All Knowing). And there is some truth to the fears of certain critics that the current vogue for such rooted pop is symptomatic of a reactionary political climate. But “Tuff Enuff” is an honest piece of work. You can’t fake the kind of demented glee the T-Birds bring to their performances. Besides, it’s got a good beat, and you can dance to it, which are qualities not to be sneezed at no matter what the cultural context.

Van Dam: warm eloquence

Steve Simels

THE FABULOUS THUNDERBIRDS: Tuff Enuff. The Fabulous Thunderbirds (vocals and instruments); other musicians. Tuff Enuff: Tell Me; Look at That, Look at That; Two Time My Lovin; Amnesia; Wrap It Up; True Love; Why Get Up; Down at Antones. Epic BFZ 40304, © BZT 40304, no list price.

A FINE BRAHMS REQUIEM FROM KARAJAN

NEW Deutsche Grammophon recording of the Brahms German Requiem unites Herbert von Karajan with the same chorus and orchestra he conducted in the first-ever recording of this masterpiece back in 1947.
And a great one it was, with Elisabeth Schwarzkopf and Hans Hotter as his soloists and the Vienna Singverein and Vienna Philharmonic. While the Singverein also served as the chorus in Karajan's 1964 (DG) and 1977 (Angel) recordings of the Requiem, the orchestra in each of these instances was the Berlin Philharmonic. At all events, I find his latest go at it to be not only the most stirring since his 1947 version but the most impressive yet in terms of sonic impact.

A darkly solemn devotional mood pervades the opening “Selig sind, die da Leid tragen,” during which you become aware of both the ultra-spacious acoustic surround and the wonderfully full choral sound, with the male voices flawlessly balanced against the women’s. The pacing of the somber choral sound, with the male voices rounding and the wonderfully warm upper registers, and with a striking effect.

Would that this fine recording were filled out with more Brahms, such as the Schicksalslied and Gesang der Parzen. Instead, we get the Bruckner Te Deum, an imposing masterwork that Karajan previously recorded in 1976. While his new recording offers fine work on the part of the soloists, I don’t find the same controlled tension he achieved a decade ago. And the cost-conscious Compact Disc buyer will have to consider that other recordings of the German Requiem in that format come as single discs.

David Hall

BRAHMS: A German Requiem, Op. 45. Barbara Hendricks (soprano); José Van Dam (baritone); Vienna Singverein; Vienna Philharmonic. Herbert von Karajan cond. BRUCKNER: Te Deum. Janet Perry (soprano); Helga Müller-Molinari (contralto); Gösta Winbergh (tenor); Alexander Malta (bass); Vienna Singverein; Vienna Philharmonic, Herbert von Karajan cond. DEUTSCHE GRAMMOPHON 410 521-1 two discs $19.96, 410 521-4 two cassettes $19.96, 410 521-2 two CD’s no list price.

LOUDON WAINWRIGHT TAKES STOCK

BACK in the early Seventies, Loudon Wainwright III was often talked about in the same breath as Bob Dylan. A brilliant social satirist who aimed his wit primarily at the middle class, Wainwright could be biting and acerbic, but also uproariously funny in a way that Dylan never was.

For his first album in three years, “I’m Alright,” co-produced by Richard Thompson, Wainwright turns his critical eye inward. In a set of songs that analyze, reflect, and probe the ups and downs of his career and psychological condition, he surveys his own life to date. Although he admits he may have fooled himself a time or two, the songwriter decides that he’s “alright” after all.

Many of the tunes—such as One Man Guy and Cardboard Boxes, the latter about his recent move to England—highlight Wainwright’s wry sense of humor in delightful, deft treatments. Others, such as How Old Are You?, which makes mincemeat out of music journalists, carry the barb and sting of old. But Wainwright also turns pensive on Screaming Issue, Career Moves, and Not John, variously contemplating his role as a father, his years as a man who makes his living with music, and his feelings of loss at the death of John Lennon.

Co-producer Thompson has wisely chosen to let Wainwright’s acoustic-folk style stand on its own. Often the backing is only a guitar or two, with the larger pieces hauled out for an occasional Dixieland or blues approach.

From start to finish, “I’m Alright” is an album that challenges the listener—to consider the small as well as large joys of his own life, to take stock of himself, and to smile at the foibles of fate. Because sometimes, as the Chinese—or Wainwright—might say, that’s just the way the egg rolls. Alanna Nash

LOUDON WAINWRIGHT III: I’m Alright. Loudon Wainwright III (vocals, guitar); Richard Thompson (guitars, mandolin); vocal and instrumental accompaniment. One Man Guy; Lost Love; I’m Alright; Not John; Cardboard Boxes; Screaming Issue; How Old Are You?; Animal Song. Out of this World;
GOOD NEWS TRAVELS FAST. People talk, when there's something worth talking about. Like Aiwa. And Aiwa's new Avimax 8 camera-recorder. A small idea that's getting a lot of attention. What's the big deal? This new tiny 8mm video cassette for starters. It's less than half the size of a VHS cassette. Aiwa's new Avimax 8 camera-recorder gives you all the dramatic performance capabilities of the new 8mm video format. The videotape that's fast becoming the worldwide video standard. Over 100 companies are already behind it. And it's no wonder. Up to 2 hours of high-resolution recording can now fit on a video cassette as small as an audio cassette. Which brings us to sound. Remember, this Avimax 8 camera-recorder is an Aiwa. For those who love technical audio specs, here's one your neighbors will hate. Aiwa's AFM sound recording system gives you an astonishing 85dB S/N ratio! That's second only to the sound quality of the compact disc. What's more, with the optional 181-channel Tuner/Timer, it can all be activated by the Aiwa 10-key Remote Commander. Even the 3-week/4-event program timer. Now let's focus on Aiwa's amazing new CCD image sensor. It lets you be sure that when you shoot, what you shoot will come out bright and clear, just like you see it in the electronic viewfinder, without the image lag or burnout you get with conventional pickup tubes. Combine the CCD image sensor's extra-low-light sensitivity with Aiwa's 6:1 ratio f/1.4 power zoom lens and even Cecil B. DeMille gets envious. The amazing new Aiwa Avimax 8mm camera-recorder—it's portable video's open, and shut case.
It is ironic that Offenbach is most generally known for the uneven *Contes d’Hoffmann*, his one attempt at composing a serious opera. The truth is that his natural and very real talent lay in spinning out bewitching melody and in the rarer gift of writing music that is genuinely amusing. The comic opera *La belle Hélène* is a fine example of the composer at the height of his creative vigor, doing what came naturally to him, and the listener who sits down to the new Angel recording conducted by Michel Plasson is in for a delightful experience.

Every moment in the set sparkles, musically and dramatically, with ingratiating melody, inventive orchestration, amusing plotting, and individual performances that fairly bubble with good humor. While the libretto by Meilhac and Halévy (best known for their collaboration on *Carmen*) does not quite sustain the level of infectious nonsense suggested by Act I, individual later numbers do attain it, and the score never flags. It is always tuneful, original, and catchy. It is also frequently downright funny.

Every member of the large cast, headed by Jessye Norman, is quite obviously having a grand time. The rewarding effect is that the performance is truly an ensemble one. It should be noted that Janine Reiss, credited as the French-language coach, has evoked line readings, both sung and spoken, that are both delightfully inflected and totally understandable.

For those of us who admire Norman as a "serious" artist, this recording comes as a happy surprise. She takes to Offenbach’s music and to the good-humored naughtiness of the text like the proverbial duck to water. She speaks her lines with wit, and with warmth, charm, and great beauty of tone. She is a natural comic, and there are far too few of them these days.

John Aler is delightfully bumptious as Pâris. His light tenor is well suited to the score, and he creates an engaging character. As Ménélas, Charles Burles is the archetypal pantalone—stupid, credulous, complacent, and ultimately duped—and we love him for it. Gabriel Bacquier, that estimable artist, brings a bouncy zest to Agamemnon that makes his role a highlight of the recording, and Jean-Philippe Lafont’s Calchas is both well sung and funny. The chorus and orchestra based in the French city of Toulouse respond eagerly to Plasson’s conducting, which is neat, crisp, spirited, and irrepressibly ebullient. The sound, too, is absolutely first-rate throughout. 

Robert Ackart

**OFFENBACH: La belle Hélène**

Jessye Norman (soprano), Hélène; John Aler (tenor), Pâris; Charles Burles (tenor), Ménélas; Gabriel Bacquier (baritone), Agamemnon; Jean-Philippe Lafont (bass), Calchas; Colette Alliot-Lugaz (soprano), Oreste; others. Chorus and Orchestra of the Capitole de Toulouse. Michel Plasson cond. ANGEL DSB-3981 two discs $23.98. © 4D2S-3981 two cassettes $23.98.
PERFORMANCE COUNTS.
THE THRILL OF REAL CIGARETTE TASTE IN A LOW TAR.

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

9 mg. "tar", 0.7 mg. nicotine av. per cigarette by FTC method.
Let's put the screws to our CD suppliers on a fully programmable, 5hz to 20,000hz, 3 beam CD player with a novel new consumer buying tool called GREED!

By Drew Kaplan

It's a war. The major CD suppliers are each desperately trying to lock up big orders. And now, we've devised a plan to take advantage of their greed.

Together we can apply enough pressure to get you a CD player that produces sound with such sonic violence that music will simply explode in your living room. And we can get it for you for just $1499°.

This is the experience you can expect with your first introduction to digital audio. Forget any experience you've ever had before with stereo. CD audio is an awesome advance that dwarfs the switch we made years ago from 78s to LPs.

Imagine listening to music with a frequency response from 5hz to 20,000hz +0.5db -1db. Wow! Imagine sound so pure that harmonic distortion is just 0.004%. And, if you're into zeros, flutter and wow is "unmeasurable".

The sound quality, and yes, the sonic violence will thrill you. The only equal I've heard to this sound is 'live sound'. And, live sound doesn't mean the sound you hear at a concert where you are simply listening to the auditorium's PA system. Live sound means sitting right in the middle of the orchestra.

I know, I'm a cellist. And, there's just no sound experience like the sound we hear in 'the pit'.

NO SOUND AT ALL

CD gives you a signal to noise ratio of 98db. There is absolutely no hiss, no scratch, and best of all, no surface noise.

You've got to experience the silence during very quiet passages to comprehend the sonic adventure of the music.

Conventional records and tapes have a dynamic range of perhaps 50db. Dynamic range is simply the difference in sound level (volume) between the softest and loudest recorded sounds.

CD gives you a 95db dynamic range, which is roughly equivalent to the difference between absolute silence and standing next to a jet engine.

Your music will be dramatically more exciting. You won't have to carefully compare CD to conventional sound. From the very first note, you'll be in shock. It's as if the world was just created and you are listening to newly born, virgin sound.

SOUND LIKE A LIGHTNING BOLT

There's no warning. There's no record noise, no tape hiss. Vibrant but finely detailed music just explodes from your stereo system. The sound is like a shockwave reverberating through your home.

This experience is why we made this plan to deliver these CDs for such an admittedly foolhardy price. You see, it's called extortion (legal definition please) and it works like this.

There are two large CD manufacturers (BSR and Emerson) that are trying to get DAK's CD business. Honestly, the quality, guarantee and sound are so close that we couldn't decide between the two. Even their prices are close. So here's what we did. We got quotes from both of them for 5,000, and then for 50,000 of their best CD players.

And here's what we decided. As you place your orders, we'll offer each of the two companies a check (cash in advance) for the number of CDs we need.

The company with the lowest price of the day will get that day's order. You see, your orders give us incredible leverage.

Usually we buy just one CD from one supplier. Unfortunately, once they have a contract with us, they have no incentive to lower our cost. And, at our costs today, we really can't come out at only $149°.

SAFE INVESTMENT

Don't worry about your $149°. DAK is a large company. If this plan to sell 50,000 CDs fizzes out, we'll still be OK. Plus, DAK doesn't even charge your credit card until after we ship.

And most important. Each CD will come to you in its factory sealed carton, and will be backed by the manufacturer's standard limited warranty.

Finally, you won't be getting a cheap stripped down CD. We aren't dumb. We picked the CDs we wanted before we got the quotes.

And we'll get 50,000 of you new customers to send our electronics catalog to. So, even if it does fizzle, we're sure to get another chance at you later.

NOT PERFECT?

CD isn't perfect. Or rather, it is, and that's a problem. You'll hear everything. You'll hear every note, every instrument, as if you were sitting in the orchestra.

When CD first came out, there were three complaints. 1) It could sound harsh or hard. 2) There weren't enough CDs released. 3) Not all CD discs were really recorded digitally. Here are the answers.

1) Early discs did sound harsh. A characteristic of pressing LPs is that they crop off from 5-10,000hz, so recording engineers tend to boost those frequencies when they mix master recordings. A few slight cuts with an equalizer will bring even the first discs back to super smooth, sonically alive sound. CDs have a perfectly flat vibrant response.

2) True again. CDs were in short supply and not many titles were released during the first few months. Now there's a virtual avalanche of thousands of titles.

3) True again. Not all CDs come from digital masters. CDs from digital masters can sound phenomenally better than

CD Extortion

Let's put the screws to our CD suppliers on a fully programmable, 5hz to 20,000hz, 3 beam CD player with a novel new consumer buying tool called GREED!
Even before we could get our catalog to press with BSR's and Emerson's CDs, Sharp brought in their CD and
you like. Then, just sit back and enjoy the
with heavy sampling for superb sound.
Japanese-made second generation, type.
from an analog master isn't quite as good
virtually the same.
matter which one I
evening or a day of uninterrupted music.
will automatically repeat endlessly, for an
song, or any songs you have programmed.
You can have the entire CD repeat, a single
feature not found on most CDs. And of
course, it's fully programmable.
You can program up to 9 selections in
any order you desire. You can program
them at the player or from the remote.
Then if you touch the repeat key, you
have the entire CD repeat, a single
song, or any songs you have programmed.
So, whatever selection(s) you choose,
will automatically repeat endlessly, for an
evening or a day of uninterrupted music.

ALL THE SAME
The plain truth about CDs is that no
matter which one I test, they all sound
virtually the same.
All their specs are so far beyond the

So, you can repeat your selected tracks
or the entire disc over and over again.
Just touch a button and you can skip
to the next track during play, or repeat
the track you are listening to. A display
shows you the track that is playing and
the elapsed time, or the total time.
Installation consists of simply plug-
ging it into any 'aux' input on your re-
ceiver or preamp, nothing special.
So, about the only difference between
BSR's and Emerson's is that BSR's can
program 16 tracks instead of 9, and Em-
erson's has a 95db dynamic range as
compared to BSR's 96dB.
TRY EXPLOSIVE SOUND RISK FREE
Plug it in. Experience music with
a thrilling frequency response and sonic
range. Plus, you'll be thrilled by the hiss,
and background noise you won't hear.
If you're not 100% satisfied, simply
return it to DAK within 30 days in its
original box for a courteous refund.

To order your Fully Programmable CD
Disc Player and experience the sonic
thrills of a lifetime, call toll free, or send
your check for DAK's market breaking
price of just $1499 ($9 P&H), Order No.
4546. CA res add sales tax.

IMPORTANT NOTE: If you have a
particular love for either CD player, you
can have your choice for just $1599 ($7
P&H). Use Order No. 4326 for the BSR
CD, or use Order No. 4304 for the Emer-
son CD. So, you'll pay only $1499 if the
choice is ours, or $1599 if it's yours.
It may strain my credibility to describe
any device I'm offering for only $1499
as providing sound many times better
than anything you've ever heard before.
But, use DAK's risk free trial to experience
this bigger than life sound for yourself.
PLEASE USE ADDRESS AND PHONE
AT BOTTOM OF PAGE

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CD Extortion Works

Even before we could get our catalog to press with BSR's and Emerson's CDs, Sharp brought in their CD and
wanted to be in our catalog. Well with two CDs already, I had to say no. But, Sharp wanted in, so read on.

By Drew Kaplan

It's a remote CD. Sharp gave us their
top of the line programmable CD with
infrared remote control.
You can sit in your favorite easy chair
and simply touch the '9 Button' to listen
to track 9. You can hear a track again by
simply pushing Reverse APSS (Automati-
cal Program Search). And, if you want to
skip to the next track, push Forward APSS.
You even have remote 'Cue' and 'Re-
view' which lets you listen to a song at
15 times normal speed to find just the
part you want. It's a feature I've never
seen in a CD, and obviously requires
incredible technology.
And speaking of extra features, Sharp's
has a headphone jack which is another
feature not found on most CDs. And of
course, it's fully programmable.
You can program up to 9 selections in
any order you desire. You can program
them at the player or from the remote.

Then if you touch the repeat key, you
can have the entire CD repeat, a single
song, or any songs you have programmed.
So, whatever selection(s) you choose,
will automatically repeat endlessly, for an
evening or a day of uninterrupted music.

---

I often like to hear the same song a
second time or skip through a song I
don't like. And, selecting what I want to
hear from across the room really enhan-
ces my musical enjoyment.

It's backed by Sharp's standard limit-
ed warranty.

ENJOY REMOTE EXPLOSIVE SOUND
RISK FREE

You'll thrill to the sonic vibrance of
your music. You'll thrill to the remote
Ease. And, you'll thrill to the remote pro-
grammable control of your music.
If you're not 100% satisfied, simply
return it in its original box within 30 days
for a courteous refund.

To order your Sharp Programmable
Infrared Wireless Remote Control CD
Player risk free with your credit card, call
toll free, or send your check for DAK's
extorted price of just $1999 ($8 P&H).
Order No. 4427. CA res add tax.
Now the choice is yours. You can have
incredibly explosive sound for just $1499
or you can have incredibly explosive
remote controlled sound for just $1999.
When the price of Gary's Revenge was beaten, Gary came back fighting with a real market breaker. It's a VHS video recorder with 20-20,000hz VHS HiFi Stereo, a built-in Stereo TV tuner and more, for just $399. Wow!

By Drew Kaplan

It's not bait and switch. After reading Gary's Revenge, you probably expect me to say that this top of the line VHS HiFi recorder is 100 times better, and the extra dollars would be well invested. Well, it's not. Both machines are superbly built in Japan. Both are cable compatible. And, both have infrared remote control. But, if you're into perfection in sound as well as superb video pictures, then read on.

But first, a word about Gary. He was so upset about being stabbed on Gary's Revenge's price, that not only did he get us a better price on that recorder, but he said, "I'll more than make up the price on the VHS Stereo HiFi Recorder".

And, if you have the slightest doubts about Gary really existing, watch my next catalog, because I've agreed to use him in one of my pictures as a thank you for his going to bat for DAK.

VIDEO IN YOUR STEREO SYSTEM

AND STEREO TV TOO

VHS Stereo HiFi gives you an incredible 20Hz to 20,000Hz response with an 80db dynamic range. You'll experience the full sonic drama of movies that you rent, and add a superb audio tape deck to your stereo system. And, not only can you turn any TV into a cable compatible TV by using the all electronic tuner with wireless remote, you can turn any VHS HiFi uses a second set of spinning heads to record sound along with the video on the tape in excess of 200 inches per second. So, the sound quality is to say the least astounding. Of course, there's a conventional stationary audio head, so this recorder is compatible with all standard tapes, but wait till you hear the sound. And, wait till you use this recorder for recording music in your stereo system.

Just imagine, for only $150 more than Gary's Revenge, you can add an audio deck to your stereo system that will beat any thousand dollar home cassette deck. And, look at this. With VHS tapes selling for about $5, you can record up to 6 hours of this incredible sound on one cassette with or without a picture.

THE BAD PART

Connecting this video recorder to your TV is easy as duck soup. Just unscrew your cable from your TV (round or flat) and connect it to the recorder. Then connect the included cable between the recorder and your TV. Then just record. To utilize the VHS HiFi and Stereo TV tuning, you must also connect this recorder to your stereo system. Just connect the standard stereo patch cords included, and you'll have fabulous sound from movies and simply the best cassette deck for your audio system.

So, the bad part is that if your TV and stereo aren't together, this incredible machine isn't for you. Of course, it always sends conventional TV sound to your TV.

TOP OF THE LINE VIDEO TOO

Start with all the fine quality features you'll find in Gary's Revenge. You'll have 4 event 2 week programming, controlled by a super easy to use clock/timer. You'll record shows you miss when you're out or asleep, and shows that you want your children to see at a more appropriate time. I record cable movies to watch when I have time.

And look at this. It can receive up to 139 electronically synthesized cable compatible channels. VHF 2-13, UHF 14-83, and cable 14-65 and Cable Sub Band 95-97. It's more channels than I've seen on any current cable, and every one is ready for stereo.

You can set any 16 preset channels. Just push the corresponding one button on the remote and you'll have instant random access from the remote. And, speaking of the remote, you'll even be able to control still frame, slow motion and high speed forward and reverse visual search. So, you can play the same scene over and over again.

And, there's a one button record timer which lets you record from 30 minutes up to 2 hours without programming.

Much more. The deck features motorized front loading. There's a tape counter, a picture sharpness control, and both high and low speed recording.

TOUGH CHOICE

Both recorders are reliable long term investments. If $150 sounds like a good investment for dramatically alive sound from movies and the most incredible recorder you can add to your stereo system, then Gary's Killer HiFi is for you. It's made by Emerson. And, it's backed by their standard limited warranty.

TRY GARY'S KILLER HI FI

RISK FREE

Wait till you experience the freedom of watching any program when you want. Wait till you see how easy it is. And, wait till you hear the sound.

If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Emerson's Gary's Killer HiFi VHS Stereo HiFi Video Cassette Recorder for your TV and your Stereo System risk free with your credit card, call toll free, or send your check for Gary's Killer Price of just $399 plus $11 P/H. Order No. 4360. CA res add tax.

Now you can watch last night's midnight show at dinner, or tonight's dinner show at midnight. And, wait till you see the quality of the picture and thrill to the drama of the Stereo VHS HiFi Sound.

TRY GARY'S KILLER HI FI

RISK FREE

Wait till you experience the freedom of watching any program when you want. Wait till you see how easy it is. And, wait till you hear the sound.

If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Emerson's Gary's Killer HiFi VHS Stereo HiFi Video Cassette Recorder for your TV and your Stereo System risk free with your credit card, call toll free, or send your check for Gary's Killer Price of just $399 plus $11 P/H. Order No. 4360. CA res add tax.

Now you can watch last night's midnight show at dinner, or tonight's dinner show at midnight. And, wait till you see the quality of the picture and thrill to the drama of the Stereo VHS HiFi Sound.
A $10,000 Challenge To Escort

Let's cut through the Radar Detector Glut. We challenge Escort to a one on one Distance and Falsing 'duel to the death' on the highway of their choice. If they win, the $10,000 check pictured below is theirs.

By Drew Kaplan

We've put up our $10,000. We challenge Escort to take on Maxon's new Dual Superheterodyne RD-1 $9900 radar detector on the road of their choice in a one on one conflict.

Even Escort says that everyone compares themselves to Escort, and they're right. They were the first in 1978 to use superheterodyne circuits and they've got a virtual stranglehold on the magazine test reports.

But, the real question today is: 1) How many feet of sensing difference, if any, is there between this top of the line Maxon Detector and Escort's? And 2) Which unit is more accurate at interpreting real radar versus false signals?

So Escort, you pick the road (continental U.S. please). You pick the equipment to create the false signals. And finally, you pick the radar gun.

Maxon and DAK will come to your highway with engineers and equipment to verify the results. And oh yes, we'll have the $10,000 check (pictured) to hand over if you beat us by more than 10 feet on the X band detection.

BOB SAYS MAXON IS BETTER

Here's how it started. Maxon is a mammoth electronics prime manufacturer. They actually make all types of sophisticated electronic products for some of the biggest U.S. Electronics Companies. (No, they don't make Escort's).

Bob Thetford, the president of Maxon and a friend of mine, was explaining their new RD-1 anti-falsing Dual Superheterodyne Radar detector to me. I said, "You know Bob, I think Escort really has the market locked up."

He said, "Our new design can beat theirs".

So, since I've never been one to be in second place, I said, "Would you bet $10,000 that you can beat Escort?" And, as they say, the rest is history.

By the way, Bob is about 6'9" tall, so if we can't beat Escort, we can sure scare the you know what out of them. But, Bob and his engineers are deadly serious about this 'duel'. And you can bet that our $10,000 is serious.

We ask only the following. 1) The public be invited to watch. 2) Maxon's Engineers as well as Escort's check the radar gun and the test and the results. 3) The same car be used in both tests.

4) We do this test during the summer months. (I'm from California, and anything below 80° will do me in.)

5) We'd like an answer from Escort no later than June 1, 1986 and 30 days notice of the time and place of the conflict. And, 6) We'd like them to come before it explodes.

MAXON LEAPS AHEAD OF THE PACK

Just imagine the sophistication of a device that can test a signal 4 times in less than 1/4 of one second. Maxon's technology is mind boggling.

But, using it isn't. This long range detector has all the bells and whistles. It has a separate audible sound for X and K band radar signals because you've only got about 1/3 the time to react with K band.

There's a 10 step LED Bar Graph Meter to accurately show the radar signal's strength. And, you won't have to look at a needle in a meter. You can see the Bar Graph Meter with your peripheral vision and keep your eyes on the road and put your foot on the brake.

So, just turn on the Power/Volume knob, clip it to your visor or put it on your dash. Then plug in its cigarette lighter cord cigarette adaptor.

And you'll have a very high level of protection. Maxon's Dual Conversion Scanning Superheterodyne circuitry combined with its ridge guide wideband horn internal antenna, really ferrets out radar signals.

By the way Escort, we'll be happy to have our test around a bend in the road or over a hill. Maxon's detector really picks up 'ambush type' radar signals.

And the key word is 'radar', not trash signals. The 4 test check system that operates in 1/4 second gives you extremely high protection from signals from other detectors, intrusion systems and garage door openers.

So, when the lights and X or K band sounds explode into action, take care, there's very likely police radar nearby. You'll have full volume control, and a City/Highway button reduces the less important X band reception in the city.

Escort really has the market locked up."

It's much smaller than Escort at just 3½' Wide, 4¾' deep and 1½' high. It's backed by Maxon's standard limited warranty. Maxon's detector is illegal in some states.

2) Speeding is dangerous. Use this detector to help keep you safe when you forget, not to get away with speeding.

CHECK OUT RADAR YOURSELF RISK FREE

Put this detector on your visor. When it sounds, look around for the police. There's a good chance you'll be saving money in fines and higher insurance rates. And, if you slow down, you may even save lives.

If you aren't 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To get your Maxon, Dual Superheterodyne. Anti-Falsing Radar Detector risk free with your credit card, call toll free or send your check for just $9900 ($4 PHS) Order No. 4407. CA res add tax.

OK Escort, it's up to you. We've got $10,000 that says you can't beat Maxon on the road. Your answer, please?

Escort is a registered trademark of Cincinnati Microwave.

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DAK
84527334
Singing TV & Cable Commander

Now you can enjoy excitingly vibrant simulated stereo sound with any TV while you tune in VHF, UHF and Cable Channels with Universal's new amplified cable controller/switcher. Just wait till you hear your TV sound. Wow!

By Drew Kaplan

I hate conventional TV sound. It's boring and flat. Now, whatever TV you own, you're in for a sonic adventure in sound.

You're also in for a selection adventure in programming. Whether you tune in Cable or use your own antenna, you can now have complete wireless infrared remote tuning from up to 30 feet away.

Plus, you'll have incredibly powerful simulated stereo sound with full volume control and mute, through the system's speakers or monaurally through your TV.

You'll tune in all UHF channels 14 to 83 and VHF 2-13, Cable channels A-I (14-22) & J-W (23-36), and, the A1 and A2 Cable Sub Bands.

You can even remotely switch between your UHF/VHF antenna and your cable. And, whatever you tune in, you'll have complete random access remote control.

NOTE: Check with your cable company before tuning in anything at all, to see if they require you to pay a fee.

This isn't one of the infamous 'Black Boxes' that decode various 'Pay TV Channels'. On cable, most of the programming isn't scrambled, it's just found outside the tuning range of the average TV. But, this Controller tunes them in.

Just push '2' & '4' when you want to watch channel 24. And you can watch 24 on either cable or UHF by just touching the input select button on the remote.

You can also step tune from channel to channel. And, look at this. You can assign any stations you want (no limit) a 'Special' Status. With a second set of step tuning buttons you can search only your favorite channels.

I have 4 movie channels on my cable. So, I use the 'Favorite' feature a great deal. The large LED display shows you your channel, its 'Favorite' Status, and if you've selected cable or antenna.

MARVELOUS SOUND

While you don't need cable to use this incredible new tuning, switching and music making device, just think of the excitement of watching movies with the theater type massively vibrant sound.

You'll hear sounds from your TV's 3' to 5' speaker never even thought about reproducing. You'll become emotionally involved in car chases and other dramatic events. And if there's music, wow! The simulated stereo, which is powerfully amplified and then reproduced by two-way speaker systems, will quite literally knock your socks off.

And, instead of listening to one small point of sound, the sound will spread out across an entire wall. It's an awesome improvement in your viewing experience.

EFFORTLESS INSTALLATION

It's easy. Just unscrew your antenna or cable connector from the back of your TV. There are three inputs on the back of the Controller. Just screw it into 1) Cable, 2) VHF Antenna, or 3) UHF.

Use the included cable to connect the Controller to your TV. Hook your VCR before or after the Controller. And look at this. If you hook your VCR in after the Controller (to make your VCR cable compatible), you can hook its output to one of the Controller's unused inputs for a massive sonic improvement.

Just tune your TV to channel 3 and the noise-free tuner with automatic fine tuning will do all the work. Then plug your TV's AC plug into the Cable Controller. So, when you turn off the Controller, your TV will shut off.

You'll have effortless remote control of all channels on 3 bands (UHF, VHF and Cable) and even the volume.

Its memory is nonvolatile, so it won't be lost during power failures. But best of all, you'll experience massively powerful, vibrant TV sound.

It's made by Universal and backed by their standard limited warranty.

GET CABLE, UHF, AND VHF

In POWERFUL SIMULATED STEREO

RISK FREE

Wait till you hear the sound. Wait till you switch between your video sources. And wait till you flip through your 'Favorite' channels. If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Universal's Cable, UHF, VHF Tuner with Built-In Switcher, Volume, Amplifier, Advanced Simulated Stereo Circuit and Complete Infrared Remote Control risk free with your credit card, call toll free or send your check for DAK's breakthrough price of just $149.95 ($8 P&H). Order No. 4553. CA res add tax.

Now you can tune in virtually any TV broadcast and listen to the most phenomenally dramatic sound, plus, you'll have remote control of all functions.
A puppy may be man's best friend. Woof, Woof. But, now I've got a new friend you can add on to your stereo system. It doesn't need to be taken on walks, washed or fed. But, it makes a great cocktail table for you when you're being fed. And, oh what a woof it has.

**GREAT SOUND FOR EVERYONE**

It's called a subwoofer. And, normally it is the beloved pet of only the most ardent audiophiles.

It's not generally understood that it can be used with virtually any speaker system in any stereo. And, in addition to substantially increasing and perfecting the bass response, it has a significant impact on the mid-range clarity too.

Before I tell you exactly how marvelous your stereo will sound when you connect this subwoofer to it, there are two things you should know.

**First**, you'll be getting your new friend at a phenomenal price. DAK has sold over 10,000 of Cerwin-Vega's 12" subwoofers. They had a retail price of $332, but we sold them for $164.

**Second**, your new friend comes complete with a paid up health insurance policy in the form of a 2 year limited warranty from its father, BSR.

By the way, the puppy sitting on top of the subwoofer is the same puppy I used with Cerwin-Vega's, but wait till you hear what the puppy has now. You'll have BSR's 15" massive infusion of explosive bass, added to your system for just $99.

**But don't be misled**. BSR bass is clean and tight; never sloppy or overpowering. It adds a feeling of depth and fullness to your music that you simply can't get with either two-way or three-way speaker systems.

**HERE'S WHAT IT DOES**

Basically, the problem with most speaker systems is that the bass overpowers the system. In a 3-way system, a woofer may be crossed over at about 800hz. And, in a 2-way system as high as 3000hz.

So, the woofer must handle movements of up to an inch at frequencies below about 80hz, while at the same time attempting to reproduce the very fine vibration type movements of the mid-range frequencies.

It is this difference in movements that causes both the bass to be weak or not precise, and the mid-range to become muddy (intermodulation distortion).

Even the best 3-way systems fall prey to these problems. And, it's why a subwoofer can do so much for your mid-range clarity as well as your bass.

**PROBLEM SOLVED**

BSR's subwoofer has a specially engineered crossover network that sends frequencies above 120hz to your regular speakers and reproduces just the mammoth movement frequencies from 120hz down to 22hz with a special floor firing dual wound super subwoofer.

If you have downstairs neighbors, this subwoofer isn't for you. The woofer is a very special hybrid. It has a mammoth one and one half inch voice coil which allows the speaker to make the very large movements required to reproduce the very low frequencies.

But, it would do a lousy job of reproducing mid-range, which is why, cost aside, manufacturers don't put big voice coils in normal 10" or 12" woofers.

To make the massive movements accurate, this woofer has a very large magnetic structure. This magnetic structure also makes the subwoofer system extremely efficient. (The sensitivity is 91.5 db at 1 watt at 1 meter.)

So, whether you have two or three-way speaker systems, with 8", 10" 12" or even 15" woofers, you'll find the sonic improvements staggering.

You'll hear and feel the awesome effect of thunder rumbling through your home. You'll hear a depth and dramatic fullness to your music that won't be heavy but will thrill you with its massive strength.

**EASY HOOKUP**

It's easy to connect. Simply run the right and left speaker wires from your amplifier to the input terminals of the subwoofer. It works with any system from 20 to 150 watts per channel.

Then, you simply connect the speaker wires from your two stereo speaker systems to the output terminals of the subwoofer. They receive the exact signal that they did before except that everything from 120hz down is routed only to the subwoofer.

Placement of your regular speakers is just as critical as usual for stereo imaging, but the subwoofer can be placed anywhere because low frequency material is totally non-directional.

The subwoofer makes a perfect cocktail or end table. It's rich wood-tone appearance matches any decor. It is 24 1/2" long, 16 1/4" high and 20" wide.

**TRY AUDIOPHILE'S BEST FRIEND RISK FREE**

The fullness, richness and depth is awe inspiring. Wait till you connect this subwoofer to your system and experience truly massive force from your music.

If you aren't 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order BSR's Thundering Subwoofer with its dramatic 15" Dual Wound Voice Coil Subwoofer risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just $99 ($14 PetH), Or. No. 4514. CA res add tax.

You can't replace the love and softness of a warm puppy. But, wait till you experience the richness and depth this subwoofer will add to your bass and the clarity you'll hear in your mid-range.
BSR's Endangered Colossus

Prepare for bone jarring bass and dramatically clear highs from these newly developed 15" 3-way 5 speaker systems that nearly missed their chance to charm an audiophile's ear. BSR moved its dbx and ADC divisions into one facility and these speakers almost became orphans. So now, they're yours at a close-out price.

By Drew Kaplan

It's a shame. But, it's also a great opportunity to get a pair of 15" audiophile loudspeakers with the newest in stereo imaging at a market-breaking price.

Imagine a precisely matched mirror image pair of top-of-the-line BSR speakers that can effortlessly recreate the cataclysmic impact of a full orchestral crescendo at full volume and yet offer flawlessly subtle sound detail to 21,500Hz. You'll thrill to thunderous bass all the way down to 26Hz. Incredibly rich, full, vibrant sound at low volume will explode with life as you increase the volume.

But before we examine the front speaker complement, the twin overlapping crossovers and the top mounted sonic placement and ambiance speakers, let's see why they were almost orphaned.

You see, BSR, the half billion dollar electronics giant, is the parent company of two of the best names in up-scale audio, dbx and ADC.

Last year dbx developed a new multi-thousand dollar speaker system called the Soundfield One which lets you sit virtually anywhere in your room and have full stereo imaging and terrific sound.

BSR decided to consolidate ADC and dbx into one building (still 2 companies) and put all its speaker efforts into dbx.

POOR JACK

Well, while dbx’s engineers were off designing their multi-thousand dollar masterpieces, BSR’s Senior Acoustical Engineer (he had been Fisher’s Chief Engineer for 10 years during its top end component stereo days), was designing BSR’s radically new speaker line.

The revolutionary top of the line 15" stereo imaging pair pictured above will let you enjoy superb stereo imaging without sitting directly in front of your speakers.

But unfortunately, in the consolidation move, BSR’s speakers went by the wayside, and so did Jack.

Enter DAK. After a few fearful negotiations and considering the engineering costs BSR had already expended, they agreed to make the speakers just for DAK.

Because there’s virtually no BSR overhead left on these speakers, and the R&D was all but complete, we’ve gotten these speakers for virtually the component costs plus a little BSR labor.

And don’t worry about Jack. BSR had him finish the engineering (they are great people) and they’ll pay him royalty on each speaker we sell. Besides, by the time you read this, Jack is sure to be snapped up as the Chief Engineer at another esoteric audio company.

WHAT’S STEREO IMAGING?

Stereo imagery is the logical separation and interaction between channels. It’s the successful creation of a panoramic wall or stage of music rather than the confined, easily located 2 speaker sound. IT’S WHAT’S INSIDE THAT COUNTS

Imagine the full thunder of a kettle drum, or the pluck of a string bass being explosively recreated in your living room. BSR’s 15" sub-bass acoustic suspension driver will revolutionize your concept of low clean bass.

Its magnetic structure weighs a thundering 48 ounces. But that’s not all. The magnetic field is developed by the rare earth metal Strontium for state of the art massive but flawlessly controlled bass.

A 38mm voice coil with a 200° centigrade temperature capacity, will handle the most demanding digital or analog recordings. And, a new super rigid cabinet design virtually eliminates coloration due to uncontrolled cabinet resonance.

At low volume, the bass will fill in and envelope you. At high volume, your room, your walls and your neighbors will shake. This is definitely not a speaker system for apartment dwellers.

MATCHED PAIRS

The mid-range and high end of BSR’s speakers are truly unique. Front mounted 8" polypropylene mid-range drivers reproduce what's really the major portion of the sound spectrum. BSR's 8" and 5" polypropylene mid-ranges are rigid, exciting drivers that deliver incredibly pure uncolored sound.

They have matched 25mm voice coils, also protected by ferro-fluid and polyamid-imid to 200° centigrade. They are driven by powerful Barium Ferrite magnetic fields.

To prevent phase shift and cancellation, two totally separate crossover networks are employed in these speakers.

Next page please...
BSR's Colossus Continued

All frequencies below 800 Hz are directed to the 15" woofer. The front system routes frequencies above 800Hz to the 8" mid-range to take full advantage of its superb reproduction capabilities. Frequencies above 3400Hz are routed to the horn tweeter.

The top mounted system routes only frequencies above 1200Hz to the 5" polypropylene ambiance mid-range driver, and frequencies above 3400Hz are routed to the top sonic placement tweeter.

There are level controls for both the top and front mounted speakers so that you can voice the speakers to match your musical taste and environment.

Note: Only the top tweeters are mounted at the the edges. The front mounted tweeters are conventionally mounted for acoustical symmetry. Each speaker is fuse protected for up to 200 watts peak, 150 watts continuous power. You can operate these super efficient speakers with as little as 20 watts.

AND OH WHAT A PRETTY FACE
The speaker systems are 30" tall, 19½" wide and 10½" deep. Their lovely oak wood-grain appearance is enhanced by the dark removable grill cloths that beautifully contrast with the rich wood-grain tones. They’re a statement of audio elegance when placed in any room. They’re backed by BSR’s 2 year limited warranty.

A COLOSSAL DREAM COMES TRUE RISK FREE
You’ll hear depth of sound at low levels that was previously unobtainable. And yes, when you crank up the volume, your music will explode with realism and drama.

These speakers are 23¾" tall, 13¾" wide, and 8¾" deep. Their rich oak wood-grain appearance which surrounds the contrasting dark grill cloth, will be an elegant addition to any room.

8" BOOKSHELF COLOSSUS
Where space is a consideration, your music need not suffer. BSR’s newest 2-way 8" systems provide an astounding level of musical fullness.

BSR's exponential horn tweeter produces superb highs to 21,500Hz. The 8" woofer/mid-range produces bass down to a very respectable 38Hz and powerfully clean mid-range up to 2500Hz.

On the floor or in a bookcase, these speakers will give you years of full rich, beautiful sound. They are just 19¾" tall, 11¾" wide and 8¾" deep. Their rich oak wood-grain appearance which surrounds the contrasting grill will be a beautiful addition to any room.

All BSR speaker systems are fuse protected and backed by BSR’s standard 2 year limited warranty.

TRY RICH DRAMATIC SOUND RISK FREE
These smaller versions of the Colossus may have a hard time competing with the awe inspiring sonic violence of their bigger brother. But, compared with traditional speakers, you’ll find they’ve gained greatly by their genetic origin.

If you’re not 100% satisfied, simply return them to DAK within 30 days in their original boxes for a refund.

To order the 10" 3-way Sane Colossus with its horn tweeter, polypropylene mid-range and 10" Strontium woofer risk free with your credit card, call toll free, or send your check for DAK’s breakthrough price of just $298 for the MATCHED PAIR plus $22 for Postage and Handling. Order No. 4352. CA res add tax. It’s a dream system for an audiophile. Sonically pure, thunderously powerful, these BSR speakers will make your future listening years an on-going fabulous, if not earthshaking experience.
Obliterate the wall between you and the individual instruments in your music. Infuse your own stereo system's sound with a breathtakingly vibrant 30 to 50% improvement in sound quality that you can measure with this superb BSR Equalizer/Spectrum Analyzer limited $149 close-out.

By Drew Kaplan

Close your eyes. Touch a button. And you'll hear your stereo system literally explode with life. You'll hear the gentle brushes on a snare drum, the startling bone-jarring realism of a thunder clap, or the excitement of a full cymbal crash.

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

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

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

Plus, there's more. A subsonic filter effectively adds the equivalent of many watts onto the power of your amplifier. Plus, with its provision for two separate tape decks including two way dubbing, you'll have much more than just greatly improved sound.

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

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

FIRST THE EQUALIZER

YOUR STEREO'S HIDDEN SOUNDS

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

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

You'll be able to prove this with a few simple tests we'll try when we discuss the Spectrum Analyzer. You see, certain frequencies are simply not reproduced with as much volume as are the mid-range frequencies which stretch from about 800hz to 2,000hz.

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

TOTAL MUSICAL CONTROL

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

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

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

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

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

But there's more. You can boost trumpets at 300 to 500hz or a clarinet at 1000hz. You can boost or cut any part of the frequency spectrum a full ±15db.

TAPE DECK HEAVEN

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

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

SIMPLY PLUG IT IN

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks. Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver or preamp. We even supply the cables. As you listen to your records, FM or any 'Aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

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

When you want to listen to a tape deck, just select which tape deck you want, turn the switch on the equalizer.
and your tape deck will work exactly as it did before. Except, now you can listen with or without equalization.

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

**THE SUBSONIC FILTER**

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CLASSICAL MUSIC

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

Performance: Compelling
Recording: Excellent

Many Americans have heard a good deal of William Alwyn's music in the form of film scores, but few of us can claim any familiarity with his concert works. While some have circulated here on various labels in past years, the bulk of the Sehnsuehnings today are recent Chandos recordings of his songs and chamber music. This new disc of the Fantasy-Waltzes and Twelve Preludes, possibly intended as an eightieth-birthday-day tribute, appears now in the nature of a memorial to the composer, who died last September 11, some eight weeks shy of the anniversary date. It is, I think, the first recording of any of Alwyn's piano music to reach our shores, and it could hardly be in better hands.

John Ogdon, from whom we have not heard nearly enough lately, made this recording in London in 1984, and he has supplemented Alwyn's brief annotations with somewhat more extended and quite intriguing notes of his own. He observes, for example, that the third of the eleven Fantasy-Waltzes is "a tearful song, presaging the famous pop song 'Cry Me a River' (sung by Julie London) ...." For his own part, Alwyn advised that it was a visit to Grieg's home in Norway that gave him the idea for his own song Opus 64 No. 7 (written in New York). The listener will seek in vain for any reminder of Grieg in the Fantasy-Waltzes, but in the two longest, Nos. 6 and 11, you may find reminders of another composer, the Ravel of the Valses nobles et sentimentales.

A somewhat Gershwinian flavor—recalling the second theme of the Concerto in F in particular—might be said to inform the pithy Prelude No. 3. Alwyn indicated no programmatic intent for these characterful preludes except for No. 5, which is an elegy for the composer. The attention already focused on Grieg in the Fantasy-Waltzes, but in the two longest, Nos. 6 and 11, you may find reminders of another composer, the Ravel of the Valses nobles et sentimentales.

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EXPLANATION OF SYMBOLS:
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A TALE OF TWO PIANISTS

This is a story of two Russian Jewish pianists. The first is Sergei Edelmann, who in January 1984, arriving with his family in New York. Within months he won first prize in the Young Concert Artists International Auditions and the Gina Bachauer Memorial Scholarship, which enabled him to study with Rudolf Firkusny at Juilhard. In little more than a year after his arrival he struck out on a concert career and caught the attention of important people at RCA Records. Edelmann has been compared to the young Horowitz, and by now, at twenty-five, he has already played with several big American orchestras and has recorded enough to fill five or six LP's. RCA recently issued the first one, a Schumann program comprising the Symphonic Etudes, the Arabesque, and the Toccata. (It is an analog recording, by the way, and a very good one.) Several exceptions that young pianists have chosen to introduce themselves on records with Schumann: the youthful quality in these particular works, all composed in Schumann's twenties, makes them perhaps especially apt. In any event, Edelmann's response to them is superb, realizing all the poetry as well as all the fire. Throughout all three works, in matters of phrasing, tempo, balancing of inner voices, and overall proportion, Edelmann never puts a foot wrong—or a finger. These are bracing and heartwarming performances to which one returns happily again and again. What they promise for the future is perhaps more heartening still. (Incidentally, pianists who include the five posthumous variations in the Symphonic Etudes usually have their own ideas about where to fit them in. Arrau and Perahia scatter them through the sequence, each in a pattern of his own. Pollini plays them all after Variation V: Edelmann plays them all after Variation IV.)

The second pianist, Vladimir Feltsman, is, like Edelmann, unfamiliar to most Americans, and there is not a word about him on the jacket of his new CBS recording of the Chopin preludes. But as we reported in "Record Makers" last month, he has not been allowed to leave Russia. His Chopin recording, the first to reach the West, was not made in a studio but during a live performance at the U.S. Ambassador's residence in Moscow. (This information, too, is omitted from the record jacket, which, in fact, lists no credits at all.)

It is a very good recording—not digital but with warm, realistic piano sound, very well focused, and with only one or two barely noticeable extraneous noises to certify the "live" conditions. The tempo struck me as a tiny bit unsteady in the first piece—understandable enough under the circumstances—but after that the playing is unalloyed joy. Feltsman, it appears, has no patience with surface glitter (though he shows a fine regard for tone), but is a pianist who goes directly and deeply into the heart of the music. While this record may not displace those of Ashkenazy, Arrau, or Rubinstein, it is definitely in the same class.

The attention already focused on Feltsman by the press and protests by Western musicians seem to have had some impact in the U.S.S.R., but the circulation of this record should help find him an international audience. It certainly makes it clear that Feltsman is a pianist worth fussing over—one who ought to be heard everywhere.

Richard Freed


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New Zealand pianist Richard Farrell. Ogdon has volunteered descriptive titles, which range from Haiku and Marriage of the Earth to An Afro-Hungarian Caravan and Balinese. Whatever you may think of the aptness of these titles, there can be no questioning the authority or commitment of Ogdon's altogether compelling performances.

How delighted Alwyn must have been with both Ogdon and the way his piano was captured by the Chandos engineers! And how delighted anyone with working ears will be to discover the substantial and fascinating music so beautifully recorded here.

R. F.


Performance: Wagner Recording: Excellent

Although Gustav Leonhardt's hard-line approach to authentic performance practice is an admirable one, the results have frequently been more intellectual than musical. Recently, however, Leonhardt seems to have mellowed. The articulation is less severe, rhythmic alternations have been softened, and a long-line legato has crept in. While all we know of "authenticity" is still there, it has now been put into the service of musical expression with a newfound warmth and humanity. This wonderful recording of Bach's English Suites exemplifies the new Leonhardt, and it is a joy to hear.

S. L.

BRAHMS: A German Requiem (see Best of the Month, page 83)


Performance: Luminous Recording: Splendid

Written in 1825 for the sumptuous coronation of Charles X in the Cathedral at Rheims, Cherubini's A Major Mass should be a razzle-dazzle affair, in the tradition of Delalande or Charpentier, for multiple choirs and lots of fanfaring trumpets and drums. No such thing. Eschewing the pomp and glitter of the event, Cherubini concentrated on its religious solemnity in a spiritually edifying work that combines the ecstasy of Beethoven's Missa Solemnis and the French Catholic mysticism of the Fauré Requiem. The result is a masterpiece that rejuvenates the age-old text in a truly original way.

Riccardo Muti's reading is superbly paced and spacious. He carefully molds Cherubini's taut lines and elicits stark contrasts between sections like the "Et sepultus est" and the "Resurrexit." While there are thrilling sections calling for large forces complete with trumpets and drums, Muti, like Cherubini, is more interested in the reflective pas-
sages. The final "Marche religieuse," for example, is not the triumph of a freshly crowned monarch but rather the solemn progress of a priest-king accepting the responsibilities of fulfilling a holy order.

This Mass is unique, and Muti's performance reveals the greatness of Cherubini's genius. I hope it will lead to a reconsideration of the music of this too often neglected composer.

S. L.


Performance: Searching, eloquent Recording: Splendid

This CD-only coupling restores a first-class recording of the Dvořák Cello Concerto to the catalog (the analog LP was released in 1981 but has since been deleted) and combines it not with a makeweight filler but with a full-scale masterpiece. Moreover, this performance of Elgar's Cello Concerto (formerly available on LP with his Cockaigne Overture and the Introduction and Allegro for Strings) makes it a rival with the Dvořák for supreme place in the Romantic cello-concerto literature.

Heinrich Schiff and Sir Colin Davis with the Concertgebouw Orchestra form a team that very nearly equals that of Pablo Casals, George Szell, and the Czech Philharmonic in their famous and unforgettable prerecord recording of the Dvořák concerto. In the long opening orchestral tutti, Davis brings out every single detail of texture and color, showing us the infinite poetry in the music. Schiff's initial entrance with superb address, and his reading progresses to a triumphant first-move
tment conclusion. His playing in the adagio has a quiet eloquence that makes the orchestral outbursts midterm through that much more telling. The high point of the finale is, of course, the lingering, ineffably touching coda, but the performance's poignant lyricism betrays no attempt to "milk" sentiment for its own sake. Other than some barely audible ambient noise, one would never know that the recording was not a digital master. The sound is rich and beautiful, with flawless balancing of soloist and orchestra.

In the Elgar concerto Schiff works with the formidable Dresden Staatskapelle under Sir Neville Marriner to produce the most sinewy and dramatic reading of the work that has come my way. Elglic the music surely is, but in this performance it is endowed with more strength and dramatic power than usual. The Dresden orchestra plays with tremendous weight but never heavy-handedly. Schiff's opening cadenza "motto" carries unmistakable authori

ty, and he and Marriner bring remarkable drive and eloquence to the first
movement. Schiff is dazzling in the moto perpetuo of the scherzo. The slow movement is quietly eloquent, and in the finale, the most elaborate portion of the concerto, there is maximum contrast between Falstaffian bravado and heart-rending lamentation. The very end, as in the scherzo, is quick and bit-ter. The recording is altogether superb in every respect. I would go so far as to call this the best single cello-concerto package now available on CD. D.H.

ELGAR: Cello Concerto in E Minor, Op. 85 (see DVORAK)

HANDEL: Atalanta. Katalin Farkas (soprano), Atlantala; Eva Bártfi-Barta (soprano), Meleagro; János Bándi (tenor), Aminta; József Gregor (bass), Nicandro, others. Savaria Vocal Ensemble; Capella Savaria, Nicholas McGegan cond. HUNGAROTON SLPM 12612-14 three discs $32.94.

Performance: A joy
Recording: Excellent

The plot of Handel's Atalanta is in the highest Arcadian tradition. The princess Atalanta, disguised as the shepherdess Amarylli, falls in love with Meleagro, the King of Aeolita, disguised as the shepherd. But neither king nor princess can marry below their rank. In three delightful acts, nymphs and shepherds play their intriguing love games; tokens of love go to the wrong persons, messages are intercepted, eavesdropping abound, and jealousies are evoked by false declarations of love. Truth will out, however, and the lovers, finally unmasked, are united in a wonderful finale.

Atalanta is surely one of Handel's frothiest concoctions, but every emotion—rage, hate, jealousy, despair, joy, love—is carefully heard by the master's free-flowing melodic genius. Title aside, it is really Meleagro's show, and a splendid show it is. At first Eva Bártfi-Barta's vibratoless singing seems to betray a sort of vocal immaturity, but as she warms up, her musicianship and technique become more and more impressive. She brings the first act to a brilliant climax.

Katalin Farkas's Atalanta is beautifully done, especially the moving second-act lament. Unusually generous with his love-is carefully etched by the master, the King of Aetolia, disguised as the shepherdess Atalanta, disguised as the shepherdess Aminta, unmasked, are united in a wonderful finale.


Performance: Understanding
Recording: Clean

Serial or twelve-tone techniques rarely lead to music with much expressive content. In the hands of Schoenberg they were a means of personal expression appropriately post-Romantic and neurotically Freudian. But for many composers it becomes a matter of overintellectualization, and Perle in particular of these techniques becomes message enough. This approach to composition restricts the emotional range of expression to the nightmarish world of the deranged. I can think of no serial or twelve-tone music that is happy, spiritual, contemplative (unless it's contemplative nightmare spirituality). George Perle's pieces here represent an attempt to retain the twelve-tone technique while trying to warm up the "sound" and the "feeling" of the music. To a certain degree he succeeds. Still, the underlying, unsettled feelings and all-pervasive mood of neurotic anxiety poke through the outer layer, giving you the feeling that these are scores for Alfred Hitchcock movies. Richard Goode, Gerard Schwarz, and the Music Today Ensemble play this music with considerable technical fluency, understanding, and sympathy. They provide a good deal of improvisational spirit, too, as Perle intended.

Curiously, the two sides of the LP were recorded by different producers but sound quite similar. Marc Aubert and Joanna Nickrenz chose to record the Serenade in RCA Studio A the previous year, and year later Max Wilcox recorded the ballade and concerto in RCA's Studio A. The hard-surfaced walls of the church emphasize the highs, but the room's cavities soften the harshness by creating some beautiful resonance regions in the upper portion of the spectrum. The effect on the sound of the woodwinds is especially mellowing. The instruments seem a bit closer in the studio recording, but Aubert and Nickrenz stepped back just enough to allow that beautiful natural church ambience to make its effect.

ROPARTZ: Symphony No. 3, in E Major. Françoise Pollet (soprano); Nathalie Stutzmann (contralto); Thierry Dran (tenor), Frédéric Vassar (bass); Orfeon Donostiarra; Orchestre du Capitole de Toulouse, Michel Plasson cond. PATHÉ MARCONI/EMI 2703481 $12.98, © 2703484 $12.98 (from International Book and Record Distributors, 40-11 24th St., Long Island City, NY 11101).

Performance: Devoted
Recording: Good

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“We were determined to make the ultimate in die-cast models,” said Mr. Buehrig.
“We succeeded!”
ually turned to music, first studying with Madame and completing his training under César Franck. Until now, Ropartz's representation on discs has been chiefly by way of chamber works and songs, and it was not until last year, thirty years after his death, that one of his big works, the Third Symphony, was recorded.

The symphony is to all intents and purposes a three-movement choral work with extended orchestral interludes. The musical language is decidedly post-Franckian, but with neither the hothouse passion of Chausson nor the cerebral coolness of D'Indy. The melodic lines are long and richly scored for both the vocal and orchestral forces, and the harmony is post-Wagnerian with occasional impressionist-modal flavoring. The vocal text, by Ropartz himself, is almost pantheistic in its evolution of sea, plain, and forest. It is also utopian-idealistic in its hopes that a suffering humanity will one day achieve a society based on "Truth, Justice, and Love!"

Noble sentiments these, and from time to time they give rise to noble music, but a major undiscovered masterpiece it is not. Still, it was worth recording as a significant product of that generation of French symphonic composers who came to maturity between the death of Franck and the emergence of Roussel. Michel Plas-son and his excellent Toulouse orchestra, with San Sebastian's fine Orfeon Donostiarra chorus and a team of good soloists, perform it with the utmost dedication. The recorded sound is excellent throughout.

D.H.

SCHUBERT: Die schöne Müllerin (D. 795). Francisco Araiza (tenor); Irwin Gage (piano). DEUTSCHE GRAMMOPHON 415 347-1 $10.98, @ 415 347-4 $10.98, @ 415 347-2 no list price.

Performance: Excellent Recording: Favor's piano

Apparently Francisco Araiza's first lieder recording, this is certainly an impressive and vastly enjoyable one. According to the booklet accompanying the CD, Araiza has sung Die schöne Müllerin successfully in public before, and the performance recorded here suggests a long and especially long acquaintance. It is a complete fusion of musical and dramatic values he projects: his tone is beautiful, his articulation remarkably clean and clear, and the sentiment rings true. Indeed, there is not a phrase or gesture throughout the cycle that fails to be convincing on its deepest level. Irwin Gage's accompaniments are exceptional, though the sonic focus seems to favor the piano rather frequently, placing it too far forward in relation to the singer. But the sound must otherwise be acknowledged as warm, well defined, and exceptionally lifelike.

R.F.

TCHAIKOVSKY: Yolanta. Galina Vishnevskaya (soprano), Yolanta, Ni-
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Discs and tapes reviewed by

Chris Albertson
Phyl Garland
Alanna Nash
Mark Peel
Peter Reilly
Steve Simels

ARCADIA: So Red the Rose. Simon LeBon, Roger Taylor, Nick Rhodes (vocals and instrumentals); vocal and instrumental accompaniment. Election Day: Keep Me in the Dark; Goodbye Is Forever; The Flame; Missing; and four others. CAPITOL SV-12428 $9.98, © 4XV-12428 $9.98.

Performance: Dur-eedful
Recording: Gummy

Arcadia’s “So Red the Rose” is the second special project from Duran Duran and a worthy successor to the Power Station’s “33⅓,” one of the ten worst albums of 1985. This time Simon LeBon, Roger Taylor, and Nick Rhodes have collaborated to produce a snarled, overwrought session that wavers between the unlistenable and the merely laughable. While Sting, Herbie Hancock, Dave Van Tiegham (percussionist for Laurie Anderson), and Andy McKay are here to lend star quality, their contrived contributions are buried in a kind of musical sludge.

Most of side one is plagued by gooey, purposeless synth rhythms that stick to your woofers like a wad of bubble gum on a pair of sneakers. And though side two introduces some musical ideas, they’re usually hokey. Skip it.

CLUSTER AND BRIAN ENO: Old Land. Brian Eno, Hans-Joachim Roedelius, Dieter Moebius (vocals, synthesizers, percussion). Base & Apex: Broken Head; The Belladog; Tzima N’arki; and five others. RELATIVITY EMC 8057 $8.98, © EMCT 8057 $8.98, © EMCD 8057 no list price (from Important Record Distributors, 149-03 Guy R. Brewer Blvd., Jamaica, NY 11434).

Performance: Intriguing
Recording: Very good

While there’s no indication on the record jacket, “Old Land” dates from 1978 and 1979 when Brian Eno was collaborating with the Dutch New Age musicians Hans-Joachim Roedelius and Dieter Moebius. It’s an interesting musical statement.

SANDY DENNY IN RETROSPECT

The late Sandy Denny, the star of Fairport Convention along with Richard Thompson, had one of the most hauntingly lovely voices ever possessed by a human being. Unfortunately, she was also pudgy and just this side of plain, which is probably the chief reason she never achieved the Linda Ronstadt-like success she deserved.

Denny was much loved in England, of course, but in the U.S. she was never much more than a folk-rock cult figure. She died in 1978 at the tragically early age of thirty, and if American pop fans remember her at all, it’s most likely for having sung on Led Zeppelin’s The Battle of Evermore or for writing Judy Collins’s Who Knows Where the Time Goes?—which is also the title of a new four-disc retrospective of her work on Hannibal Records.

Lack of commercial recognition notwithstanding, Denny was one of the most interesting of all the pre-punk English rock women (admittedly, not a large group), and the retrospective set is both a well-deserved tribute and one of the most enjoyable listening experiences in recent memory. Lovingly assembled by ex-Fairport Convention producer Joe Boyd and Denny’s singer-songwriter husband, Trevor Lucas, it showcases both her group work (with Fairport and Fotheringay) and her solo numbers, particularly the Fotheringay numbers, particularly the most gorgeous pop duet recording of the last twenty years. But almost every selection here has its pleasures, and the remastering is flawless. Few of the more familiar numbers sounded as good in their original versions.

Add to all the above a lovely selection of photos and the lyrics to all the songs, and you’ve got a genuinely poignant retrospective package. An exemplary job, long overdue.

STEVE SIMELS

SANDY DENNY: Who Knows Where the Time Goes? Sandy Denny (vocals, piano, guitar); Fairport Convention (vocals and instrumentals); Fotheringay (vocals and instrumentals); other musicians. The Lady; Listen, Listen; Next Time Around; Farewell, Farewell; The Music Weaver; Tomorrow Is a Long Time; The Quiet Joys of Brotherhood; The Pond and the Stream; One Way Donkey Ride; Take Away the Load; One More Chance; Brion Town; Blackwater: Tam Lin; The Banks of the Nile; Solo: When Will I Be Loved; Knockin’ on Heaven’s Door, Who Knows Where the Time Goes? and twenty-four others. HANNIBAL HNBX 5301 four discs $26.98.
example of Eno's efforts to create a kind of rigidly academic Muzak—minimalist tone poems with only the barest melody, harmony, and rhythm. Using synthesizers and percussion, Roedelius, Moebius, and Eno strip music down to the most basic, abstract levels of duration, pitch, and tone color. Although Eno's vocals on side one tend to break the spell for me—a distracting intrusion by reality—side two has some of the most intriguing "ambient music" Eno's ever done, a strange, paradoxical mixture of serenity and uncertainty. Recommended. M.P.

THE FABULOUS THUNDERBIRDS: Tuff Enuff (see Best of the Month, page 83)

FALCO: Falco 3. Falco (vocals); instrumental accompaniment. Rock Me Amadeus; America; Tango the Night; Munich Girls (Looking for Love); Jenny; and five others. A&M SP 5105 $8.98, 0

MIMI FARINA: Solo. Mimi Farina (vocals, guitar); vocal and instrumental accompaniment. Best of Friends; Big Party; Walk Me 'Round Your Garden; If My Eyes Were Blind; Deep Feelings; How Can We Hang On to a Dream; and four others. PHIL 1102 $8.98.


In the years since, Farina has been the prime force behind Bread and Roses, a nonprofit organization dedicated to bringing free, live entertainment to people confined in institutions—convalescent homes, drug-abuse centers, prisons, mental hospitals, and juvenile treatment centers.

Anyone who cares that much about humanity is bound to spill that concern over into her music, and "Solo" is a reflection of relationships Farina has enjoyed—both personally and vicariously—through the past twenty years. There are songs about war resisters and Vietnam veterans, songs about women at the beginning and at the end of their lives, and songs written by poets who stayed on this earth only a short while. None of them are good-time songs, and all of them will make you more than a bit wistful.

Farina doesn't have that shimmering soprano Baez possesses, but her voice has an honest, homey quality that makes it seem less strident and somehow more genuine than her sister's. That, plus a fascinating combination of dynamic range than ever before. The unitized array gives the woofer a larger working area, of mounting the midrange and tweeter in one goes from a single pile mount to any comparable competitive amplifier at any level you choose. Cut in any Jensen Classic speaker, then switch over to any comparable competitive speaker. Now switch back and forth to compare the two. In every model category the Jensen Classic speaker will stand out right there on the floor!

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most car stereo speakers have pole mounts. Jensen Classic speakers have the unitized array. This improved method of mounting the midrange and tweeter gives the woofer a larger working area, and better bass response than possible with other systems. The unitized array
Here is material Gaye recorded on his own between 1967 and 1974, first laying down the instrumental tracks and then, intermittently, the vocals. He sneaked the project away when he went into exile in Europe during the late Seventies, but he told Larkin Arnold about it over there. It was Arnold who was responsible for resurrecting Gaye's career by signing him with CBS and producing his hit album "Midnight Love," and it was Arnold who assembled "Romantically Yours" after Gaye's death.

It is a fascinating set in that it reveals an unusually conventional Marvin Gaye. The sexuality is more subtle, the vocal approach more restrained, with just an occasional well-placed stylistic twist. On the first side, Gaye croons a set of standards, including More, Why Did I Choose You?, Fly Me to the Moon, and I Won't Cry Anymore. Just Like: Walkin' in the Rain; and three others. COLUMBIA FC 40208, © FCT 40208, no list price.

Performance: Surprising
Recording: Good

Although Marvin Gaye presented many musical faces to us during his lifetime, from the boyishly shy performer of his early Motown days and the concerned social commentator of What's Goin' On? to the sensual giant he became in his later years, one of his deepest desires was to achieve widespread recognition as a mainstream balladeer like Nat King Cole. Indeed, he recorded a tribute to Cole in 1966, the year he also recorded Smokey Robinson's I Second You with the Miracles. Now, after twenty years, we get another glimpse of this facet of his complex personality with "Romantically Yours."
enjoyable set, punctuated by Harris’s last year, but “Thirteen” is still a most
Cajun music in Lacassine Special, and there’s a nod to the current vogue of
Springsteen’s connecting framework riffs. With his distinctive, breakneck solo and
Elvis Presley gem, a neo-rockabilly feel, guitarist, who gives Mystery Train, the
performance and the

Harris has never been afraid to take chances. In addition to a genuinely moving and poignant version of Bruce Springsteen’s My Father’s House, there’s a nod to the current vogue of Cajun music in Lacassine Special, and Your Long Journey, with its synthesized bagpipes, gives Harris a chance to explore her fascination with the music of the Celts.

The real stunners on the album, however, are two songs Harris wrote with her coproducer and new husband, Paul Kennerley. Sweetheart of the Pines and When I Was Yours. Sweetheart is the more haunting, full of feeling and bluegrass verve. Also worth mentioning is Harris’s duet with John Anderson on One I Used to Know.

Frankie Miller: Dancing in the Rain. Frankie Miller (vocals, guitar); other musicians. I’d Lie To You for Your Love, That’s How Long My Love Is; Do It ’Till We Drop, How Many Tears Can You Hide; and six others. MERCURY 826 647-1 $8.98, 826 647-4 $8.98, 826 647-2 no list price.

Performance: Well-intentioned
Recording: Good

As we used to say in the days before MTV, Frankie Miller has paid his dues. He’s a likable enough blues- and r-&-b-influenced belter, but when you get down to it, he’s only a journeyman, a Bob Seger without the vision. Here, playing up his natural vocal resemblance to Paul Rogers (a similarity heightened by having Rogers’s old Bad Company bandmate Simon Kirke on drums), Miller blusters his way through a set of tunes whose roots are mostly mid-Seventies heavy metal. He performs with impressive professionalism, but why bother? True, I’d Lie To You for Your Love, a country hit for the Bellamy Brothers some years back, has flashes of wit, and the obligatory Motown cover, the Temptations’ semi-obscure Shakey Ground, does work up a nice bluesy head of steam. But this is mostly the kind of by-the-book corporate rock that’s made AOR the most obnoxious radio experience since Dr. Ruth Westheimer.

GRACE JONES: Island Life. Grace Jones (vocals); instrumental accompaniment. La Vie en rose; I Need a Man; Do or Die; Private Life; I’ve Seen That Face Before (Liber Tango); Love Is the Drug; and four others. ISLAND 90491-1 $8.98, 90491-4 $8.98.

Performance: Illusion
Recording: Okay

Grace Jones typifies rock music’s identity crisis in the video age, although I doubt if she herself suffers from it. The issue is, is rock really about music any more? Or is it just one component of a larger entertainment, neither more nor less important than photography or art direction, theatrical performance, set design, even costume and make-up art? As Glenn O’Brien’s liner notes on “Island Life” attest, Grace Jones is a big star. But as a singer—as a musician—Jones has never been much more than a stunning woman with a bizarre haircut. Her success has far more to do with image than sound. In fact, Jones seems to have been a rather passive participant in her music career, which has been managed for her both in the studio and in the press.

“Island Life” is a retrospective of Jones’s career, with material from both her “Disco Diva” period and her later work with some of Jamaica’s top reggae session players. What is clear at every stage is the trendiness of her music and her severe limitations as a singer. I would go further and say that, aside from Jones’s exotic looks, one could quickly coach a New Jersey housewife to do her breathy chanteuse or camp dominatrix act.

Jones was a top fashion model when she recorded her first album, “Portfolio,” and you’re aware of it through every painful note of La Vie en rose and I Need a Man. Yet thanks to the wonderful nostalgia of La Vie and the dead-beat of Man, these were enormous club hits. The music got better when she began recording with the Compass Point All Stars (Sty and Robbie and others), and Jones got better too. The hybrid reggae/disco fusion of Love Is the Drug and Waitin’ in the Rain is tougher and more forceful—by “Warm Leatherette” we were taking Grace Jones seriously. But what all these tracks miss is her paramount quality—the eerie, almost scary geometry of Grace Jones’s beauty. This is the video age, and this music would make a lot more sense on a videocassette.

THE ISLEY BROTHERS: Masterpiece. The Isley Brothers (vocals); instrumental accompaniment. May I?; My Best Was Good Enough; If Leaving Me Is Easy; You Never Know When You’ve Gonna Fall in Love; Stay Gold; and four others. WARNER BROS. 25347-1 $8.98, 25347-4 $8.98.

Performance: In their groove
Recording: Satisfactory

Like Old Man River, the Isley Brothers just keep rolling along, but after twenty-five years on the boards they don’t seem to be rolling quite as swiftly as they once did. There are times on this new album when the pace seems positively arthritic, which is not just to say that it’s slow. The original threesome of Ronald, Rudolph, and O’Kelly are still warbling away in their established, “mellow” mood, but it can become monotonous after a while. The amazing thing is that while all the songs here are by different composers, from Stevie Wonder to Phil Collins, the Isleys manage to make them sound alike. That takes some doing.

JUICE NEWTON: Old Flame. Juice Newton (vocals); vocal and instrumental accompaniment. Cheap Love; You Make Me Want To Make You Mine; Hur!; Old Flame; Stuck in the Middle with You; and five others. RCA AHL 5493 $8.98, AHK1-5493 $8.98.

Performance: Juicy-y Fruit
Recording: Good

Well, judging from the mail, I really stepped in it last time I reviewed a Juice Newton album. But now that I have another one on my turntable, I have to say that I’m sorry—sorry I didn’t say it earlier. With the exception of the title cut and What Can I Do with My Heart, Newton comes across on “Old Flame” the same way she usually does: as an emotionally sterile vocalist who does a better job of acting hurt in her accompanying videos than she sounds on her records. Newton also continues to mine herself

Island Life: the success of an image
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ATLANTIC'S RHYTHM-AND-BLUES

For two richly rewarding decades, Victor's Bluebird label was the soil in which the seeds of rhythm-and-blues germinated, and when Sonny Boy Williamson, Arthur Crudup, Lil Green, and others gave way to a new generation, Atlantic Records provided fertile ground for the transplant. Significant r&b recordings appeared on other small labels, but Atlantic had the edge. It was the label of Ray Charles, LaVern Baker, Clyde McPhatter, Ben E. King, Wilson Pickett, Otis Redding, and Aretha Franklin; it brought us the harmonizing of the Spinners, the Clovers, the Drifters, and the Spinners. In an era when the earthy sounds of r&b bounced off barricades of stigma, Atlantic's r&b artists often found that their music had the ears of white collegians—the very people who were said to frown on anything that might possibly climb a pop chart. The quiet crossover was part due to the label's concurrent, tastefully conceived cover jazz releases, which lent it an air of respectability and helped establish a solid distributor base.

I have mentioned only a handful of the great artists who spun their magic on Atlantic and its subsidiary labels. There were many others, and sixty-five of them are represented in "Atlantic Rhythm and Blues," a seven-volume, fourteen-record set containing 186 tracks of music recorded between 1947 and 1974. This is not the first time Atlantic has tapped its vault for an album series devoted to this music—there was the eight-volume "History of Rhythm and Blues," which appeared in 1969—but the new release is certainly the company's most ambitious such project to date.

With informative, detailed notes by Robert Pruter and Peter Grendysa and wonderful cover collages by Fred Otnes, the packaging is worthy of the treasures within. These start with some late-Forties tracks that have their roots in jazz. The opening selection in Volume One, "Lowe Groovin'," is by Joe Morris, a former Lionel Hampton sideman who became an important breadwinner for Atlantic in its early days. The performance here features tenor saxophonist Johnny Griffin. Then there are tracks by guitarist Tiny Grimes, who cut himself a permanent niche in jazz history through a series of recordings with Art Tatum, and by Ruth Brown, fresh out of the bands of Lucky Millinder and Blanche Calloway. By the time we reach the end of Volume One, we have heard from a broad variety of artists—Professor Longhair, the Cardinals, Joe Turner, the Clovers, and Ray Charles, the man who came to personify "soul music."

Subsequent volumes take us into the Fifties, when vocal groups liked to name themselves after birds and black pop artists regularly found their material “covered” by pale imitators whose race was more acceptable to radio-station executives and promoters. As long as record companies continue to have "black music" departments, a form of racism is kept alive within the industry, but it was much worse when these recordings first appeared, and many of the artists heard here saw only a token amount of the income they generated. That began to change in the Sixties, a period represented in Volumes Four, Five, and Six by such memorable performers as Otis Redding, Sam and Dave, Wilson Pickett, and the incomparable Aretha Franklin.

The soul sounds of the Seventies occupy most of Volume Seven, which includes Funky Nassau by the short-lived and (sadly) aptly named Bahamian group Beginning of the End—a hint of things to come from the Caribbean. This seventh album also includes the smoother sounds of Roberta Flack and Donny Hathaway's "Where Is the Love?" and Eddie Harris's "Compared to What," and the perennially up-to-date Aretha Franklin.

Atlantic could have carried the series into the Eighties but obviously decided to stop in the mid-Seventies, at the dawn of the disco era, when soul music plugged in and took on a somewhat artificial high-tech sheen. Atlantic did well in the disco era, and I suppose that it too will be covered in a retrospective collection someday, probably around the turn of the century. By that time, I hope we will no longer be putting music into narrow boxes labeled according to the color of an artist's skin.

This fourteen-record anthology is a wonderful blend of hits and near hits sung and played by people who have woven their artistry into the fabric of American music. You may not have heard of everyone represented here, but something in every track will undoubtedly either trigger your memory or give you a better understanding of the sounds that shaped the popular music of today.

Chris Albertson

in formula, resurrecting old rock hits and employing bland, predictable instrumental arrangements. You don’t hear the term “bubblegum” rockers too much any more, but if you did, Juice Newton—who otherwise displays fine vocal control and a better-than-average range—could easily lead the pack. A.N.

LEON REDBONE: Red to Blue. Leon Redbone (guitar, vocals); vocal and instrumental accompaniment. Diamonds Don’t Mean a Thing; Lovesick Blues; Reaching for Someone and Not Finding Anyone There; Steal Away Blues; and eight others. AUGUST AS 8888 $8.98.

Performance: Singular
Recording: Good

When Leon Redbone first appeared back in the mid-Seventies, Warner Bros. marketed him as a novelty—an eccentric singer of blues and New Orleans jazz whose age and origin were unknown. The strategy made Redbone’s first album a much bigger success than it would have been otherwise—and it all but doomed his long-term career prospects. Nothing is so ephemeral as a novelty act. It’s been five years since Warner’s ended its relationship with Redbone and probably that long since most of us have given a thought to the mysterious, goateed man in the ice-cream suit.

“Red to Blue” on August Records (distributed by that bastion of America-Rounders Records) represents considerably scaled-down commercial possibilities but shows no diminution of Redbone’s essential charm. He still sounds like a Kentucky colonel who’s managed to get a tuba and a banjo player into the tub with him. Even in the dead of winter, listening to Redbone yodel Hank Williams’s Lovesick Blues or growl his own version of Salty Dog makes me feel like I’m floating in a hammock with a cool drink on a hot August day. Leon, where ya been? M.P.

DIANA ROSS: Eaten Alive. Diana Ross (vocals); vocal and instrumental accompaniment. Eaten Alive; Oh Teacher; Experience; Chain Reaction; More and More; and five others. RCA AFL-5422 $8.98, © AFK1-5422 $8.98.

Performance: Star-heavy
Recording: Good

Here’s an album that’s easy to forget. Much of the hoopla it has generated rests on its being a collaboration with the Brothers Gibb, who wrote the songs, and Diana Ross’s “special friend” Michael Jackson, who can be heard faintly in the background on the title track, which he co-wrote. Actually, Jackson’s voice so closely resembles Ross’s in pitch that it’s hard to tell them apart.

The assortment of tempos here is carefully plotted, ranging from thunderous thumpers to Chain Reaction, which mimics the old Motown sound that brought Ross her initial fame. More and More provides an interesting change, with Ross cooing torquishly against a subdued piano accompaniment. What is lacking throughout, however, is any depth of feeling. P.G.

PETE TOWNSHEND: White City. Pete Townshend (vocals, guitar, keyboards, other musicians). Give Blood; Brilliant Blues; Face the Face; Hiding Out; Secondhand Love; and four others. ATEC 90473-1 $8.98, © 90473-4 $8.98, © 9047-2 no list price.

Performance: No visuals?
Recording: Excellent

Pete Townshend can be a hell of a prose writer, as anybody who read the short story in the “Quadrophenia” album package can testify, but his efforts on the jacket of his new “White City,” apparently a story-line synopsis of the long video of the same name, come off as a fairly muddled bit of self-referential surrealism. Without having seen the video, I can only guess what Pete is going on about here, but the music is rarely compelling enough to make me want to find out. Stylistically, it ranges all over the map, from Sixties soul to techno-pop, and it’s impecsably played and produced (nice to see that Clem Burke, the great Blondie drummer and noted Keith Moon fan is in there somewhere). But the music seems to exist in a weird kind of limbo without the visuals, sort of the opposite of MTV with the sound turned off. In short, a great album this ain’t (probably), but it’s a decent enough trailer for the video, which does make it some kind of a first.

S.S.

LOUDON WAINWRIGHT III: I’m Alright (see Best of the Month, page 84)

WHITE ANIMALS. White Animals (vocals and instrumental). Help Yourself; Old Fashion Day; Caught Up in the Dread; She’s So Different; I Can’t Wait; Big Shot; and four others. DREAD BEAT DBLP-1986 $8.98, © DBC-1986 $8.98 (from Dread Beat Records, P.O. Box 121356, Nashville, TN 37212).

Performance: Futuristic retrograde
Recording: Sixties-style mix

White Animals is a Nashville band that bears about as much resemblance to country music as Cyndi Lauper does to Kitty Wells. The idea here, the press release says, is to fuse a modern sound that “honors [the] passion and craftsmanship” of the Sixties with whatever eclectic influences any of the band members might have. In other words, you can hear whatever you want to in this—shades of the Zombies, of David Bowie, of the Beau Brummels, of Talking Heads, of the Kinks, and, on the down side, maybe even Herman’s Hermits. You get it. Southern r- & -b meets the British invasion at CBGB’s.

It’s a pretty infectious blend, even if the lyrics—more typical of Sixties music—don’t have a heck of a lot to say. Produced in Memphis by Busta Jones (the Ramones, Brian Eno, Talking Heads), the album has that old-fashioned “wash” sound to it (not a lot of high end), which helps to create the mood they’re after. All in all, neat stuff. A.N.

DON WILLIAMS: New Moves. Don Williams (vocals, guitar); instrumental accompaniment. Heartbeat in the Darkness; I’ll Never Be in Love Again; Sho Full of Love; Send Her Roses; The Light in Your Eyes; and five others. CAPITOL/EMI ST-12440 $8.98, © 4XT-12440 $8.98.

Performance: Renewed vigor
Recording: Nice

The title of Don Williams’s current release refers to his change of record labels and, happily, not to his style. Williams is still about as laid-back as a performer can be and still be breathing, he still brings about old-fashioned virtues and true-heart romance, and his voice is still mellow as a cello. As with his last few albums for MCA, this one gently allows Williams to keep up with the times by adding the slightest pop instrumentation and the occasional Fifties-style rock tune while retaining his country-folk base. Good move, Don. A.N.
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JAZZ

JAKI BYARD: Phantasies. Diane Byard, Denyce Byard (vocals); Jaki Byard and the Apollo Stompers (instrumentals). Lover Man: Medley—Black & Tan Fantasy/Prelude to a Kiss/Prelude No. 29/Do Nothing Till You Hear from Me; and five others. SOUL NOTE/PSI SN 1075 $9.98, © SNC 1075 $9.98.

Performance: Mostly fine
Recording: Very good

Jaki Byard’s Apollo Stompers form a fairly traditional big band, but his fertile musical imagination led me to expect more daring arrangements. “Phantasies” is nevertheless very pleasant—until you get to Ellington’s “Do Nothing Till You Hear from Me,” and six others. SOUL NOTE/PSI SN 1075 $9.98, © SNC 1075 $9.98.

Performance: Mostly fine
Recording: Very good

Herbie Mann’s Legacy. Herbie Mann (flute, percussion); vocal and instrumental accompaniment. Keep the Spirits Singing: Inner City Blues; Zigaboob; and four others. ATLANTIC 81285-1 $8.98, © 81285-4 $8.98.

Performance: Formula stuff
Recording: Very good

Herbie Mann’s flute is heavily echoed on “See Through Spirits,” a new Atlantic release in which the veteran jazz player bounces his way through an uninspired program of elevator fare. Nearly half of these tunes were written by one Odonel Levy, who also sings and plays guitar and synthesizers on the album. Mann clearly takes a back seat on these tracks. Only on his own Zigaboo do we hear anything approaching the artistry that earned him his high reputation as a jazz musician. C.A.

JON FADDIS: Legacy. Jon Faddis (trumpet, flugelhorn); Harold Land (tenor saxophone); Kenny Barron (piano); Ray Brown (bass); Mel Lewis (drums). West End Blues; Little Jazz; Night in Tunisia; and five others. CONCORD JAZZ CJ-291 $8.98, © CJ-291-C $8.98.

Performance: Superb
Recording: Very good

Anyone who has followed the jazz scene closely over the past ten years can tell you that trumpeter Jon Faddis has never received his rightful share of attention. Largely buried as a studio musician, Faddis steps into the spotlight only occasionally, but when he does the result is often dazzling.

Dazzling aptly describes “Legacy,” on which Faddis, saxophonist Harold Land, and a fine rhythm section led by pianist Kenny Barron pay tribute to such trumpet masters as Louis Armstrong, Roy Eldridge, and Dizzy Gillespie. From the opening track, a stunning mirror of Armstrong’s celebrated 1928 introduction to West End Blues, to the beautiful rendition of Benny Golson’s Whisper Not that ends the set, this is an fine sample of Faddis’s artistry. C.A.


Performance: Resilient reed
Recording: Good remote

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Now these recordings have been issued in "A Touch of Ragtime," which also contains a handful of "live" performances. The Thiele's wife, Teresa Brewer, a guest appearance by Harry Nilsson, and a recording of "Georgia on My Mind," captures an unusual musical interlude, turning here and there to musical flashes of brilliance here, but much of the set sounds like so much practice.

Performance: Good 

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**VIDEO REVIEWS**

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**JIMMY BUFFETT: Live by the Bay.**
Jimmy Buffett and the Coral Reefer Band (vocals and instrumentals). Door Number Three; We Are the People; Come Monday; Rag Top Day; Who’s the Blonde Stranger; and thirteen others. MCA 80332 VHS Hi-Fi and Beta Hi-Fi $29.95

**Performance:** Slow gin fizz
**Recording:** Good remote

As a songwriter, Jimmy Buffett has built himself a cult following with songs of whimsy, romance, and rogish der-ring-do populated by pirates, pranksters, and philanderers. Translated into concert attendance, that means Buffett has a full house of fans who fantasize about being pirates, pranksters, and philanderers, and a good time is usually had by all.

“Live by the Bay” is a live concert recorded in Florida, Buffett’s spiritual home, and amounts to a greatest-hits package. Unlike the way I remember a Buffett concert from some years back, this one starts off slowly, stays relatively low key, and runs, at eighty-seven minutes, about half an hour too long. To top it off, Buffett’s between-song prattle hardly raises a chuckle, and the performances, like the production techniques, are little more than shipshape.

If you are a genuine pirate, prankster, or philanderer, this will probably do little for you. The Walter Mittys of the dry-dock set may wish to sneak a peek, however.

**A.N.**

**JOE COCKER: Mad Dogs and Englishmen.** Joe Cocker (vocals); vocal and instrumental accompaniment. Delta Lady; The Letter; Honky Tonk Woman; Lawdy Miss Clawdy; Let It Be; With a Little Help from My Friends; Sticks and Stones; Something; and eight others. PIONEER PA-85-133 LaserDisc $29.95

**Performance:** Vibrant
**Recording:** Very good

If you are over thirty, you undoubtedly remember Joe Cocker, his high-energy touring company, and his many hit records. If you are younger, perhaps you recall seeing Cocker on NBC’s Saturday Night Live singing at the side of the late John Belushi, who expertly mimicked him. But even if Cocker isn’t programmed into your memory bank, you might want to experience “Mad Dogs and Englishmen,” a two-hour documentary that captures a 1971 concert tour by Cocker and his group of performers, friends, and hangers-on. It is a vivid slice of life on the road during the colorful, psychedelic period when flower children equated drugs with love, “Stop the war in Vietnam” was the rallying cry, and anybody who was anybody in the booming rock business had to have a billboard on Sunset Strip and a guru in India.

With Rita Coolidge among the back-up singers and Leon Russell up front with Cocker, the group performs big numbers of that time, from Russell’s Delta Lady and Please Give Peace a Chance to hits by Mick Jagger, Leonard Cohen, Titus Turner, Lloyd Price, and Lennon and McCartney. In between, we catch glimpses of backstage life in hotel rooms, touring bus rides, hops in a chartered plane, interview sessions with dumb disc jockeys, talks with even dumber groupies, and private moments when the group relaxes and performs rituals that seem quaintly outdated in this day of high-tech egomania.

The camera work and editing on “Mad Dogs” is professional and well

**BEATLES CLASSICS**

A NEW video featuring the Beatles catches the adorable mop-tops in a 1965 British TV appearance where they seem to be lip-synching to live tracks recorded before the broadcast (Ringo’s flubbed entrance on I Wanna Be Your Man is the giveaway). But this was a common practice of the period and, given the amount of noise the studio audience was generating, probably a sensible one. That consumer caveat aside, however, what’s on view is a prime slice of Beatlemania in the raw, a twenty-minute time capsule that’s compelling both as rock-and-roll and as never-to-be-duplicated social history: a crystallization, in glorious mono and living black and white, of pop’s last innocent moment, a document of the Teen Scream before the sixties burst wide open and nothing was ever the same again.

There are also, of course, a lot of terrific songs and a glimpse of four genuinely compelling personalities who make the interchangeable, manufactured faces that dominate today’s music and video scenes look like the soulless manikins they mostly are. This is a wonderful package by any standard, and the price is certainly right.

Extra for trivia fans: those are the Animals making utter fools of themselves on the balcony overlooking the Fab Four.

**Louis Meredith**

**THE BEATLES: Live on Ready Steady Go!** The Beatles (vocals and instrumentals). Twist and Shout; Roll Over Beethoven; I Wanna Be Your Man; Long Tall Sally; Love Me Do; Please Please Me; From Me to You; She Loves You; I Wanna Hold Your Hand; Can’t Buy Me Love; Shout. SONY 97W50093 VHS Hi-Fi $16.95, 97W00092 Beta Hi-Fi $16.95.
paced, the transfer to LaserDisc is excellent in every respect, and the on-stage footage—though a bit grainy—is better than most of the recent concert material that has found its way into home video. I spent a good deal of time backstaging at New York's Fillmore East and other rock palaces during the late Sixties and early Seventies, and I did my share of interviews in dressing rooms and hotel suites, so I can vouch for the flavor captured here. It's the real thing.

C.A.

MOZART: Idomeneo. Richard Lewis (tenor), Idomeneo; Leo Goecke (tenor), Idamante; Bozena Betley (soprano), Ilia; Josephine Barstow (soprano), Electra. Glyndebourne Festival Chorus; London Philharmonic Orchestra, John Pritchard cond. VIDEO ARTS INTERNATIONAL 69025 VHS $69.95, 29025 Beta $69.95.

Performance: Very good
Recording: Good

Despite occasional fuzziness of sound, this tape of a 1974 Glyndebourne Festival performance offers a rewarding artistic accompaniment. That's All Right; Heartbreak Hotel; Love Me; Blue Suede Shoes; Are You Lonesome Tonight; One Night with You; Memories; and five others. MEDIA HOME ENTERTAINMENT M467 VHS and Beta $19.95, PIONEER ARTISTS PA-85-146 LaserDisc (electronically rechanneled for stereo) $29.95.

Performance: Presley at his peak
Recording: 1968 network TV

"Elvis: One Night with You" is one of the many Presley specials that aired on cable TV last year as part of the celebration of King's fiftieth birthday. All of the footage, however, comes from Presley's now-legendary 1968 Christmas Special (also known as the Comeback Special and as the Singer Special, the latter derived from the sewing-machine company that sponsored it) on which the thirty-three-year-old Elvis wore his black-leather suit and generally ripped it up in a way he hadn't done in nearly a decade. In its final form, the special contained two black-leather performance situations, one where Presley sat around with his cronies and reminisced between songs and one where he prowled the stage like a caged, sweaty tiger. In the editing, only parts of both performances made it into the broadcast.

This video release features the entire improvisational sequence, uncut and unedited, in fifty-three minutes. Without a doubt, the animated, strutting sequence was more musically and sexually exciting, but this one tells more about Presley the man—and Presley the frightened performer who hadn't set foot on a stage in seven years. The bandleader— with musicians Scotty Moore, D. J. Fontana, Charlie Hodge, and buddy Alan Fortas—often runs along the Crackerjack variety, and some of the shots are poorly composed and dated. But when Presley really cuts loose, he is nothing short of spellbinding—the very personification of raw, gritty rock-and-roll. On the whole, this is a magical performance, and a must-have for any video collection.

A.N.
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<th>MODEL</th>
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CAR AMPLIFIERS/EGS

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CAR SPEAKERS PER PIR

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HiFi/Stereo

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Sony

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<td>SHERWOOD</td>
<td>BOOMA SYSTEM</td>
</tr>
</tbody>
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<tr>
<th>MODEL</th>
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<tr>
<td>SM4015X</td>
<td>$145.00</td>
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**Sharp**

Sharp's DX-620 Compact Disc player has an infrared remote control with a keypad for programming and direct access to desired tracks. Programming on the player itself is done with the skip/search controls. An entire disc or selected tracks can be programmed to repeat. Displays indicate mode (play, pause, and repeat), track number, and elapsed time of the current track. A headphone jack is included. Price: $289.95. Sharp Electronics Corp., Dept. SR, 10 Sharp Plaza, Paramus, NJ 07652.

**Hifonics**

The Ceres from Hifonics is a three-band parametric equalizer designed to correct frequency-response inaccuracies in car stereo systems. Center frequencies can be set from 40 to 640 Hz for Band 1, from 100 to 3,000 Hz for Band 2, and from 500 to 16,000 Hz for Band 3. Each bandwidth is variable from 0.16 to 2 octaves, with a maximum boost or cut of 20 dB at the 0.16-octave bandwidth. A loop switch allows active crossovers to be inserted before the fader circuit for constant sub-bass level regardless of the fader setting.

Switching between tape/tuner and a Compact Disc player is automatic. The unit has volume and fader controls, and the input sensitivity can be varied for use with other components. Frequency response is given as 5 to 50,000 Hz +0, -3 dB, signal-to-noise ratio as 85 dB (A-weighted), and total harmonic distortion as less than 0.02 percent at any output. Price: $400. Hifonics, Dept. SR, 845 Broad Avenue, Ridgefield, NJ 07657.

**Soundstream**

The Play Trim circuit in the TC-308 car stereo cassette tuner from Soundstream allows adjustment of playback equalization to correct for high-frequency errors before Dolby decoding, which is said to reduce Dolby mistracking. Along with Dolby B and Dolby C noise reduction, the cassette deck features autoreverse, motor-assisted loading, switchable 70- or 120-µs equalization, and a music sensor that finds the start of the current or next selection. The quartz-PLL tuner features six FM and six AM presets, auto-scan tuning, and a switch that automatically selects the tuner while a tape is fast-winding. With an optional handle, the TC-308 can be removed from the dash and stowed in the trunk or elsewhere. Prices: TC-308, $579; SH-30 handle, $20. Soundstream Technologies, Dept. SR, 2907 W. 182nd St., Redondo Beach, CA 90278.
Phase Linear

Four new car speakers from Phase Linear use graphite-composite cones in their low-frequency drivers for wider frequency response and lower distortion. The line includes the PL 3690, a 6 x 9-inch three-way; the PL 2650, a 6½-inch two-way; the PL 2450, a 6½-inch dual-cone; and the PL 1400 (shown), a 4-inch dual-cone. Three models have a polycarbonate dome tweeter, and there is a polycarbonate midrange in the PL 3690. The PL 2650 and PL 3690 can be biamped. Maximum-power ratings for the PL 3690, 2650, 2450, and 1400 are 110, 80, 50, and 35 watts rms, respectively. Prices (per pair): PL 3690, $200; PL 2650, $130; PL 2450, $85; PL 1400, $65. Phase Linear Division of International Jensen, Dept. SR, 4134 N. United Pkwy., Schiller Park, IL 60176. Circle 129 on reader service card

Wharfedale

A hybrid of the Wharfedale Diamond and Model 708 speakers, the Model 504 compact speaker has a 110-mm woofer and a 19-mm aluminum-dome tweeter. The woofer's maximum power-handling capability is 100 watts. The drivers are housed in a cast-magnesium chassis, and Wharfedale's bayonet fixing method is used in the bass unit instead of T-nuts or screws. Recommended placement is a rigid mounting about 21 inches above the floor and about 6 inches from the back wall. Frequency response is given as 50 to 20,000 Hz. With grille, the Model 504 is 7 inches wide, 11 inches high, and 8 inches deep. Price: $320 per pair. Wharfedale USA, Dept. SR, 700 Billings St., Suite E, Aurora, CO 80011. Circle 130 on reader service card

Magnavox

The Magnavox CD-9510 portable Compact Disc player weighs 2½ pounds with its optional battery pack and measures less than 5 x 1½ x 7½ inches. Ten tracks can be programmed for playback or repeat. With the supplied cables and a.c. adaptor, the player plugs into a stereo system for home use. Controls allow skipping to the previous or next track and scanning forward or backward. The display shows elapsed or remaining time in the track. Price: $300; battery pack, carrying case, shoulder strap, and headphones, $50. Magnavox, Dept. SR, Interstate 40 and Straw Plains Pike, P.O. Box 6950, Knoxville, TN 37914. Circle 131 on reader service card

More New Products on page 16
If you aspire to owning the famous Energy ESM-2 Pro Monitor but can't quite afford it, hear the ESM-2. With size and performance approaching the 22, it is "both a fine loudspeaker and an excellent value."

Or perhaps the more compact ESM-3 will better suit you - it is "definitely an excellent value."

On a student budget? Try the new ESM-4 bookshelf monitor - very affordable!

Audit on any of the ESM monitors. We think you'll agree with what Stereo Review, High Fidelity and Audio Ideas say below.

"AMAZING AT THE PRICE"

"response varied only ± 1.5 dB from 180 to 18,000 Hz which is unquestionably one of the smoothest responses we have yet encountered from a speaker ... dispersion on a par with response flatness ... phase shift highly linear ... excellent peak power-handling ability ... only at 100 Hz did we manage to reach the speaker's (power handling) limits: with 990 watts (using single cycle bursts followed by 128 cycles of silence) ... smooth midrange and high frequency response, excellent dispersion and group delay, and exceptional short-term power-handling ability ... definitely an excellent value."

"a fine loudspeaker and an excellent value ... very smooth and quite flat, falling within ± 3 1/2 dB on-axis throughout the range above the 50 Hz band ... in the lab's 300 Hz pulse test the ESM-2 accepted without noticeable complaint the full output of the test amplifier ... (470 watts, peak into 8 ohms), for a calculated SPL (Sound Pressure Level) of 114 3/4 dB. Loud transients thus should be handled well ... bass sounds more extended than the response curves might suggest, with surprising heft at the very bottom ... Stereo imaging, too is very good ... Even if your budget can accommodate twice the ESM-2's price - you owe it to yourself to audition Energy's latest design."

"exceptional overtone balance ... imaging was just about the best I've heard ... excellent dynamic range ... it sounds great ... no real compromises in its design ... anyone looking for a $1,500 to $2,000 system would be foolish not to carefully audition the Energy ESM-2 ... amazing at the price."
A new release from Nonesuch recently reissued by Nonesuch. The sonatas of Scriabin, recorded to perform and record all works (and the first in America), is the first in America. Rachmaninoff (CBS Masterworks) has many firsts to her credit. She was the first pianist to record the whole thing, and she played it in New York. Among the inductees was Chuck Berry, whose award was presented by Rolling Stone Keith Richards (appropriately, since Keith’s been playing Chuck’s licks almost as long as Chuck has). Other

inductee-presenter pairings included the Everly Brothers and Neil Young, James Brown and Stevie Winwood, and Fats Domino with fellow pianist Billy Joel. Capping the evening was an impromptu jam session featuring all of the above plus Jerry Lee Lewis, John Fogerty, Chubby Checker, and Julian Lennon. The whole thing was video-taped, but at press time no plans had been announced for home-video release.

WIDELY known as “America’s first lady of the piano,” Ruth Laredo has many firsts to her credit. She was the first pianist to record all the solo works of Rachmaninoff (CBS Masterworks) and the first in America to perform and record all the sonatas of Scriabin, recently reissued by Nonesuch. A new release from Nonesuch

is Laredo’s recording of Tchaikovsky’s The Seasons. Also new is Laredo’s recording of three Beethoven sonatas, including the Appassionata, on the Second Hearing label. Coming this summer, also from Second Hearing, is a collection of French music for flute and piano in which Laredo is joined by a flutist with whom she frequently tours, Paula Robison. Included are works by Poulenc, Ravel, Chaminade, and Lili Boulanger. (Second Hearing, by the way, is one of a small but growing number of labels releasing CD’s only.)

In a June CD release from Denon, Laredo teams up with another pianist, Jacques Rouvier, for a recording of Ravel’s music for two pianos and piano duo.

NEXT to Michael Jackson’s “Thriller,” the most-nominated album in the history of the Grammy Awards was Manhattan Transfer’s “Vocalese,” which was cited in a dozen categories this year. That’s pretty good for a jazz album, even for an album that went to No. 1 on the country’s jazz charts.

At awards time “Vocalese” picked up two Grammys, one for Best Jazz Vocal Performance, Duo or Group, and the other for Best Jazz Vocal Performance, Male. The latter was for the album’s Another Night in Tunisia track, in which the group was joined by Jon Hendricks and Bobby McFerrin.

Another record was set, or improved upon, by conductor Sir Georg Solti, who has now won twenty-four Grammys, more than anyone else in the business by a margin. Runners-up are Henry Mancini, with twenty Grammies, and Vladimir Horowitz, with eighteen.

HARD to believe but true: It is now ten years since punk rock, in the guise of the infamous Sex Pistols, first made its spike-haired, safety-pinned assault on the sensibilities of anguished parents around the world. In recognition of this remarkable anniversary, we’d like to point out that ex-head-Pistol, John Lydon, aka Johnny Rotten, has a brand-new Elektra album titled “Album” (the cassette is titled “Cassette”).

Lydon and the other surviving band members have just been awarded close to £1 million in back royalties, plus the rights to their film Great Rock and Roll Swindle, which means an American video release may at last be in the cards. Watch, too, for Embassy’s forthcoming feature Sid and Nancy, a bio-pic of the doomed romance between the late Pistols bassist Sid Vicious and the equally late so-

by Christie Barter & Steve Simels

THE most star-studded rock affair in recent memory was the first awards ceremony of the Rock and Roll Hall of Fame. The institution’s future location may be Cleveland, Ohio, but since an official home had not been chosen in time for the awards, the ceremonies were held at the Waldorf-Astoria Hotel in New York.

Among the inductees was Chuck Berry, whose award was presented by Rolling Stone Keith Richards (appropriate, since Keith’s been playing Chuck’s licks almost as long as Chuck has). Other
beneficiary of royalties from sales of the album "Alfred Brendel Live" is Amnesty International, the organization that monitors human rights around the world. Included in the set are works by Franz Liszt, Alban Berg, and Ferruccio Busoni.

ONE of the best things about country-rock favorites Lone Justice is lead singer Maria McKee. The good news is that you can soon see more of her, and in the privacy of your own home, courtesy of Delilah Films, the same wonderful archivists who earlier brought us "The Compleat Beatles" and "Girl Groups."

McKee will be interviewed at some length in Delilah's forthcoming "Women in Rock," due later this year from MCA, and will be glimpsed performing as well. Also included in the program are such notables as ex-Go-Go Jane Wiedlin, new mom Lisa Marie Presley, and (the pride of Bergenfield, New Jersey) Bruce Springsteen.

A generous gift toward defraying the costs of Carnegie's face-lift has been made by the artist Jim Dine, famous for his drawings and paintings of big Valentine-like hearts, and his exclusive American representatives, the Pace Gallery and Pace Editions in New York. Their gift was a specially created Carnegie Hall Heart, a five-color lithograph in a signed and numbered edition of 150. A good number of Dine's Carnegie Hall Hearts were presented, appropriately, as part of a Valentine's Day benefit package requiring contributions of $1,000 per couple, but some remain. Potential benefactors should write the Carnegie Hall Society at 881 Seventh Avenue, New York, NY 10019, or phone (212) 903-9650.

Carnegie Hall, a symbol of achievement and excellence in American musical life, is currently undergoing a $50-million renovation and restoration. Beginning May 18, the hall will close its doors for seven months in order to finish a major portion of the basic construction work involved.

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This year's album of historic recordings produced by the New York Philharmonic for the WQXR Radiothon features composers conducting works by other composers. Aaron Copland, for instance, conducts Dvořák's Violin Concerto with John Corigliano as the soloist, and Leonard Bernstein conducts Copland's Lincoln Portrait with William Warfield as the narrator. The eight works contained in the album were chosen from broadcast performances given between 1940 and 1976 and have never been released before.

The two-record or two-cassette package, "Composers Conduct," can be ordered by sending a check for $20, payable to the New York Philharmonic, directly to the Philharmonic at Avery Fisher Hall, Lincoln Center, Broadway at 65th Street, New York, NY 10023.

Best known in the United States for his recordings, Austrian cellist Heinrich Schiff is now performing more frequently in this country with major orchestras. This month he is introducing a 1953 work by Hans Werner Henze titled Ode to the Westwind in performances with the Cleveland Orchestra in Cleveland and in New York City.

Toward the end of last year Schiff won three major record prizes in Europe—Belgium's Caecilia Prize for Bach's Suites for Unaccompanied Cello (EMI), Holland's Edition Prize for the Shostakovich Cello Sonata (also EMI), and France's Grand Prix du Disque for the two Shostakovich Cello Concertos (Philipps). The first two are not yet available in the United States, but we reviewed the third very favorably back in January.

Philips recently released on Compact Disc a coupling of Schiff's performances of the cello concertos by Dvořák and Elgar. The new CD is reviewed on page 101.
by Ralph Hodges

A Micro-Ounce of Prevention

You can still get an argument over the benefits of expensive audiophile speaker and patch cables no matter where you turn, but on the subject of audio mating connectors—plugs, jacks, and the rest—the opinion has always been unanimous: the best are poor and the worst are unspeakable. Furthermore, the situation deteriorates where the need is most critical. You can lavish solid-gold BNC-type hardware between your preamplifier and power amplifier and exult in contact security forever, but the volt or so of signal passing between those two components would survive much humbler connectors pretty well. At your phone cartridge, however, where fractions of millivolts must make a difficult passage, at best you’re given bitsy clips of brass and wires with the gauge—but nowhere near the tensile strength—of dental floss.

It has always been good practice to spend some maintenance time on an audio system’s connectors at least once a year, lightening them as needed, polishing them where pitting, corrosion, and tarnish appear, and perhaps zapping them with TV-tuner contact cleaner. Even the abrasive action of repeatedly making and breaking connections helps—much to the benefit of those high-enders who swap their cartridges and preamps around twice a month. But there’s no sidestepping the fact that once the maintenance has been performed, it’s all downhill until the next time, with noise and distortion from low-level signal intermittency, blockage, and rectification effects growing worse daily.

Yet maybe, just maybe, some succor has arrived. Many months ago I was handed a small vial—well, a pseudo-hypodermic syringe—of a product called Tweek and was told to use it and have misgivings no more. According to the accompanying literature, the stuff within, styled a “contact enhancer,” was a nonconductive fluid that, applied in a thin coating, fills the microscopic gaps in a metal-to-metal contact and effectively multiplies the apparent contact area. Rubber cement would do precisely the same, I thought, so I initially regarded Tweek and its cutey name with the same affection as I do record-treatment solutions that promise to banish scratches (as if they were not as much a part of the signal as the music).

My attitude changed dramatically when I was faced recently with the overhaul of a neighbor’s mid-fi rack system that was so hopelessly “misconnected” anything was worth trying. I unlimbered the Tweek syringe, and the results went beyond pleasing—they were startling. Signal increases of 5 or 6 dB and more began turning up very suddenly, much to the risk of the test meter and the loudspeakers. Connections that had balked the ministrations of emery boards and boiling sulfuric acid (well, almost) became clean sounding with the application of a microdrop. It was almost as if Tweek had gained, and although the treatment didn’t last beyond that evening—vibrations from moving the equipment back into place probably jarred the connections loose again—the listening was well-nigh impossibly good for the next few hours, all things considered.

According to Mike Wright, principal of the Dayton-Wright Group, which is responsible for the formulation but not its marketing for audio applications, Tweek is not a nonconductor at all but rather a block polymer that behaves as an amorphous fluid semiconductor. In other words, it “turns on” (becomes conductive) with the application of a threshold voltage, and it can be adjusted chemically to hit some industrially useful properties.

In audiophile and similar applications, the material is claimed to increase electrical contact area by factors of twenty-five or more and to exert a detergent action that lifts up films of surface contamination and prevents them from reforming, yet it remains stable and inert. One critical Tweek treatment is reportedly still going strong after ten years without renewal; the substance itself took about that long to refine after its rather accidental discovery.

Disadvantages of using Tweek? So far I’ve discovered or heard of none, but Wright admits that its efficacy can be impaired if mechanical contact of connectors is not secure or if the connectors are of metals with highly dissimilar galvanic properties (gold with aluminum is cited as a particularly bad pairing). But these conditions would be at least equally problematic without Tweek treatment.

One frustration is that the substance’s benefits are difficult to measure. I recently refurbished a transistorized multimeter with the stuff—switches, potentiometers, IC sockets, probe sockets, and everything else I could get at—and observed not one significant drop in the instrument’s internal resistance throughout the process. The performance difference was a matter of consistency: time and again, after the treatment, the meter needle sought the correct value without twitches, dithers, coaxing, or afterthoughts, and it remained there.

Tweek is marketed to the audio market by Sumiko. A bottle with applicator brush costs $15 and holds 7 cc (using too much causes no harm, but a very little goes a long way). If you don’t like it, isopropyl alcohol takes it off. Obviously, you can’t expect a 5- or 6-dB improvement in any well-maintained high-end system, but using Tweek can’t hurt, and I’m now convinced that this unusual substance can make a worthwhile difference.
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